HEALTH INFRASTRUCTURE

Review of Environmental Factors – Glen Innes Ambulance Station

Prepared by GeoLINK

23/09/2022

Version 2

Version Control

Version	Date	Author	Description	Reviewed by	Approved by
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Declaration

This Review of Environmental Factors (REF) has been prepared for NSW Health Infrastructure (HI) and assesses the potential environmental impacts which could arise from the proposed ambulance station development at 85 Taylor Street, Glen Innes.

This REF has been prepared in accordance with the relevant provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) and *State Environmental Planning Policy (Transport & Infrastructure) 2021* (TI SEPP).

This REF provides a true and fair review of the activity in relation to its likely impact on the environment. It addresses to the fullest extent possible, all the factors listed in Section 171 of the EP&A Regulation and the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC ACT).

On the basis of the information presented in this REF it is concluded that by adopting the recommended mitigation measures it is unlikely there would be any significant environmental impacts associated with the activity. Consequently, an Environmental Impact Statement (EIS) is not required.

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A	Architectural Plans	DJRD Architects	18 May 2022
B	Civil Works Package	Meinhardt Bonacci	May 2022
C	BCA Assessment Report	BCA Logic	23 May 2022
D	Access Assessment Report	BCA Access	23 May 2022
E	Return Brief	DJRD Architects	13 January 2022
F	PSI & DSI Site Investigation	JK Environments	25 May 2022

G	Heritage Impact Statement	Wehir Phillips Heritage & Planning	May 2022
H	Clinical & Related Waste Management for Health Services	NSW Government	December 2020
I	Geotechnical Investigation	JK Geotechnics	25 May 2022
J	Civil Engineering Design Report	Meinhardt Bonacci	May 2022
K	AHIMS Web Service Search NSW Heritage Search EPBC Act Protected Matters Report	NSW Government NSW Government Australian Government	23 June 2022 01 June 2022 28 June 2022
L	Arboricultural Impact Assessment	Civica	02 May 2022
M	Landscaping Plans	Site Image Landscape Architects	Job. SS22-4920
N	Acoustic Report	JHA Services	01 June 2022
O	Due Diligence Report: Electrical & Hydraulic Services	JHA Services	22 March 2022
P	Mitigation Measures	GeoLINK	01 July 2022
Q	Planning Certificate 10.7(2) 409/21-22 Planning Certificate 10.7(5) 396/21-22	Glen Innes Severn Council Glen Innes Severn Council	05 May 2022 28 April 2022
R	Plans: Electrical, Hydraulic & Mechanical Services	DJRD architects	April 2022
S	Traffic Impact Assessment	RoadNet Engineering Pty Ltd	12 July 2022
T	Notification letters	Health Infrastructure	08 June 2022
U	Design Development Report	Health Infrastructure	08 June 2022

Abbreviations

Abbreviation	Description
AEC	Area of Environmental Concern
AHD	Australian Height Datum
AHIP	Aboriginal Heritage Impact Permit
AHIMs	Aboriginal Heritage Information Management System BC Regulation
AMG	Australian Map Grid
BC Act 2016	Biodiversity Conservation Act 2016
BC Act 2017	Biodiversity Conservation Act 2017
BC Regulation	Biodiversity Conservation Regulation 2017
BAM	Biodiversity Assessment Method
CA	Certifying Authority
CE	Chief Executive
CM Act	Coastal Management Act 2016
CMP	Construction Management Plan
CWC	Connecting with Country
CRA	Conservation Risk Assessment
DPC	Department of Premier and Cabinet
DPE	Department of Planning and Environment

Abbreviation	Description
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EES	Environment, Energy and Science
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPBC Act (Cwth)	Environment Protection and Biodiversity Conservation Act 1999
EPI	Environmental Planning Instrument
EPL	Environment Protection License
FM Act	Fisheries Management Act 1994
Ha	Hectares
HHIMS	Historic Heritage Information Management System
HI	Health Infrastructure
LEP	Local Environmental Plan
LGA	Local Government Area
MPS	Multipurpose Service
MNES	Matters of National Environmental Significance
NPW Act	National Parks and Wildlife Act 1974
NPW Regulation	National Parks and Wildlife Regulation 2009
NPWS	National Parks and Wildlife Service (part of EES)
NT Act (Cth)	Commonwealth Native Title Act 1993
OEH	(Former) Office of Environment and Heritage
PCMP	Preliminary Construction Management Plan
Planning Systems SEPP	State Environmental Planning Policy (Planning Systems) 2021
POEO Act	Protection of the Environment Operations Act 1997
Proponent	NSW Health Infrastructure
REF	Review of Environmental Factors
RF Act	Rural Fires Act 1997
RFS	Rural Fire Service
Resilience and Hazards SEPP	State Environmental Planning Policy (Resilience and Hazards) 2021
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
TISEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021
WM Act	Water Management Act 2000

Executive Summary

- The Proposal

Health Infrastructure (HI) and Ambulance Service of NSW (NSW Ambulance) proposes to construct a new ambulance station at the Glen Innes District Hospital, located at 85 Taylor Street, Glen Innes. Fifteen trees will require removal to enable construction of the development.

- Need for the Proposal

HI and NSW Ambulance are improving infrastructure across regional and rural areas. The Rural Ambulance Infrastructure Reconfiguration (RAIR) Program for NSW Ambulance was initiated to provide high quality, improved services for rural NSW that protect and maintain the health of the community, and to do so with timely access and effective infrastructure. NSW Government's initial $132.1 million RAIR Program, was supplemented in November 2020 when the NSW Budget for 2020-2021 announced $100 million to accelerate the implementation of Stage 2 of the Rural Ambulance Infrastructure Reconfiguration, improving access to emergency health services for communities across regional NSW and improve workplace conditions for a significant proportion of NSW Ambulance employees. The RAIR 2 Program includes various locations across the state that will benefit from an upgraded, rebuilt or entirely new ambulance station. The proposed new ambulance station at Glen Innes is part of this initiative.

- Proposal Objectives

The primary objective of the Proposal is to provide improved emergency health services for regional and rural NSW. Secondary objectives for the development of the site include:

- Minimising visual, noise and vibration impacts on adjoining properties;
- Minimising traffic impacts;
- Minimising impacts on heritage items;
- Minimising soil and stormwater impacts; and
- Maintaining adequate services.

- Options Considered

The preferred option is for the provision of the new ambulance station at the Glen Innes District Hospital. The development will provide contemporary facilities and equipment to support the delivery of emergency health services to the community and the location at the Glen Innes District Hospital improves emergency delivery.

The only other option is to continue using the existing Glen Innes Ambulance Station at 106 Bourke Street, Glen Innes which would not meet the ongoing requirements of NSW Ambulance.

- Site Details

The proposed Activity is located on land described as Lot 2 DP1208729 No. 85 Taylor Street, Glen Innes.

- Planning Approval Pathway

Section 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) states that if an environmental planning instrument (EPI) provides that development may be carried out without the need for development consent, a person may carry the development out, in accordance with the EPI, on land to which the provision applies. However, the environmental assessment of the development is required under Part 5 of the Act.

State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) aims to facilitate the effective delivery of infrastructure across the State. Division 10 of TISEPP outlines the approval requirements for health service facilities.

Section 2.61(1) of TISEPP enables development for the purpose of patient transport facilities, including ambulance facilities, to be carried out by or on behalf of a public authority, without consent, on any land if the development is within the boundaries of an existing health services facility. Pursuant to Section 2.61(2) the ambulance station will not exceed 15 m in height or be located closer than 5 m to any property boundary.

The project, however, becomes an 'activity' for the purposes of Part 5 of EP&A Act and is subject to an environmental assessment (Review of Environmental Factors). The development is considered an 'activity' in accordance with Clause 5.1 of the *EP&A Act* because the development involves erection of a building and carrying out of work by HI and NSW Ambulance (public authority).

- Statutory Consultation

Pursuant to Section 2.62(2) of TISEPP the proponent of the development must give:

- written notice of the intention to carry out the development to the council for the area in which the land is located (unless the proponent is that council) and to the occupiers of adjoining land; and
- take into consideration any response to the notice that is received within 21 days after the notice is given.

The proposed development site is located on land upon which an item of local heritage significance is located and therefore notification to the council is also required pursuant to Section 2.11 of TISEPP. Written notice of the intention to carry out the development is required, and HI/ NSW Ambulance must take into consideration any response to the notice that is received within 21 days after the notice is given.

- Environmental Impacts

This REF provides an assessment of the proposed new ambulance station. It considers to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the proposed development as is required under the EP&A Act. The REF also sets out the commitments made by HI to manage and minimise potential impacts arising from the development. The REF finds an Environmental Impact Statement (EIS) is not required and this REF is an adequate level of impact assessment.

The proposed ambulance station will predominantly result in environmental impacts that are either negligible or low. The most notable potential environmental impact relates to short-term noise impacts associated with the proposal construction, stormwater management and heritage implications.

The activity will provide improved emergency health services for the region. In effect the Proposal will be perceived positively by the local community and result in a long-term positive impact on health service delivery within the community.

- Justification and Conclusion

Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed development, it is determined that:

- The extent and nature of potential impacts will not have significant adverse effects on the locality, community and the environment.
- Potential impacts can be appropriately mitigated or managed to ensure that there is minimal effect on the locality and community.
- From an analysis of the environmental impacts associated with the proposed development activity, it has been determined that preparation of an EIS is not required.
- The proposed development will not have any effect on matters of national significance and approval of the activity under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* is not required.
- There are no separate approvals, authorisations or notifications required in relation to the proposed development activity prior to determination under Part 5 of the EP&A Act or under any other Acts.
- It is recommended that HI approve the proposed activity in accordance with Part 5 of the EP&A Act and subject to adoption and implementation of matters outlined in Section 6.

1. Introduction

NSW Health Infrastructure (HI) propose to construct a new ambulance station (the proposal) at the Glen Innes District Hospital, 85 Taylor Street, Glen Innes (the site) as part of their delivery of infrastructure solutions and services to support the healthcare needs of the NSW communities.

This Review of Environmental Factors (REF) has been prepared by GeoLINK on behalf of HI to determine the environmental impacts of the proposed ambulance station at 85 Taylor Street, Glen Innes. For the purposes of these works, HI is the proponent and the determining authority under Part 5 of the EP&A Act.

The purpose of the REF is to describe the proposal, to document the likely impacts of the proposal on the environment and to detail protective measures to be implemented to mitigate impacts.

The description of the proposed works and associated environmental impacts have been undertaken in the context of Section 171(2) of the EP&A Regulation 2021 and the Australian Government's Environment Protection and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The assessment contained within the REF has been prepared having regard to:

- whether the proposed activity is likely to have a significant impact on the environment and therefore the necessity for an EIS to be prepared and approval to be sought from the Minister for Planning and Homes under Part 5.1 of the EP&A Act; and
- the potential for the proposal to significantly impact *Matters of National Environmental Significance* (MNES) on Commonwealth land and the need to make a referral to the Australian Government Department of Environment and Energy for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.

The REF helps to fulfil the requirements of section 5.5 of the EP&A Act, which requires that HI examine, and take into account to the fullest extent possible, all matters affecting, or likely to affect, the environment by reason of the proposed activity.

1.1 Proposal Need and Alternatives

The existing ambulance station was constructed nearly 80 years ago and no longer meets current requirements for ambulance stations. Construction of the new ambulance station at the Glen Innes District Hospital will centralise health services and provide contemporary facilities and equipment to support the delivery of emergency health services to the community both now and into the future.

Included amongst the alternatives considered was the continued use of the existing Ambulance Station at 106 Bourke Street, which would not meet the ongoing requirements of NSW Ambulance. Also considered was refurbishment of the existing station which would be cost prohibitive and restricted by site characteristics.

2. Site Analysis and Description

2.1 The Site and Locality

Glen Innes is situated on the Northern Tablelands in the New England region of New South Wales, approximately 100 km north of Armidale, 150 km west of Grafton and 600 km north of Sydney. Glen Innes is within the Glen Innes Severn Local Government Area (LGA). The Traditional land-owners for the Glen Innes region are the Ngoorabul/ Ngarabal people. The Local Aboriginal Land Council area is Glen Innes Local Aboriginal Land Council.

This site is located within the grounds of the Glen Innes District Hospital Campus at 85 Taylor Street, Glen Innes. The site is described in real property terms as Lot 2 DP1208729. Lot 2 has an area of approximately 3 ha in area. The site area is 3384.15 m^2. NSW Health is the landowner, and the Glen Innes District Hospital currently operates on the site.

The development site is approximately 1.5 km north-west of the Glen Innes Central Business District (CBD). The ambulance station will be located in the north-eastern corner of the site, with dual access off Taylor Street and West Avenue. The new station will front Taylor Street.

The site is within an area of manicured lawn with scattered trees throughout, which are mostly introduced species and typical of the New England area. A low brick boundary wall runs along the northern property. The site falls across the site to the north-east from a height of around 1,065 m AHD in the south-western corner, down to a low of around 1,055 m AHD (8.2%) in the north-eastern corner, which is the location of the proposed ambulance station.

The surrounding land uses are primarily general residential and health services, with a strip of parkland and recreational areas to the east (swimming pool complex, tennis courts, netball courts, playing fields, parkland) and a museum on Lot 1 to the south. Streets are wide and carry traffic in both directions and feature street parking, kerb and gutter, nature strips and mature street trees. Rocky Ponds Creek is approximately 130 m east of the development site.

Current and historic buildings associated with the hospital campus are located on both the subject lot, Lot 2 DP1208729, and the adjoining Lot 1 DP1208729 in the south-east corner. Together Lot 1 and 2 form a square block which is enclosed by Taylor Street, Ferguson Street, West Avenue, and Macquarie Street. Apart from the north-eastern corner of the site, the entire site has been predominantly built up with hospital related buildings, including the original hospital which has been converted to a museum.

The site is heritage listed as a place of Local significance under the Glen Innes LEP 2012 as the Land of the Beardies Museum (former hospital complex). The majority of buildings included in this listing are located on the adjoining Lot 1 DP1208729, however there appears to be some buildings on Lot 2 that were either part of the older hospital and/or form part of the Museum. The Museum is also the premises of the Glen Innes and District Historical Society. There are a number of other heritage listed items (mostly dwellings) within the vicinity of the site.

Existing utilities including stormwater, electrical (overhead powerlines), water, and telecommunication lines located within and around the site boundary. An existing stormwater pipe is located adjacent and within the proposed site location . A sewer line is also located adjacent to the proposed development.

The site is zoned R1 General Residential under the Glen Innes Severn Local Environmental Plan 2012 (LEP).

The site is not identified as bushfire or flood prone. There are no other environmental constraints, such as acid sulfate soils, drinking water catchment or biodiversity.

The existing ambulance station is currently located at 106 Bourke Street, approximately 520 m south of the proposed site.

A Site Locality Plan is provided at **Illustration 2.1** and a Site Context Plan is provided at **Illustration 2.2**.

2.2 Existing Development

The Glen Innes District Hospital currently operates on the site, Lot 2 DP1208729. The hospital is a 28-bed facility that provides a range of services including acute medical and surgical, maternity, emergency and subacute services,

ambulatory care, allied and oral health, mental health, child and family services. The hospital contains a mix of single storey and two storey buildings. Landscaping and larger mature trees occur throughout the site.

The closest building is the Main Hospital building, which is a c.1956 freestanding, two story Post-WWII Period hospital building, fronting Taylor Street. There is a driveway accessible via Taylor Street and a connecting carpark located directly in front of the hospital.

The Glen Innes and District Historical Society operates from the historic hospital buildings (Land of the Beardies Museum) located to the south of the site on Lot 1 DP1208729, which is a Crown Reserve.

A utility review process revealed that currently no major underground electrical assets exist on site that require relocation or re-diversion, as confirmed by survey. Assessment of Essential Energy GIS information revealed low voltage (LV) overhead power lines along the north side of Taylor Street and on the eastern side of West Avenue, which could be used as a connection point.

There are no existing electrical services telecommunications services within the proposed site boundary. Therefore, no services will need to be decommissioned and/or diverted.

DBYD revealed NBN & Telstra network infrastructure along the northern side of Taylor Street via underground conduits and pits.

The site is surrounded by two potable water mains and two sewer mains located along Taylor Street and West Avenue. Information on the size and location of the sewer and water main were obtained from Council, indicating authority assets are not impacted upon by the proposed Station and subdivision.

There are three (3) fire hydrants; one 15 m from the property boundary in Taylor Street, another 40m away in Taylor Street and a third in West Avenue 10 m from the property boundary.

There is no natural gas service required for the proposed development.

2.3 Site Considerations and Constraints

Section 10.7 Planning Certificate No's 396/21-22 and 409/21-22 dated 28 April and 5 May 2022 identify that the site is located within the R1 General Residential zone under Glen Innes Severn Council Local Environmental Plan 2012, and are provided at **Appendix Q**.

Table 1: Section 10.7 Planning Constraints

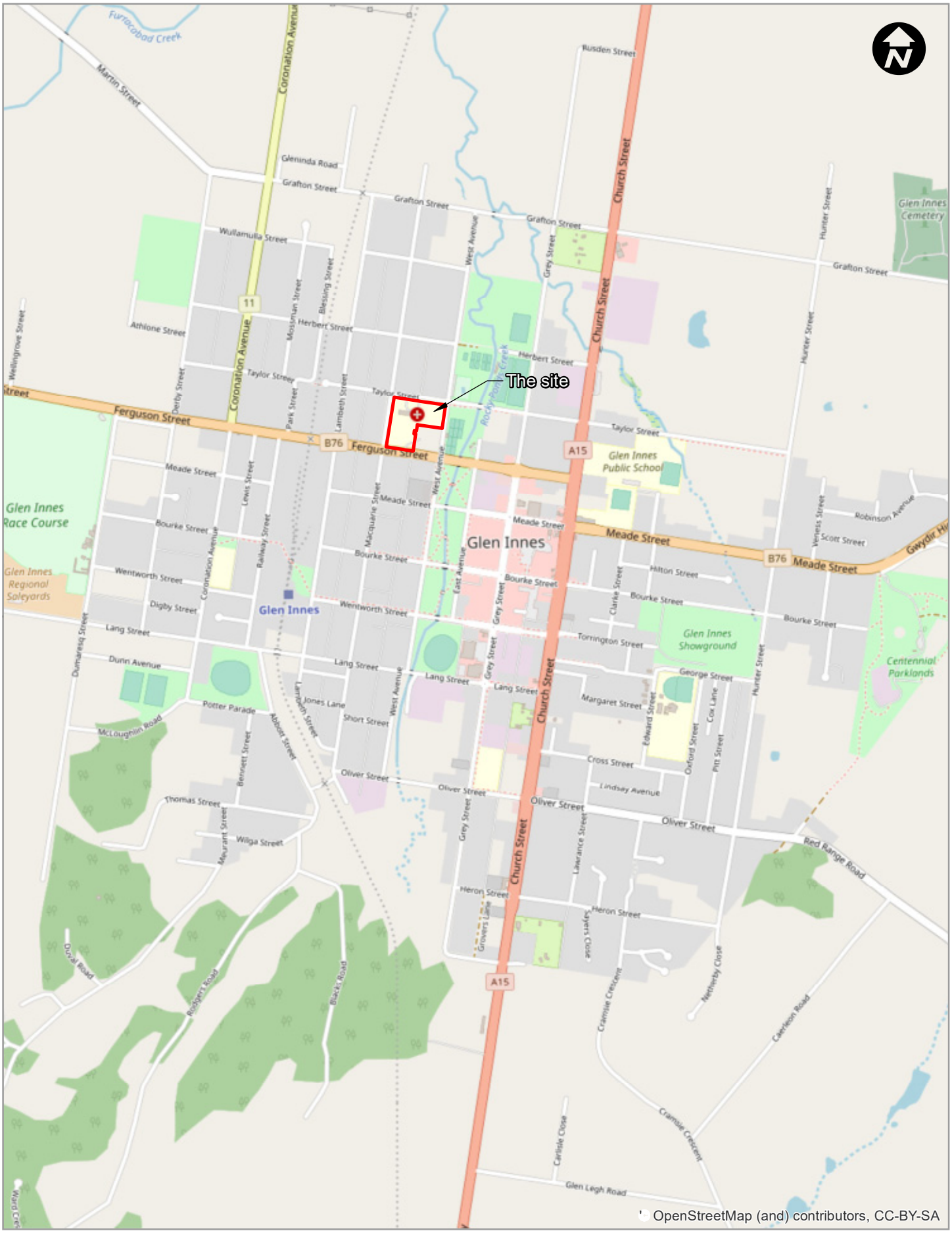
Affectation	Yes	No
Critical habitat		✓
Conservation area		✓
Item of environmental heritage	✓	
Affected by section 38 or 39 of the Coastal Management Act 2016 (CM Act)		✓
Proclaimed to be in a mine subsidence district		✓
Affected by a road widening or road realignment		✓
Affected by a planning agreement		✓
Affected by a policy that restricts development of land due to the likelihood of landslip		✓
Affected by bushfire, tidal inundation, subsidence, acid sulphate or any other risk		✓
Affected by any acquisition of land provision		✓
Biodiversity certified land or subject to any bio-banking agreement or property vegetation plan		✓
Significantly contaminated		✓

Affectation	Yes	No
Subject to flood related development controls		✓
List other relevant constraints		n/a

2.4 Surrounding Development

The site is in a residential area, mostly zoned R1 General Residential. Land uses in the vicinity of the site are mostly residential along Taylor, Macquarie, and Ferguson Streets to the north, south and west. Land along the eastern side of West Avenue comprises recreational parkland (Coronation Park) and sporting fields zoned RE1 Public Recreation and include netball and tennis courts, aquatic centre and playing fields.

An RFBI Glen Innes Masonic Village is located approximately 300 m west of the development site along Taylor Street and a number of commercial/industrial properties are located south-west of the site along Ferguson Street (Gwydir Highway) zoned IN1 General Industrial. The Glen Innes CBD is located approximately 1.5 km south-east of the site.



0 400 Metres

Site Locality Plan - Illustration 2.1

Review of Environmental Factors - Glen Innes Ambulance Station
3730-1342

Information shown is for illustrative purposes only
Drawn by: AB Checked by: RE Reviewed by: ERA
Source of base data: Open Street Map
Date: 03/06/2022

GDA 1994 MGA Zone 56

LEGEND

- Site boundary
- Cadastre
- Development area
- Contour at 2m intervals
- Proposed site plan

0 30 Metres

Site Plan - Illustration 2.2

GeoLINK environmental management and design

Review of Environmental Factors - Glen Innes Ambulance Station
3730-1343

Information shown is for illustrative purposes only
Drawn by: AB Checked by: RE Reviewed by: ERA
Source of base data: Google Map
Date: 03/06/2022

3. Proposed Activity

3.1 Proposal Overview

The proposed development relates to the construction of a new ambulance station at the Glen Innes District Hospital to improve the delivery of emergency services within the region.

The new single storey ambulance station will include:

- Operations rooms including amenities, administration and office space, outdoor areas, lockers, common room, medical store and a gymnasium.
- Plant room providing six (6) ambulance parking bays, wash bay, oil separation, delivery area and waste storage area.
- External hardstand areas including walkways, six (6) light vehicle parking bays, one (1) relief parking space, one (1) PWD parking space, one (1) DOM covered parking bay, one (1) service bay.
- Access via Taylor Street and West Avenue.

The Activity involves tree removal and excavation works, and landscaping at the completion of construction works

A set of Architectural Plans is provided as **Appendix A**. A Civil Works Package is provided as **Appendix B**.

3.1.1 Design Approach

Placemaking and Design

The primary focus of the NSW Government's RAIR Program is to deliver improved access to emergency health services to communities across regional NSW in addition to providing improved workplace conditions for NSW Ambulance employee. It also provides opportunities for the Government to partake in "place making", to *"deliver a multi-faceted approach to the planning, design and management of public spaces".*

In 2017 the NSW Government Architected produced *Better Placed* (GANSW, May 2017), which is *"an integrated design policy for the built environment of New South Wales".* Better Placed provides an effective Design Guide which, *"is about enhancing the design quality of our built environment, raising expectations and raising standards, about working better and creating better environments".* HI has effectively adopted the principles outlined in Better Placed to provide facilities that not only serve their local communities but capitalise on the available opportunities to provide integrated places that link communities, functions and activities within a cohesive place.

The design of the new RAIR projects, including the Glen Innes Station, present a consistent and recognisable identity that also responds to the local environment and contributes to the public realm. To achieve this, the RAIR program has involved direct consultation with local communities and services providers and utilised the services of a range of development and building professionals. This is demonstrated throughout this REF which assesses and presents these results in its findings.

There are seven objectives identified in *Better Placed* that define the key considerations that are necessary in the design of the built environment. **Table 2** below provides an assessment of how these objectives are demonstrated in the overall design of the proposed Glen Innes Ambulance station.

Table 2: Better Placed Assessment

Design Objectives	
Objective 1: Better fit	The development site is in an area of mixed uses; health services, residential and recreational. The grounds of the Glen Innes Hospital feature buildings from various design eras, including buildings of local heritage significance. The proposal features a contemporary design which is recognisable and consistent with new ambulance buildings. However, the low-rise, simplified design, neutral colour palette and location in the north-eastern corner of the hospital site ensures that the new building will be compatible within the mixed uses of the surrounding area and with the scale of the local built form.

Design Objectives	
Objective 2: Better performance	The RAIR programme is targeting compliance with the Design Guidance Note No. 058 rating tool for new rural ambulance stations. To achieve this a pathway has been developed which identifies which credits will be targeted to meet this rating (ref. Design for a better future, Rural Ambulance Station Facilities ESD Design Guidelines, Sept 2021). The implementation of this system will create buildings that feature reduced energy and water demand, be adaptable over time, provide comfortable, healthy working environments, maintain value into the future and reduce overall environmental impacts over time.
Objective 3: Better for community	The new Ambulance station will improve local emergency health services and workplace conditions for employees. The site will be utilised by NSW Ambulance and will generally not be available to the general public. As a place for employees, the accessibility of the building has been assessed against the applicable requirements and found to be comply or capable of complying. The site has ready access to public transport, the town centre and residential areas and will centralise health services within the town. The operation of the proposed development will not jeopardise traffic safety and will contribute to improved public safety in its location. The building's design and site selection demonstrate numerous examples where the implementation of Crime Prevention through Environmental Design principles have been considered and incorporated.
Objective 4: Better for people	The proposed Station includes facilities and amenities to maintain the health of and accommodate the needs of NSW Ambulance employees. The Rural Ambulance Station Facilities ESD Design Guidelines referenced above includes design responses to maintain a safe and comfortable work environment (i.e. indoor air quality, acoustic and visual comfort, material selection, thermal comfort, microbial control and fire safety). External issues are also addressed (i.e. light pollution, night sky pollution). The Development Report addresses due diligence and safety in design considerations appropriate to Ambulance Stations. These factors result in a well-designed building that is suitable for its purpose and its people.
Objective 5: Better working	The proposed development is a 'fit -for-purpose', functional building which is designed for the specific purpose of providing improved and contemporary health services to the community, both now and into the future. This has been achieved through the extensive consultation process and involvement of a wide range of professionals involved in the development and building industry.
Objective 6: Better value	The RAIR program represents the investment by HI and NSW Ambulance into providing improved facilities and services for regional communities and its people. As a result, the proposed new Station will meet contemporary standards, deliver good design outcomes and high-quality construction standards, and will deliver social, environmental and economic benefits to the proponents and the community.
Objective 7: Better look and feel	The design of the proposed Ambulance station will utilise high quality materials and provide an aesthetically pleasing, contemporary building which will contribute in a positive fashion to the public realm.

A Design Development Report prepared by the RAIR Program Architects, DJRD Architects is attached as **Appendix U**.

Sustainability

As noted above, the proposed Glen Innes ambulance station has been designed, and will be constructed to achieve equivalence to the Health Infrastructure Design Guidance Note (DGN) no. 058, which directly corresponds to Green Star sustainability rating of 4-stars. A pathway has been developed to identify the credits that will be targeted to achieve DGN 058 equivalence as a minimum of 45 points and targeting 50 points. The Contractor for the project will be provided with a design that is able to achieve the required credits and it will be a condition of Contract that they

engage a qualified sustainability professional to assist them in ensuring that the completed station meets or exceeds the minimum of 45 credit points.

3.1.2 Proposed Activity

Site Acquisition and Exempt Subdivision

The proposed new ambulance station is to be located on land currently owned by NSW Health, described as Lot 2 DP1208729.

It is proposed to excise a portion of the site for the ambulance station development, in accordance with the exempt development provisions in the TISEPP. The current size of Lot 2 DP1208729 is approximately 3.85 ha (38,500 m^2). This will be reduced to approximately 3.58 ha as a result of the subdivision. Whilst subdivision does not form part of the Activity as it is exempt development, for completeness a review of the development against the relevant requirements is undertaken in **Section 4.1** of this report.

Built Form

The building has been developed in conjunction with other new RAIR projects. Its overall form, material selection and aesthetics will be similar to the other RAIR stations, providing a recognisable and consistent approach for new RAIR buildings. This is considered important to reflect the cohesive nature of the ambulance service providing staff with workplaces that do not differ significantly from one RAIR station to another. Selection of the colour of materials will be used appropriately with consideration given to the site context.

The building height and form has been simplified to maintain an efficient building shape. The roof is a skillion roof and kept to a low pitch of approximately 3.5 degrees to further refine the building form. In maintaining as small and simple a form as possible, any overshadowing or overpowering of adjacent buildings has been minimised. Considering the interior minimum height requirements and the internal clear spans of the office and plant areas, an efficient steel portal frame has been incorporated as the primary structure for the building envelope. Internal walls are non-load bearing to allow for future flexibility and internal rearrangement of spaces. The ambulance station's common room, meals room and outdoor area have been located to the west of the plant room and have been provided with windows that offer natural light and outlook.

Roadworks and Parking

Onsite parking for the new Station is proposed as follows:

- six (6) ambulance parking bays
- six (6) staff car parking spaces
- one (1) wash bay
- one (1) accessible park
- one (1) Directorate of Management (DOM) covered parking bay
- one (1) relief bay

The height of the proposed ambulance station will be 6 m. The gross floor area will be 776.75 m^2.

Two (2) new driveways will be constructed for the proposed station, one (1) on Taylor Street and one (1) on West Avenue.

The Activity includes storm water infrastructure, essential services connections, solar power units, establishing and decommissioning of a temporary site compound, erosion and sediment controls, internal traffic/ pedestrian management and site stabilisation at the completion of works.

Tree Removal and Landscaping

Twenty-three (23) trees, mainly of exotic species, are located within the grounds of the Glen Innes Hospital. Fifteen (15) trees are recommended for removal to allow the proposed development. No trees have been identified as being of national, state or local heritage significance and all are generally species that are common to the local area

and have limited botanical significance. Eight (8) trees are recommended for retention. To offset their removal, landscaping of the site, including 15 replacement trees plus a mix of shrubs, grasses and groundcovers, will be implemented as part of the overall project.

Palisade fencing will be installed delineating the ambulance station site. Some excavation will be necessary to provide a level site and retaining walls installed around the external parking areas.

Services

EXISTING

A copy of an Electrical and Hydraulic Services Due Diligence Report prepared by JHA Services is attached as **Appendix O**. Design drawings for the proposed Electrical, Hydraulic and Mechanical Services are attached as **Appendix R**.

Electrical Services: A utility review process revealed that currently no major underground electrical assets existing on site that require relocation or re-diversion. Essential Energy GIS information detailed the presence of low voltage (LV) overhead power lines along the north side of Taylor Street and on the eastern side of West Avenue, which could be used as a connection point. The final solution will be determined by the authority, however it is anticipated that supply to the Station will be via overhead LV power lines from the existing pole in the corner of Taylor Street and West Avenue, to a pole in the property boundary.

Telecommunication Services: Currently there are no existing telecommunications services within the proposed site. Therefore no services will need to be decommissioned and/or diverted. DBYD revealed NBN & Telstra network infrastructure along the northern side of Taylor Street via underground conduits and pits.

Water: The site is surrounded by two potable water mains; 100mm water mains are located along Taylor Street and West Avenue.

Sewer: There is a 150mm sewer main located in Taylor Street and a 225mm water main on West Avenue.

Fire Hydrants: There are 3 fire hydrants surrounding the site located on a 100mm water main; one 15 m from the property boundary in Taylor Street, another 40m away in Taylor Street and a third in West Avenue 10 m from the property boundary.

Information on the size and location of the sewer and water main obtained from Council indicates authority assets are not impacted by the proposed building or lot boundaries.

PROPOSED

Electrical Services: Based on the RAIR Glen Innes Test Fit, Preliminary Maximum Demand calculations of approximately 120 Amps 3 phase power supply connection is anticipated to provide power to the site (subject to further detailed Architectural layouts). An ASP Level 3 designer might need to be engaged to document any potential modifications to the Essential Energy network due to the estimated maximum demand to be above 63 Amps 3-phase.

Telecommunication Services: It is proposed to use the existing Telstra pit in the north-west corner of Taylor Street and West Avenue and extend a new NBN service to a new pit in front of the property boundary. This new pit will be used as a connection point to serve the site (subject to provider terms and conditions).

Water: It is proposed that a new 40 mm water connection with a 32 mm water meter and backflow prevention device in an assembly will be required in accordance with Council requirements to service the proposed Station to the 100 mm water main in West Avenue. Pressure and flow information has been obtained from Glen Innes Severn Council and is attached with **Appendix O**.

Hot water to supply the development is proposed to be via a centralised electric storage hot water plant via a flow and return system. The hydraulic plant shall be equal to Rheem 315L 4.8kW complete with a dual circulating pumpset.

Sewer & Trade Waste Drainage Services: It is proposed that the new Ambulance Station's sewer services will be connected to the sewer main in West Avenue and a sewer gravity line extended to the boundary, subject to Council requirements and final design process. Subject to approval by Council, trade waste discharge from the wash bay is proposed to be treated with a diaphragm pump and above ground oil separator unit prior to discharging to Council's sewer main, separating any oils, hydrocarbons or chemicals not deemed acceptable to discharge to sewer by Council's guidelines.

Fire Hydrant & Hose Reel Coverage: Based on a test fit the new building and plant zone is measured to be over 500m^2, requiring a hydrant flow rate of 20L/s to comply with AS2419. Based on preliminary coverage assessment and diagrams, it appears that fire hydrant coverage can be obtained from the street hydrant in West Avenue (n.b. to be confirmed as the layout is further developed, which may introduce a fire hydrant system on the project site). Currently a fire hydrant water storage tank and pressure boosting pump-set are to be confirmed subject to the sufficiency of the pressure and flow information obtained from Council to meet the fire hydrant system demands.

Stormwater: Stormwater drainage will utilise a combination of onsite bioretention and existing stormwater/kerb and gutter facilities in West Avenue, management of overland flow paths and stormwater quality management (refer **section 6.1.3**).

Ancillary Facilities

A temporary site compound and material stockpile areas would be established within the activity area. The appointed contractor will be required to undertake an initial site-specific safety check prior to site establishment. Site containment fencing will be erected to restrict public access to the works zone. The temporary fencing will be secured from any unauthorised access via padlock.

Prior to the commencement of work, contractor staff will be inducted on the works methodology, environmental issues and key mitigation relating to the works. The immediate neighbours will be given written notification of the works and anticipated works period.

Erosion and sediment controls would be designed and implemented prior to undertaking the activity. The controls would be maintained during the project and would not be removed until the site has been suitably stabilised.

Figure 1 Proposed Ambulance Station

Building Code of Australia

A BCA Assessment Report was prepared for the Proposal by BCA Logic and is attached as **Appendix C**. The building is required to be of Type C Construction under provisions of the Building Code of Australia (BCA). The ambulance station is classified under the BCA as:

- Class 3: Sleeping pods
- Class 5: Offices, amenities, meeting and communal ancillary areas
- Class 7a: Plant room used for the parking of the ambulances

The Report assessed the architectural design documentation against the applicable provisions of the Building Code of Australia, (BCA) and determined that the documentation either complies or is capable of complying with the relevant provisions of the BCA, for the purposes of a Review of Environmental Factors (REF).

Accessibility

BCA Access have prepared an Access Assessment Report for the proposed new Ambulance Facility (attached as **Appendix D**). The following areas of the building are required to be accessible:

- Class 3 Sleeping pods: An exemption under Clause D3.4 has been assumed, on the basis that the occupants of the sleeping pods will be operational ambulance employees. It is readily assumed that the operational ambulance workers will be able-bodied persons who will not require the room to have accessible features.
- Class 5 Offices, amenities, meeting and communal ancillary areas: To and within all areas normally used by the occupants.
- Class 7a Plant room used for the parking of the ambulances: There are no accessible carparking spaces in the plantroom, however there is an accessible sanitary compartment provided in the plant room and therefore an accessway shall be provided to this compartment. Furthermore, there is an accessible carparking space located in the external public parking area, therefore access from this space to the building must be provided.

The Access Assessment Report assessed the design documentation against the applicable provisions for Accessibility as outlined above and determined that the documentation complies or is capable of complying with those documents, for the purposes of a Review of Environmental Factors.

3.2 Proposal Need, Options and Alternatives

3.2.1 Strategic Justification

HI and NSW Ambulance are improving infrastructure across regional and rural areas as part of the Rural Ambulance Infrastructure Reconfiguration (RAIR) Program. The RAIR 2 Program includes various locations across the State that will benefit from an upgraded, rebuilt or entirely new ambulance station. The proposed new Ambulance Station at Glen Innes is part of this initiative.

3.2.2 Alternatives and Options

The existing Glen Innes Ambulance Station is nearly 80 years old and no longer meets industry standards. The construction of a new Ambulance Station in the location selected will:

- Provide modern facilities and improved service delivery to the community.
- Provide contemporary staff facilities which comply with modern standards.
- Provide increased onsite vehicle parking that will accommodate up to six emergency ambulance vehicles as well as onsite light vehicle parking (including a PWD parking space).
- Ensure that stormwater and trade waste discharge is appropriately managed and treated in accordance with relevant standards.

- Integrate with existing health services.
- Incorporate design measures to achieve ecologically sustainable development objectives.

An overview of the alternatives, and an identification of the preferred alternative, for the Proposal are provided within Table 4 below.

Table 3: Alternatives considered for the proposal

Alternative description	Advantages and disadvantages	Preferred alternative
Construct new Ambulance Station in grounds of Glen Innes District Hospital.	Advantages: • Provision of new station and contemporary facilities will improve emergency services coordination and delivery. • Availability of essential services. • Availability of suitable, unconstrained land. • Minimal impacts. • Proximity to hospital, town centre and major transport routes. Disadvantage: • Decrease in area of hospital grounds.	✓
Redevelopment of the existing Glen Innes Ambulance Station.	Disadvantages: • Cost prohibitive in terms of scale of work required to provide contemporary facilities and equipment. • Site constraints.	
Continue using Glen Innes Ambulance Station in its current form.	Disadvantages: • Does not meet industry standards. • Too small to house sufficient number of modern ambulances. • Does not provide a suitable operating environment.	
Identify a new location and build a new station.	• No other suitable land available in Glen Innes that is close to existing health services and main transport routes.	

3.3 Construction Activities

The works are short term (several months). The Activity site is separate from the Hospital and therefore construction activities will not affect the ongoing operation of the Hospital and/or associated services.

Table 4: Project Timeframes and Construction Activities

Construction activity	Description
Commencement Date	Work is currently expected to commence at the beginning of October 2022 and be completed by mid-2023.
Work Duration/Methodology	The works is expected to take approximately seven months. The general works methodology would involve: • site establishment and preparation • construction works • site clean-up and reinstatement.
Work Hours and Duration/Construction	Works will be undertaken during standard hours as per the Interim Construction Noise Guideline: • Monday to Friday: 7:00 am to 6:00 pm • Saturday: 8:00 am to 1:00 pm • Sunday and Public Holidays: No work
Ancillary Facilities	A temporary site compound and material stockpile areas would be established within the Activity area. Site containment fencing will be erected to restrict public access to the works zone. Erosion and sediment controls would be designed and implemented prior to undertaking the activity. The controls would be maintained during the project and would not be removed until the site has been suitably stabilised.

Construction activity	Description
Plant Equipment	The main plant likely to be used for the works would include, but are not limited to: • Trucks; • Excavator; • Concrete trucks; • Handheld power and battery-operated tools; • Dump trucks/skips; and • Other small equipment.
Earthworks	Cut and fill earthworks will be required for the construction of the new station, pavement and carparking areas. Any clean excess spoil (soil) will be used within landscaping treatments throughout the site or removed from site and disposed of appropriately.
Source and Quantity of Materials	Any required materials will be sourced locally from licensed quarries and operators. All materials will be certified uncontaminated and environmentally safe.
Traffic Management and Access	Access to the site for the works will be via an existing access in West Avenue. Street parking is available. Construction traffic management will be undertaken in accordance with an approved Construction Environmental Management Plan.

3.4 Operational Activities

Use

The new building will be for the purpose of a new ambulance station for the services of NSW Ambulance. The building will be used by ambulance service paramedics and administration staff. The building is not intended for public access, and it is not anticipated that there will be a high number of visitors to the building.

Staff

The station is expected to be staffed at a rate of 24 full time equivalent (FTE) staff by the year 2031, with emergency vehicle crews on 12 hour shifts and shifts being allocated according to expected callouts and staff fatigue management policies. Office staff hours are typically 0800-1600 on weekdays. Typical emergency crew shift times (as advised by HI) include:

- 0800– 1800
- 0800 – 2000
- 1200 – 0000
- 1500 – 0000
- 2000 – 0800

NSW Ambulance has advised the following in relation to staff on site at any one time:

- The average case load per month for this year has been 136 cases per month. 50% of these cases are out of hours (11pm to 7am). As with all stations not all of these on shift cases will be responded from the station and will depend on where the crew is at the time of the call.
- The maximum number of staff on site at one time (day and afternoon shift overlap) is 6.

Based on this advice, the expected maximum number of people on-site at one time will be six people. This will be during the change of shifts between night and day shift for emergency crews and the beginning of the office staff day shift and includes allowance for 'ride-alongs' and staff or students in training.

A copy of the Return Brief for the Glen Innes Ambulance Station with comprehensive details on staffing is attached as **Appendix E**.

Traffic and Parking

Onsite parking would comprise six (6) ambulance parking bays within the Plant Room, six (6) staff car parking bays, one (1) accessible parking space, one (1) relief bay, one (1) Directorate of Management (DOM) covered parking bay and one (1) service bay.

Access would be available via new driveways constructed off Taylor Street and West Avenue.

4. Statutory Framework

4.1 Planning Approval Pathway

4.1.1 Subdivision

Whilst subdivision is not part of the proposed Activity, it is proposed to excise a portion of Lot 2 DP1208729 for development of the ambulance station, via an exempt development process. The existing and proposed property boundaries are shown on the architectural drawings at **Appendix A**. The resulting lot will be used for emergency services purposes. Section 2.75(f) of the Exempt & Complying Development Codes SEPP states:

Part 2 Exempt Development codes

2.75 Specified development

The subdivision of land, for the purpose only of any one or more of the following, is development specified for this code-

…(f) excising from a lot land that is, or is intended to be, used for public purposes, including drainage purposes, rural fire brigade or other emergency service purposes or public toilets.

As such, the creation of such a lot can be undertaken as exempt development, provided the general requirements for exempt development in Section 1.16 of the Codes SEPP are met. For completeness, a review of the development against these requirements is provided below.

Table 5: Section 1.16 Assessment

Clause	Comment
1. To be exempt development for the purposes of this policy, the development-	
(a) must meet the relevant deemed-to-satisfy provisions of the Building Code of Australia, or if there are no such relevant provisions, must be structurally adequate, and	The proposed development will meet the relevant deemed-to-satisfy provisions of the Building Code of Australia.
(b) must not, if it relates to an existing building, cause the building to contravene the Building Code of Australia, and	Not applicable
(b1) must not be carried out on land that is a declared area of outstanding biodiversity value under the Biodiversity Conservation Act 2016 or declared critical habitat under Part 7A of the Fisheries Management Act 1994	The land is not declared to have outstanding biodiversity value. The land is not declared critical habitat under the *Fisheries Management Act 1994*.
(b2) must not be carried out on land that is, or is part of, a wilderness area (within the meaning of Wilderness Act 1987), and	The land is not a wilderness area.
(c) must not be carried out on land that is, or on which there is, an item that is listed on the State Heritage Register under the *Heritage Act 1977,* or that is subject to an interim heritage order under that Act, and	The land does not contain any State listed heritage items.
(d) must not be carried out on land that is described or otherwise identified on a map specified in Schedule 4.	The land is not identified in a map in Schedule 4.
2. Development that relates to an existing building that is classified under the *Building Code of Australia* as class 1b or class 2-9 is exempt development for the purposes of this Policy only if:	
(a) the building has a current fire safety certificate or fire safety statement, or	Not applicable
(b) no fire safety measures are currently implemented, required or proposed for the building.	
3. To be exempt development for the purposes of this Policy, the development must:	
(a) be installed in accordance with the manufacturer's specifications, if applicable, and	Not applicable

Clause	Comment
(b) not involve the removal or pruning of a tree or other vegetation that requires a permit or a development consent for removal or pruning unless that removal or pruning is undertaken in accordance with a permit or development consent.	The subdivision will not require the removal or pruning of any vegetation. The removal of vegetation is assessed as part of the ambulance station development.

It is noted that before Council can issue a subdivision certificate it must consider the provisions set out in Section 6.15 of the EP&A Act. A review of the development against these requirements is undertaken below.

Table 6: Section 6.5 Assessment

Clause	Comment
1. A subdivision certificate must not be issued for subdivision unless-	
(a) the subdivision is not prohibited by or under this Act; and	The subdivision is not prohibited.
(b) in the case of subdivision that cannot be carried out except with development consent, a development consent is in force with respect to the subdivision, and	Not applicable – development consent is not required.
(c) in the case of subdivision for which a development consent has been granted, all the conditions of the development consent that, by its terms, are required to be complied with before a subdivision certificate may be issued in relation to the plan of subdivision have been complied with, and	Not applicable – development consent is not required.
(d) in the case of subdivision of land to which a planning agreement referred to in Part 7 applies, all the requirements of the agreement that, by its terms, are required to be complied with before a subdivision certificate may be issued in relation to the plan of subdivision have been complied with, and	Not applicable – a planning agreement does not apply.
(e) in the case of subdivision for which the operation of the development consent has been deferred under Part 4, the applicant has satisfied the consent authority concerning all matters as to which the consent authority must be satisfied before the development consent can operate, and	Not applicable – a 'deferred commencement' consent has not been granted.
(f) in the case of subdivision the subject of a development consent for which the consent authority is required by or under this Act to notify any objector: i. at least 28 days have elapsed since the objector was notified, or ii. if an appeal has been made by the objector within that time, the appeal has been finally determined.	Not applicable – development consent is not required.
2. Without limiting subsection (1), a subdivision certificate must not be issued for a subdivision that involves subdivision work unless: (a) the work has been completed, or	Not applicable – no work is required.
(b) agreement has been reached between the applicant for the certificate and the consent authority: i. as to the payment by the applicant to the consent authority of the cost of carrying out the work; and ii. as to when the work will be completed by the consent authority, or	Not applicable – no work is required.
(c) agreement has been reached between the applicant for the certificate and the consent authority; i. as to the security to be given by the applicant to the consent authority with respect to the work to be completed, and ii. as to when the work will be completed by the applicant,	Not applicable – no work is required.
3. Subsection (2) does not prevent the issue of a subdivision certificate for part only of land that may be subdivided in accordance with a development consent as long as the requirements of that subsection have been complied with in relation to that part.	Not applicable – development consent is not required.

In summary, the proposed subdivision for use as an ambulance station is classified as exempt development in accordance with Clause 2.75(f) of the Codes SEPP. A preliminary review of the subdivision against the general requirements for exempt development has been undertaken and the subdivision meets all of these requirements.

Section 6.15 of the EP&A Act sets out the matters that Glen Innes Severn Council must consider before issuing a subdivision certificate.

An application for a Subdivision Certificate will be lodged with Glen Innes Severn Council separately, after Health Infrastructure have approved this REF for the land use.

4.1.2 Ambulance Station

Section 4.1 of the EP&A Act states that if an EPI provides that development may be carried out without the need for development consent, a person may carry the development out, in accordance with the EPI, on land to which the provision applies. However, the environmental assessment of the development is required under Part 5 of the Act.

State Environmental Planning Policy (Transport & Infrastructure) 2021 (TI SEPP) aims to facilitate the effective delivery of infrastructure across the State. In accordance with the TISEPP "***emergency services facility*** *means a building or place (including a helipad) used in connection with the provision of services by an emergency services organisation…".* An emergency services organisation includes the Ambulance Service of NSW.

The site is zoned R1 General Residential under the provisions of the Glen Innes Severn LEP 2012. Division 6 of TI SEPP outlines the approval requirements for emergency services facilities. However pursuant to Section 2.52(1) of ISEPP, development for the purpose of an emergency service facility may only be carried out by or on behalf of a public authority without consent in a prescribed zone. R1 General Residential zone is not a prescribed zone under Division 6. Section 2.52(2) of ISEPP does not apply to the proposed Activity as the facility will provide parking for more than two ambulances.

Division 10 of TI SEPP outlines the approval requirements for health service facilities. Pursuant to section 2.61(1)(d) *"development for the purposes of patient transport facilities, including helipads and ambulance facilities"*, may be carried out by or on behalf of a public authority without consent on any land if the development is carried out within the boundaries of an existing health services facility. Section 2.61(2) does not permit the erection of any building that exceeds 15 m in height or is located closer than 5 m to any property boundary. However, Section 2.61(3) permits a building to be located up to 1 m from a boundary if it does not exceed one storey or 5 m in height and land on the other side of the property boundary is not in a residential or environmental living zone.

The proposal involves the construction of a new ambulance facility by HI and NSW Ambulance within the boundaries of the Glen Innes District Hospital, which is classified as development without consent as the proposed activity is consistent with clause 2.61(1)(d) of TI SEPP. Furthermore, the proposed station will not exceed 15 m in height and will be greater than 5 m from the nearest property boundary.

Therefore, the project is considered an 'activity' for the purposes of Part 5 of the EP&A Act and is subject to an environmental assessment (REF). The proposal is considered an 'activity' in accordance with clause 5.1 of the EPA Act because the development involves the erection of a building and the carrying out of a work. The development is also not any act, matter or thing for which development consent under Part 4 is required, is not prohibited under an environmental planning instrument, and is not exempt development.

TISEPP consultation is discussed within **Section 5** of this REF.

Table 6: Description of proposed activities

Division 10 s.2.61within TISEPP	Description of Works
Section 2.61(d)	The proposed Activity is for the construction of a new Ambulance Station, which may be carried out by or on behalf of a public authority without consent on any land if the development is carried out within the boundaries of an existing health services facility. The building does not exceed 15 m in height is not less than 5 m to the nearest property boundary.

4.2 Environmental Protection and Biodiversity Conservation Act 1999

Pursuant to the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action that has, or is likely to have, a significant impact on matters of national environmental significance (MNES) or other aspects of the environment, such as on commonwealth land, may progress only with approval of the Commonwealth Minister for the Environment under Part 9 of the EPBC Act.

An EPBC Act Protected Matters Report was undertaken on 28 June 2022 to identify records of threatened species recorded within a 1 km x 1 km search area centred on the site **(Appendix K).** Results indicate 11 migratory species and 30 threatened species have been recorded within the search area and potential habitat occurs for three Threatened Ecological Communities.

The Activity site is within the previously cleared, maintained grounds of an existing hospital. The tree removal required will not constitute loss of habitat. Due to the nature and scope of the proposed works, the Activity would have negligible impacts on biodiversity. The Activity is unlikely to have a significant impact on any threatened species or communities listed under the BC Act, EPBC Act or FM Act.

The provisions of the EPBC Act do not affect the proposal as it is not development that takes place on or affects Commonwealth land or waters. Further, it is not development carried out by a Commonwealth agency, nor does the proposed development affect any matters of national significance. An assessment against the EPBC Act checklist is provided below.

Table 7: EPBC Checklist

Consideration	Yes/No
The activity will not have any significant impact on a declared World Heritage Property?	No
The activity will not have any significant impact on a National Heritage place?	No
The activity will not have any significant impact on a declared Ramsar wetland?	No
The activity will not have any significant impact on Commonwealth listed threatened species or endangered community?	No
The activity will not have any significant impact on listed migratory species?	No
The activity does not involve nuclear actions?	No
The activity will not have any significant impact on Commonwealth marine areas?	No
The activity will not have any significant impact on Commonwealth land?	No
The activity does not relate to a water resource, a coal seam gas development or large coal mining development?	No

An EPBC Act Protected Matters Report is attached as part of **Appendix K**.

4.3 Environmental Planning and Assessment Act 1979

Duty to Consider Environmental Impact

Part 5 of the EP&A Act applies to activities that are permissible without consent and are generally carried out by a public authority. Activities under Part 5 of the EP&A Act are assessed and determined by a public authority, referred to as the determining authority. Health Infrastructure is a public authority and is the proponent and determining authority for the proposed works.

For the purpose of satisfying the objects of the EP&A Act relating to the protection and enhancement of the environment, a determining authority, in its consideration of an activity shall, notwithstanding any other provisions of the Act or the provisions of any other Act or of any instrument made under the EP&A Act or any other Act, examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity (refer to sub-section 1 of section 5.5 of the EP&A Act).

Section 171 of the EP&A Regulation defines the factors which must be considered when assessing the likely impact of an activity on the environment under Part 5 of the EP&A Act. Section 7.1 specifically responds to the factors for consideration under section 171.

Table 8 below demonstrates the effect of the proposed development activity on the matters listed for consideration in sub-section 3 of section 5.5 of the EP&A Act.

Table 8: Matters for consideration under Sub-Section 3, Section 5.5 of the EP&A Act

Matter for Consideration	Impacts of Activity
Sub-section 3: Without limiting subsection 1, a determining authority shall consider the effect of any activity on any wilderness area (within the meaning of the *Wilderness Act 1987*) in the locality in which the activity is intended to be carried on.	The land is not a wilderness area.
Note: If a biobanking statement has been issued in respect of a development under Part 7A of the *Threatened Species Conservation Act 1995*, the determining authority is not required to consider the impact of the activity on biodiversity values.	

4.4 Environmental Planning and Assessment Regulation 2021

Part 8, Section 171 of the EP&A Regulation provides a list of factors that must be taken into account for an environmental assessment under Part 5 of the EP&A Act. These requirements are considered at **Section 6.1** of this REF report.

4.5 Other NSW Legislation

The following table lists any additional legislation that is required to be considered if it is applicable to the proposed activity.

Table 9: Other Possible Legislative Requirements

Legislation	Comment	Relevant? Yes/No
State Legislation		
Rural Fires Act 1997	*Is the site identified on the Bushfire Prone Land Map?* No	No
Biodiversity Conservation Act 2016	Does the site contain any critical habitat, threatened species or ecological population or community? Part 7 of the *Biodiversity Conservation Act 2016* (BC Act) sets out the requirements for biodiversity assessment and approvals under the EP&A Act. For the purposes of Part 5 of the EP&A Act, an activity is to be regarded as likely to significantly affect the environment if it is expected to significantly affect threatened species. The proposed activity occurs on a suburban site and will not affect important vegetation or habitat. It will not have a significant impact upon any threatened species, ecological communities or populations such that a viable local population will be placed at risk of extinction. An EPBC Act Protected Matters Report is attached as part of **Appendix K**.	No Refer s.6.2.4.
Water Management Act 2000	*Are the works within 40 metres of a watercourse?* No. Rocky Ponds Creek is the nearest watercourse and is more than 100 m southeast of the Activity site.	No Refer s.6.2.3
Contaminated Land Management Act 1997	*Is the site listed on the register of contaminated sites?* A search of the NSW Environmental Protection Authority (EPA) contaminated land data base was undertaken for the Glen Innes area. The closest site is located over 200 m from the Activity site and noted with an 'EHC Act Revocation Notice' and 'Section 36 EHC Act Order'. The site would not have an impact on the Activity. A copy of the search is attached as **Appendix K**. A Preliminary (Stage 1) Site Investigation (PSI) and Detailed (Stage 2) Site Investigation has been undertaken (refer to **Appendix F**). The scope of work was undertaken to satisfy the requirements of the Contaminated Land Management Act (1997). It was determined that the site is suitable for the proposed activity.	No Refer s.6.2.2.

Legislation	Comment	Relevant? Yes/No
Heritage Act 1977	*Any impacts on local or state or national heritage? If any assessment provided, note where.* The *NSW Heritage Act 1977* provides for the conservation of items of environmental heritage in NSW. The Act defines heritage as items or places that are of State and/or local heritage significance and includes: places, buildings, works, relics, moveable objects and precincts. As part of NSW heritage protection and management, the Act establishes a register including an inventory and list to protect the listed items. The Beardies Museum (former hospital complex) on adjoining Lot 1 is included as a Local heritage item in Schedule 5 of the Glen Innes Severn LEP 2012 (Item No. I076). However it is not listed on the State heritage register and no part of the Activity site is State listed. The nearest State listed item is the Glen Innes Railway Station Group (I123) approximately 600 m south-west of the site in Ferguson Street. The proposed Activity will not affect the heritage significance of the site. The archaeological provisions of the *NSW Heritage Act 1977* are applicable, however, as all "relics" are protected under the NSW Heritage Act, regardless of whether or not the place is listed as a heritage item at a local, State or national level. Should any unexpected relics be disturbed during excavation of the site they must be managed under the archaeological provisions of the NSW Heritage Act. Searches of the State Heritage Register were undertaken for the activity on 23/06/2022 refer to **Appendix K**.	Yes Refer s.6.2.10
Roads Act 1993	*Any works to a public road, or pumping of water onto a public road, or involve the connection of a road to a classified road?* Section 138 of the NSW Roads Act requires that all activities undertaken within Council's road reserve be approved by Council prior to the activities being undertaken. Health Infrastructure will need to obtain a Section 138 Approval for works within the road reserve/connection of the new driveways to Taylor Street and West Avenue.	Yes
Other Acts as required	*Any other acts as required to be addressed?* Yes – refer below.	Yes
Protection of the Environment Operations Act 1997	There are no Protection of the Environment Policies (PEPs) that are relevant to the activity. No licenses will be required pursuant to the Protection of the Environment Operations Act 1997. HI and/ or contractors working on behalf of HI are required to notify OEH when a 'pollution incident' occurs that is likely to impact upon the environment. It is an offence to negligently dispose of waste in a manner that harms the environment. Waste will be managed in accordance with the Waste Avoidance and Resource Recovery Act 2001. The activity will aim to reduce the environmental impact of dumping waste and include mechanisms to recover resources and reduce the production of waste where possible.	No
National Parks and Wildlife Act 1974	The *National Parks and Wildlife Act 1974* (NPW Act) provides for the legal protection and management of Aboriginal sites within NSW. The key principles of the Act in relation to Aboriginal heritage are the prevention of unnecessary or unwarranted destruction of Aboriginal objects, and the active protection and conservation of objects which are of high cultural significance. It is an offence to knowingly disturb an Aboriginal object, irrespective of its nature or significance, without the prior consent of the relevant Director-General. Given the activity affects suburban land that has been disturbed as part of the historical use associated with the hospital, the potential for undiscovered Aboriginal heritage items would be very low and unexpected. However, to limit any potential impact on any unknown Aboriginal sites or objects, mitigation and management measures are proposed in this REF to provide the necessary safeguards. AHIMS search was undertaken on 23/06/2022 for the site and there are no registered items within the site (refer to **Appendix K**).	Yes Refer s.6.2.9
Local Government Act 1993	Various activities (e.g. water, sewer, stormwater connections, amongst other things) generally require the approval of Council under Section 68 of the Local Government Act 1993. However, pursuant to Section 69 (Crown exemption from approval to do things incidental to erection or demolition of building) of the Local Government Act 1993, Section 68 does not require the Crown, or a person prescribed by the regulations to obtain the approval of a council to do anything that is incidental to the erection or demolition of a building.	Yes

Legislation	Comment	Relevant? Yes/No
State Legislation Planning Policies		
State Environmental Planning Policy (Biodiversity and Conservation) 2021	• Chapter 2 Vegetation in non-rural areas This SEPP applies (as applicable) to clearing vegetation in non-rural areas of the State, including environmental zones, not associated with a Development Application. Section 2.7 outlines clearing that does not require authority under this Policy, including: (1) A permit or approval to clear vegetation is not required under this Chapter if it is clearing of a kind that is authorised under the Local Land Services Act 2013 (Clearing authorised under other legislation) section 60O or under Part 5B (Private native forestry). On this basis and Clause 60O of the Local Land Services Act 2013 (LLS Act), and given the Proposal is a Part 5 Activity, any vegetation clearing is authorised by way of compliance with that part of the EP&A Act and authority under the Vegetation SEPP is not required.	Yes
	• Chapter 4 - Koala habitat protection 2021 Chapter 4 of the BCSEPP aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. It applies when Councils assess development applications within all local government areas (LGAs) listed under Schedule 2, which includes Glen Innes Severn Shire. Although this SEPP does not technically apply to the Part 5 Approval Pathway under the EP&A Act, Koala habitat and associated protections have been considered in the context of assessing the potential environmental impacts of the proposed Activity to the fullest extent possible, in order to fulfill the requirements of Part 5. The proposed works occur within an urban area and despite the removal of two trees, there would be no impact to Koala feed trees or Koala habitat as a result of the Activity.	Yes
State Environmental Planning Policy (Resilience and Hazards) 2021	*Contamination, hazardous materials/development coastal management* • Chapter 4 Remediation of land The objective of Chapter 4 of the RHSEPP is to provide for a State-wide planning approach to the remediation of contaminated land. It aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. Chapter 4 applies to rezoning and development applications for development requiring consent. The Proposal does not require development consent pursuant to provisions of ISEPP. As the proposed development does not involve a change of use and does not involve a development application, the provisions of Section 4.6 of the RHSEPP are not triggered. However, HI must still consider the potential for the land to be contaminated and make a determination of suitability of the land for its intended use. Under Section 4.5.1 of the Managing Land Contamination Planning Guidelines SEPP 55–Remediation of Land (1998), remediation is a Part 5 activity when: • it is carried out ancillary to an activity under Part 5, for example, development which does not require consent under Part 4, and which requires an approval from a public authority, or • it is in category 2 (without consent) under SEPP 55 and an approval from a public authority is required. Furthermore, Section 4.16(3) of Chapter 4 outlines that if a provision of another State environmental planning policy or of a regional environmental plan, whether made before or after this Chapter, permits a remediation work without development consent, a requirement in this Policy to obtain development consent to carry out the work does not prevail over that provision. On this basis, any proposed/required remediation work described in this REF is ancillary to the Activity under Part 5 of the EP&A Act, which is principally for a health services facility (patient transport facility) which is permitted as development without consent pursuant to ISEPP. JK Environments undertook a Preliminary (Stage 1) and Detailed (Stage 2) Site Investigation (PSI/DSI) for the proposed development (**Appendix F**). JK Environment determined that the site is suitable for the proposed development and that remediation is not required. An unexpected finds protocol was recommended to manage any unexpected finds during the development.	Yes

Legislation	Comment	Relevant? Yes/No
	The findings of the PSI/DSI and potential impacts associated with hazardous materials and contamination are discussed further in **Section 6.1.2**.	
State Environmental Planning Policy (Transport and Infrastructure) 2021	The proposed activity is for the construction of a new ambulance station within the Glen Innes District Hospital grounds. Division 10 of the TISEPP outlines the approval requirements for health services facilities. "Patient transport facilities", including ambulance facilities, are defined as a health services facility under this division. Section 2.61 (1) of TISEPP enables development for the purpose of an ambulance station (patient transport facility) to be carried out by or on behalf of a public authority without consent on any land if the development is carried out within the boundaries of an existing health services facility. The proposed ambulance station development is to be undertaken on behalf of HI and NSW Ambulance. The proposed ambulance station will not exceed 15 m in height nor be located within 5 metres of the property boundary and is therefore compliant with Section 2.61(1) of TISEPP. The development becomes an 'activity' for the purposes of Part 5 of the EP&A Act and is subject to an environmental impact assessment.	
Glen Innes Severn Local Environmental Plan 2012		
Zone	The site is zoned R1 General Residential. Objectives of the R1 zone include: • To provide for the housing needs of the community. • To provide for a variety of housing types and densities. • To enable other land uses that provide facilities or services to meet the day to day needs of residents. The activity represents the provision of ongoing health services (health infrastructure) for the community and is therefore consistent with the R1 zone objectives presented above.	Yes
Height of Buildings	This provision has not been adopted in the Glen Innes Severn LEP 2012. The proposed ambulance station is single storey, and the height is compatible with the character of the area.	No
Floor Space Ratio	This provision has not been adopted in the Glen Innes Severn LEP 2012.	No
Minimum Lot size	Clause 4.1: The Lot Size Map provides a minimum lot size of 450m2 for the site.	No
Heritage	Clause 5.10: The development site is listed as a being of local heritage significance in Schedule 5 of the Glen Innes Severn LEP 2012 (I076). A Heritage Impact Statement has been prepared (refer to **Appendix G**) for the proposed activity and concluded that the development is acceptable and would not adversely impact the heritage significance of nearby heritage items. (Refer **Section 6.1.9**).	Yes
Flood planning	Clause 5.21: The site is not flood prone.	No
Drinking water catchments	Clause 7.2: The site is not mapped drinking water catchments.	No
Essential services	Clause 7.3: All services are available to the lot.	No

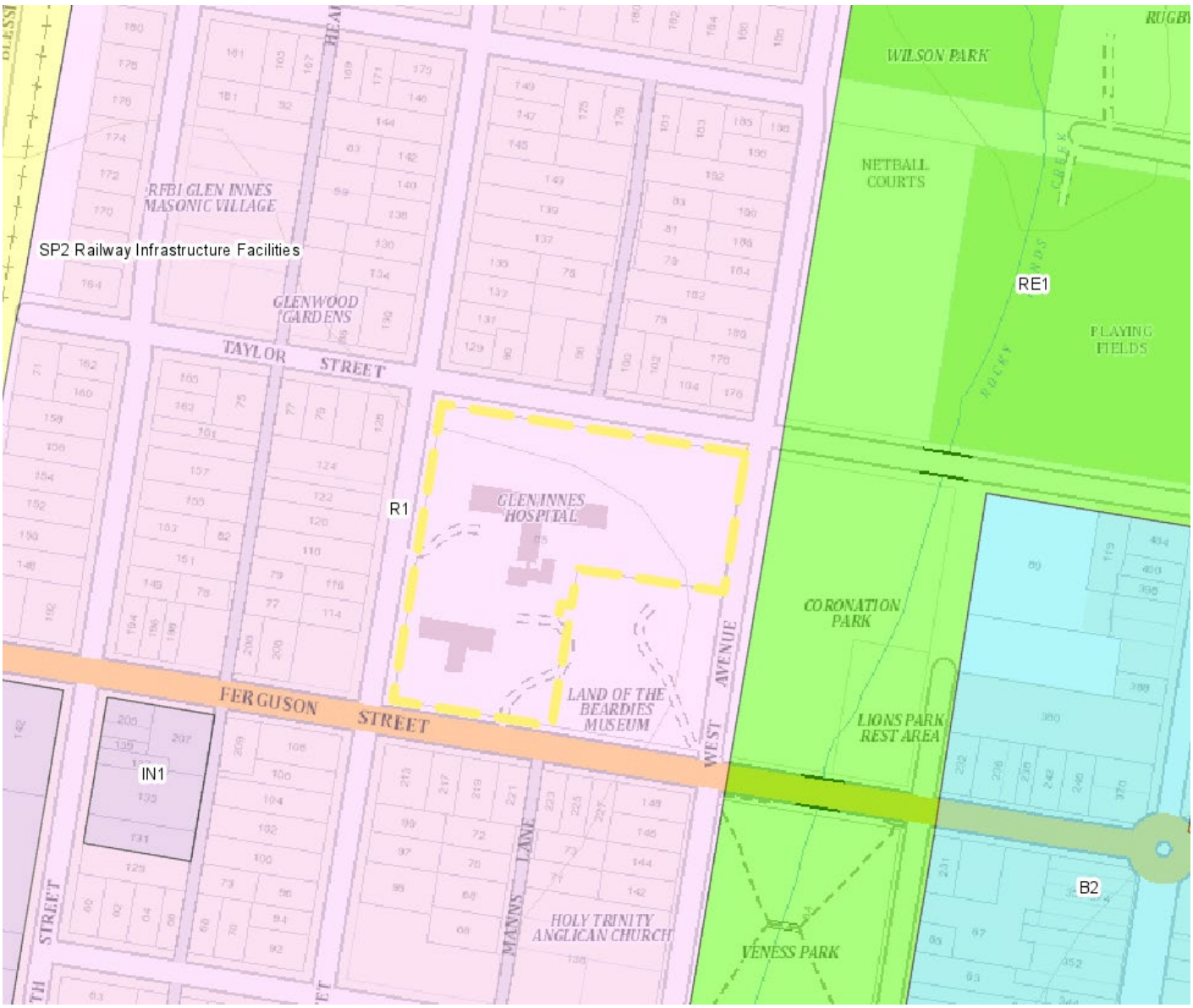


Figure 2 Zoning Map (Source: ePlanning Spatial Viewer)

5. Consultation

Consultation requirements are established through Part 2.2 Division 1 and Section 2.62(2) of the TISEPP.

Pursuant to Section 2.10 & 2.11 of TISEPP the proposed development is required to be notified to Council in relation to potential impacts on Council services and heritage items. The activity also will trigger notification to Council and adjoining occupiers of land pursuant to Section 2.62(2) of TISEPP. In all instances, written notice of the intention to carry out the development is required, and HI and NSW Ambulance must take into consideration any response to the notice that is received within 21 days after the notice is given.

The REF scope of works was notified for 21 calendar days to the stakeholders outlined in **Table 10** below.

Table 10: Stakeholders required to be notified

Stakeholder	Relevant Section
Glen Innes Severn Council	s.2.11: Consultation with councils-development with impacts on local heritage s.2.52(7): Development permitted without consent
Occupiers of adjoining land	s.2.52(7): Development permitted without consent

The notification commenced on 8 June and concluded on 29 June 2022. Copies of the notification letters are provided at **Appendix T**. No submissions were received.

6. Environmental Impact Assessment

Environmental Planning and Assessment Regulation 2021 – Assessment Considerations

The relevant assessment considerations under Section 171(2) of the EP&A Regulation are provided below.

Table 11: Summary of Environmental Factors Reviewed in Relation to the Activity

Relevant Consideration	Response/Assessment	Positive/Negative	
a) Any environmental impact on a community	The site selected for the proposed Development is sympathetic to the existing use of the site as a hospital. Impacts on the existing Facility will be negligible. In addition to the appropriateness of the site, the design of the Station will contribute in a positive fashion to the adjoining residential and recreational areas. Potential impacts will be either short-term or negligible. The proposed Activity will provide improved health services to the broader community in general.	-ve	✓
		Nil	
		+ve	
(b) Transformation of a locality	The proposed Ambulance Station is well designed and appropriately scaled and located to be compatible with the existing character. It is appropriate in the context of the character of the hospital complex.	-ve	✓
		Nil	
		+ve	
(c) Any environmental impact on the ecosystem of the locality	Fifteen trees will need to be removed to construct the proposed Station. There is no important vegetation or habitat onsite; none of the trees are heritage listed. A full assessment of environmental impacts, including ecology and water quality, is contained in **Section 0**. Any environmental impacts will be minimal and will be subject to appropriate mitigation measures.	-ve	
		Nil	✓
		+ve	
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.	No. Visual impacts associated with construction works will be short-term. The proposed new Station will contribute in a positive fashion to the existing neighbourhood character and will not impact heritage items in the locality.	-ve	
		Nil	✓
		+ve	
e) Any effect on locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific, or social significance or other special value for present or future generations.	No. A Heritage Impact Statement undertaken for the proposed Activity concluded that the development is acceptable and would not adversely impact the heritage significance of nearby heritage items (refer **Section 6.1.10** and **Appendix G**). Based on the Due Diligence Code of Practice for the Protection of Aboriginal Objects (DECCW 2010) there is very low probability of Aboriginal objects occurring in the Activity Area (refer **Section 6.1.11**).	-ve	
		Nil	✓
		+ve	
(f) Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974)	The Activity site is within the maintained grounds of an existing hospital complex and is not identified as important vegetation or habitat (refer **Section 6.1.4)**	-ve	
		Nil	✓
		+ve	
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	As above. The site is unlikely to include habitat utilised by any threatened species.	-ve	
		Nil	✓
		+ve	
(h) Any long term impacts on the environment	Impacts associated with construction works will be temporary and subject to mitigation measures (e.g. noise, visual, air quality). Permanent variation to the man-made environment as a result of the proposed Activity would be low impact (i.e. visual) and not detrimental or unreasonable in the locality. Long term impacts on the natural environment will be negligible. These matters are discussed in further detail in **Section 6**.	-ve	
		Nil	✓
		+ve	

Relevant Consideration	Response/Assessment	Positive/Negative	
(i) Any degradation of the quality of the environment	No. Increased storm water generated as a result of the proposed Activity has been assessed and management strategies will be incorporated to reduce the amount of runoff and maintain water quality. Erosion control measures will be implemented on site to minimise soil erosion.	-ve	
		Nil	✓
		+ve	
j) Any risk of safety of the environment	No. Where required mitigation measures will be implemented to minimise any potential impact from contamination..	-ve	
		Nil	✓
		+ve	
(k) Any reduction in the range of beneficial uses of the environment	No. The proposed Ambulance Station will coordinate with the existing services provided by the Hospital.	-ve	✓
		Nil	
		+ve	
(l) Any pollution of the environment	The proposed design responds to the characteristics of the site and appropriate mitigation measures will be incorporated to minimise any potential pollution of the environmental (e.g. erosion control, water quality, contamination).	-ve	
		Nil	✓
		+ve	
(m) Any environmental problems associated with the disposal of waste	No. Waste management Refer **Section 6.1.13**. Safeguards will be implemented during construction works to minimise potential waste impacts during construction. The proposed Station will operate in accordance with the NSW Health Policy Clinical and Related Waste Management for Health Services (refer to **Appendix H**).	-ve	
		Nil	✓
		+ve	
n) Any increased demanded on resources (natural or otherwise) that are, or are likely to become, in short supply	Impacts associated with the consumption of natural resource would be minimal (refer **Section 6.1.15**).	-ve	✓
		Nil	
		+ve	
(o) Any cumulative environmental effects with other existing or likely future activities.	No. Refer **Section 6.1.15**.	-ve	
		Nil	✓
		+ve	
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions.	No. The site is not in the Coastal Zone as identified in the *Coastal Management Act 2016*.	-ve	
		Nil	✓
		+ve	
q) Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1	• Glen Innes is identified as a Strategic Centre in the New England North West Regional Plan 2036. This Plan is the NSW Government's strategy for guiding land-use planning decisions for the New England North West and provides direction for regional and local planning decisions. 'Direction 16: Coordinate infrastructure delivery' includes the need to identify appropriate sites for emergency services facilities. The proposed Activity is part of the Rural Ambulance Infrastructure Reconfiguration (RAIR) Program for NSW Ambulance, which is aimed at providing high quality, improved services for rural NSW. • The proposed Activity is also consistent with the Strategic Direction (Chapter 7) of the Glen Innes Severn Land Use Strategy 2010 relating to the provision of quality services and facilities.	-ve	✓
		Nil	
		+ve	

6.1 Identification of Issues

6.1.1 Soils and Geology

Questions to consider	Yes	No
Will the works require land disturbance?	✓	
Are the works within a landslip area?		✓
Are the works within an area of high erosion potential?		✓
Could the works disturb any natural cliff features, rock outcrops or rock shelves?		✓
Will the works result in permanent changes to surface slope or topography?	✓	
Are there acid sulphate soils within or immediately adjacent to the boundaries of the work area? And could the works result in the disturbance of acid sulphate soils?		✓
Are the works within an area affected by salinity?		✓
Is there potential for the works to encounter any contaminated material?	✓	

Existing Environment

Based on the NSW Government eSPADE, the site is not mapped as being prone to acid sulphate soil, furthermore the Glen Innes landscape does not present acid sulphate soils.

A Geotechnical Investigation Report was prepared by JK Geotechnics **(Appendix I)**. The purpose of the investigation was to obtain geotechnical information on the subsurface conditions, and to use this as a basis for providing comments and recommendations on site classification, excavation conditions, footings, earthquake design classification, subgrade preparation and engineered fill.

The investigation involved fieldwork and comprised four boreholes drilled to termination depths between 3.0m and 8.0m below existing surface levels, augmented by four Dynamic Cone Penetration tests that extended to refusal depths of 1.5m to 1.6m below existing surface levels. Samples were returned to NATA accredited laboratories for testing and results analysed. Groundwater observations were made in the boreholes during and on completion of drilling. No longer term groundwater monitoring has been undertaken.

The boreholes disclosed a subsurface profile generally comprising fill and topsoil overlying residual clays with occasional sand and gravel inclusions. Weathered basalt was encountered at relatively shallow depths. Groundwater was only encountered in one borehole within the rock profile.

Fill was encountered at the surface in all boreholes extending depths between 0.2m and 0.6m below existing surface level. The fill predominantly comprised silty clay assessed to be of low to medium plasticity with varying amounts of sand, root fibres and some gravel in part. Residual clay was encountered below the fill in all boreholes, extending to depths between 1.6m and 2.4m below existing surface levels. The residual clay then transitioned into sandy clay and gravelly clay. The clays were assessed to be of stiff to very stiff strength and of low to medium plasticity. The moisture content was typically greater than the plastic limit.

Weathered basalt bedrock was encountered in all boreholes at depths between 1.6m and 2.4m depth below existing surface levels, or between about RL1055.5m and RL1061.2m, indicating the bedrock surface slopes down north. The bedrock was assessed to typically be extremely weathered and of hard soil strength improving to very low to low strength at depths between 2.6m and 6.5m.

Impact Assessment

The earthwork quantities associated with the proposed development are estimated to be as follows:

- Cut – 2770m^3
- Fill – 134m^3

The majority of the earthworks involve cut and will generate approximately 2636m^3 of excess material.

Site Preparation

Site preparation is expected to comprise removal of trees and stripping of topsoil and/ or root affected soils. In areas where no excavation is required, any obvious deleterious or contaminated existing fill not disclosed by this investigation should be removed. These stripped materials should be taken offsite as they are not suitable for re-use as engineered fill. The topsoil and/ or root affected soils may be separately stockpiled and used for subsequent landscaping purpose, or appropriately disposed of.

Tree root systems dry out the surrounding clayey soils and their removal will result in localised moisture recovery leading to swelling which may have a detrimental impact on the performance of proposed nearby buildings and paved surfaces founded/ supported in the clayey soil profile within the site. Therefore, trees should only be removed where necessary and as soon as practicable, in order for the moisture content of the clayey subsoils to recover; ideally this would be years in advance of construction though we understand this is usually not feasible.

Due to the existing site slope, cut and fill earthworks will be required to achieve design surface levels. The soil materials and extremely weathered bedrock should be readily excavated using the buckets of conventional earthmoving equipment, such as hydraulic excavators, although localised areas of higher strength bedrock may be encountered that could require the use of a hydraulic impact hammer.

Temporary batter slopes of 1 Vertical (V) in 1 Horizontal (H) through the clay soils are generally considered to be appropriate. If permanent batters are proposed, then we recommend the batters are no steeper than 1V:3H and appropriately vegetated to prevent erosion.

Retaining Walls

For any cantilevered gravity type retaining walls supporting soil materials, it is recommended that walls be designed on the basis of an ‘active’ earth pressure co-efficient (Ka) of 0.35 where some wall movements are tolerable and assuming a horizontal backfill surface. If retaining walls are temporarily propped, backfilled and permanently supported by the structure then an ‘at rest’ earth pressure co-efficient (Ko) of 0.55 should be adopted. A bulk unit weight of 20kN/m3 should be adopted for the soil profile. Surcharge loads (e.g. nearby footings, compaction stresses, sloping retained surfaces, construction loads etc) should be allowed for in the design using the appropriate above earth pressure coefficient. The retaining walls should be designed as drained, otherwise hydrostatic pressures would be in addition to the above earth pressures. Any backfill behind retaining walls should comprise engineered fill in order to reduce post construction settlements.

Post construction settlements can cause adverse impacts on paving, landscaped retaining walls or other structures and services founded on or within the backfill. If potential post construction settlements are deemed problematic by the designers, further geotechnical advice should be obtained. However, due to the limited space that may be available behind the walls, backfill using a single sized durable gravel, such as ‘blue metal’ or crushed concrete gravel (free of fines) should be used. A non-woven geotextile filter fabric should be placed over the cut faces prior to backfilling and then over the top surface of the gravel in order to reduce subsoil erosion. A clay capping layer should be provided above the free draining backfill material to reduce the likelihood of surface water entering the backfill and surcharging the retaining walls.

Earthquake Design Classification

Based upon AS1170.4-2007 “Structural Design Actions, Part 4: Earthquake Actions in Australia”, the following design parameters were recommended:

- Hazard Factor (Z) = 0.08
- Class Ce – Shallow soil site.

Construction Works

The Geotechnical Investigation Report provides specific construction and design requirements for different stages of the proposed works and would be taken into consideration during the detailed design and construction phases of the project.

Erosion Control

To minimise loss of soil from the site and potential effects on water quality a Stormwater Management Plan for the proposed activity prepared by Meinhardt Bonacci **(Appendix J)**. This Plan includes erosion and sediment control measures to be implemented during construction in accordance with the Landcom "Blue Book (refer **Section 6.1.3**).

Mitigation Measures

The following mitigation measures would be implemented to manage impacts relating to soil, erosion and sedimentation:

- Implement the recommendations contained in the Geotechnical Investigation Report prepared by JK Geotechnics;
- Erosion and sediment controls would be implemented in accordance with the Landcom/ Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) and ensure any water diversion or control outlets associated with the site compound/ stockpile do not result in scouring;
- The Stormwater Management Plan, including sediment and erosion notes and conditions would be implemented in accordance with The Civil Engineering Design Report by Meinhardt Bonacci;
- Works would only commence once all erosion and sediment controls have been established. The controls would be maintained in place until the works are complete, and all exposed erodible materials are stable;
- Erosion and sedimentation controls would be checked and maintained (including clearing of sediment from behind barriers) on a regular basis (including after any precipitation events) and records kept and provided on request;
- All sediment control measures would be checked and repaired or re-installed (if required) if heavy rainfall was forecast;
- Imported materials would be sourced as clean fill from an approved site; and
- Disturbance of natural sediments and vegetation would be minimised.

6.1.2 Hazardous Materials and Contamination

Questions to consider	Yes	No
Is there potential for the works to encounter any contaminated material?	✓	
Will the works involve the disturbance or removal of asbestos?		✓
Is the work site located on land that is known to be or is potentially contaminated?		✓
Is a Remediation Action Plan required?		✓
Is the work category 2 works under Former SEPP 55 (Resilience & Hazards SEPP 2021)?		✓

Existing Environment

The site is located in a predominantly residential area of Glen Innes. It is in undulating regional topography, on the lower slopes of a hill, and slopes towards the north-east at approximately 5-6°. The site comprises a vacant grass covered garden/ landscaped area of the wider hospital grounds. A Contaminated Land Searched conducted on 8 July did not identify any contaminated lands in proximity to the site (**Appendix K**).

JK Environments undertook a Preliminary (Stage 1) and Detailed (Stage 2) Site Investigation (PSI/DSI) for the proposed development (**Appendix F**). The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make an assessment of the soil and groundwater contamination conditions. The investigation included a review of historical information, soil sampling from four boreholes and five test pits, and installation and groundwater sampling from three monitoring wells.

Imported fill was identified as a potential contamination source. The historical information indicated that the site has formed part of the hospital land and has remained undeveloped

Impact Assessment

Potential impacts associated with hazardous materials and contamination that could arise from the Activity generally include:

- Importation of contaminated or dispersive material to the site.
- A variety of dispersible liquid materials will be used which pose a potential pollutant threat to local water quality. These liquids include but are not limited to diesel, unleaded petrol, machinery oils and lubricants. The nature of these liquids and their ability to disperse away from the work site means that they could have a negative impact on ground or surface water on or adjacent to the site, especially during rain.
- Disturbance of contaminated soil/material within the site.

Results from the PSI/DSI found that the boreholes generally encountered fill materials to depths of approximately 0.1mBGL to 0.6mBGL, underlain by natural residual clayey soils. The fill contained inclusions of igneous and ironstone gravel, brick (whole and fragments), sand, ash and root fibres.

A selection of soil and groundwater samples were analysed for the contaminants of potential concern (CoPC) identified in the conceptual site model (CSM). Elevated concentrations of the CoPC were not encountered above the adopted health or ecological-based site assessment criteria (SAC) in any of the soil samples analysed.

Elevated concentrations of zinc were encountered in one groundwater sample. However, this is considered to be a regional issue and not considered to pose a risk to site receptors.

Based on the findings of the DSI, JK Environment is of the opinion that the site is suitable for the proposed development. Remediation is not required. An unexpected finds protocol was recommended to manage any unexpected finds during the development.

Mitigation Measures

The following mitigation measures would be implemented to manage impacts relating to hazardous materials and contamination:

- Storage and handling of material shall be in accordance with AS1940 The Storage and Handling of Flammable and Combustible Liquids, SafeWork NSW Code of Practice - Managing Risks of Hazardous Chemicals at Workplaces, *Protection of the Environment Operations Act 1997* and *Work Health and Safety Act and Regulations 2011*.
- A spill containment kit would be available at all times. All personnel would be made aware of the location of the kit and trained in its effective deployment.
- Any hazardous materials would be handled, managed, transported, and disposed of according to applicable regulations, including WH&S and EPA waste protocols.
- The Stormwater Management Plan, including sediment and erosion notes and conditions would be implemented in accordance with the Civil Engineering Design Report by Meinhardt Bonacci;
- As part of the implementation of unexpected finds protocol, a suitably qualified contaminated land consultant should be engaged to inspect the site during development works in the event that there are unexpected finds. Unexpected finds may include stained or odorous soil, and/or fill that appears different to that recorded on the borehole or test pit logs and that has other indicators of contamination such as fibre cement, ash or slag etc. Where an inspection is triggered, a letter should be prepared by the consultant to document the findings of the inspection(s) and provide further commentary on assessing/ managing potential contamination and the unexpected find. The following should be implemented in the event of an unexpected find:
    - All work in the immediate vicinity should cease, and the contaminated land consultant should be contacted immediately to inspect and document the find. The project manager/client must also be contacted and advised of the find;
    - Temporary barricades should be erected to isolate the area;
    - The consultant should develop and implement a strategy to assess the issue and provide guidance on the appropriate course of action;

- Review and update the waste classification for the off-site disposal of the suspect material; and
- Any actions should be implemented and validated to demonstrate that there are no unacceptable risks to the receptors.

6.1.3 Hydrology, Flooding and Water Quality

Questions to consider	Yes	No
Are the works located near a natural watercourse?		✓
Are the works located within a floodplain?		✓
Will the works intercept groundwater?		✓
Will a licence under the Water Act 1912 or the Water Management Act 2000 be required?		✓

Existing Environment

The grass covered site area covers approximately 3,838 m^2 and slopes approximately 8.2% towards the intersection north-east of the site.

There are no natural drainage lines or watercourses within or near the site. Rocky Ponds Creek traverses Anzac Park, approximately 130 east of the site. The Section 10.7 Planning Certificate states the land is not flood prone and is not subject to flood related development controls.

Existing stormwater facilities are located in West Avenue.

Impact Assessment

The activity will not affect a natural waterbody, wetland or groundwater aquifer or natural water drainage pattern. There are no flood constraints that impact the development as proposed.

Potential impacts to hydrology, flooding and water quality that could arise from the Activity generally relate to the disturbance of soil and chemical spills during construction and/ or operation that may enter the public stormwater system and potentially make their way into natural waterways. A spill kit will be on-site as a precaution in the event of any potential spills.

Adequate erosion and sediment control measures will be put in place in accordance with the Blue Book to prevent any materials entering the public stormwater system.

<u>Stormwater Management</u>

A Civil Engineering Design Report attached as **Appendix J** outlines the proposed plan for stormwater management. The strategic plan for the management of stormwater is to generally maintain the existing catchment stormwater flow rates and stormwater quality by providing stormwater detention and treatment control devices. A bioretention basin with surcharge pits is proposed to achieve the required run off and pollutant reductions. It is the design intent that all existing overland flow rates and discharge points will be preserved.

As required by Glen Innes Severn Council (GISC), the design of stormwater drainage systems shall be carried out in accordance with Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia 2019, and the requirements of GISC for Stormwater Drainage.

The existing site is 0% impervious. This will increase to approximately 52% impervious based on the proposed concept design details. A bioretention basin with Surcharge pits is proposed to limit the post-development flows to the pre-development conditions as outlined in NSW Ambulance, RASFED Guideline. The preliminary analysis undertaken using DRAINS computer software indicates a volume of approximately 30m^3 of detention storage is required. The proposed development's bioretention is designed to outlet on a pipe tapping on an existing drainage pit located along West Avenue.

The estimated pre-development stormwater flow rate is 0.137m3/s = 137L/s, and the unmitigated post-development is 149L/s for the 1 in 100 years ARI rainfall event (Q100). With on-site detention, the post-development stormwater flow rates are smaller than the pre-development flow rates, also, for other rainfall events.

A major system is also required for the proposed development in the form of overland flow paths. The major system should be designed to convey flows surcharged from the underground drainage system for storm events up to 100-year ARI. The overland flow is to be directed away from the buildings and carparks and towards the public road kerb and gutter provided.

Stormwater Quality Management

WSUD Guidelines require any development must undertake a stormwater quality assessment to demonstrate that the development will retain existing pollutant loads for the site. Treatments were determined in accordance with NSW Ambulance Water Quality Targets.

To achieve the required run off and pollutant reductions, a bioretention basin with surcharge pits is proposed for the site as water quality treatment. For the benefit of reducing the demand on water supply, a rainwater harvesting system could also be proposed onsite via the provision of a rainwater tank, subject to confirmation by the Project Manager.

Mitigation Measures

The following mitigation measure would be implemented to manage impacts relating to hydrology, flooding and water quality:

- The erosion and sediment control measures for the site will be implemented during construction. The design of these measures is to be in accordance with the Landcom “Blue Book”. These will include:
  - A sediment fence.
  - Temporary access to site with shaker pad.
  - An indicative stockpile area with sediment fence around it during construction.
  - Geotextile inlet pit filters or sandbags to be placed around existing stormwater pits.

6.1.4 Ecology

Questions to consider	Yes	No
Could the works affect any Environmental Protection and Biodiversity Conservation Act 1999 (Cth) listed threatened species, ecological community or migratory species?		✓
Is it likely that the activity will have a significant impact in accordance with the Biodiversity Conservation Act (2016)? In order to determine if there is a significant impact REF report must address relevant requirements of clause 7.2 of the BC Act: • Clause 7.2 (a) - Test for significant impact in accordance with clause section 7.3 of the BC Act. • Clause 7.2 (c) it is carried out in a declared area of outstanding biodiversity value.		✓
Could the works affect a National Park or reserve administered by EES?		✓
Is there any important vegetation or habitat (i.e. Biodiversity & Conservation SEPP 2021 (Former SEPP 9 Urban Bushland, SEPP 14 Wetlands, SEPP 26 Littoral Rainforest) within or adjacent to the work area?		✓
Could the works impact on any aquatic flora or habitat (i.e. seagrasses, mangroves)?		✓
Are there any noxious or environmental weeds present within the work area?		✓
Will clearing of native vegetation be required?		✓

Existing Environment

The site is a suburban land parcel and is not identified as biodiversity certified land.

An Arboricultural Impact Assessment (AIA) prepared by Civica Pty Ltd identified twenty-three (23) trees located within the grounds of the Glen Innes Hospital. The majority of the trees are of exotic species, planted for amenity value, with the exception of a large Mountain Blue Gum *(Eucalyptus deanei)*. There are no trees identified as being of national,

state or local heritage significance. The site trees were considered common species in the local area and to hold limited botanical significance. A copy of the AIA is attached as **Appendix L**.

An EPBC Act Protected Matters Report undertaken on 28 June 2022 identified habitat for three threatened ecological communities and 30 threatened species (9 flora and 21 fauna species) within 1 km of the site (refer **Appendix K**).

Impact Assessment

The Assessment recommended that fifteen (15) trees would require removal to allow the proposed development. The Demolition Plan also identifies 15 trees to be removed. Nine (9) of these (one of which is a Council street tree) are affected by direct footprint conflict and/ or major TPZ encroachment to the point they would be non-viable following the completion of the development works. Six (6) trees should be removed in the context of the development due to poor health and/or structure and very limited useful life expectancy. **Note:** A Traffic Impact Statement for the proposed station also notes "a series of medium size bushes are planted along Taylor Street" and recommends that, "to maintain adequate levels of sight distance adjacent to the proposed driveway, a few of the existing vegetation may need to be removed either side of the driveway". This additional vegetation is not included in the AIA. The removal of these shrubs is not considered significant and would be carried out as part of any future Roads Act Approval

Eight (8) trees were recommended for retention and require generic protection measures during construction to ensure they remain viable following the completion of works.

The trees proposed to be removed are considered to have been planted as landscaping within the site and, except for the Mountain Blue Gum, are not native. The species proposed to be removed do not provide important habitat for any threatened fauna or represent threatened flora or communities listed under the *Biodiversity Conservation Act 2016* or *Environment Protection and Biodiversity Conservation Act 1999.* The Activity will not impact biodiversity. None of the vegetation proposed to be removed is considered to be of conservation significance or part of a cultural landscape value.

To compensate for tree loss and complement the development, Landscaping Plans have been prepared for the Activity by Site Image Landscape Architects **(Appendix M)**. The plans show 15 replacement trees plus a mix of mainly native species to be planted at the completion of construction works. It is noted that HI's policy is a 1:1 replacement ratio, therefore 15 replacements trees have therefore been included in the landscaping. Plant species will range in size from trees to shrubs, grasses and ground covers and include species appropriate for the bioretention area. The planting design embodies a low maintenance and sustainable approach in terms of species choices and incorporates trees and low planting at the property entry, while maintaining as many existing trees as possible around other boundaries.

Mitigation Measures

The following mitigation measures would be implemented to prevent impacts trees adjoining the development area:

- Trees identified for retention will be protected during construction in accordance with the Arboricultural Impact Assessment prepared by Civica (May 2022).
- Landscaping of the site will be carried out in accordance with the plans prepared by Site Image Landscape Architects (Project No. SS22-4920 June 2022).
- All trees to be removed shall be replaced on site on a 1:1 basis with appropriate native species of similar size to the tree being removed.

6.1.5 Bushfire Prone Land

Questions to consider	Yes	No
Are the works located on bushfire prone land		✓
Do the works include bushfire hazard reduction work?		✓
Is the work consistent with a bush fire risk management plan within the meaning of the ***Rural Fires Act 1997*** **(RF Act)** that applies to the area or locality in which the activity is proposed to be carried out?		✓

Existing environment

The site is not identified as bushfire prone land. There are no significant stands of vegetation near the activity.

Impact Assessment

The Section 10.7 Planning Certificate issued by Glen Innes Severn Council indicates that the site is not bushfire prone land.

Mitigation Measures

No mitigation measures are required.

6.1.6 Traffic, Access and Parking

Questions to consider	Yes	No
Will the works affect traffic or access on any local or regional roads?		✓
Will the works disrupt access to private properties?		✓
Are there likely to be any difficulties associated with site access?		✓
Are the works located in an area that may be highly sensitive to movement of vehicles or machinery to and from the work site (i.e. schools, quiet streets)?		✓
Will full or partial road closures be required?		✓
Will the proposal result in a loss of onsite car parking?		✓
Is there onsite parking for construction workers?	✓	

RoadNet Engineering Pty Ltd have prepared a Traffic Impact Assessment (TIA) for the proposed Ambulance station. A copy is attached as **Appendix S**.

Existing Environment

The activity site is bound by Taylor Street to the North and West Avenue on the East. The road network immediately surrounding the subject site is predominantly comprised of Local Roads, under the jurisdiction of Glen Innes Severn Council.

Taylor Street, which fronts the site, is a two-lane, undivided Local Road with a carriageway width of approximately 20 m and a speed limit of 50 km/h. The closets intersection is with West Avenue, which is also a Local Road, with a 9 m carriageway width and 50 speed km/h speed limit. There have been no crash or casualties within the surroundings recorded within the five-year period from 2016-2020.

Impact Assessment

<u>Construction Phase</u>

An increased volume of daily traffic and parking demand is likely during the construction phase of the development. However, the volume of additional traffic will not be significant and is unlikely to have more than minor impacts on the local traffic network.

Traffic increase will be associated with the arrival of work crews and the transport of machinery and waste materials. These additional movements may contribute to some increased road traffic noise and potential minor disruption of existing traffic and pedestrian movements immediately around the site. However, it is considered that the identified impacts will be temporary and will have only a minor contribution to road traffic volumes. The potential impacts are considered reasonable and unlikely to cause significant adverse impacts to the traffic, access and parking.

It is anticipated that any temporary impacts associated with the activity will be confined to the site or its immediate surrounds. The broader community is unlikely to experience adverse impacts in relation to traffic and parking. There are no sensitive areas within the vicinity of the site.

There is space available onsite, however should an additional area be required to accommodate short-term parking and access requirements during construction works, Taylor Street and West Avenue road reserves adjacent to the site

will be used. To effectively manage car parking and access requirements during the construction period, a traffic control and access plan will be required to ensure the safety of the public during construction.

Operation

In addition to reviewing the existing conditions surrounding the site, the TIA includes an estimate of the development's traffic generation figures and an assessment of the on-site parking provisions and layout against Glen Innes Severn Council Development Control Plan (DCP) and AS2890 requirements.

Additional traffic generated by the new station is not expected to result in any substantial impact on the operation or safety of the surrounding road network. The station is estimated to generate eight trips during both peak hours, equating to approximately one (1) vehicle every seven (7) minutes during the peak hour periods (including staff movements and emergency responses).

NSW Ambulance has advised the following in relation to staff on site at any one time:

- The average case load per month for this year has been 136 cases per month. 50% of these cases are out of hours (11pm to 7am). As with all stations not all of these on shift cases will be responded from the station and will depend on where the crew is at the time of the call.
- The maximum number of staff on site at one time (day and afternoon shift overlap) is 6.

Based on this advice, the expected maximum number of people on-site at one time will be six people. This will be during the change of shifts between night and day shift for emergency crews and the beginning of the office staff day shift and includes allowance for 'ride-alongs' and staff or students in training. A copy of the Return Brief for the Glen Innes Ambulance Station with comprehensive details on staffing is attached as **Appendix E**.

The Glen Innes ambulance station proposes to provide six (6) ambulance parking bays, six (6) staff car parking spaces, one (1) wash bay, one (1) relief bay, one (1) accessible park, one (1) Directorate of Management (DOM) covered parking bay, satisfying the requirements of the Glen Innes RAIR Ambulance Station Return Brief.

Two new driveways will be constructed for the proposed station; one (1) all-movement access (for staff and ambulance) on Taylor Street and one (1) egress only (ambulance only) on West Avenue. Details are as follows:

Table 12: Driveway details

Design Element	Details
Access facility category	Type 1 as per AS2890.1 (i.e., User Class 1/1A, less than 25 car parking spaces and local road frontage)
Crossover form	Crossover shall be designed in accordance with Institute of Public works Engineering Australia – Heavy Duty Vehicle Crossing SEQ R-051
Pedestrian sight triangle	Pedestrian sight triangles shall be made available on both sides of the driveway at 2 m along the property boundary and 2.5 m into the site. In accordance with AS2890.1 the areas within the triangles is to remain clear of all obstructions to visibility.

Sight distance requirements for both accesses have been assessed and determined to be in accordance with the requirements of AS2890.1 . To maintain safe egress from the proposed driveway on Taylor Street, the TIA recommends that some of the adjacent medium sized bushes at either side of the driveway be removed.

The following details are also confirmed in the TIA:

- An onsite bin storage area is proposed with waste collection proposed to utilise the existing kerbside collection service.
- A service bay for maintenance and delivery vehicles included in the proposal is suitable for a Medium Rigid Vehicle (MRV).
- The provision of one (1) service bay is also compliant with the requirements of Council's DCP.
- The off-street geometric layout is generally provided in accordance with the relevant requirements of the DCP and Australian Standard AS2890.1 Parking Facilities – Part 1: Off-street car parking.

- A 'swept path analysis' based on a vehicle which most closely resembles the size of current NSW ambulance vehicles demonstrated that ambulance vehicles are able to access the proposed parking bays and manoeuvre through the site.

Mitigation Measures

The following mitigation measures would be implemented to manage impacts relating to traffic, access and parking:

- A Traffic Control Plan (TCP) shall be prepared by a suitably qualified person and implemented for the works in accordance with the requirements of the Traffic Control at Worksites Manual (RTA 2010 V4) and AS1742.3. Licensed traffic controllers will assist with traffic control during the construction phase of the project.
- Where possible, current traffic movements will be maintained during the works.
- Regard to public safety will be maintained at all times.
- Appropriate signage will be erected, and details will be confirmed by appropriate Project personnel responsible for site safety during the development.
- Traffic delay notifications will be issued to Council at least two weeks prior to commencement of works requiring full or partial road closure. An Access Management Plan shall be prepared to manage internal site traffic and pedestrian movements to ensure the safety of workers and public within the site.
- Neighbouring residents and property owners are to be informed in writing at least two weeks prior with respect to any changes to pedestrian movements and parking restrictions associated with the development.

6.1.7 Noise and Vibration

Questions to consider	Yes	No
Are there residential properties or other sensitive land uses or areas that may be affected by noise from the proposal during construction? (i.e. schools, nursing homes, residential areas or native fauna populations)?	✓	
Will any receivers be affected by noise for greater than three weeks?	✓	
Are there sensitive land uses or areas that may be affected by noise from the proposal during operation?	✓	
Will the works be undertaken outside of standard working hours? Monday – Friday: 7am to 6pm Saturday: 8am to 1pm Sunday and public holidays: no work		✓
Will the works result in vibration being experienced by any surrounding properties or infrastructure?		✓

Existing Environment

The site occurs within a general residential area adjacent to the Glen Innes District Hospital in the Glen Innes Township. The site is surrounded by healthcare, heritage and residential buildings as well as recreational areas in a suburban residential environment.

The proposed development will operate 24 hours per day, 7 days per week. The noise sensitive receivers surrounding the site are healthcare, heritage/retail, active recreational and residential. The closest residence is located at 176 West Avenue, approximately 40 m north of the activity site.

Impact Assessment

To identify any potential noise and vibration impacts as a result of the proposal, JHA Consulting Engineers have prepared an Acoustic Report for the proposal (refer **Appendix N**). It is noted that the assessment does not involve a noise survey and is based on a desktop assessment. This is considered acceptable given the scale and nature of the proposed Activity. In the absence of a noise survey, the recommended background noise levels from the NSW Noise Policy for Industry (EPA 2017) have been used as the basis for the noise assessment as they will set a stringent noise level criteria.

OPERATIONAL NOISE

The sources of potential noise break-out from the proposed Ambulance Station which may impact on existing noise sensitive receivers have been assumed to be noise emissions from the mechanical plant and any traffic generated by the development and noise emissions from the wash bay. These noise sources were considered in the noise emissions assessment and the acoustic assessment has considered the following:

- Noise levels have been considered as continuous over assessment time period to provide the worst-case scenario.
- Distance attenuation, building reflections and directivity.
- Lowest estimated background noise levels at the nearest noise sensitive receiver have been used to provide a worst-case scenario.

- *External Mechanical Plant*

  Based on the results of the noise assessment and the NSW NPI noise level criteria, the mechanical plant will meet the noise level criteria at the nearest noise sensitive receivers. If new or replacing external mechanical plant is proposed, then an acoustic assessment of all mechanical plant shall continue during the detailed design phase of the project in order to confirm any noise control measures.

- *Vehicle Noise Emissions: Ambulance & Staff Movements*

  The potential noise sources associated with the proposed vehicle operations will be:

  - Noise generated by vehicles movements, particularly ambulances dispatched for emergencies during night-time.
  - Noise generated by ambulance sirens.
  - Noise generated by staff vehicles movements.

  It is expected that vehicle movements will be moving slowly, and the number of vehicles movement will be low compared with the existing traffic flows. Existing ambient and background noise levels will not be significantly increased by vehicle movements from the Ambulance Station as there will only be a slight increase in traffic (i.e. an additional eight Ambulance vehicles and seven staff carpark spaces).

  Traffic noise associated with the ambulance movements is therefore expected to meet the NSW RNP recommendations.

- *Ambulance Sirens*

  The use of ambulance sirens on site (when ambulances depart to attend incidents) is not specifically addressed in the relevant regulations. When in use, noise levels from ambulance sirens will be audible at the nearest residential receivers. Events identified as Priority One events (Life Threating Emergencies), require that warning devices must be used, including warning lights and sirens.

  It is understood that ambulance drivers will make a judgement call on whether to use ambulance sirens on a case-by-case basis. It is further understood that it is the practice of Paramedics to minimise the use of sirens when it will cause a noise disturbance and the sirens are deemed unnecessary. It is recommended that their operation within the development and surroundings should be addressed in the Management Plan and minimised whenever possible.

- *Ambulance Wash Bay*

  Wash bay operations will not be used continuously and are expected to comply with the relevant noise criteria as it is proposed within the ambulance plantroom. Therefore, the building façade will offer shielding to the nearest noise sensitive receivers. It is expected that the pressure washer will not impact the nearest noise sensitive receivers.

  As required by the NSW POEO NCR 2008, noise from all power tools, including the pressure washer, should not be audible within any habitable room in any residential premises outside the proposed hours. The allowed operation time period is between 7 am and 8 pm Monday to Friday, and between 8 am and 8 pm on Saturday, Sundays and Public Holidays. Therefore, whenever reasonable, the pressure washer shall only be used during these hours.

- *Noise Intrusion*

  The total noise level within the internal spaces of the proposed development will be a result of the combination of external noise and noise from the building services. Noise generated by building services, particularly the air-conditioning and ventilation systems, needs to be considered to ensure that the internal noise levels for each space of the Ambulance Station meet the ambient noise levels as per NSW Health Infrastructure ESG.

  In order to achieve these internal noise levels for each space, noise control treatments will need to be incorporated into the mechanical systems as required.

CONSTRUCTION NOISE & VIBRATION PLANNING

Preliminary construction noise and vibration management planning has been presented in the report and recommendations based on the relevant guidelines provided. This preliminary advice is to form the basis for the Contractor's Construction Noise and Vibration Management Plan (CNVMP) which will identify any noise criteria exceedance once construction methods and stages are known.

The proposed construction hours are within the recommended NSW EPA hours.

CONCLUSION

Based on the information presented in the acoustic report, relevant objectives will be satisfied and therefore the proposed Activity is acceptable.

Mitigation Measures

The following noise and vibration controls measures/strategies are recommended by the Acoustic Report dated 1 June 2022:

- The following construction hours are proposed:
  - Monday to Friday: 7am to 6pm.
  - Saturday: 8am to 1pm.
  - Sundays and Public Holidays: No excavation or construction works.

  Noise control measures are to be implemented during these hours in accordance with the approved construction noise and vibration management plan.

  High noise level works – i.e. piling, excavation, etc – should be scheduled to not occur during shoulder periods of the recommended standard hours – i.e. 7 am to 8 am and 5 pm to 6 pm.

- A detailed Construction Noise and Vibration Management Plan (CNVMP) is to be prepared to further assess the noise impact of construction works, include a protocol to minimise any potential noise impacts to identified sensitive receivers, and to ensure that appropriate noise control measures are defined and implemented to comply with all relevant noise guidelines.

  In order to meet the noise and vibration requirements for the site, the Contractor will be required to engage a qualified acoustic consultant to assist in the compilation of a Construction Noise and Vibration Management Plan (CNVMP) and undertake noise and vibration monitoring for the duration of the project, if required by the CNVMP and / or Conditions of Consent.

- Plant and equipment:
  - Employing quieter techniques for all high noise activities such as rock breaking, concrete sawing, and using power and pneumatic tools.
  - Use quieter plant and equipment based on the optimal power and size to perform the required tasks most efficiently.

- Selecting plant and equipment with low vibration generation characteristics.
- Operate plant in a quietest and most effective manner.
- Where appropriate, limit the operating noise of equipment.
- Regularly inspecting and maintain plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively.

- On site noise management:
  - Maximising the distance between noise activities and noise sensitive receivers. Strategically locate equipment and plant.
  - Undertaking noisy fabrication work off-site where possible.
  - Avoid the use of reversing beeping alarms or provide for alternative systems, such as broadband reversing alarms.
  - Maintaining any pre-existing barriers or walls on a demolition or excavation site as long as possible to provide optimum sound propagation control.
  - Constructing barriers that are part of the project design early in the project to afford mitigation against site noise.
  - Using temporary site building and material stockpiles as noise barriers. These can often be created using site earthworks and may be included as a part of final landscape design.
  - Installing purpose-built noise barriers, acoustic sheds and enclosures.
- Work scheduling:
  - Provide respite periods, including restricting very noisy activities to daytime, restricting the number of nights that after-hours work is conducted near residences, or by determining any specific requirements, particularly those needed for noise sensitive receivers.
  - Scheduling activities to minimise impacts by undertaking all possible work during hours that will least adversely affect sensitive receivers and by avoiding conflicts with other scheduled events.
  - Scheduling work to coincide with non-sensitive periods.
  - Scheduling noisy activities to coincide with high levels of neighbourhood noise so that noise from the activities is partially masked and not as intrusive.
  - Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from sensitive receivers.
  - Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours.
  - Designating, designing and maintaining access routes to the site to minimise impacts.
- Consultation, notification and complaints handling:
  - Provide information to neighbours before and during construction.
  - Maintain good communication between the community and Project staff.
  - Have a documented complaints process and keep register of any complaints.
  - Give complaints a fair hearing and provide for a quick response.

- Implement all feasible and reasonable measures to address the source of complaint. Implementation of all reasonable and feasible mitigation measures for all works will ensure that any adverse noise impacts to surrounding receivers are minimised when noise goals cannot be met due to safety or space constraints.

- If, during construction, an item of equipment exceeds either the noise criteria at any location or the equipment noise level limits, the following noise control measures, together with construction best practices, shall be considered to minimise the noise impacts on the neighbourhood.
  - Schedule noisy activities to occur outside of the most sensitive times of the day for each nominated receiver.
  - Consider implementing equipment-specific screening or other noise control measures in Appendix C of AS 2436:2010.
  - Limit the number of trucks on site at the commencement of site activities to the minimum required by the loading facilities on site.
  - When loading trucks, adopt best practice noise management strategies to avoid materials being dropped from height into dump trucks.
  - Avoid unnecessary idling of trucks and equipment.
  - Ensure that any miscellaneous equipment (extraction fans, hand tools, etc.) not specifically identified in the CNVMP incorporates silencing/shielding equipment as required to meet the noise criteria.
- Whenever possible, the pressure washer and other power tools shall be operated between 7am to 8pm during Monday and Friday and between 8am to 8pm on Saturdays, Sundays and Public Holidays.
- Use of ambulance sirens within the Ambulance Station lot and surroundings should be minimised whenever possible and their operation addressed in the Management Plan.
- To minimise impact on the surrounding amenity, Waste Collection movements are recommended to occur during the day-time.

6.1.8 Air Quality and Energy

Questions to consider	Yes	No
Could the works result in dust generation?	✓	
Could the works generate odours (during construction or operation)		✓
Will the works involve the use of fuel-driven heavy machinery or equipment?	✓	
Are the works located in an area or adjacent to land uses (e.g. schools, nursing homes) that may be highly sensitive to dust, odours, or emissions?	✓	
Have energy use considerations been included in the project design?	✓	

Existing Environment

The site and surrounding area is zoned R1 General Residential. The site occurs within a general residential area adjacent to the Glen Innes District Hospital in the Glen Innes Township. The site fronts a Local Road and is surrounded by healthcare, heritage and residential buildings as well as recreational areas. The local air quality is generally good. Potential airborne particles within the locality would be restricted to vehicle emissions.

Impact Assessment

In the short-term construction period, the Activity has potential to generate dust and may cumulatively contribute to generating exhaust emissions locally through:

- Excavation resulting in dust generation;
- Exhaust emissions from machinery and associated transportation; and

- Material blown from the site during high winds.

Dust generation during the proposed construction works is likely but would be minimal and limited to the immediate vicinity of the work area. Mobilisation of dust during construction works pose risks to worker and public safety. Notwithstanding these risks, significant quantities of dust are unlikely, especially with effective implementation of appropriate safeguards and mitigation measures.

The Traffic Impact Study determined that additional traffic generated by the new station is not expected to be significant (i.e. 8 trips during both peak hours). The ongoing operation of the station is therefore not anticipated to affected local air quality.

The new building will feature a 30.14kW (total 90-OFF 335W Panels or equivalent) solar power system. New fixtures and fittings would be meet relevant energy efficiency standards and benefit emission reduction and energy efficiency.

As discussed in section 3.1.1, the RAIR programme is targeting 50 points under the Design Guidance Note No. 058 rating tool for new rural ambulance stations. In accordance with Design for a better future, Rural Ambulance Station Facilities ESD Design Guidelines, Sept 2021 a pathway has been developed identifying credits to be targeted to meet this rating. These targets include features that measure and reduce energy consumption.

The Activity would contribute to greenhouse gas emissions to a minor extent via the emissions from construction equipment and traffic, as well as the consumption of materials requiring carbon emissions. Given the scale of the works however, the influence on greenhouse gas emissions would be negligible. However, it is appropriate to implement measures that can reduce or minimise such effects.

Mitigation Measures

The following mitigation measures would be implemented to manage impacts relating to air quality and energy:

- No materials will be burnt on site.
- Vehicles transporting waste or other materials that may produce dust will be covered during transportation.
- Vehicles, machinery and equipment will be maintained in accordance with manufacturer's specifications in order to meet the requirements of the Protection of the Environment Operations Act 1997 and associated regulations.
- Vehicles and equipment will be switched off when not operating.
- Debris and waste will be immediately collected into appropriate storage facilities and removed from the site as soon as practical to ensure light-weight material is not dispersed by wind gusts.
- Stockpiles and exposed soils will be covered or dampened to reduce incidence of air dispersal.
- Appropriate practices are to be in place to minimise dust that could be dispersed during excavation.
- New fixtures and fittings would meet relevant energy efficiency standards.

6.1.9 Non-Aboriginal Heritage

Questions to consider	Yes	No
Are there any heritage items listed on the following registers within or in the vicinity of the work area? NSW heritage database (includes section 170 and local items) Commonwealth EPBC heritage list?	✓	✓
Will works occur in areas that may have archaeological remains?	✓	
Is the demolition of any heritage occurring?		✓

Existing Environment

The Land of the Beardies Museum (former hospital complex) south of the site on Lot 1 DP1208729 is included as a local heritage item in Schedule 5 of the Glen Innes Severn LEP 2012 (Item No. I076). However it is not listed on the

State Heritage Register associated with the *NSW Heritage Act 1977*. The site is not within a heritage conservation area, however other locally listed heritage items occur in the surrounds as depicted in **Figure 3** below.

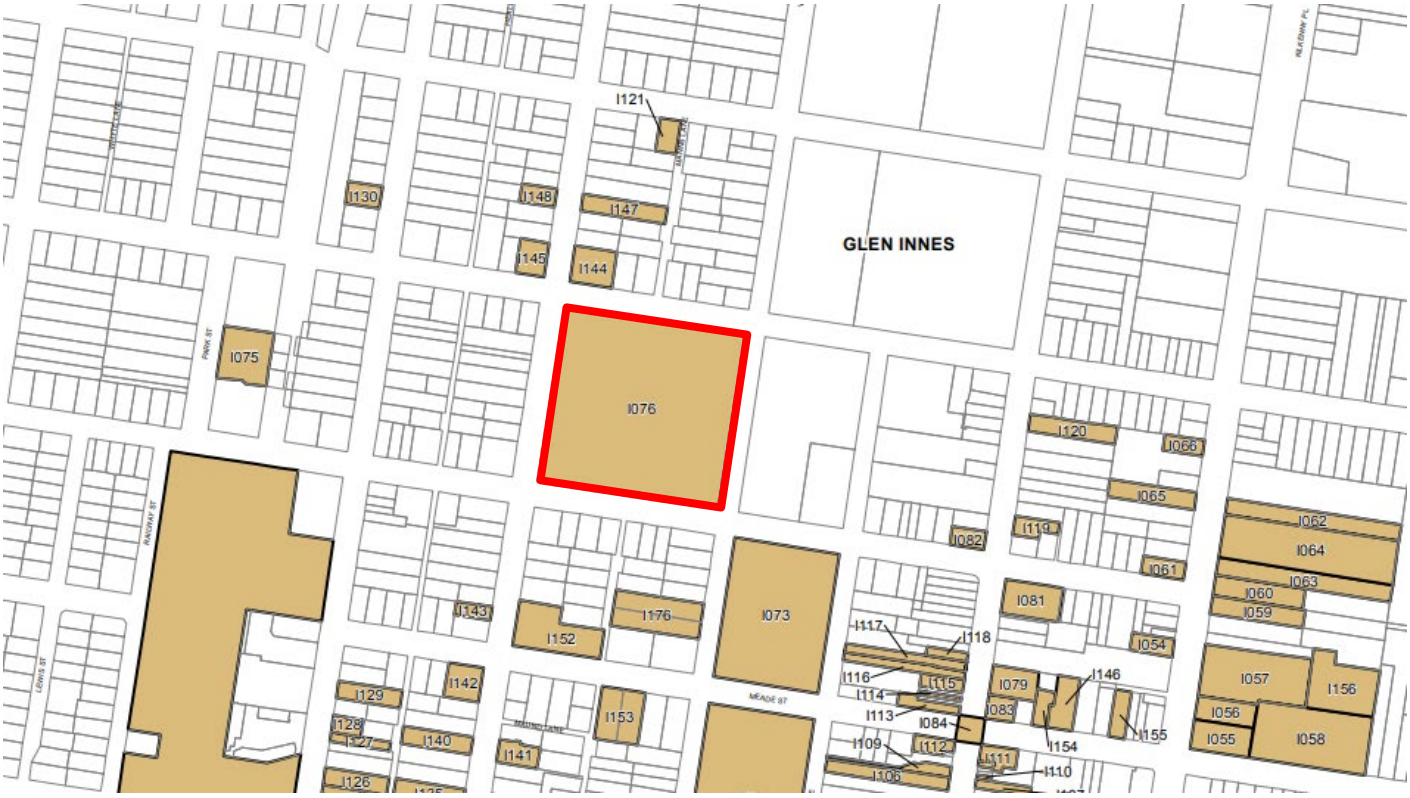


Figure 3 Glen Innes Severn LEP 2012 Heritage Map.

Impact Assessment

A Heritage Impact Assessment (HIS) has been prepared (refer to **Appendix G)** to assess the potential impacts of the Activity on the locally listed heritage item and surrounds.

The HIS provides an assessment of the entire site and notes that, apart from the proposed ambulance station site in the north-eastern corner of the property, the site is predominantly built up with hospital related buildings and the original hospital which has been converted to a museum. Research indicates that the location of the proposed ambulance station has always been a landscaped area.

Glen Innes District Hospital Building is a c.1956 freestanding, two story Post-WWII Period hospital building constructed of face brickwork with a hipped roof clad in corrugated steel concealed behind a high, stepped brick parapet. The driveway is accessible via Taylor Street and the connecting carpark located in front of the hospital.

The HIS confirms that the Glen Innes District Hospital is not a historically significant building, and it is not described on any statutory heritage register.

The Land of the Beardies Museum (former hospital complex) located to the south-east of the Glen Innes Historic/District Hospital complex is listed in Schedule 5 of Glen Innes Severn LEP 2012 (I076). The Statement of Significance assesses it as having *"historic, social, cultural, archaeological, architectural, aesthetic, rarity, group and landmark values"*.

The HIS also identifies the following heritage items in the vicinity of the site (refer **Figure 3** above):

- House, 129 Macquarie Street, Glen Innes (I144).
- House, 130 Macquarie Street, Glen Innes (I145).
- Veness Park, East Avenue, Glen Innes (I073)

The proposed freestanding ambulance station will have a minimal and acceptable impact on the significance of the subject site for the following reasons:

- The site's topography ensures that the proposed structure will be mostly below ground level, with the roof being the only component visible from the former Glen Innes Hospital site. From the main circular driveway on the western side of the former hospital the proposed ambulance station is site is largely obscured by extant vegetation.
- The proposed vegetation will further screen views towards the proposed Ambulance station from the former Glen Innes Hospital. The proposed ambulance station will also be screened from Taylor Street and West Avenue through the proposed boundary plantings around the site perimeter.
- Due to the low profile of the proposed Ambulance Station no views towards the former Hospital Complex will be impacted . Views towards the north-eastern part of the site from West Avenue are oriented away from the main cluster of buildings and are separated from the buildings by approximately 100m to the northwest.
- The proposed Ambulance station is simple in form, finishes and detailing and, where visible, will clearly read as secondary, contemporary buildings in response to the former rural hospital constructed in the late 19th Century. This is an appropriate response given the character of the former Hospital Complex.
- The proposed driveway off Taylor Street will require the removal of a small portion of the existing low boundary wall. To minimise the impact on the fence the proposed entry will be flanked by two new brick piers to match the existing piers.
- The design is consistent with other rural ambulance station designs across New South Wales.

The proposed works will have a minimal and acceptable impact on the heritage items in the vicinity of the site for the following reasons:

- Views from heritage items to the northwest of the site will largely be obscured from the site. The proposed cutting into the existing sloped site will obscure much of the built form by the landscape, the remainder of the station will largely be obscured by the proposed boundary plantings. Their setting will not be affected.
- The heritage items in the vicinity will continue to be read and understood as good examples of their respective type.
- The proposed ambulance station will largely not be visible from, or in conjunction with, any of the heritage items in the vicinity due to intervening topography, vegetation and structures.
- The simple material palette and neutral tones of the addition will help to ensure it does not dominate or detract from heritage items in the vicinity.

Overall, the proposed works are to be located away from the historically significant buildings within the wider Glen Innes District Hospital site. The site's topography ensures that the proposed structure will be mostly below ground level, with the roof being the only component visible from the former Glen Innes Hospital site. From the main circular driveway on the western side of the former hospital, the proposed ambulance station site is largely obscured by extant vegetation. The heritage listed former hospital will continue to make a positive contribution to the setting of heritage items in the vicinity of the site.

The proposal fulfils the objectives for works to a heritage item, within the vicinity of heritage items as set out by the Glen Innes Severn LEP 2012 and the Glen Innes Severn DCP 2014

Mitigation Measures

No specific measures are required. The following standard protocol will be adapted for unexpected finds:

- The stop work provision should be applied in line with the requirements of the *NSW Heritage Act 1977* if any unexpected archaeological both historical and Aboriginal find be exposed during construction and earthworks. An appropriately qualified heritage professional and an archaeologist should be engaged to assess the finds and advise on their management.

6.1.10 Aboriginal Heritage

Questions to consider	Yes	No
Will the works disturb any culturally modified trees?		✓
Are there any known items of Aboriginal heritage located in the works area or in the vicinity of the works area (e.g. previous studies or reports from related projects)?		✓
Are there any other sources of information that indicate Aboriginal objects are likely to be present in the area (e.g. previous studies or reports from related projects)?		✓
Will the works occur in the location of one or more of these landscape features and is on land not previously disturbed? • Within 200m of waters. • Located within a sand dune system. • Located on a ridge top, ridge line or headland. • Located within 200m below, or above a cliff face. • Within 20m of, or in a cave, rock shelter or a cave mouth		✓
If Aboriginal objects or landscape features are present, can impacts be avoided?	n/a	
If the above steps indicate that there remains a risk of harm or disturbance, has a desktop assessment and visual inspection been undertaken?	n/a	
Is the activity likely to affect wild resources or access to these resources, which are used or valued by the Aboriginal community?		✓
Is the activity likely to affect the cultural value or significance of the site?		✓

Existing Environment

The Activity is located within a residential area within a site that has been historically cleared and associated with the hospital use. The development area meets the definition of disturbed land as defined under the Due Diligence Code of Practice for the Protection of Aboriginal Objects (DECCW 2010).

The Traditional land-owners of Glen Innes are the Ngoorabul/Ngarabal people. The Activity is located within the Glen Innes Local Aboriginal Land Council (LALC) area. An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the site on 23 June 2022 **(Appendix K**). Search results indicate that there are no Aboriginal sites recorded in or near the site.

Impact Assessment

Based on the above information and with consideration of the Due Diligence Code of Practice for the Protection of Aboriginal Objects (DECCW 2010) there is very low probability of Aboriginal objects occurring in the Activity Area. An overview of the application of the Due Diligence Code of Practice for the Protection of Aboriginal Objects is presented at **Table 13** below.

Table 13: Due Diligence Code of Practice for the Protection of Aboriginal Objects

Step		Comment
1	Will the activity disturb the ground surface? Disturbed land is defined under the code as: Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable. Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks.	Yes. The activity includes the construction of a new ambulance station and associated installation of services infrastructure. However, as discussed, the land has historically been associated with the hospital use and is defined as Disturbed land.
2a	AHIMS database	An AHIMS search was undertaken for the activity. The results of the AHIMS search determined that

Step		Comment
		there are no known Aboriginal cultural heritage items within the activity area.
2b	Is the activity: - Within 200m of waters - Located within a sand dune system - Located on a ridge top, ridge line or headland - Located within 200m below, or above a cliff face - Within 20m of, or in a cave, rock shelter or a cave mouth - On land that is not disturbed land. If, after completing steps 2a and 2b, it is reasonable to conclude that there are no known Aboriginal objects or a low probability of objects occurring in the area of the proposed activity, you can proceed with caution without applying for an AHIP.	The development area does not include any culturally significant landscape features. As detailed in Step 1, the development area is consistent with the definition of disturbed land under the code.
3	Can you avoid harm to the object or disturbance of the landscape feature	This step only applies if the activity is on land that is not disturbed land or contains known Aboriginal objects.
4	Desktop assessment and visual inspection	Only applies if the activity is on land that is not disturbed land or contains known Aboriginal objects.
5	Further investigations and impact assessment	If after a detailed investigation and impact assessment has been undertaken and that harm would occur to Aboriginal objects then an AHIP application must be made. Only applies if the activity is on land that is not disturbed land or contains known Aboriginal objects.

Mitigation Measures

The following mitigation measures would be implemented to manage impacts relating to Aboriginal Heritage:

- All personnel working on site would receive induction on their responsibilities under the NPW Act; and
- If Aboriginal cultural material is identified on site, a Stop Work Procedure will be followed, which includes:
  - Works will cease immediately.
  - A temporary exclusion zone established.
  - CVC project manager and Local Aboriginal Land Council will be contacted immediately.
  - Heritage NSW contacted immediately.

6.1.11 Visual Amenity

Questions to consider	Yes	No
Are the works visible from residential properties, or other land uses that may be sensitive to visual impacts?	✓	
Will the works be visible from the public domain?	✓	
Are the works located in areas of high scenic value?		✓
Will the works involve night work requiring lighting?		✓

Existing Environment

The activity will occur in a corner location within the grounds of the Glen Innes Hospital, which is currently managed land with some established trees.

Surrounding land uses are primarily general residential and health services, with recreational and community use premises to the east and a museum to the south. Visual amenity in the location of the development area is considered moderate.

There are currently twenty-three (23) trees located within or adjacent to the proposed site of the new ambulance station. Fifteen (15) trees would require removal; eight (8) trees are identified for retention.

Impact Assessment

The construction phase of the Project will require the establishment of a site compound including the presence of works crew, plant and equipment, representing a minor short-term variation in the visual environment.

Upon completion of the new ambulance building, the visual amenity of the site will be changed from landscaped land to the new Ambulance Station. The new Station will be visible from residences and vehicular traffic in Taylor Street and West Avenue and adjoining recreational lands to the north-east.

Fifteen trees within the existing managed land will be replaced by the new building. The majority of street trees will remain, with only one street tree to be removed, and eight trees surrounding the development site also to be retained. Landscaping incorporated into the new station site, including plants species ranging in size from trees (15) to shrubs, will soften the design and minimise the visual impact of the Project and also be consistent with the existing character of the streetscape and surrounding areas. The retention of street trees and 8 trees onsite, plus additional landscaping, and retention of the existing brick wall will maintain much of the existing visual amenity.

The proposed new building will be well designed and visually pleasing. Consistent with other RAIR projects the building height and form is simple with a low-rise, skillion roof and neutral colour palette. The Project is therefore compatible with the scale of the local built form and is considered to be an appropriate form of development within the mixed uses of the surrounding areas. Furthermore, as the site slopes down to the eastern corner, the building will be sited in a lower portion of the site, minimising the building's visual impact within the site and from the street and adjoining properties. The Plant Room and parking areas are internal and not visible from the streets. Overall, the development proposed would result in a low impact permanent variation in the visual environment, however this would not be detrimental or unreasonable in the locality.

From within the site, the proposed structure will be mostly below ground level, with the roof being the only component visible. From the main circular driveway on the western side of the former hospital the proposed ambulance station is site is largely obscured by vegetation.

The proposal would not result in any unreasonable environmental amenity impacts to adjoining properties, such as overshadowing, sunlight access reduction, privacy issues or visual bulk.

Mitigation Measures

The following mitigation measures would be implemented to manage impacts relating to Visual Amenity:

- Upon completion of construction, any works areas would be restored to an acceptable visual state.
- The construction worksite would be maintained, kept free of rubbish and cleaned up at the end of each workday.

6.1.12 Land Uses and Services

Questions to consider	Yes	No
Will the works result in a loss of, or permanent disruption of an existing land use?		✓
Will the works involve the installation of structures or services that may be perceived as objectionable or nuisance?		✓
Will the works impact on, or be in the vicinity of other services?	✓	

Existing Environment

The site is located in the grounds of the Glen Innes Hospital, which is currently an area of open space comprising lawn and planted trees. The proposal will change the use of this land to an emergency services facility and reduce the amount of landscaped area within the Hospital grounds.

Impact Assessment

The Activity is to construct a new Ambulance Station within the grounds of the existing hospital grounds. The use of this land for an Ambulance service will provide centralised health services that will integrate well with the existing services and mix of surrounding land uses. As noted in **Section 6.1.11**, the proposed Station is not of a significant scale and would be compatible with the site context. With regard to the change in land use, there are other landscaped areas around the grounds and the site is also in proximity to large, level recreational areas in the adjoining parkland. As confirmed in other parts of **Section 6**, the proposed Activity is not likely to result in significant impacts on adjoining properties and is compatible with the uses and building types in the area. In relation to noise from sirens, **Section 6.1.7** notes that ambulance sirens could cause disturbance when leaving the site, particularly at night. However, Paramedics follow suitable protocols to minimise the use of sirens in sensitive areas of their use is not critical. For these reasons, no unreasonable impacts or nuisance is expected.

Information on the size and location of the sewer and water main obtained from Council indicates authority assets are not impacted by the proposed building or lot boundaries.

Notification will be provided of any potential services disruptions

Mitigation Measures

The following mitigation measures would be implemented to manage impacts relating to Land Uses and Services:

- Any potential service interruptions shall be minimised as far as practicable and communicated to the relevant services authorities to enable flow on notifications to any affected service customers.

6.1.13 Waste Generation

Questions to consider	Yes	No
Will the works result in the generation of non-hazardous waste?	✓	
Will the works result in the generation of hazardous waste?		✓
Will the works result in the generation of wastewater requiring off-site disposal?		✓

Existing Environment

The site is currently maintained as public open space.

Impact Assessment

The activity will be undertaken to ensure minimal impacts are generated from waste material produced on-site by ensuring that all waste is collected and disposed of or recycled in accordance with legislative waste disposal protocols and EPA guidelines. No materials will be used in a manner that poses a risk to public safety.

The proposed construction will generate waste products in the form of spoil and vegetative matter (lawn and tree) removed to enable construction of the new ambulance station. This material will be reused on-site and within landscaping maintenance activities across the site where feasible, or otherwise disposed of at a licenced waste facility.

Packaging, plastic and timber waste may be generated during construction and would be disposed of in accordance with legislative waste disposal protocols and EPA guidelines. Waste bins will be established within the ancillary facility to separate waste streams to foster waste avoidance and resource recovery. Overall the proposed construction presents a minor short-term impact regarding waste generation.

Operation of the ambulance station will generate the following waste streams:

- special waste (clinical and related waste);
- liquid waste;
- hazardous waste and restricted solid waste;
- general solid waste (putrescible); and

- general solid waste (non-putrescible).

Operation of the ambulance station will be undertaken in accordance with legislative waste disposal protocols and EPA guidelines. The facility will be required to operate in accordance with the NSW Health Policy Clinical and Related Waste Management for Health Services (refer to **Appendix H**).

The ambulance station will be connected to the internal sewer/ stormwater system that links into the public network for both services.

The ambulance station will have a bin enclosure with an area of 8 m^2, capable of housing four large wheelie bins.

Mitigation Measures

The following safeguards will be implemented in order to manage potential waste impacts:

- Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each construction day.
- Waste material is not to be left on site once the works have been completed.
- The working areas will accommodate separate bins and other waste storage structures to cater for waste streams required to foster waste avoidance and resource recovery.
- Operation of the ambulance station will be undertaken in accordance with the NSW Health Policy Clinical and Related Waste Management for Health Services.

6.1.14 Community Impact/ Social Impact

Questions to consider	Yes	No
Is the activity likely to affect community services or infrastructure?		✓
Does the activity affect sites of importance to local or the broader community for their recreational or other values or access to these sites?		✓
Is the activity likely to affect economic factors, including employment numbers or industry value?		✓
Is the activity likely to have an impact on the safety of the community?		✓
Will the activity affect the visual or scenic landscape? This should include consideration of any permanent or temporary signage.		✓
Is the activity likely to cause noise, pollution, visual impact, loss of privacy, glare or overshadowing to members of the community, particularly adjoining landowners?		✓

Impact Assessment

The proposed new Glen Innes Ambulance Station is part of the RAIR program and development of a new contemporary Ambulance Station will provide improved health services to the community of Glen Innes and surrounding areas. The new facility will have a significant positive impact on residents in the area improving ambulances services which will effectively result in more lives being saved to reduced response times to incidents.

The location of the Station within the grounds of the hospital provides a centralised location for the delivery of emergency services that will enable greater efficiencies for hospital transfers and response timeframes. The new station will be close to major transport routes, the CBD, residential, recreational, and mixed-use areas.

Heritage qualities associated with the historic hospital site are maintained and the design of the new station will ensure that the new building contributes to the surrounding streetscape and hospital complex in a positive fashion.

As the site of the proposed Station does not adjoin any residential properties there will be no loss of privacy or impacts from glare or overshadowing.

Some temporary minor amenity impacts resulting from construction works associated with noise, visual change and air quality may be experienced by adjoining residents, but overall, the new Ambulance Station represents a benefit to the community. To minimize impacts on the community, environment, and existing services the Station design has

evolved from extensive consideration of site characteristics, availability of existing services and operational requirements and functions of the new Station. Environmental issues associated with potential contamination, erosion control, water quality, traffic, visual amenity, noise, and waste management have been addressed in **Section 6** and found to be satisfactory. Where necessary the implementation of appropriate mitigation measures have been proposed. No further measures are required.

6.1.15 Cumulative Impact

Questions to consider	Yes	No
Has there been any other development approved within 500m of the site?		✓
Will there be significant impacts (for example, including but not limited to, construction traffic impacts) from other development approved or currently under construction within 500m of the site?		✓

Existing Environment

The Glen Innes District Hospital is located in proximity to the Glen Innes CBD, recreational, residential, industrial and mixed-use zones.

Impact Assessment

The scale of the proposed development is not considered significant and presents minimal environmental impacts that can be adequately addressed via safeguards outlined within this REF.

It is expected that the activity would add to a number of common cumulative impacts, including resource consumption (e.g. construction material) and generation of greenhouse gas emissions (e.g. through operation of vehicles and equipment and use of electricity). However, the environmental management measures identified within this REF and the choice of methodology for completion of the Project aim to minimise the extent to which the Project contributes to cumulative adverse environmental impacts.

A review of DPIE's major projects register and Glen Innes Council's website found no recently lodged or approved significant developments within proximity to the site that would result in significant implications in regard to traffic, infrastructure services, amenity and /or environmental impacts when considered in-light of the proposed ambulance station.

Health Infrastructure propose to demolish the Old Nurses Quarters as an enabling stage for the redevelopment of the Glen Innes Hospital. The Old Nurses Quarters is in the south-west corner of the hospital grounds. Given the specifics of the individual projects, and considering their location, distance, service requirements and separate access points, even if proceeding simultaneously, the two projects are not likely to conflict with each other or affect adjoining uses, (including the ongoing operation of the hospital or museum) or cause disruptions or conflict within the general community.

Given the absence of any significant local projects or urban growth, the proposed activity has no potential of affecting any major approvals or projects locally. The cumulative impacts of undertaking the proposed activity in the context of the local region is therefore considered low.

Mitigation Measures

The following safeguards will be implemented in order to manage potential cumulative impacts:

- HI and project staff shall monitor DPIE's major projects register and Glen Innes Severn Council's Development Application tracker for any significant developments that may occur locally and with potential to coincide with the activity construction period.
- Where required project staff will undertake pre-construction review and liaison with other development sites to co-ordinate works and minimise impacts (e.g. delivery times, parking).

7. Summary of Mitigation Measure

Mitigation measures are to be implemented for the proposal to reduce impacts on the environment. The mitigation measures are provided at **Appendix P.**

7.1 Summary of Impacts

Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed development, it is determined that:

- The extent and nature of potential impacts are low and will not have significant adverse effects on the locality, community and the environment;
- Potential impacts can be appropriately mitigated or managed to ensure that there is minimal effect on the locality, community; and
- Given the above, it is determined that an EIS is not required for the proposed development activity.

8. Justification and Conclusion

The proposed Ambulance Station at 85 Taylor Street, Glen Innes is subject to assessment under Part 5 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting, or likely to affect, the environment by reason of the proposed activity.

As discussed in detail in this report, the proposal will not result in any significant or long-term impact. The potential impacts identified can be reasonably mitigated and where necessary managed through the adoption of suitable site practices and adherence to accepted industry standards.

As outlined in this REF, the proposed activity can be justified on the following grounds:

- It responds to an existing need within the community;
- It generally complies with, or is consistent with all relevant legislation, plans and policies;
- It has minimal environmental impacts; and
- Adequate mitigation measures have been proposed to address these impacts.

The environmental impacts of the proposal are not likely to be significant and therefore it is not necessary for an EIS to be prepared and approval to be sought for the proposal from the Minister for Planning and Homes under Part 5.1 of the EP&A Act. On this basis, it is recommended that HI determine the proposed activity in accordance with Part 5 of the EP&A Act and subject to the adoption and implementation of mitigation measures identified within this report.

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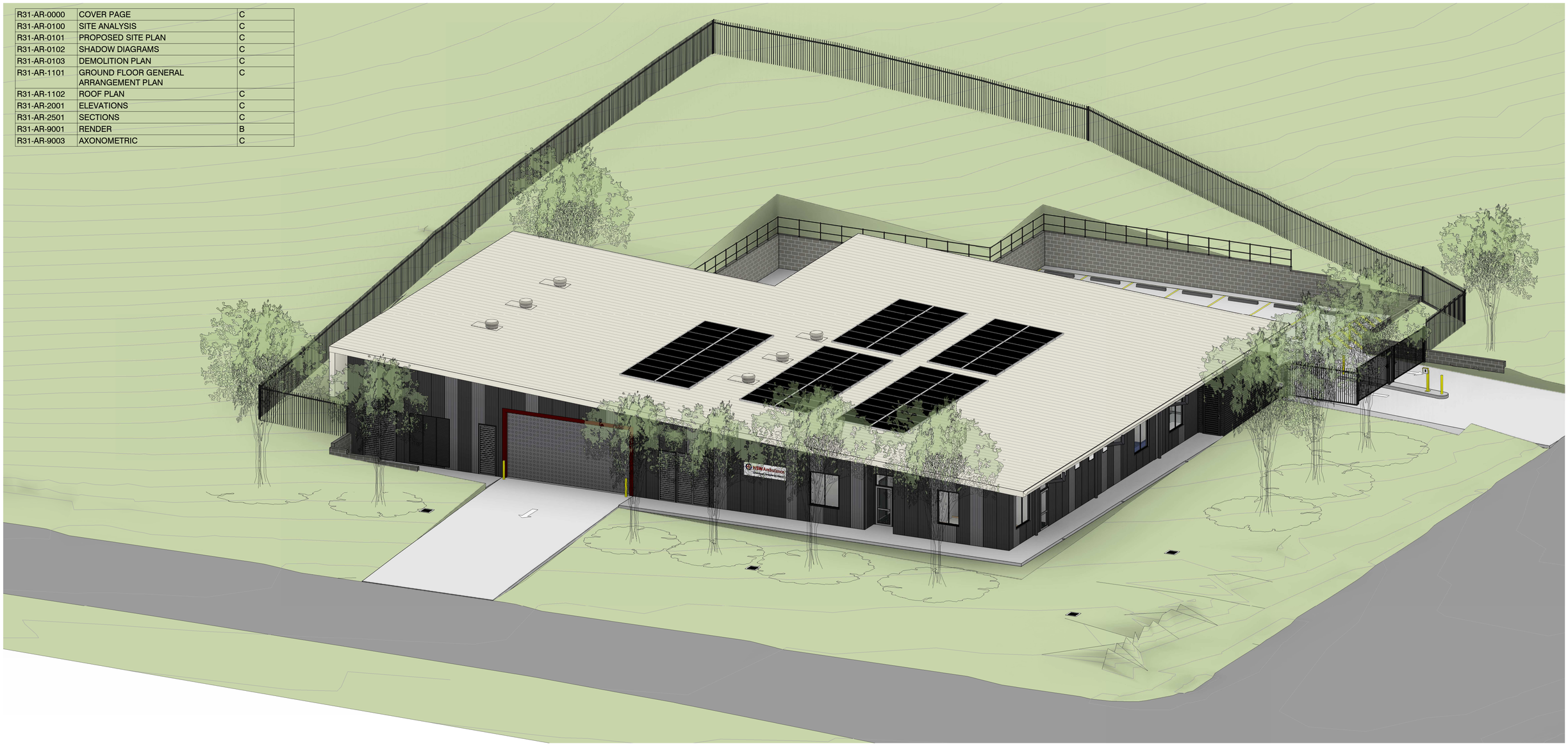
NSW GOVERNMENT

RAIR - RURAL AMBULANCE INFRUSTRUCTURE RECONFIGURATION PROGRAM

R31 GLEN INNES - TAYLOR STREET GLEN INNES

SHEET LIST

Sheet Number	Sheet Name	Current Revision
R31-AR-0000	COVER PAGE	C
R31-AR-0100	SITE ANALYSIS	C
R31-AR-0101	PROPOSED SITE PLAN	C
R31-AR-0102	SHADOW DIAGRAMS	C
R31-AR-0103	DEMOLITION PLAN	C
R31-AR-1101	GROUND FLOOR GENERAL ARRANGEMENT PLAN	C
R31-AR-1102	ROOF PLAN	C
R31-AR-2001	ELEVATIONS	C
R31-AR-2501	SECTIONS	C
R31-AR-9001	RENDER	B
R31-AR-9003	AXONOMETRIC	C



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ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR

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Building the future response for our state

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This drawing should be read in conjunction with all relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

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DRAWN BY: AF
SCALE AT A1
DESCRIPTION: COVER PAGE

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0000	C

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

GLEN INNES CLIMATE

Long Term Averages

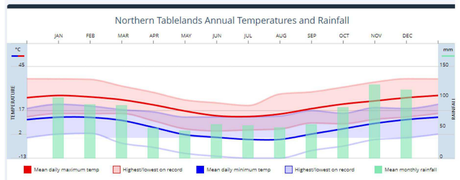
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean Max (°C)	26.7	25.8	24.0	20.8	16.9	13.9	13.4	15.0	18.4	21.3	23.3	25.3	20.4
Mean Min (°C)	13.0	12.9	11.0	6.6	2.0	0.3	-1.0	-1.0	2.4	5.7	9.1	11.5	6.0
Mean Rain (mm)	98.9	87.7	86.3	49.3	44.7	55.2	53.3	49.9	55.0	82.9	120.1	111.7	892.8
Median Rain (mm)	66.6	88.6	54.4	46.4	21.4	37.0	37.4	36.4	45.6	75.5	108.2	102.6	864.4
Mean Rain Days	11.0	11.2	11.8	9.9	12.5	15.7	14.0	11.0	9.0	10.9	11.9	12.4	141.4

Daily Records

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	37.2	36.9	32.7	28.7	23.9	22.1	20.4	27.7	29.0	32.0	35.2	37.3	37.3
Low Max (°C)	15.3	15.2	15.3	10.7	5.6	4.3	4.9	5.5	9.3	8.8	11.6	13.1	4.3
High Min (°C)	21.2	20.1	17.8	16.4	13.1	13.2	13.2	13.8	17.2	15.5	19.1	18.5	21.2
Low Min (°C)	2.3	2.8	-3.4	-6.0	-9.8	-11.6	-12.8	-12.8	-8.0	-5.2	-1.1	0.0	-12.8
High Rain (mm)	98.4	64.0	91.2	88.6	121.4	63.2	83.2	59.4	72.4	96.6	87.4	92.2	121.4

Monthly Records

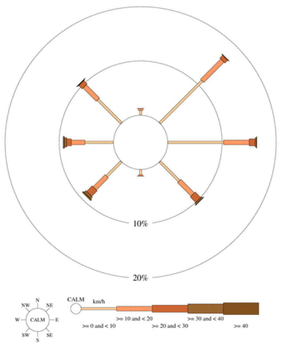
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	30.6	28.3	28.0	23.5	20.1	15.6	15.5	17.8	21.4	24.1	27.6	29.8	22.7
Low Max (°C)	23.8	22.9	22.2	18.2	15.1	11.4	11.7	12.4	15.8	18.1	18.9	21.3	18.9
High Mean (°C)	15.7	14.4	12.7	9.0	4.5	3.4	2.5	3.4	5.6	8.7	11.5	13.2	7.1
Low Mean (°C)	10.9	10.5	7.8	3.6	-1.7	-3.1	-5.7	-3.8	0.5	3.3	6.5	9.6	5.0
High Rain (mm)	233.4	166.8	297.8	221.8	156.0	150.0	211.0	152.0	171.8	203.4	264.8	178.4	1458.4
Low Rain (mm)	27.6	3.0	1.0	1.2	1.6	9.4	3.8	3.0	4.8	16.2	19.6	16.2	369.8

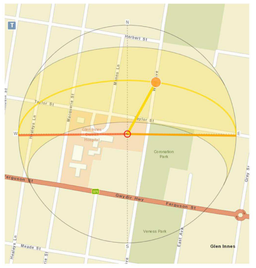


Average Number of Days with Temperatures

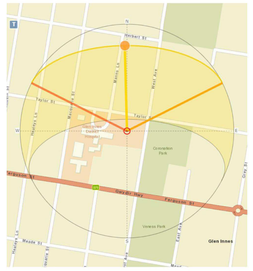
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
≥ 40.0°C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
≥ 35.0°C	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
≥ 30.0°C	6.0	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0	3.0	15.8
≤ 2.0°C	0.0	0.0	0.3	4.1	15.4	19.1	23.1	23.1	14.8	6.3	1.1	0.2	107.4
≤ 0.0°C	0.0	0.0	0.1	1.8	10.4	14.5	18.5	18.6	8.5	2.5	0.3	0.1	75.1

YEARLY WIND ROSE

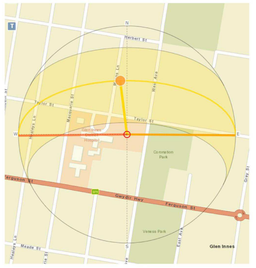




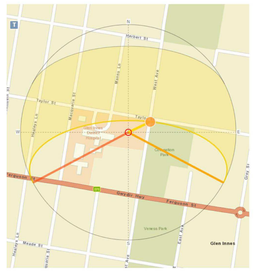
MARCH 20TH- 12PM SUN PATH



JUNE 21TH- 12PM SUN PATH

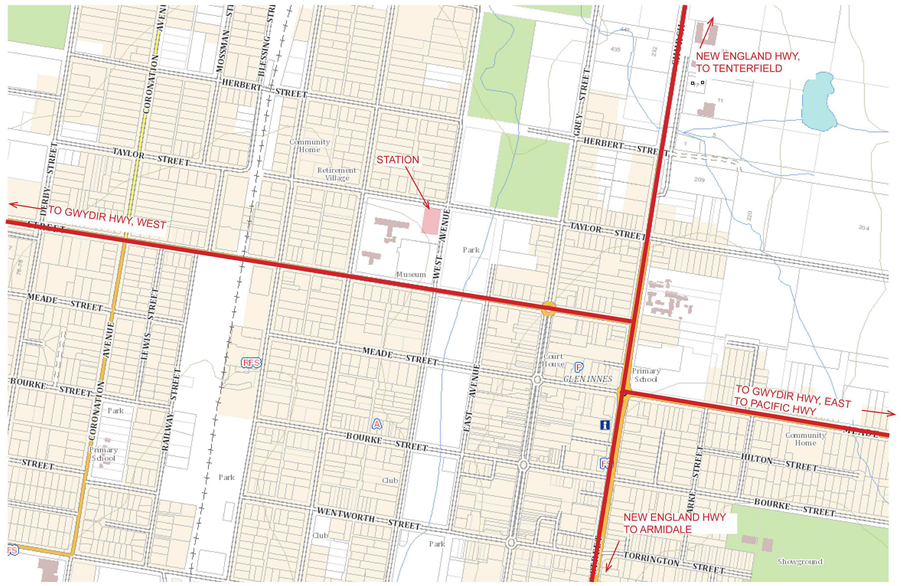


SEPTEMBER 23RD- 12PM SUNPATH



DECEMBER 22ND- 12PM SUNPATH

1:1000 SETBACK, VIEWS, VEGETATION



1:10000 MAJOR ROADS RELATED TO STATION

VIEW 1 - WEST AVENUE , FACING NORTH-WEST

VIEW 2 - WEST AVENUE, FACING SITE

VIEW 3 - TAYLOR STREET, FACING SITE

VIEW 4- TALOR STREET, FACING EAST

DATE PRINTED: 18/05/2022 10:46:08

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

SERVICES: 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000 — JHA

PROJECT MANAGER: LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555 — mace

STRUCTURE & CIVIL: LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400 — BONACCI

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

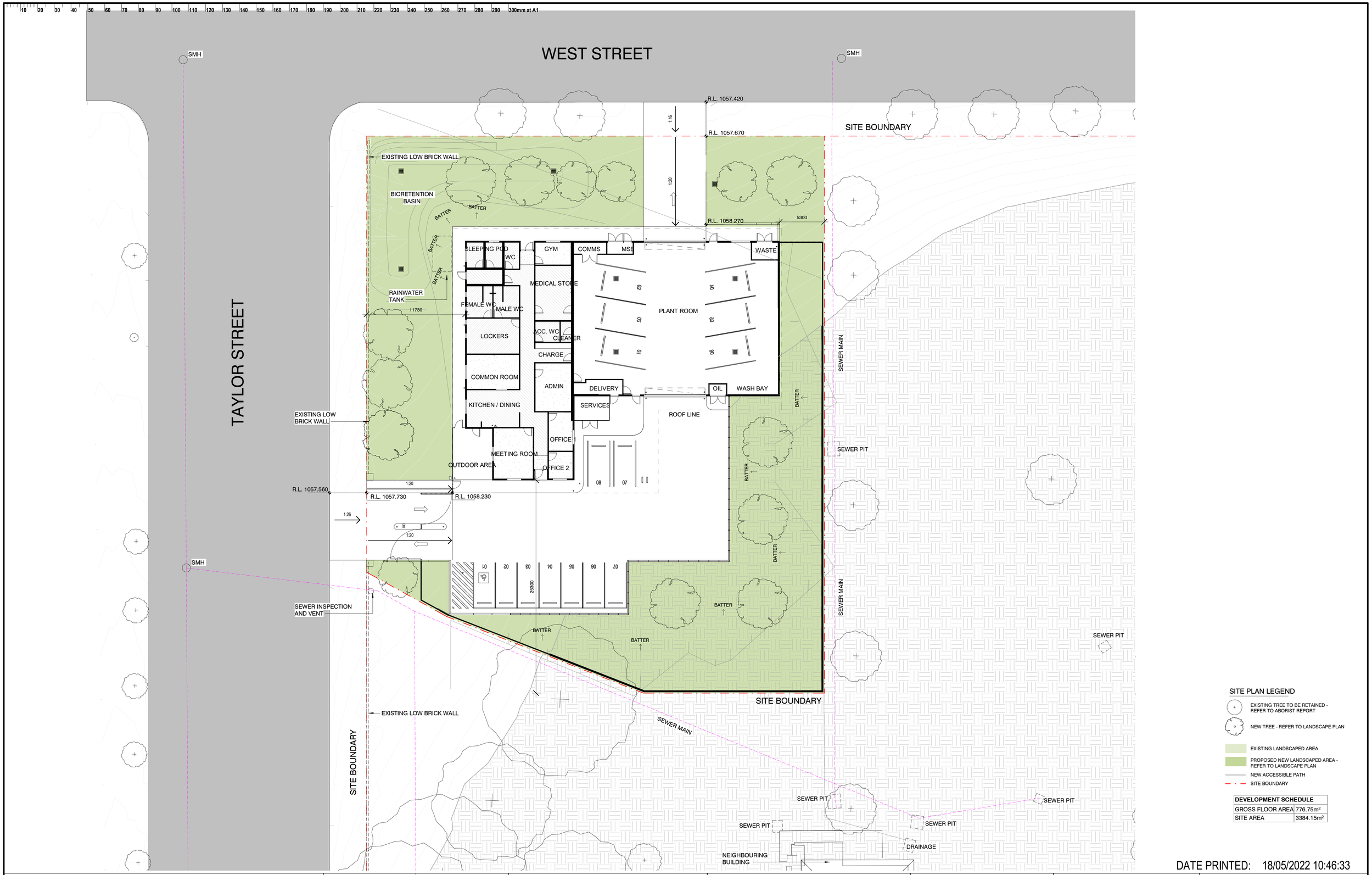
PROJECT ADDRESS: TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
63 Myrtle Street, Chippendale NSW 2008, Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1

DESCRIPTION: SITE ANALYSIS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0100	C



SITE PLAN LEGEND

- EXISTING TREE TO BE RETAINED - REFER TO ABORIST REPORT
- NEW TREE - REFER TO LANDSCAPE PLAN
- EXISTING LANDSCAPED AREA
- PROPOSED NEW LANDSCAPED AREA - REFER TO LANDSCAPE PLAN
- NEW ACCESSIBLE PATH
- SITE BOUNDARY

DEVELOPMENT SCHEDULE	
GROSS FLOOR AREA	776.75m²
SITE AREA	3384.15m²

DATE PRINTED: 18/05/2022 10:46:33

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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C	18.05.22	UPDATED REF	MR

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

SERVICES: JHA — 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000

STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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TRUE NORTH

1:100 — 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
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ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
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DRAWN BY	SCALE AT A1
AF	1 : 200

DESCRIPTION
PROPOSED SITE PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0101	C

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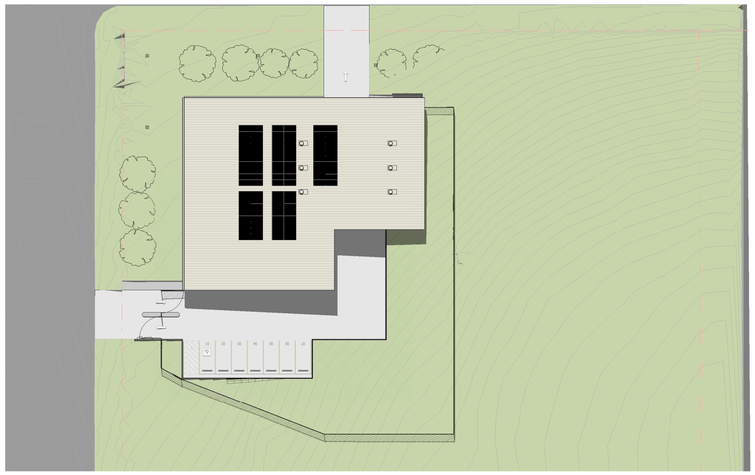
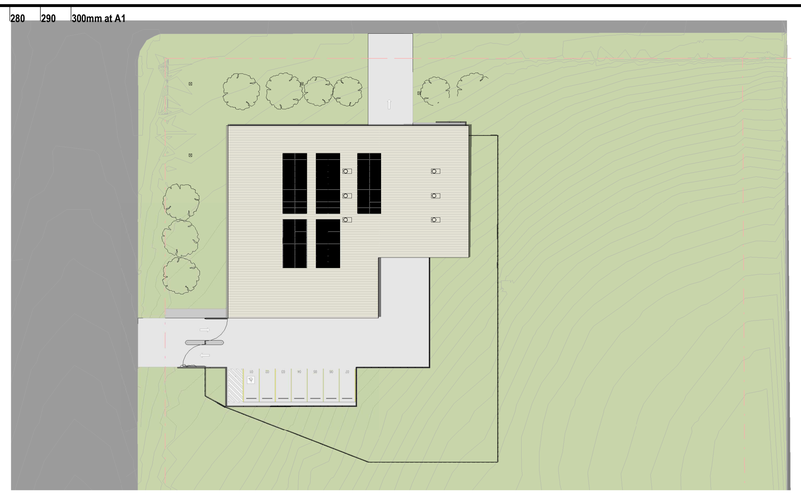
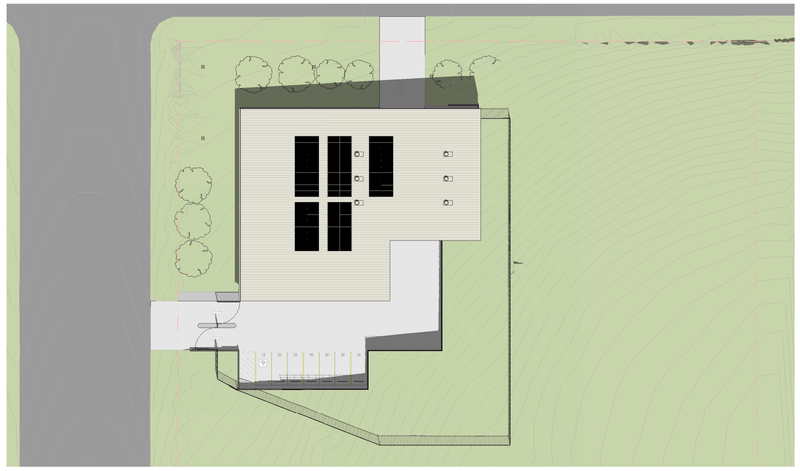


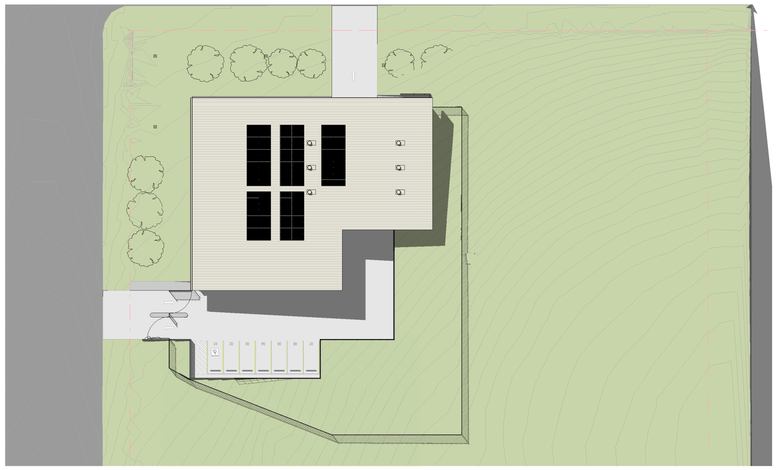
01 AR-2007 9am SUMMER
1 : 500



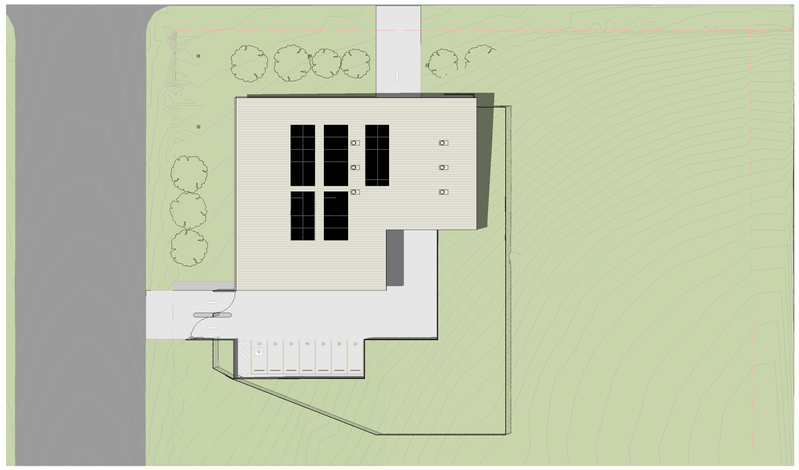
02 AR-2007 12pm SUMMER
1 : 500



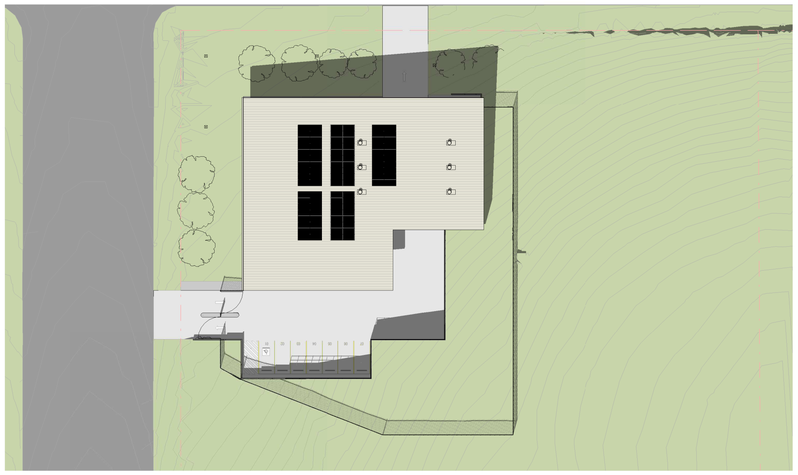
03 AR-2007 3pm SUMMER
1 : 500



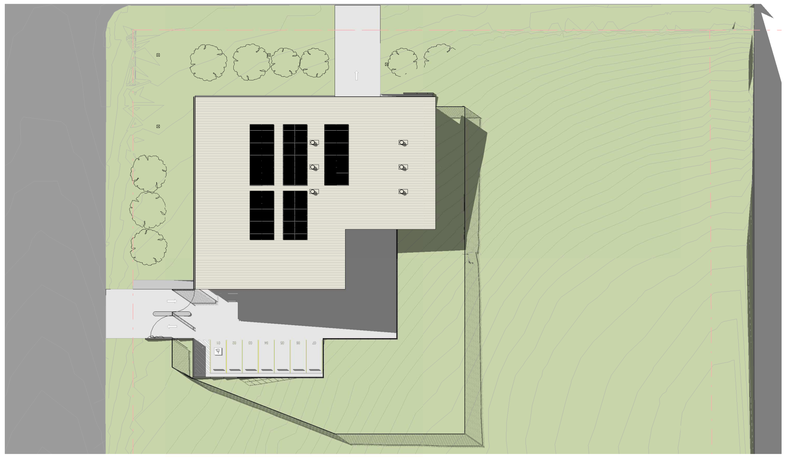
04 AR-2007 9am EQUINOX
1 : 500



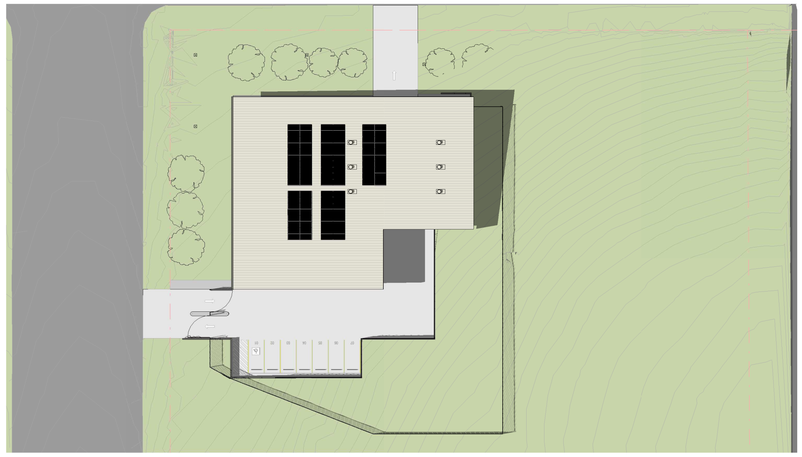
05 AR-2007 12pm EQUINOX
1 : 500



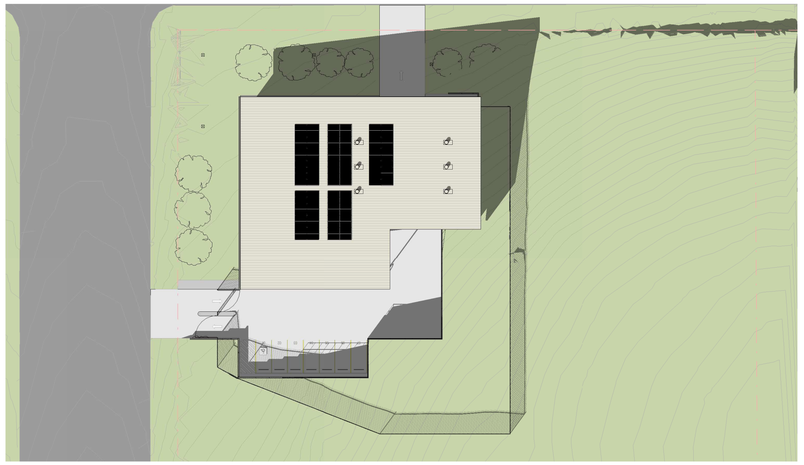
06 AR-2007 3pm EQUINOX
1 : 500



07 AR-2007 9am WINTER
1 : 500



08 AR-2007 12pm WINTER
1 : 500



09 AR-2007 3pm WINTER
1 : 500

DATE PRINTED: 18/05/2022 10:47:52

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

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STRUCTURE & CIVIL
BONACCI
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SYDNEY NSW 2000
T +61 2 8247 8400

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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT
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T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects:
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Daniel Beekwilder 6192
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Sydney Australia
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DRAWN BY: AF
SCALE AT A1: 1 : 500
DESCRIPTION: SHADOW DIAGRAMS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0102	C

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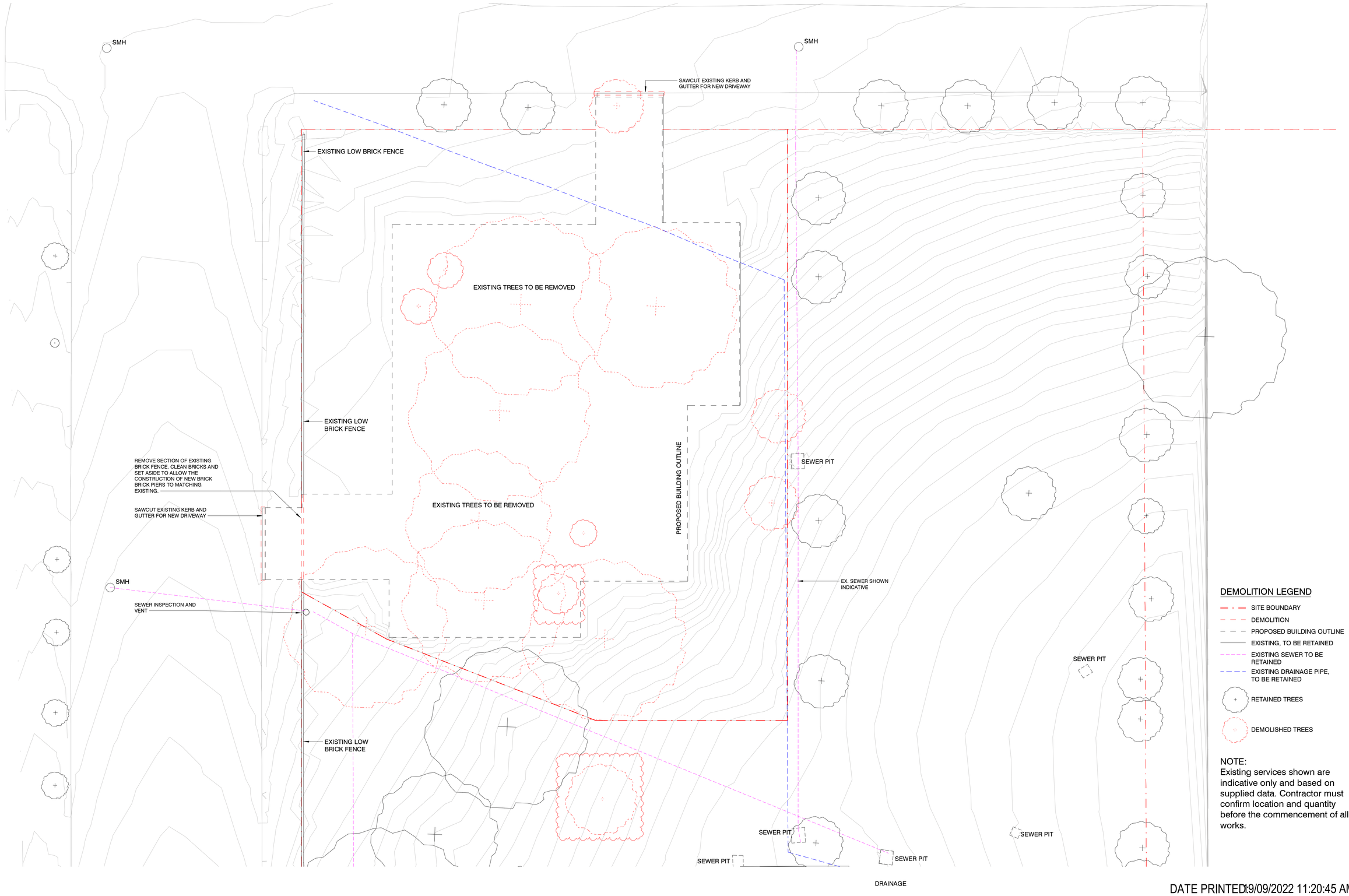

DEMOLITION LEGEND

- SITE BOUNDARY
- DEMOLITION
- PROPOSED BUILDING OUTLINE
- EXISTING, TO BE RETAINED
- EXISTING SEWER TO BE RETAINED
- EXISTING DRAINAGE PIPE, TO BE RETAINED
- RETAINED TREES
- DEMOLISHED TREES

NOTE:
Existing services shown are indicative only and based on supplied data. Contractor must confirm location and quantity before the commencement of all works.

DATE PRINTED: 19/09/2022 11:20:45 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR
D	28.05.22	TENDER	MR
E	06.07.22	DRAFT CONTRACT ISSUE	MR
F	18.07.22	FOR COORDINATION	MR
G	23.07.22	CONTRACT ISSUE	MR
H	19.09.22	REF UPDATE	MR

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TRUE NORTH

1:200 0 2 4 6 8 10 20m

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

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Sydney Australia
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DRAWN BY: AF
SCALE AT A1: 1 : 200

DESCRIPTION
TREE REMOVAL PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0103	H

DATE PRINTED: 18/05/2022 10:48:29

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR

RAIR
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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

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Sydney Australia
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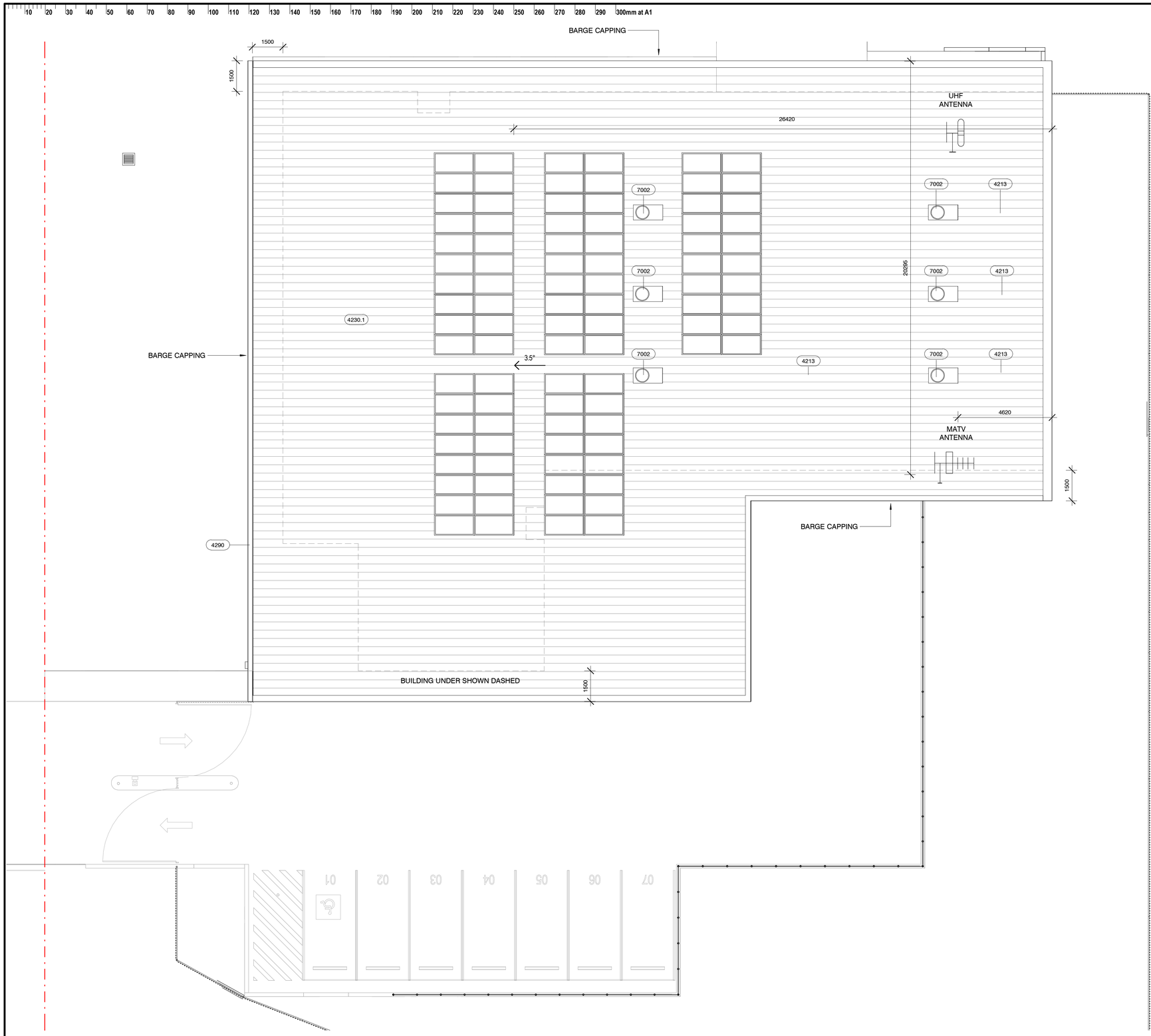
DRAWN BY: AF
SCALE AT A1: 1 : 100

DESCRIPTION
GROUND FLOOR GENERAL ARRANGEMENT PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1101	C



KEYNOTE LEGEND

4213	ROOF BACK FLASHING
4230.1	ROOF SHEETING TYPE 1
4290	HALF ROUND EAVES GUTTER
7002	ROOF VENTILATOR

DATE PRINTED: 18/05/2022 10:48:40

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR

RAIR
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PROJECT MANAGER
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BONACCI

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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE
INFRASTRUCTURE PROGRAM (RAIR)
GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
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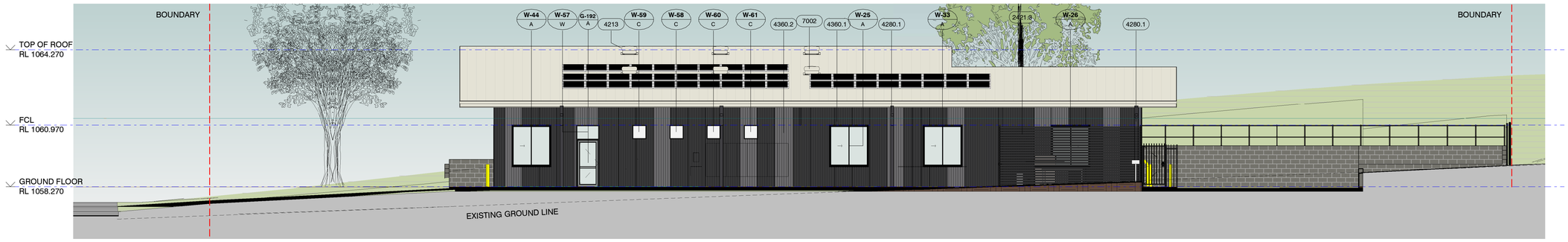
DRAWN BY	SCALE AT A1
AF	1 : 100

DESCRIPTION
ROOF PLAN

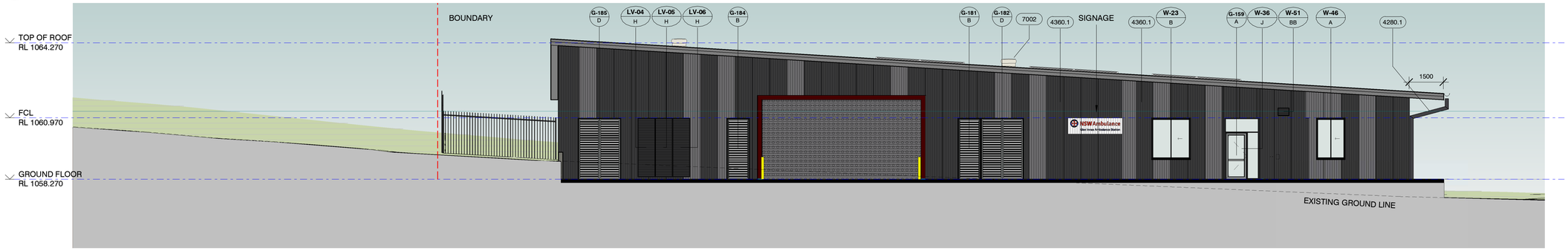
PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1102	C

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

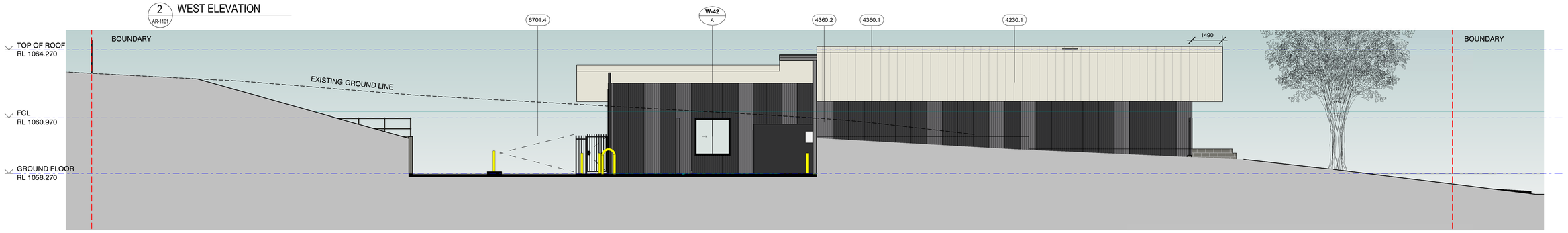
KEYNOTE LEGEND	
2421.3	FENCE TYPE C
4213	ROOF BACK FLASHING
4230.1	ROOF SHEETING TYPE 1
4280.1	DOWNPIPE TYPE 1
4360.1	METAL WALL SHEETING TYPE 1
4360.2	METAL WALL SHEETING TYPE 2
6701.4	PAINT TYPE 4
7002	ROOF VENTILATOR



1 AR-1101 SOUTH ELEVATION



2 AR-1101 WEST ELEVATION



3 AR-1101 NORTH ELEVATION

4 AR-1101 EAST ELEVATION

GENERAL NOTES:

1. Requirements of gates and fences dependent on security desktop review per site

DATE PRINTED: 18/05/2022 10:49:12

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR

RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

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1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

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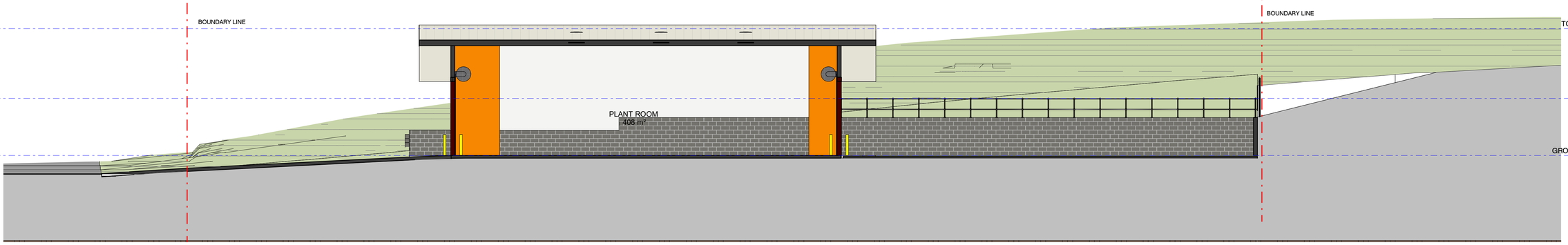
DRAWN BY	SCALE AT A1
SM	1 : 100

DESCRIPTION
ELEVATIONS

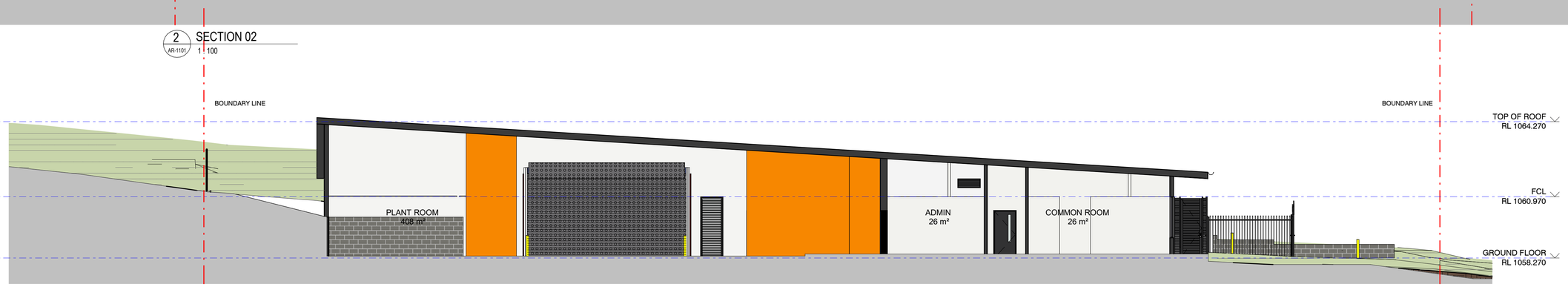
PROJECT No	DRAWING No	REVISION
22 417	R31- AR-2001	C

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

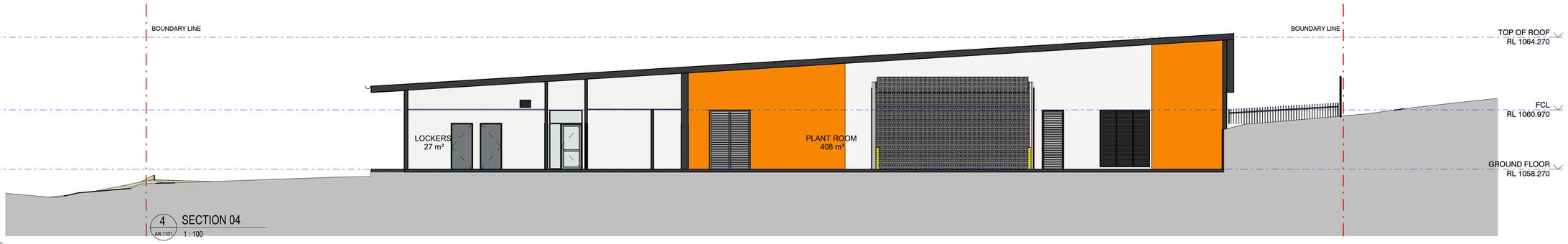


1 AR-1101 SECTION 01
1 : 100

2 AR-1101 SECTION 02
1 : 100



3 AR-1101 SECTION 03
1 : 100



4 AR-1101 SECTION 04
1 : 100

GENERAL NOTES:

1. Requirements of gates and fences dependent on security desktop review per site

DATE PRINTED: 18/05/2022 10:49:38

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

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BONACCI

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1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

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ABN: 48 942 921 969
Nominated Architects:
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Daniel Beekwilder 6192
63 Myrtle Street
Chippendale NSW 2008
Sydney Australia
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DRAWN BY: AF
SCALE AT A1: 1 : 100
DESCRIPTION: SECTIONS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-2501	C

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

LYSAGHT CUSTOM ORB METAL CLADDING
- MONUMENT
4360.1

LYSAGHT CUSTOM ORB METAL CLADDING
- BASALT
4360.2

LYSAGHT ROOF SHEETING
- SURFMIST
4230.1

FEATURE TRIM DULUX PAINT FINISH TO MATCH COLORBOND
- MANOR RED
6701.5

DATE PRINTED: 18/05/2022 10:49:44

ISSUE	DATE	SUBJECT	AUTHORISED
A	23.04.22	REF ISSUE	MR
B	18.05.22	UPDATED REF	MR

RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

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1:100
0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR)
GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
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LOT2 : DP1208729

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DRAWN BY: AF
SCALE AT A1

DESCRIPTION
RENDER

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-9001	B

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

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ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR

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PROJECT
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NSW GOVERNMENT Health Infrastructure
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DRAWN BY: AF
SCALE AT A1

DESCRIPTION
AXONOMETRIC

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-9003	C

12537 01C - RAIR II R31 GLEN INNES SITE
TAYLOR STREET, GLEN INNES, NSW, 2370

CIVIL WORKS PACKAGE

CIVIL DRAWING REGISTER	
DRAWING NUMBER	DRAWING TITLE
C1101	COVER PAGE AND DRAWING REGISTER
C1102	GENERAL NOTES
C1105	SEDIMENT AND EROSION CONTROL PLAN
C1106	SEDIMENT AND EROSION CONTROL DETAILS
C1110	BULK EARTHWORKS PLAN
C1111	SITE SECTIONS
C1130	SITEWORKS AND STORMWATER DRAINAGE PLAN
C1140	EXISTING BULK CATCHMENT PLAN
C1141	PROPOSED BULK CATCHMENT PLAN
C1150	STORMWATER DRAINAGE DETAILS
C1152	ON SITE DETENTION DETAILS
C1160	PAVEMENT PLAN
C1170	SITEWORKS AND PAVEMENT DETAILS

LOCALITY PLAN

NOT TO SCALE

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Rev	Description	Date	By	App
P3	ISSUED FOR AFC	21.07.22	LD	
P2	ISSUED FOR TENDER	27.05.22	DH	
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Rev	Description	Date	By	App

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Project Name: RAIR II: GLEN INNES SITE TAYLOR STREET, GLEN INNES NSW, 2370, LOT2: DP1208729

Drawing Title: COVER PAGE AND DRAWING REGISTER

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	-	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1101
		Rev	P3

File: G:\Jobs\12537\01\03 WIP\02 Civil\01 CAD\01 Autocad\RAIR 2 - Glen Innes Zone R31\12537\01C - R31-C1101.dwg Plotted: 21.07.22 at 5:00 PM
By: Lyn Dennis

GENERAL NOTES

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

G2 MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATION, CURRENT SAA CODES, BUILDING REGULATIONS AND THE REQUIREMENTS OF ANY OTHER RELEVANT STATUTORY AUTHORITIES.

G3 THESE DRAWINGS MUST NOT BE SCALED. ALL DIMENSIONS ARE IN METERS. ALL SET OUT DIMENSIONS AND LEVELS, INCLUDING THOSE SHOWN ON THESE DRAWINGS SHALL BE IN ACCORDANCE WITH THE ARCHITECT'S DRAWINGS AND VERIFIED ON SITE.

G4 ALL SETOUT AND DIMENSIONS OF THE STRUCTURE INCLUDING KERBS AND RETAINING WALLS, AND BULK EARTHWORKS MUST BE TAKEN FROM THE ARCHITECT'S DRAWINGS. SETOUT OF THE STORMWATER PITS BY OTHERS. CONTRACTOR TO CONFIRM SETOUT OF SERVICE TRENCHING INCLUDING SUBSOIL ON SITE.

G5 THE CONTRACTOR SHALL COMPLY WITH ALL REGULATIONS OF AUTHORITIES HAVING JURISDICTON OVER THE WORKS.

G6 ALL DIMENSIONS AND REDUCED LEVELS MUST BE VERIFIED ON SITE BEFORE THE COMMENCEMENT OF ANY WORK.

G7 THE APPROVAL OF A SUBSTITUTION SHALL BE SOUGHT FROM THE SUPERINTENDENT BUT IS NOT AN AUTHORISATION OF A COST VARIATION. THE SUPERINTENDENT MUST APPROVE ANY COST VARIATION INVOLVED BEFORE ANY WORK STARTS.

G8 ALL LEVELS SHOWN ARE TO THE AUSTRALIAN HEIGHT DATUM.

G9 SERVICE INFORMATION SHOWN IS APPROXIMATE ONLY. PRIOR TO COMMENCEMENT OF ANY WORKS, THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND SERVICES AND COMPLY WITH ALL REQUIREMENTS OF THOSE AUTHORITIES.

G10 EXISTING SURFACE CONTOURS, WHERE SHOWN, ARE INTERPOLATED AND MAY NOT BE ACCURATE.

G11 UNLESS NOTED OTHERWISE, ALL VEGETATION SHALL BE STRIPPED TO A MINIMUM DEPTH OF 150mm UNDER ALL PROPOSED PAVEMENT AND BUILDING AREAS.

G12 MAKE SMOOTH CONNECTION WITH ALL EXISTING WORKS.

SITEWORKS NOTES

S1 PRIOR TO THE PLACEMENT OF ANY PAVEMENTS, BUILDINGS OR DRAINS THE EXPOSED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 98% STANDARD COMPACTION IN ACCORDANCE WITH TEST 'E1.1' OF A.S. 1289 FOR THE TOP 300mm. ANY SOFT SPOTS SHALL BE REMOVED AND REPLACED WITH GRANULAR FILL TO THE ENGINEERS APPROVAL AND COMPACTED IN ACCORDANCE WITH THE COMPACTION REQUIREMENTS SET OUT BELOW. ON HIGHLY REACTIVE CLAY AREAS SITE EXCAVATED MATERIAL MAY BE USED WITH THE PRIOR AUTHORISATION OF THE ENGINEER.

S2 ALL FILL AND PAVEMENT MATERIALS SHALL BE COMPACTED IN ACCORDANCE WITH GEOTECHNICAL REPORT BY JK GEOTECHNICS PTY LTD DATED 25 MAY 2022 (34948 SFrpt). MOISTURE CONTENT TO BE MAINTAINED AT +/- 2% OMC. MINIMUM COMPACTION REQUIREMENTS ARE DETAILED BELOW FOR (ALL REQUIREMENTS ARE TO VERIFIED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER):

- LANDSCAPED AREAS — 98% STD.
- FILL UNDER ANY FOOTINGS AND FLOOR SLABS FOR ANY STRUCTURE TO SUBGRADE LEVEL;
  - FINE CRUSHED ROCK — 98% STD.
  - SELECTED FILL WITHOUT CONSPICUOUS CLAY CONTENT — 98% STD.
- BUILDING BASECOURSE — 98% MOD
- FILL UNDER ROAD PAVEMENTS;
  - TO WITHIN 500mm OF FINISHED SUBGRADE LEVEL — 98% STD.
  - UP TO FINISHED SUBGRADE LEVEL — 98% STD.
- ROAD PAVEMENT MATERIALS;
  - SUB BASE — 98% MOD.
  - BASE COURSE — 98% MOD.

THE MAXIMUM COMPACTION IS TO BE NO GREAT THAN 4% ON TOP OF THE ABOVE MENTION VALUES.

S3 GRADE EVENLY BETWEEN FINISHED SURFACE SPOT LEVELS. FINISHED SURFACE CONTOURS ARE SHOWN FOR CLARITY. WHERE FINISHED SURFACE LEVELS ARE NOT SHOWN, THE SURFACE SHALL BE GRADED SMOOTHLY SO THAT IT WILL DRAIN AND MATCH ADJACENT SURFACES OR STRUCTURES.

S4 ALL DIMENSIONS GIVEN ARE TO FACE OF KERB, CENTER OF PIPE OR EXTERIOR FACE OF BUILDING UNLESS NOTED OTHERWISE.

S5 ANY STRUCTURES, PAVEMENTS OR SURFACES DAMAGED, DIRTIED OR MADE UNSERVICABLE DUE TO CONSTRUCTION WORK SHALL BE REINSTATED TO THE SATISFACTION OF THE ENGINEER.

S6 ANY FILL REQUIRED SHALL BE APPROVED BY THE ENGINEER / GEOTECHNICAL CONSULTANT

S7 CONTRACTOR IS TO ENSURE THAT ALL EXCAVATIONS ARE MAINTAINED IN A DRY CONDITION WITH NO WATER ALLOWED TO REMAIN IN THE EXCAVATIONS.

S8 ALL FINISHES AND COLOURS TO BE IN ACCORDANCE WITH ARCHITECTURAL SPECIFICATIONS.

S9 REFER TO STRUCTURAL DRAWINGS FOR CONCRETE, REINFORCEMENT AND RETAINING WALL DETAILS.

S10 GENERALLY FOR TRENCHING WORKS THE CONTRACTOR MUST:
A) COMPLY WITH THE GENERAL PROVISIONS OF PART 3.1 "MANAGING RISKS TO HEALTH AND SAFETY" OF NSW WORK AND HEALTH AND SAFETY REGULATION 2011

B) COMPLY PART 6.3 DIVISION 3 "EXCAVATION WORK" OF NSW WORK HEALTH AND SAFETY REGULATION NSW 2011

S11 PRIOR TO THE EXCAVATION OF ANY TRENCH DEEPER THAN 1.5 METRES THE CONTRACTOR MUST:
A) NOTIFY THE OCCUPATIONAL HEALTH AND SAFETY AUTHORITY ON THE APPROPRIATE FORM.

STORMWATER DRAINAGE NOTES

SW1 UNLESS NOTED OTHERWISE, ALL DOWNPIPES & GRATED INLETS SHALL BE CONNECTED TO PITS OR MAIN STORMWATER DRAINS WITH 150 DIA. UPVC PIPES LAID AT A MINIMUM GRADE OF 1 IN 100.

SW2 ALL MAIN STORMWATER DRAINS SHALL BE CONSTRUCTED USING MATERIALS AS SPECIFIED ON THE DRAWINGS IN ACCORDANCE WITH THE APPROPRIATE A.S. IF NOT SPECIFIED THEN CLASS 2 RRJ RCP SHALL BE USED FOR DIAMETERS > 225mm. SEWER CLASS SEH UPVC IN ACCORDANCE WITH AS1260 SHALL BE USED FOR ø225mm OR SMALLER.

SW3 ALL PIPEWORK TO BE INSTALLED IN ACCORDANCE WITH AS3725 FOR RCP AND AS2032 FOR PVC. ALL BEDDING TO BE TYPE H2 UNLESS NOTED OTHERWISE.

SW4 FOR ALL PITS > 1.2m DEEP, STEP IRONS SHALL BE INSTALLED.

SW5 PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL BY BONACCI GROUP.

SW6 ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.

SW7 WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED uPVC SEWER GRADE PIPE IS TO BE USED.

SW8 GRATES AND COVERS SHALL CONFORM WITH AS 3996 AND AS 1428.1 FOR ACCESS REQUIREMENTS.

SW9 CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES ARE NOT TO BE REDUCED WITHOUT APPROVAL.

SW10 AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.

SW11 ALL EXISTING STORMWATER DRAINAGE LINES AND PITS THAT ARE TO REMAIN ARE TO BE INSPECTED AND CLEANED. DURING THIS PROCESS ANY PART OF THE STORMWATER DRAINAGE SYSTEM THAT WARRANTS REPAIR SHALL BE REPORTED TO THE SUPERINTENDENT/ENGINEER FOR FURTHER DIRECTIONS.

KERBING NOTES

K1 ALL CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 32 MPa U.N.O.

K2 ALL KERBS, GUTTERS, DISH DRAINS AND CROSSINGS TO BE CONSTRUCTED ON 75mm GRANULAR BASECOURSE COMPACTED TO A MINIMUM 98% MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS1289 5.2.1.

K3 EXPANSION JOINTS (EJ) TO BE FORMED FROM 10mm COMPRESSIBLE CORK FILLER BOARD FOR THE FULL DEPTH OF THE SECTION AND CUT TO PROFILE. EXPANSION JOINTS TO BE LOCATED AT DRAINAGE PITS, ON TANGENT POINTS OF CURVES AND ELSEWHERE AT MAX 12m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE EXPANSION JOINTS ARE TO MATCH THE JOINT LOCATIONS IN THE SLAB.

K4 WEAKENED PLANE JOINTS TO BE MIN 3mm WIDE AND LOCATED AT 3m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE WEAKENED PLANE JOINTS ARE TO MATCH THE JOINT LOCATIONS IN THE SLAB.

K5 BROOMED FINISH TO ALL RAMPED AND VEHICULAR CROSSINGS. ALL OTHER KERBING OR DISH DRAINS TO BE STEEL FLOAT FINISHED.

K6 IN THE REPLACEMENT OF KERBS:-
- EXISTING ROAD PAVEMENT IS TO BE SAWCUT 900mm U.N.O. FROM THE LIP OF GUTTER. UPON COMPLETION OF THE NEW KERB AND GUTTER, NEW BASECOURSE AND SURFACE TO BE LAID 600mm WIDE U.N.O.
- EXISTING KERBS ARE TO BE COMPLETELY REMOVED WHERE NEW KERBS ARE SHOWN.

JOINTING NOTES

PEDESTRIAN FOOTPATH JOINTS

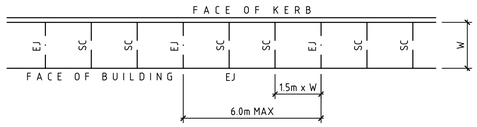
J1 EXPANSION JOINTS (EJ) ARE TO BE LOCATED WHERE POSSIBLE AT TANGENT POINTS OF CURVES AND ELSEWHERE AT 6m CENTRES.

J2 SAWCUT JOINTS (SC) ARE TO BE LOCATED AT A MAX 1.5m x WIDTH OF PAVEMENT. THE TIMING OF THE SAWCUT IS TO BE CONFIRMED BY THE CONTRACTOR ON SITE. SITE CONDITIONS WILL DETERMINE HOW MANY HOURS AFTER THE CONCRETE POUR BEFORE THE SAW CUTS ARE COMMENCED.

J3 WHERE POSSIBLE JOINTS SHOULD BE LOCATED TO MATCH KERBING AND / OR ADJACENT PAVEMENT JOINTS.

J4 PROVIDE 10mm WIDE FULL DEPTH EXPANSION JOINTS (EJ) BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVERS

J5 ALL PEDESTRIAN FOOTPATH JOINTINGS AS FOLLOWS (U.N.O.).



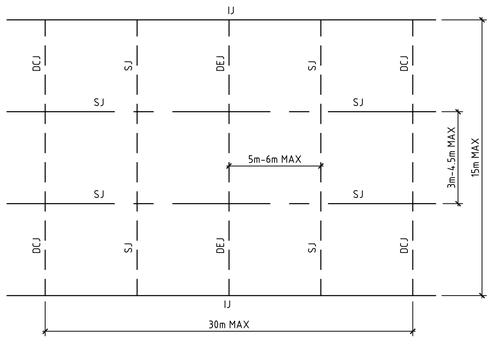
VEHICULAR PAVEMENT JOINTS

J6 ALL VEHICULAR PAVEMENTS TO BE JOINTED AS SHOWN ON DRAWINGS.

J7 ISOLATION JOINTS WITH SUB-GRADE BEAM (IJ) TO BE PROVIDED AT INTERSECTIONS OR AT THE JUNCTION OF A POUR BREAK.

J8 ALL VEHICULAR PAVEMENTS TO BE JOINTED IN ACCORDANCE WITH AUSTROADS AGPT02-12 GUIDE TO PAVEMENT TECHNOLOGY PART 2 STRUCTURAL PAVEMENT DESIGN AND SUPPLEMENT AP-T36-06 PAVEMENT DESIGN FOR LIGHT TRAFFIC

J9 VEHICULAR PAVEMENT JOINTING AS FOLLOWS (U.N.O.)



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WARNING
NO DRAINAGE WORKS SHALL COMMENCE UNTIL THE CONTRACTOR CONFIRMS THE I.L. OF ALL EXISTING DRAINS, AND CONFIRMS IN WRITING WITH THE ENGINEERING SUPERVISOR.

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

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THE CONTRACTOR SHOULD SUPPLY PRECISE LOCATIONS AND DEPTHS TO THE ENGINEER FOR REVIEW PRIOR TO ANY WORKS THAT MAY AFFECT THESE SERVICES.

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P1	ISSUED FOR DA	13.05.22	DH	

Rev	Description	Date	By	App

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Project Name: RAIR II: GLEN INNES SITE
TAYLOR STREET, GLEN INNES
NSW, 2370, LOT2: DP1208729

Drawing Title: GENERAL NOTES

AFC

Designed	AM	Approved	GK
Drawn	DH	Date	APR 2022
Scale	-	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1102
		Rev	P3

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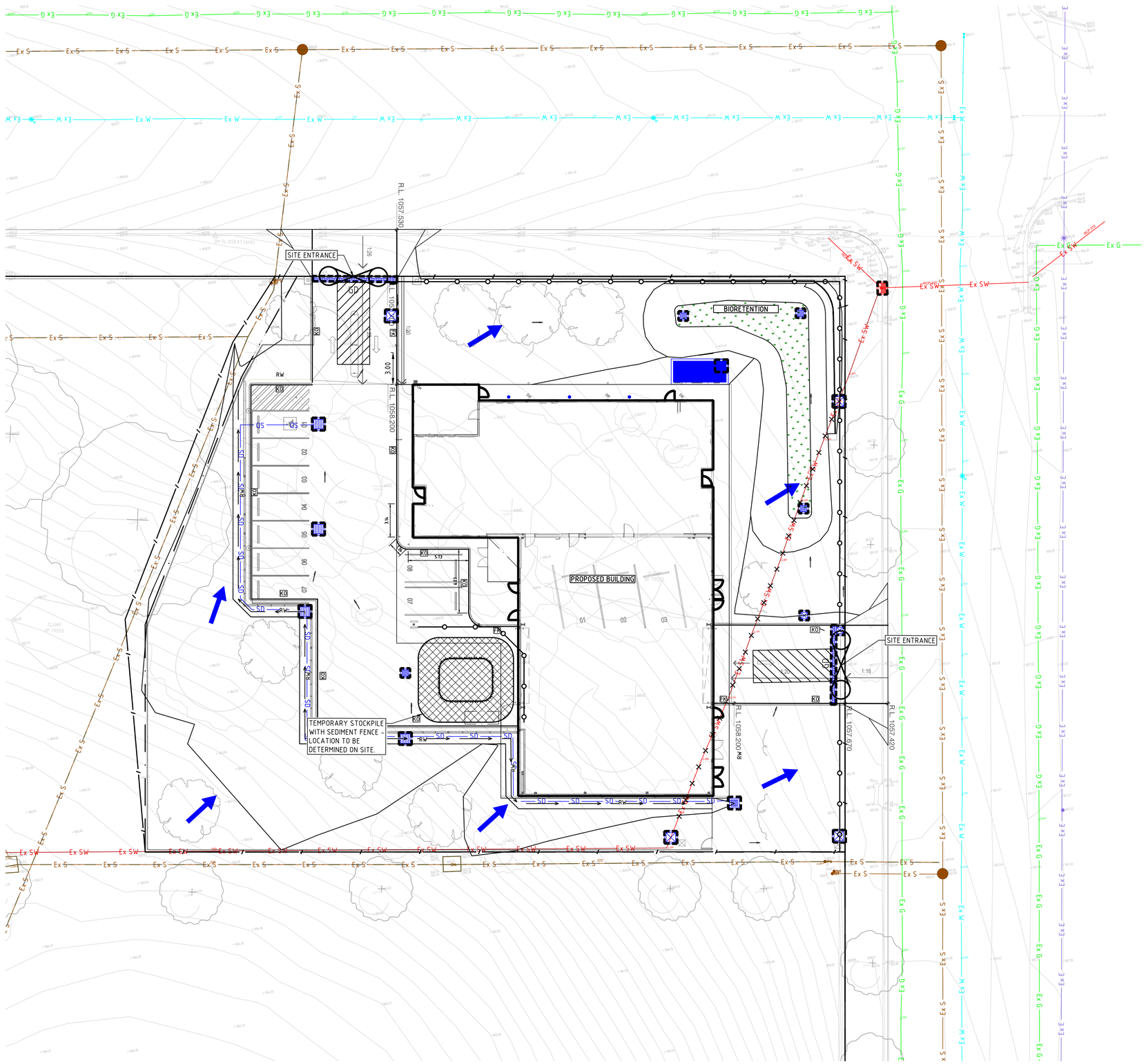
By: LYn Demesa



SEDIMENT AND EROSION CONTROL NOTES

1. IT HAS BEEN ASSUMED THAT HOARDINGS/SILT FENCING WILL BE PROVIDED TO THE STAGE BOUNDARY SUFFICIENT TO PREVENT SEDIMENT RUNOFF FROM LEAVING SITE (EXCEPT IN THE CASE OF ENTRY/EXIT LOCATIONS WHERE TEMPORARY CONSTRUCTION ENTRY/EXIT SEDIMENT TRAP ARE PROVIDED). IF THIS IS NOT THE CASE, PROVIDE SEDIMENT FENCE TO STANDARD DETAIL BELOW AS REQUIRED TO PREVENT SEDIMENT FROM LEAVING SITE, DIRECT RUNOFF TO SEDIMENT BASIN.
2. ALL SEDIMENT CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH LANDCOM MANAGING URBAN STORMWATER "BLUE BOOK".

SEDIMENT CONTROL CONDITIONS

1. SEDIMENT FENCES AND STRAW BALES WILL BE INSTALLED AS SHOWN AND ELSEWHERE AT THE DISCRETION OF THE SITE MANAGER TO CONTAIN COARSER SEDIMENT FRACTIONS (INCLUDING AGGREGATED FINES) AS NEAR AS POSSIBLE TO THEIR SOURCE.
2. SEDIMENT REMOVED FROM ANY TRAPPING DEVICE WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS & WATERWAYS CANNOT OCCUR.
3. STOCKPILES WILL BE PLACED WHERE SHOWN ON DRAWING OR ELSEWHERE AT THE DISCRETION OF THE SITE MANAGER AND NOT WITHIN 5m OF HAZARD AREAS INCLUDING LIKELY AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS & DRIVEWAYS.
4. WATER WILL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM WITH INLET FILTERS (SEE DETAILS) UNLESS IT IS SEDIMENT FREE.
5. TEMPORARY SEDIMENT TRAPS WILL BE RETAINED UNTIL AFTER THE LANDS THEY ARE PROTECTING ARE COMPLETELY REHABILITATED.

SITE INSPECTION & MAINTENANCE CONDITIONS

THE SITE MANAGER WILL INSPECT THE SITE AT LEAST WEEKLY AND WILL:

1. ENSURE THAT DRAINS OPERATE PROPERLY & TO EFFECT ANY NECESSARY REPAIRS
2. REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5m FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS & PAVED AREAS.
3. REMOVE TRAPPED SEDIMENT WHENEVER LESS THAN DESIGN CAPACITY REMAINS WITHIN THE STRUCTURE
4. ENSURE REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND TO INITIATE UPGRADING OR REPAIR AS APPROPRIATE.
5. CONSTRUCT ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS.
6. MAINTAIN EROSION & SEDIMENT CONTROL MEASURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS REHABILITATED.
7. REMOVE TEMPORARY SOIL CONSERVATION STRUCTURES AS THE LAST ACTIVITY IN THE REHABILITATION PROGRAM.

AS PART OF THE STATUTORY 'DILIGENCE OF CARE' RESPONSIBILITIES, THE SITE MANAGER WILL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL.
ENTRIES WILL INCLUDE:

1. THE VOLUME & INTENSITY OF ANY RAINFALL EVENTS
2. THE CONDITION OF ANY SOIL & WATER MANAGEMENT WORKS
3. THE CONDITION OF VEGETATION & ANY NEED TO IRRIGATE
4. THE NEED FOR DUST PREVENTION STRATEGIES
5. ANY REMEDIAL WORKS TO BE UNDERTAKEN

THE BOOK WILL BE KEPT ONSITE & MADE AVAILABLE TO ANY AUTHORISED PERSON ON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF WORKS.

SURVEY LEGEND

- SITE BOUNDARY
- EX SURFACE LEVEL
- EX SURFACE CONTOUR
- EX TREE
- Ex SW — EXISTING STORMWATER DRAINAGE LINE
- Ex S — EXISTING SEWER LINE
- Ex W — EXISTING WATER MAIN
- Ex G — EXISTING GAS LINE
- Ex T — EXISTING TELECOMMUNICATIONS LINE
- Ex E — EXISTING ELECTRICAL LINE
- EXISTING UNKNOWN SERVICE
- Ex E — EXISTING SERVICE TO BE MADE REDUNDANT

SEDIMENT AND EROSION CONTROL LEGEND

- BARRIER FENCE
- SEDIMENT FENCE
- CD — CATCH DRAIN
- TEMPORARY SHAKER RAMP FOR ENTRY/EXIT
- SEDIMENT BASIN (LOCATION TBC ON-SITE)
- TEMPORARY STOCKPILE (LOCATION TBC ON-SITE)
- GEOTEXTILE PIT FILTER / FILTER SURROUND INSTALLED ON EXISTING PIT
- SANDBAGS INSTALLED ON EXISTING PIT
- OVERLAND FLOW

WARNING
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SCALE 1:200 — 0m 2m 4m 8m 12m

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Project Name: RAIR II: GLEN INNES SITE TAYLOR STREET, GLEN INNES NSW, 2370, LOT2: DP1208729

Drawing Title: SEDIMENT AND EROSION CONTROL PLAN

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	1:200	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1105
		Rev	P3

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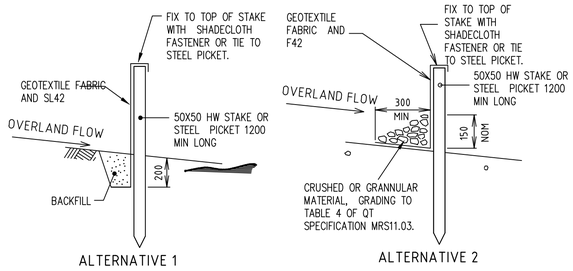
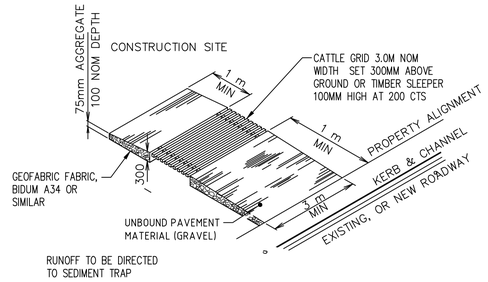
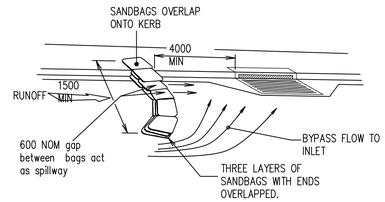
By: Lyn Demesis
Version: 1





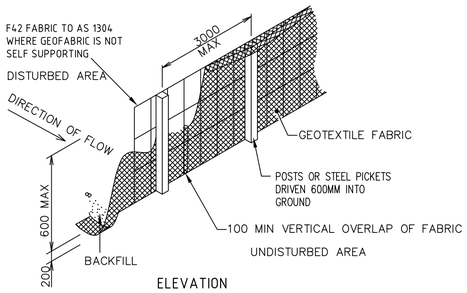
TEMPORARY CONSTRUCTION VEHICLE ENTRY/EXIT SEDIMENT TRAP

NOT TO SCALE



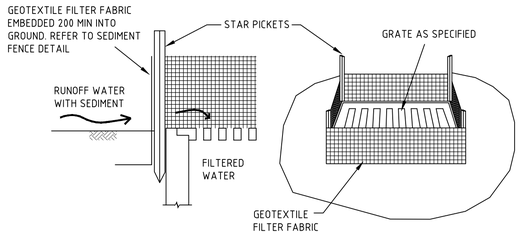
ON GRADE KERB INLET SEDIMENT TRAP

NOT TO SCALE



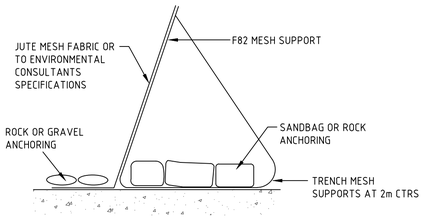
SEDIMENT FENCE

NOT TO SCALE



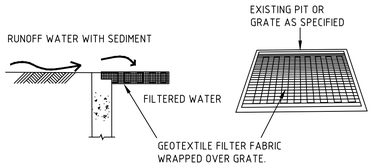
GEOTEXTILE PIT FILTER 1

NOT TO SCALE



ALTERNATIVE SEDIMENT FENCE

NOT TO SCALE



GEOTEXTILE PIT FILTER 2

NOT TO SCALE

ALTERNATIVE SEDIMENT FENCE NOTES

1. INSTALL THIS TYPE OF SEDIMENT FENCE WHEN USE OF SUPPORT POSTS IS NOT DESIRABLE OR NOT POSSIBLE. SUCH CONDITIONS MIGHT APPLY, FOR EXAMPLE, WHERE APPROVAL IS GRANTED FROM THE APPROPRIATE AUTHORITIES TO PLACE THESE FENCES IN HIGHLY SENSITIVE ESTUARINE AREAS.
2. USE BENT TRENCH MESH TO SUPPORT THE F82 WELDED MESH FACING AS SHOWN ON THE DRAWING ABOVE. ATTACH THE JUTE MESH TO THE WELDED MESH FACING USING UV-RESISTANT CABLE TIES.
3. STABILISE THE WHOLE STRUCTURE WITH SANDBAG OR ROCK ANCHORING OVER THE TRENCH MESH AND THE LEADING EDGE OF THE JUTE MESH. THE ANCHORING SHOULD BE SUFFICIENTLY LARGE TO ENSURE STABILITY OF THE STRUCTURE IN THE DESIGN STORM EVENT, USUALLY THE 10 YEAR EVENT.

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P2	ISSUED FOR TENDER	27.05.22	DH	
P1	ISSUED FOR DA	13.05.22	DH	

Rev	Description	Date	By	App

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Project Name: RAIR II: GLEN INNES SITE TAYLOR STREET, GLEN INNES NSW, 2370, LOT2: DP1208729

Drawing Title: SEDIMENT AND EROSION CONTROL DETAILS

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	NTS	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1106
		Rev	P3

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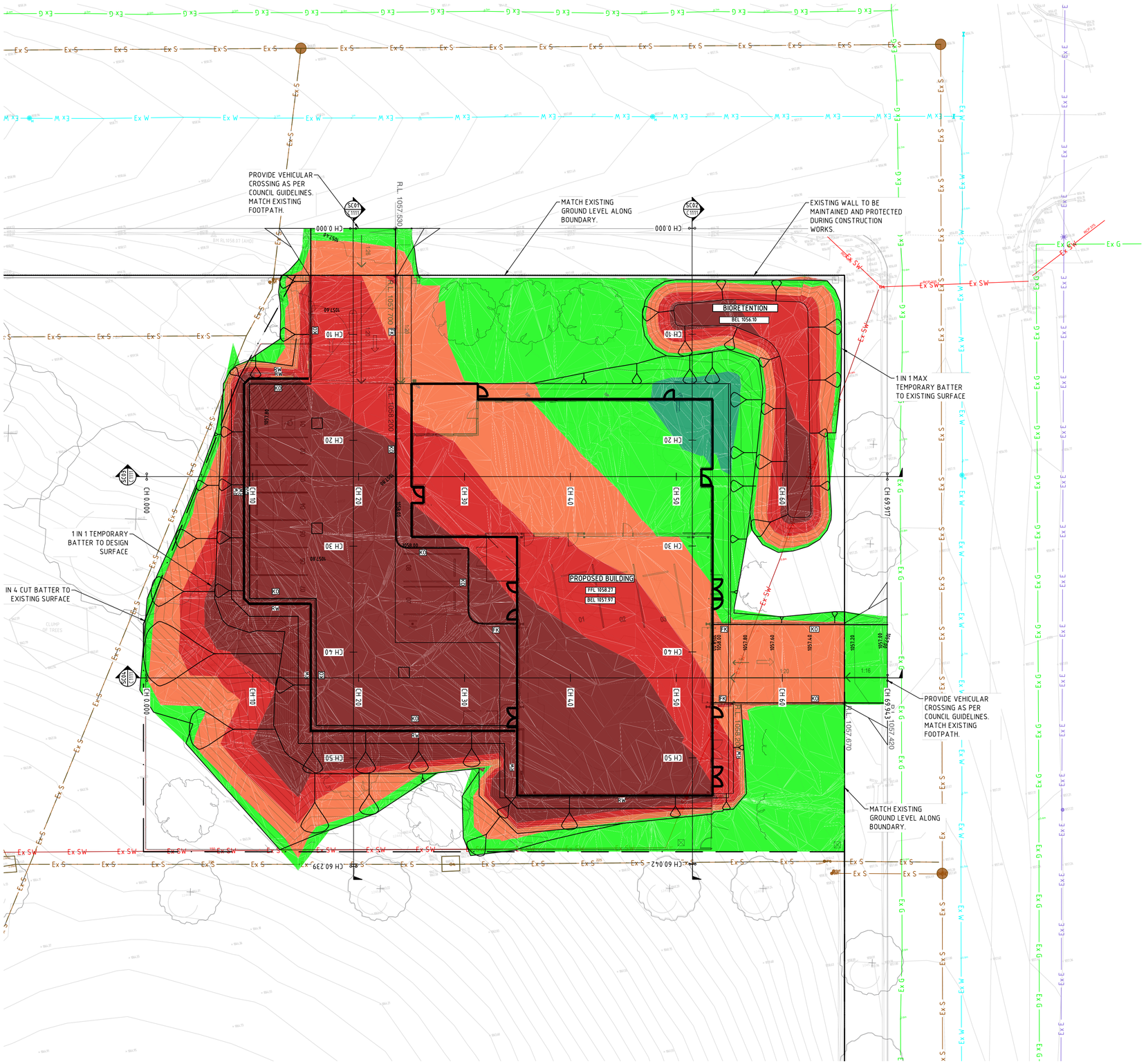
By: Lyn Demesa



EXCAVATION NOTES

E1 VOLUMES ARE APPROXIMATE ONLY AND DO NOT INCORPORATE BULKING FACTORS AND OVER EXCAVATION. VOLUMES HAVE BEEN CALCULATED BETWEEN 150mm STRIPPED SURFACE LEVELS AND BULK EARTHWORKS SURFACE OR AS NOTED IN GEOTECHNICAL REPORT.

E2 GROUND WATER SEEPAGE MAY OCCUR IN EXCAVATED AREAS. DE-WATERING MAY BE REQUIRED IN THIS INSTANCE.

E3 THIS DRAWING ONLY DETAILS EXCAVATION ASSOCIATED WITH THE BUILDING SLAB (IGNORING STRUCTURAL FOOTINGS, BEAMS AND COLUMNS). IN ADDITION TO MAKING NO ALLOWANCE FOR TRENCH BACKFILL, TREE ROOTBALLS OR DETAILED EXCAVATION.

E4 PROVIDE TEMPORARY MAXIMUM 1 IN 1 BATTERS U.N.O. GEOTECH TO CONFIRM BATTER ACCEPTABILITY DURING CONSTRUCTION.

E5 THE EXCAVATED MATERIAL IS TO BE TEMPORARILY STOCKPILED WITHIN THE LANDSCAPED AREAS (TO BE CONFIRMED ON-SITE) AND RE-USED USING VALIDATED MATERIALS AS LANDSCAPING SOIL BUILD-UP/BACKFILL IN ACCORDANCE WITH LANDSCAPE ARCHITECTS SPECIFICATIONS.

E6 REFER TO ARBORIST REPORT FOR TREE PROTECTION MEASURES IF REQUIRED.

E7 300mm BULK EARTHWORKS DEPTHS HAVE BEEN CONSIDERED FOR PLANT AREA.

E8 GRASSED AREAS HAVE BULK EARTHWORKS DEPTH OF 300mm FROM PROPOSED SURFACE LEVELS.

SURVEY LEGEND

	SITE BOUNDARY
25.50	EX SURFACE LEVEL
5.00	EX SURFACE CONTOUR
	EX TREE
Ex SW	EXISTING STORMWATER DRAINAGE LINE
Ex S	EXISTING SEWER LINE
Ex W	EXISTING WATER MAIN
Ex G	EXISTING GAS LINE
Ex T	EXISTING TELECOMMUNICATIONS LINE
Ex E	EXISTING ELECTRICAL LINE
	EXISTING UNKNOWN SERVICE
Ex E	EXISTING SERVICE TO BE MADE REDUNDANT

SITEWORKS LEGEND

32.00	FINISHED SURFACE CONTOUR
BEL 34.00	BULK EXCAVATION LEVEL
BEL 34.00	BULK EXCAVATION SPOT LEVEL

EARTHWORKS QUANTITIES

ASSUMED STRIPPED TOPSOIL (150mm) = 508m³

TOTAL CUT VOLUME = 2676m³

TOTAL FILL VOLUME = 151m³

EXCESS FILL VOLUME = 2525m³

EARTHWORKS DEPTH RANGE

Lower_value		Upper_value		Colour
-10	to	-1.0	m	
-1.0	to	-0.5	m	
-0.5	to	0	m	
0	to	0.5	m	
0.5	to	1.0	m	
1.0	to	10	m	

WARNING
NO DRAINAGE WORKS SHALL COMMENCE UNTIL THE CONTRACTOR CONFIRMS THE I.L. OF ALL EXISTING DRAINS, AND CONFIRMS IN WRITING WITH THE ENGINEERING SUPERVISOR.

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SCALE 1:200 — 0m 2m 4m 8m 12m

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P1	ISSUED FOR TENDER	27.05.22	DH	

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Project Name: RAIR II: GLEN INNES SITE
TAYLOR STREET, GLEN INNES
NSW, 2370, LOT2: DP1208729

Drawing Title: BULK EARTHWORKS PLAN

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	1:200	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1110
		Rev	P3

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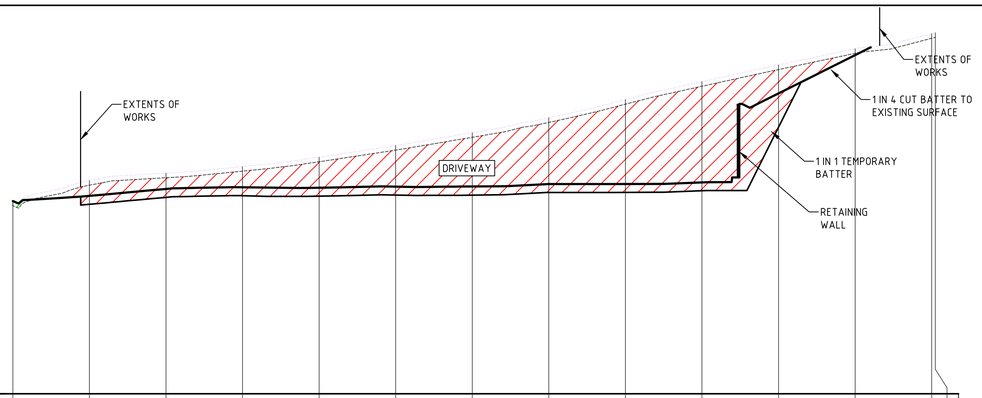
By: Lyn Demesa



DESIGN GRADELINE

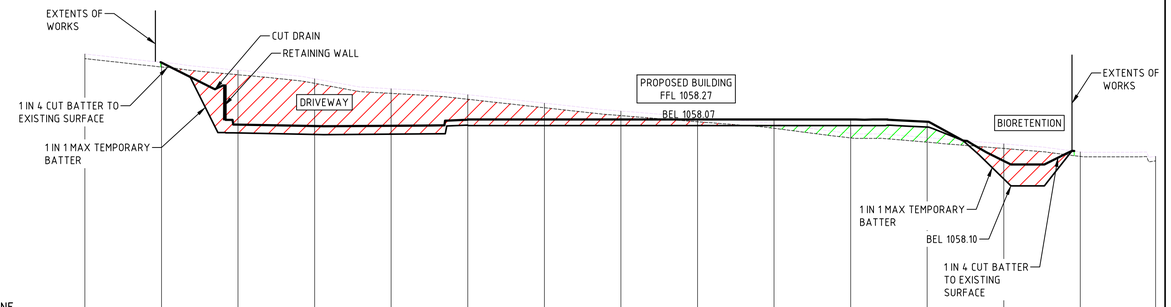
HORIZONTAL GEOMETRY

DATUM 1051.3

SC01														
DESIGN SURFACE LEVEL	1057.592	1057.760	1057.987	1058.043	1058.028	1058.061	1058.068	1058.145	1058.149	1058.202	1061.105	1062.355		
BULK EARTHWORKS SURFACE LEVEL	1057.592	1057.485	1057.712	1057.766	1057.753	1057.786	1057.784	1057.870	1057.874	1057.927	1060.003	1062.355		
STRIPPED EXISTING SURFACE LEVEL	1057.442	1058.109	1058.352	1058.568	1058.875	1059.255	1059.673	1060.159	1060.753	1061.338	1061.884	1062.414	1062.906	1062.937
EXISTING SURFACE LEVEL	1057.592	1058.259	1058.502	1058.718	1059.025	1059.405	1059.823	1060.309	1060.903	1061.488	1062.034	1062.564	1063.056	1063.087
CHAINAGES	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000	55.000	60.000	60.239

1 in 200 HORIZONTAL
1 in 100 VERTICAL

SC01 LONGITUDINAL SECTION



DESIGN GRADELINE

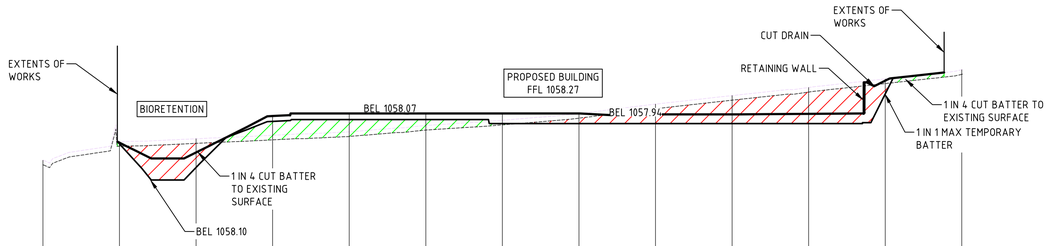
HORIZONTAL GEOMETRY

DATUM 1050.0

SC03														
DESIGN SURFACE LEVEL		1060.127	1058.103	1058.056	1058.064	1058.270	1058.270	1058.270	1058.270	1058.270	1058.270	1058.196	1056.916	
BULK EARTHWORKS SURFACE LEVEL		1060.127	1057.828	1057.781	1057.789	1058.082	1058.070	1058.070	1058.070	1058.070	1058.070	1058.021	1056.327	
STRIPPED EXISTING SURFACE LEVEL	1060.257	1059.983	1059.729	1059.448	1059.121	1058.929	1058.653	1058.395	1058.195	1057.982	1057.668	1057.526	1057.323	1057.062	1056.916
EXISTING SURFACE LEVEL	1060.407	1060.133	1059.879	1059.598	1059.271	1059.079	1058.803	1058.545	1058.345	1058.132	1057.818	1057.676	1057.473	1057.212	1057.066
CHAINAGES	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000	55.000	60.000	65.000	69.917

1 in 200 HORIZONTAL
1 in 100 VERTICAL

SC03 LONGITUDINAL SECTION



DESIGN GRADELINE

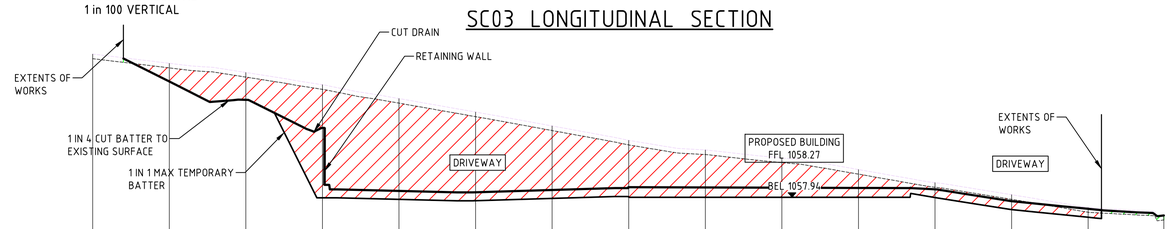
HORIZONTAL GEOMETRY

DATUM 1050.0

SC02													
DESIGN SURFACE LEVEL		1057.316	1056.997	1058.188	1058.270	1058.270	1058.270	1058.270	1058.243	1058.243	1058.258	1059.341	
BULK EARTHWORKS SURFACE LEVEL		1057.274	1056.509	1058.013	1058.070	1058.070	1057.940	1057.940	1057.940	1057.940	1057.940	1058.908	
STRIPPED EXISTING SURFACE LEVEL	1056.593	1057.202	1057.295	1057.409	1057.520	1057.728	1057.898	1058.177	1058.426	1058.704	1058.969	1059.247	1059.548
EXISTING SURFACE LEVEL	1056.743	1057.352	1057.445	1057.559	1057.670	1057.878	1058.048	1058.267	1058.576	1058.854	1059.119	1059.397	1059.698
CHAINAGES	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000	55.000	60.000

1 in 200 HORIZONTAL
1 in 100 VERTICAL

SC02 LONGITUDINAL SECTION



DESIGN GRADELINE

HORIZONTAL GEOMETRY

DATUM 1051.1

SC04														
DESIGN SURFACE LEVEL		1061.722	1061.123	1060.204	1058.147	1058.103	1058.178	1058.268	1058.260	1058.252	1058.244	1058.200	1057.813	1057.563	1057.348
BULK EARTHWORKS SURFACE LEVEL		1061.722	1061.123	1059.922	1057.872	1057.828	1057.903	1057.949	1057.940	1057.940	1057.940	1057.931	1057.538	1057.288	1057.348
STRIPPED EXISTING SURFACE LEVEL	1062.464	1062.164	1061.864	1061.464	1061.013	1060.573	1060.119	1059.649	1059.335	1059.073	1058.696	1058.268	1057.874	1057.452	1057.199
EXISTING SURFACE LEVEL	1062.614	1062.314	1062.014	1061.614	1061.163	1060.723	1060.269	1059.799	1059.485	1059.223	1058.846	1058.418	1058.024	1057.602	1057.349
CHAINAGES	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000	55.000	60.000	65.000	69.943

1 in 200 HORIZONTAL
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SC04 LONGITUDINAL SECTION

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Project Name: RAIR II: GLEN INNES SITE
TAYLOR STREET, GLEN INNES
NSW, 2370, LOT2: DP1208729

Drawing Title: SITE SECTIONS

AFC

Designed LD	Approved GK	Date APR 2022	North
Drawn DH			
Scale AS SHOWN	Project Ref 12537 01	Drawing No R31 C1111	Rev P3
Date APR 2022			
Sheet A1			

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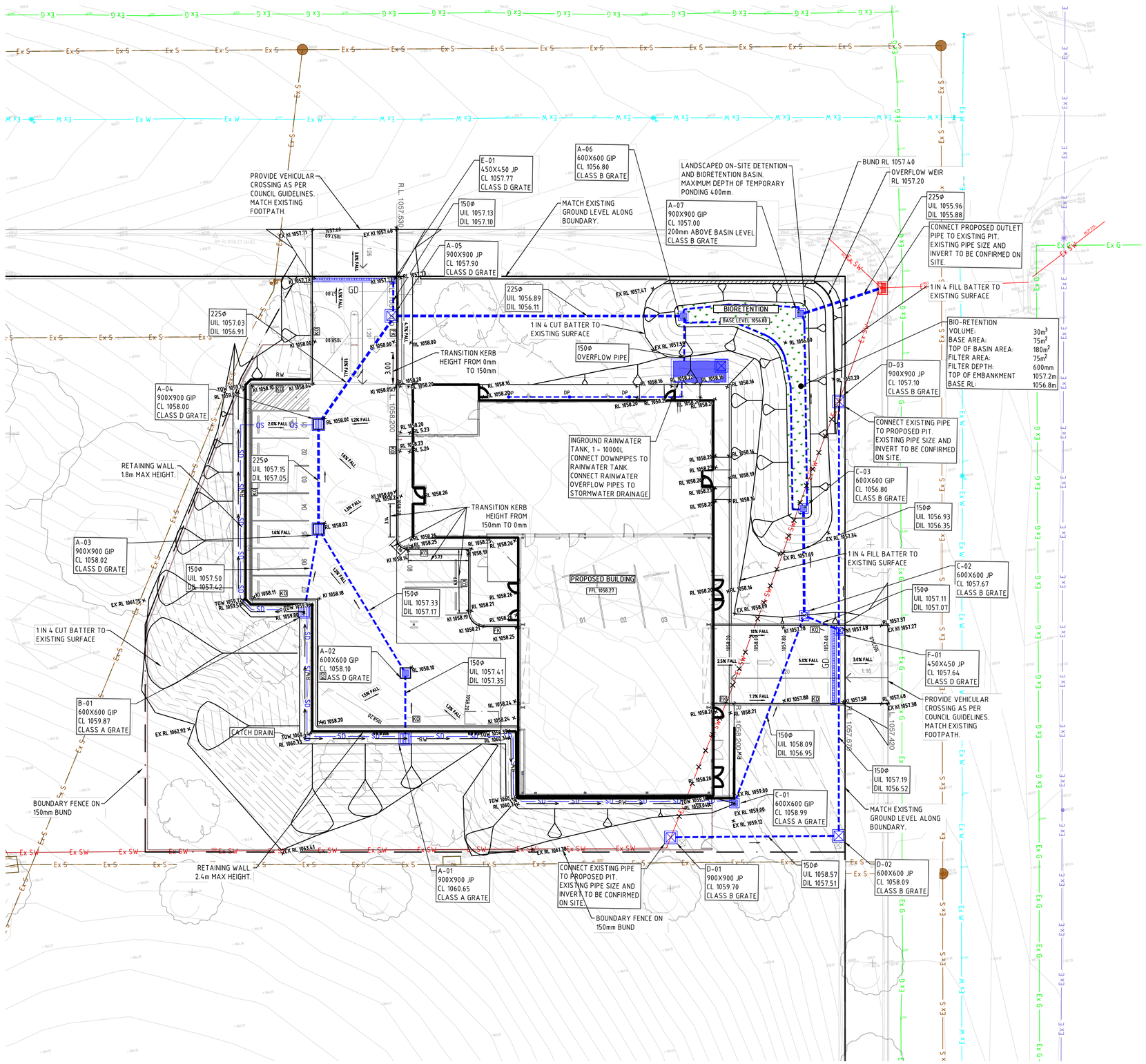
By: Lyn Lemesis



DRAINAGE LEGEND

- SURFACE INLET PIT
- JUNCTION PIT
- KERB INLET PIT
- STORMWATER DRAINAGE LINE
- GD — GRATED DRAIN
- DP — DOWNPIPE AND CONNECTION LINE (REFER TO HYDRAULIC DRAWINGS FOR DETAILS)
- FOR SD — FLUSHOUT RISER (max 30m CTRS) WITH SUBSOIL DRAINAGE (100Φ uPVC SLOTTED PIPE UN-SOCKED)
- RO — RAINWATER OULET
- OD — SWALE DRAIN
- Ex SW — EXISTING STORMWATER TO REMAIN
- Ex SW — EXISTING STORMWATER TO BE MADE REDUNDANT
- Ex SW — EXISTING STORMWATER TO REMAIN
- OVERLAND FLOW

SURVEY LEGEND

- SITE BOUNDARY
- 24.50 — EX SURFACE LEVEL
- 5.00 — EX SURFACE CONTOUR
- EX TREE
- Ex SW — EXISTING STORMWATER DRAINAGE LINE
- Ex S — EXISTING SEWER LINE
- Ex W — EXISTING WATER MAIN
- Ex G — EXISTING GAS LINE
- Ex T — EXISTING TELECOMMUNICATIONS LINE
- Ex E — EXISTING ELECTRICAL LINE
- EXISTING UNKNOWN SERVICE
- Ex E — EXISTING SERVICE TO BE MADE REDUNDANT

SITEWORKS LEGEND

- 32.00 — FINISHED SURFACE CONTOUR
- RW — PROPOSED RETAINING WALL
- RL 7.25 — FINISHED SURFACE LEVEL

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SCALE 1:200 — 0m 2m 4m 8m 12m

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Rev	Description	Date	By	App

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Project Name: RAIR II: GLEN INNES SITE TAYLOR STREET, GLEN INNES NSW, 2370, LOT2: DP1208729

Drawing Title: SITEWORKS AND STORMWATER DRAINAGE PLAN

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	1:200	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1130
		Rev	P3

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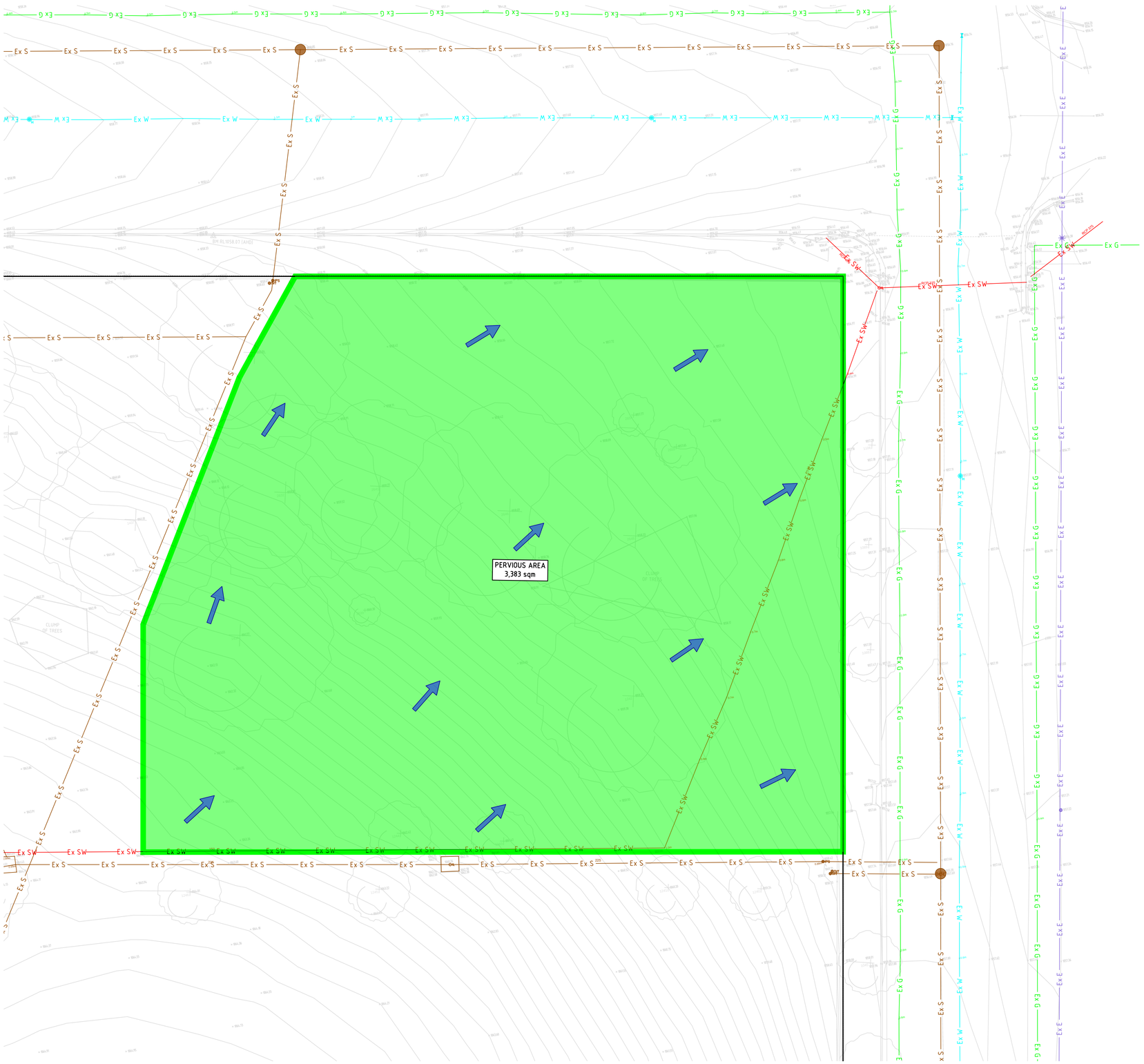
By: LYN DENESS
Version: 1



SURVEY LEGEND

- SITE BOUNDARY
- EX SURFACE LEVEL
- EX SURFACE CONTOUR
- EX TREE
- Ex SW — EXISTING STORMWATER DRAINAGE LINE
- Ex S — EXISTING SEWER LINE
- Ex W — EXISTING WATER MAIN
- Ex G — EXISTING GAS LINE
- Ex T — EXISTING TELECOMMUNICATIONS LINE
- Ex E — EXISTING ELECTRICAL LINE
- EXISTING UNKNOWN SERVICE
- Ex E — EXISTING SERVICE TO BE MADE REDUNDANT

SITEWORKS LEGEND

- 32.00 — FINISHED SURFACE CONTOUR
- PROPOSED RETAINING WALL
- RL 7.25 — FINISHED SURFACE LEVEL

CATCHMENT LEGEND

- IMPERVIOUS CATCHMENT AREA
- PERVIOUS CATCHMENT AREA
- CATCHMENT FLOW DIRECTION

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SCALE 1:200 — 0m 2m 4m 8m 12m

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Rev	Description	Date	By	App

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Project Name: RAIR II: GLEN INNES SITE TAYLOR STREET, GLEN INNES NSW, 2370, LOT2: DP1208729

Drawing Title: EXISTING BULK CATCHMENT PLAN

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	1:200	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1140
		Rev	P3

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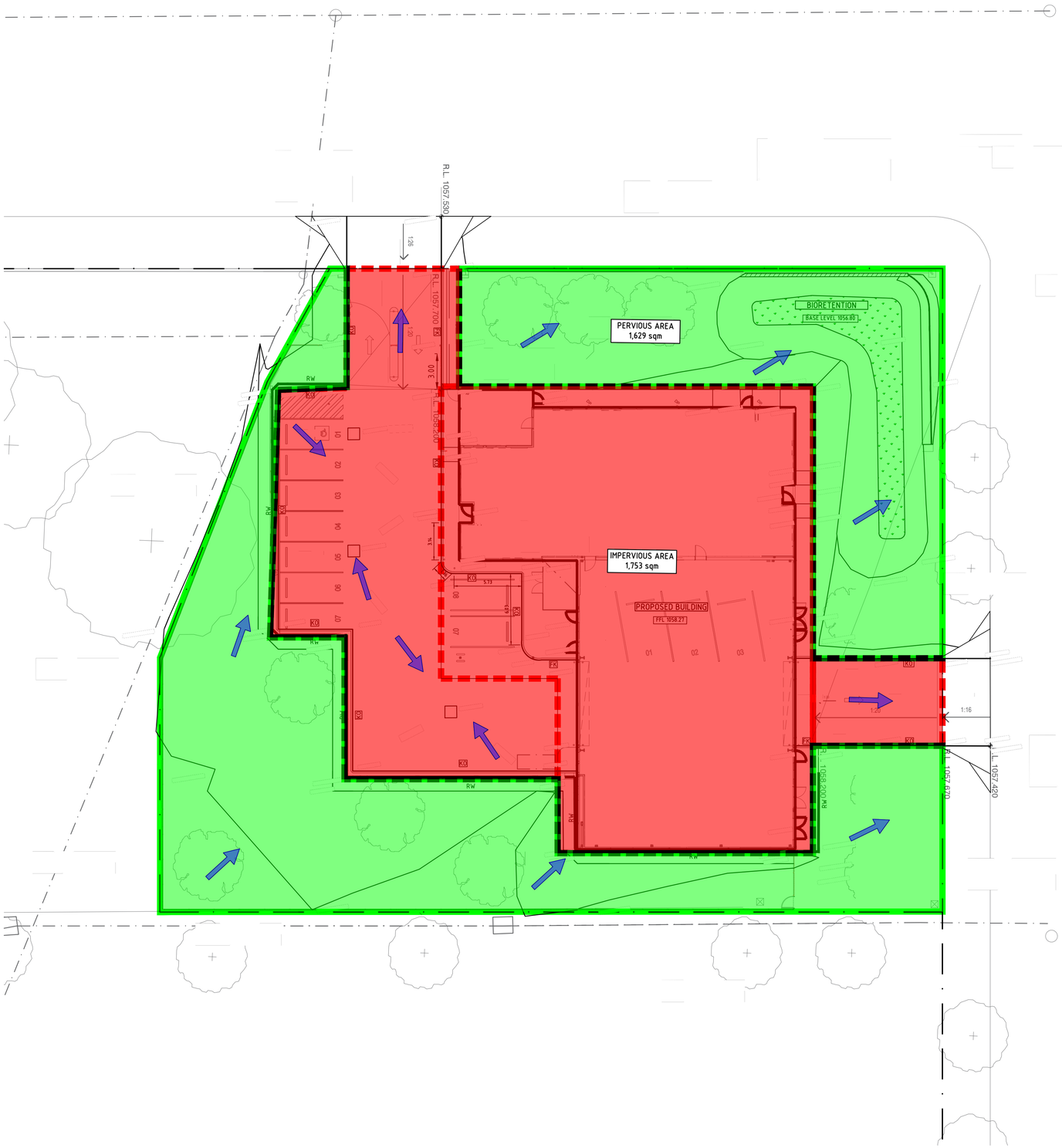
By: Lyn Demesa



SURVEY LEGEND

- SITE BOUNDARY
- EX SURFACE LEVEL
- EX SURFACE CONTOUR
- EX TREE
- Ex SW — EXISTING STORMWATER DRAINAGE LINE
- Ex S — EXISTING SEWER LINE
- Ex W — EXISTING WATER MAIN
- Ex G — EXISTING GAS LINE
- Ex T — EXISTING TELECOMMUNICATIONS LINE
- Ex E — EXISTING ELECTRICAL LINE
- EXISTING UNKNOWN SERVICE
- Ex E — EXISTING SERVICE TO BE MADE REDUNDANT

SITEWORKS LEGEND

- 32.00 — FINISHED SURFACE CONTOUR
- PROPOSED RETAINING WALL
- RL 7.25 — FINISHED SURFACE LEVEL

CATCHMENT LEGEND

- IMPERVIOUS CATCHMENT AREA
- PERVIOUS CATCHMENT AREA
- CATCHMENT FLOW DIRECTION

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WARNING
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SCALE 1:200 — 0m 2m 4m 8m 12m

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Rev	Description	Date	By	App

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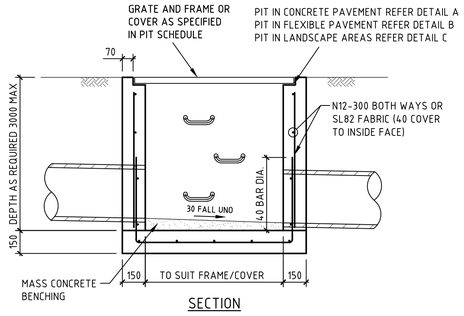
Project Name: RAIR II: GLEN INNES SITE TAYLOR STREET, GLEN INNES NSW, 2370, LOT2: DP1208729

Drawing Title: PROPOSED BULK CATCHMENT PLAN

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	1:200	Project Ref	12537 01
Date	APR 2022	Drawing No	R31 C1141
Sheet	A1	Rev	P3

North



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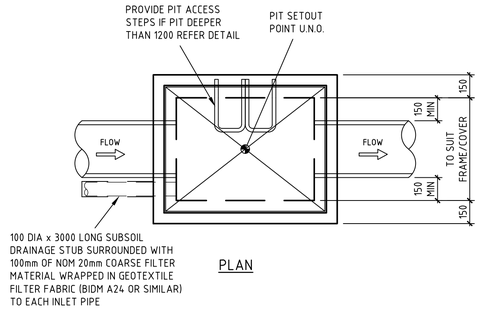
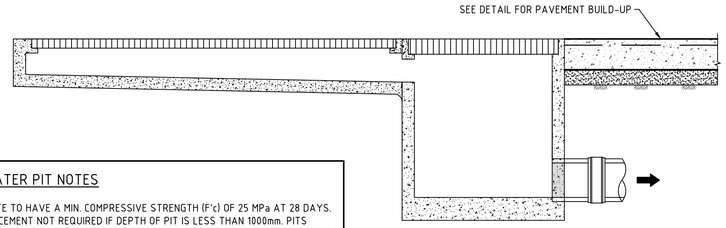


PLAN

SURFACE INLET/JUNCTION PIT DETAIL

SCALE 1:20

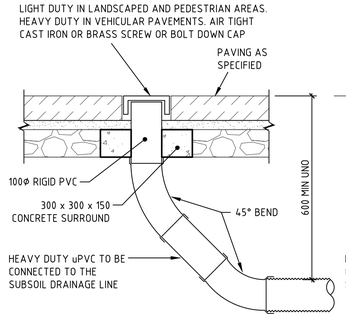


GRATED STRIP DRAIN CONFIGURATION

SCALE 1:20

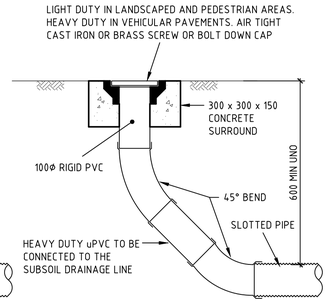
STORMWATER PIT NOTES

1. CONCRETE TO HAVE A MIN. COMPRESSIVE STRENGTH (F'c) OF 25 MPa AT 28 DAYS.
2. REINFORCEMENT NOT REQUIRED IF DEPTH OF PIT IS LESS THAN 1000mm. PITS GREATER THAN 3000mm DEEP TO HAVE WALL AND BASE 200mm THICK REINFORCED WITH N12-250 EACH WAY EACH FACE WITH CONCRETE STRENGTH F'c = 40 MPa.
3. PROVIDE STEP IRONS AT MAX 350mm CTRS IF DEPTH OF PIT EXCEEDS 1200mm.
4. IF REINFORCING FABRIC IS TO BE USED REFER TO WALL AND CORNER DETAILS
5. PRECAST PITS ARE TO GENERALLY COMPLY WITH THESE DETAILS.
6. PRECAST PIT MAY BE USED SUBJECT TO ENGINEERS APPROVAL.
7. ALL PITS TO BE LOCKABLE.
8. FINAL INTERNAL PIT DIMENSIONS ARE TO COMPLY WITH AS 3500.



FLUSHOUT RISER (FOR) IN PAVING BRICKS

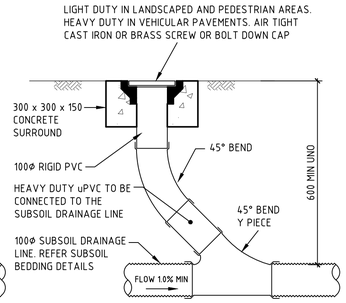
SCALE 1:10



FLUSHOUT RISER (FOR)

SCALE 1:10

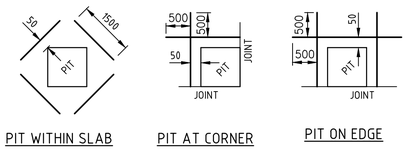
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS WITHIN DRAINAGE LAYER ONLY



INTERMEDIATE RISER

SCALE 1:10

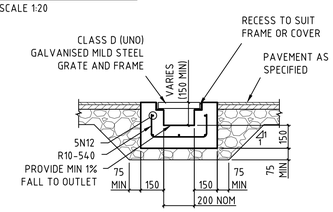
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



PIT WITHIN SLAB | PIT AT CORNER | PIT ON EDGE

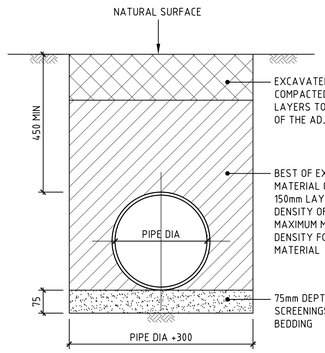
DETAIL OF SLAB REINFORCEMENT AT PITS IN CONCRETE PAVEMENT

N.T.S.



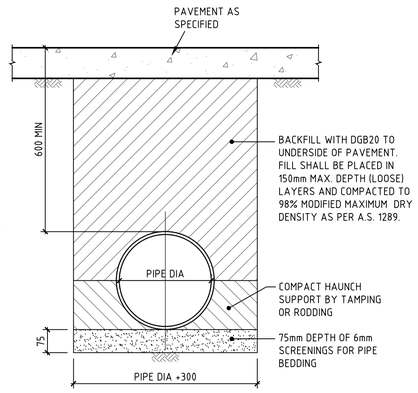
GRATED DRAIN

SCALE 1:10



PIPE LAYING DETAIL (ALL PIPES) UNDER LANDSCAPED AREAS

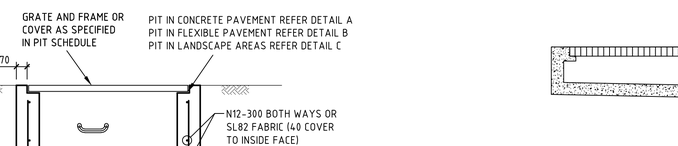
SCALE 1:10



PIPE LAYING DETAILS UNDER ALL PAVEMENTS

SCALE 1:10

NOTE: AVOID RUNNING CONSTRUCTION EQUIPMENT OVER THE PIPES UNTIL BACKFILL MATERIAL IS 300mm MIN. ABOVE CROWN OF PIPE.



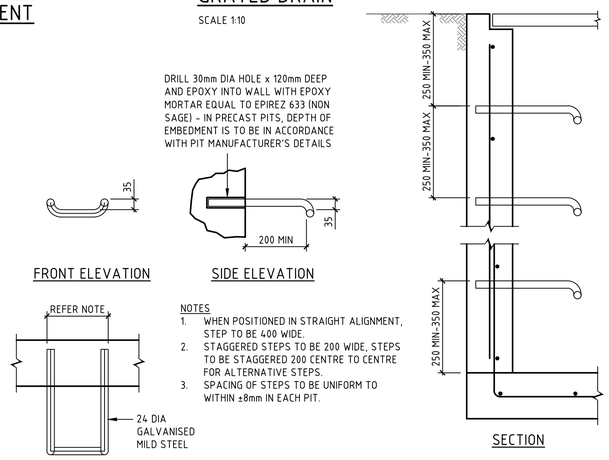
ELEVATION AT BASE | PLAN | PLAN - SINGLE LAYER | PLAN - DOUBLE LAYER

FABRIC | REINFORCEMENT

PIT CORNER DETAILS

SCALE 1:20

NOTE: DESIGNER TO VERIFY EXTENT OF DETAILING

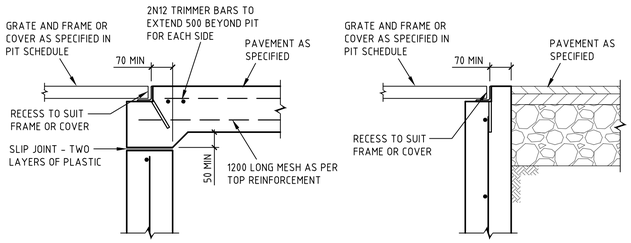


FRONT ELEVATION | SIDE ELEVATION | PLAN | SECTION

NOTES
1. WHEN POSITIONED IN STRAIGHT ALIGNMENT, STEP TO BE 400 WIDE.
2. STAGGERED STEPS TO BE 200 WIDE, STEPS TO BE STAGGERED 200 CENTRE TO CENTRE FOR ALTERNATIVE STEPS.
3. SPACING OF STEPS TO BE UNIFORM TO WITHIN ±8mm IN EACH PIT.

PIT ACCESS STEP DETAIL

SCALE 1:10



DETAIL A

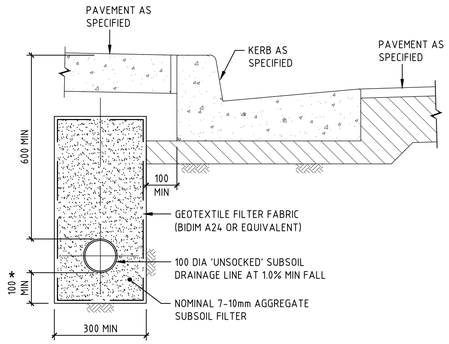
SCALE 1:10

DETAIL B

SCALE 1:10

DETAIL C

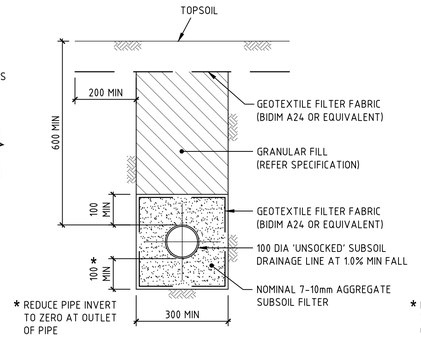
SCALE 1:10



* REDUCE PIPE INVERT TO ZERO AT OUTLET OF PIPE

SUBSOIL BEHIND KERB

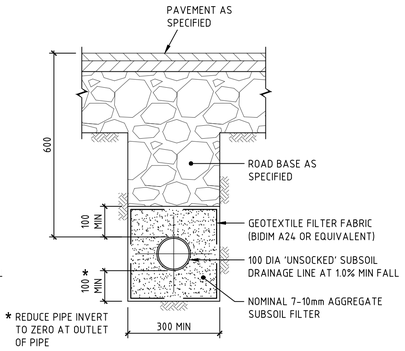
SCALE 1:10



* REDUCE PIPE INVERT TO ZERO AT OUTLET OF PIPE

SUBSOIL IN LANDSCAPED AREAS

SCALE 1:10



* REDUCE PIPE INVERT TO ZERO AT OUTLET OF PIPE

SUBSOIL IN PAVED AREAS

SCALE 1:10

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Project Name: RAIR II: GLEN INNES SITE TAYLOR STREET, GLEN INNES NSW, 2370, LOT2: DP1208729

Drawing Title: STORMWATER DRAINAGE DETAILS

AFC

Designed LD	Approved GK	Date APR 2022	North
Drawn DH			
Scale AS SHOWN			
Date APR 2022	Project Ref 12537 01	Drawing No R31 C1150	Rev P3
Sheet A1			

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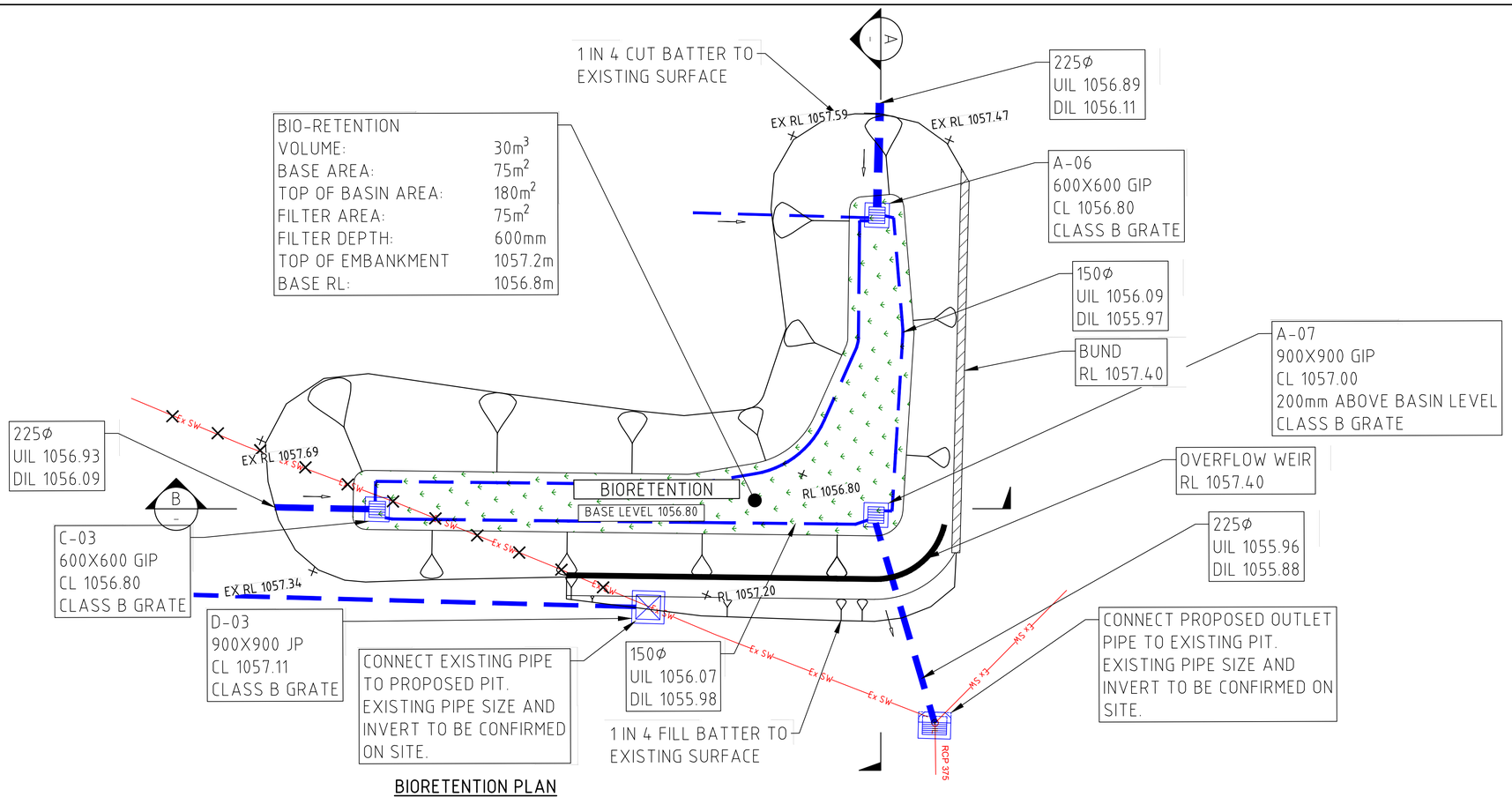
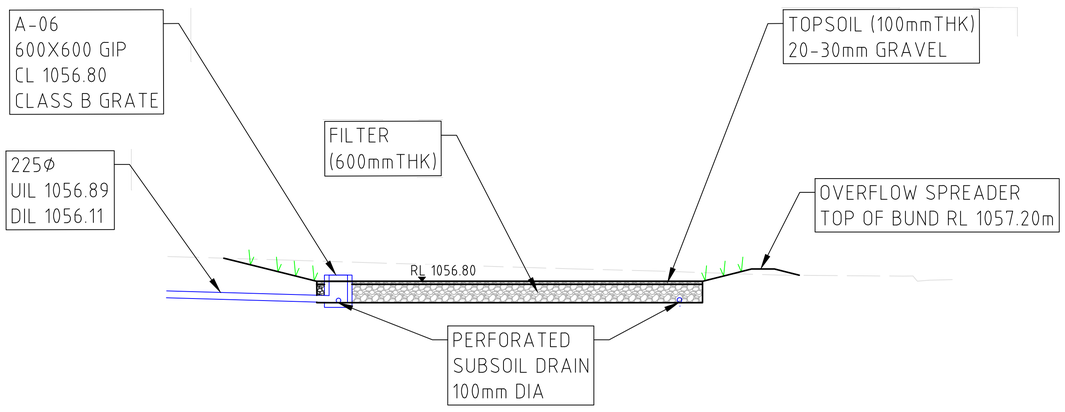


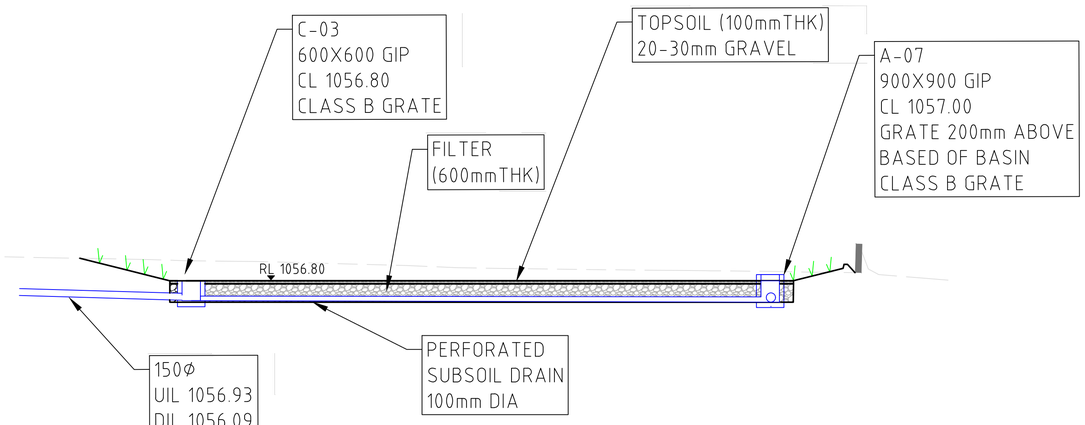
BIORETENTION PLAN

SCALE 1:100



SECTION A-A

SCALE 1:100



SECTION B-B

SCALE 1:100

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Rev	Description	Date	By	App

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Project Name: RAIR II: GLEN INNES SITE
TAYLOR STREET, GLEN INNES
NSW, 2370, LOT2: DP1208729

Drawing Title: ON SITE DETENTION DETAILS

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	AS SHOWN	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1152
		Rev	P3

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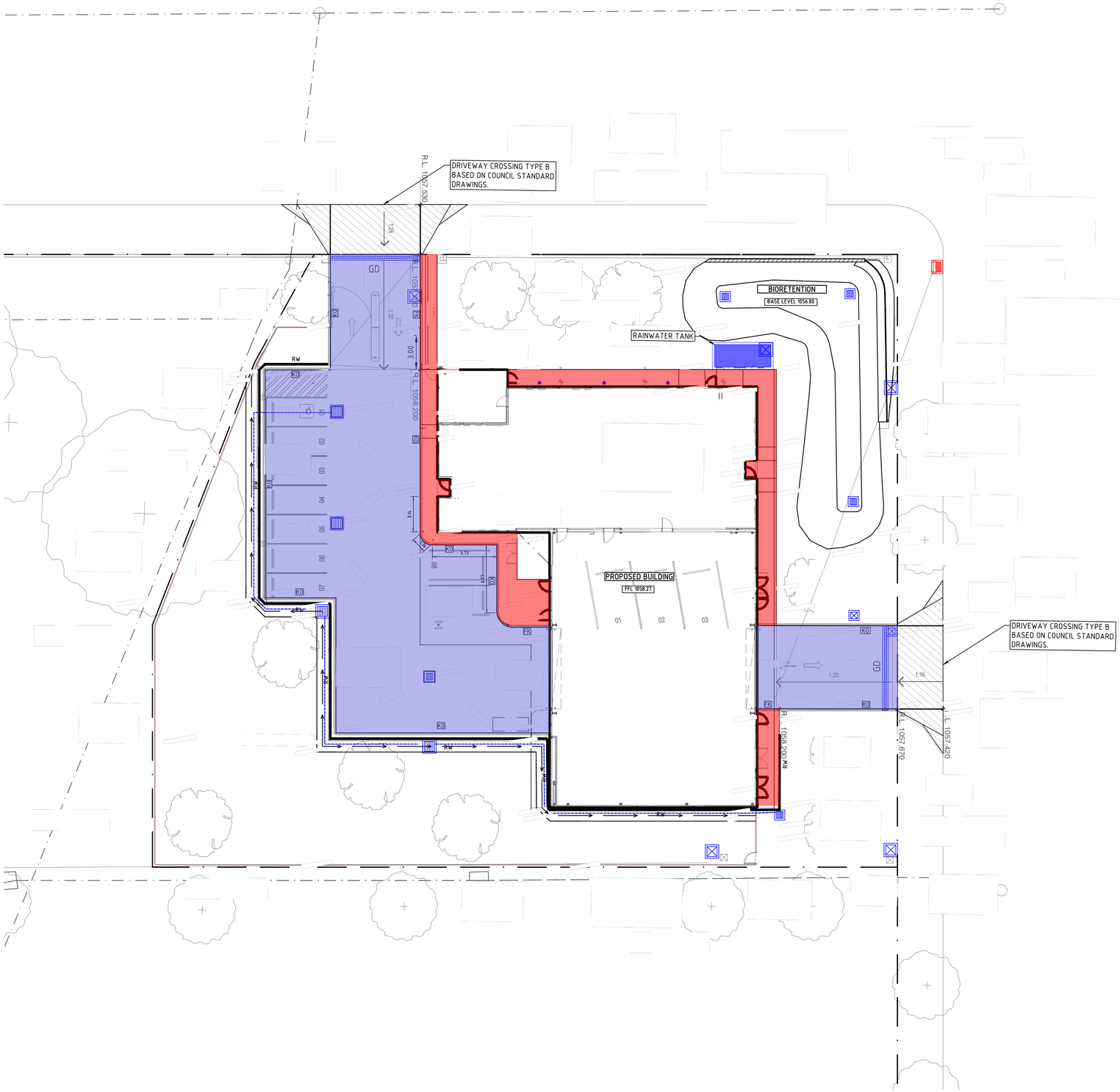

PAVEMENT LEGEND

NOTES
1. CONCRETE PAVEMENT SHALL CONFORM TO AS2150 AND THE SPECIFICATIONS
2. GEOTECHNICAL REPORT BY JK GEOTECHNICS PTY LTD DATED 10 NOVERMBER (REF 34044RFrpt)

PAVEMENT TYPE
CONCRETE PAVEMENT

PAVEMENT TYPE 7
CONCRETE FOOTPATH PAVEMENT

CONCRETE VEHICULAR CROSSING TO COUNCIL STANDARD DETAILS

SJ — SAWCUT JOINT
EJ — EXPANSION JOINT
DEJ — DOWELLED EXPANSION JOINT
KJ — KEYED CONSTRUCTION JOINT
TCJ — TRANSVERSE CONTRACTION JOINT
LWJ — LONGITUDINAL WARPING JOINT
IJ — ISOLATION JOINT

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SCALE 1:200
0m 2m 4m 8m 12m

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Rev	Description	Date	By	App

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TAYLOR STREET, GLEN INNES
NSW, 2370, LOT2: DP1208729

Drawing Title: PAVEMENT PLAN

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	1:200	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1160
		Rev	P3

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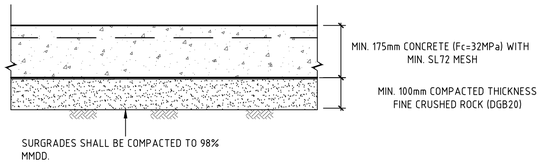
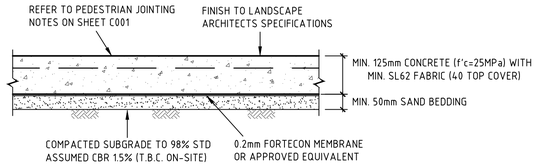


PAVEMENT TYPE CONCRETE PAVEMENT

SCALE 1:10

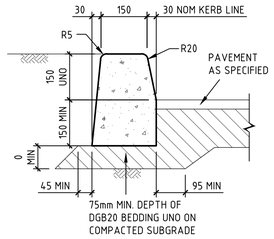
DENOTED ON PLAN



PAVEMENT TYPE P7 CONCRETE FOOTPATH PAVEMENT

SCALE 1:10

DENOTED ON PLAN



KERB ONLY (KO)

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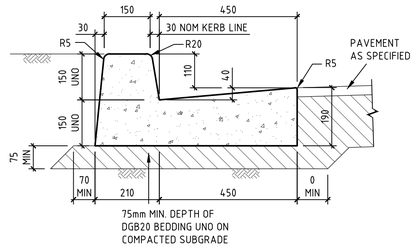

KERB AND GUTTER (K&G)

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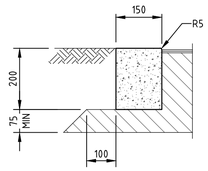


FLUSH KERB (FK)

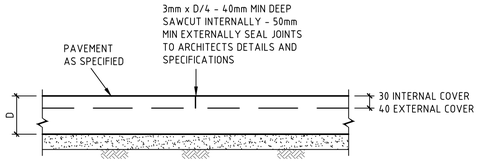
SCALE 1:10

ROAD DESIGN PARAMETERS (RIGID)

BASED ON COUNCIL RECOMMENDED PAVEMENT DESIGN FOR DRIVEWAY CROSSINGS.

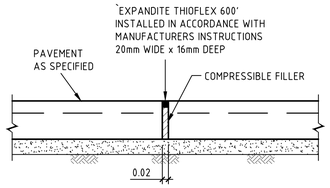
ASSUMPTIONS:

- PREPARE SUBGRADE AND SELECT FILL IN ACCORDANCE WITH JK GEOTECHNICS PTY LTD REPORT ON GEOTECHNICAL INVESTIGATION FOR PROPOSED RURAL AMBULANCE INFRASTRUCTURE AT 94 TAYLOR STREET, GLEN INNES, NSW DATED 25 MAY 2022(34948SFrpt).
- ALL AREAS SHALL BE VERIFIED BY JKGEOTECHNICS PTY LTD. AREAS NOT MEETING THIS DESIGN CRITERIA SHALL BE REMOVED AND REPLACED IN ACCORDANCE WITH THEIR ADVICE AND RECOMMENDATIONS



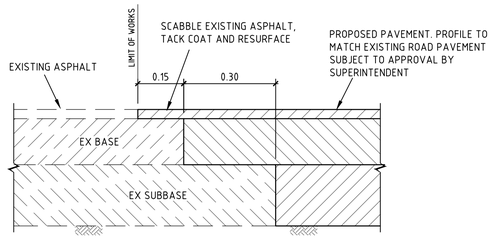
SAWCUT JOINT (SJ)

SCALE 1:10



EXPANSION JOINT (EJ)

SCALE 1:10

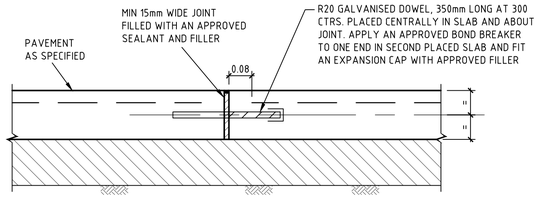


ASPHALT CONNECTION TO EXISTING PAVEMENT

SCALE 1:10

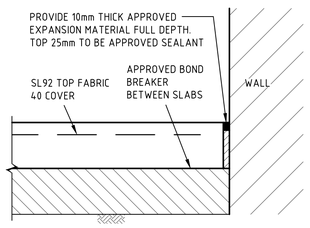
NOTES

1. SLAB MUST BE SAWCUT AS SOON AS PRACTICABLE AFTER FINISHING OF THE SLAB WITHOUT CAUSING DAMAGE TO THE SAWCUT EDGES - USUALLY 12-24 HOURS.
2. SLABS MUST NOT BE POURED IF TEMPERATURE EXCEEDS 32°
3. HOT WEATHER PLACING (25° AND OVER) MAY REQUIRE SLABS TO BE SAWCUT AS SOON AS 5-6 HOURS AFTER POURING.
4. ANY SLAB BAY IN WHICH SHRINKAGE CRACKS OCCUR DUE TO LATE SAWCUTTING MUST BE REMOVED AND REPLACED BY THE BUILDER/CONTRACTOR.



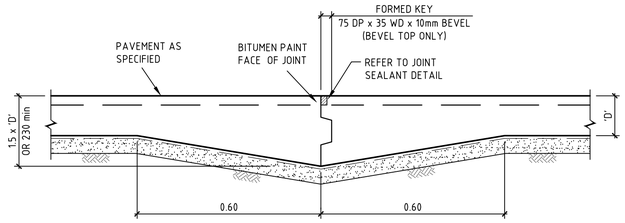
DOWELLED EXPANSION JOINT (DEJ)

SCALE 1:10



ISOLATION JOINT (IJ) WITH SUBGRADE BEAM

SCALE 1:10



KEYED CONSTRUCTION JOINT (KJ)

SCALE 1:10

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Rev	Description	Date	By	App
P3	ISSUED FOR AFC	21.07.22	LD	
P2	ISSUED FOR TENDER	27.05.22	DH	
P1	ISSUED FOR DA	13.05.22	DH	

Rev	Description	Date	By	App

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Project Name: RAIR II: GLEN INNES SITE TAYLOR STREET, GLEN INNES NSW, 2370, LOT2: DP1208729

Drawing Title: SITEWORKS AND PAVEMENT DETAILS

AFC

Designed	LD	Approved	GK
Drawn	DH	Date	APR 2022
Scale	1:10	North	
Date	APR 2022	Project Ref	12537 01
Sheet	A1	Drawing No	R31 C1170
		Rev	P3

File: G:\Jobs\12537\01\03 WIP\02 Civil\01 CAD\01 Autocad\RAIR 2 - Glen Innes Zone R31\12537\01C - R31-C1170.dwg Plotted: 21.07.22 at 5:37 PM
By: Lyn Demesa

BCA Assessment Report

Lot 2: DP 1208729 Taylor Street, Glen Innes

Project:	Lot 2: DP 1208729 Taylor Street, Glen Innes
Reference No:	113737:12a-BCA-r3
Date:	23 May 2022
Client:	DJRD Architects
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Document Control

Revision	Date	Description	
113737:12a-BCA-r1	21 April 2022	REF Stage BCA Assessment Report	
113737:12a-BCA-r2	26 April 2022	Fire wall added	
113737:12a-BCA-r3	23 May 2022	Fire Wall Location Updated	
		Prepared by	Verified by
		Jarryd Beckman	Matthew Kemp
		Accredited Certifier Grade A1, No. BDC 3126 Building Regulations Consultant	Accredited Certifier Grade A1, No. BDC 0208 Senior Building Regulations Consultant

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BASIS OF ASSESSMENT

1.1. Location and Description

The building development, the subject of this report, is located at Lot 2: DP 1208729 Taylor Street, Glen Innes. The proposed development is located on the Glen Innes District Hospital site and comprises the construction of a new single storey Ambulance station which will include an enclosed plant room used for ambulance parking, external public parking, amenities, sleeping pods and general office / communal areas.

The main pedestrian access into the building is from the northern boundary via the 1:20 walkway, while the main vehicular access is from the northern and eastern driveway entrances.

Photo sourced from DJRD Architectural Plans

1.2. Purpose

The purpose of this report is to assess the current design proposal against the Deemed-to-Satisfy Provisions of BCA 2019 Volume One Amendment 1, and to clearly outline those areas (if any) where compliance is not achieved, where areas may warrant redesign to achieve strict BCA compliance or where areas may be able to be assessed against the relevant performance criteria of BCA 2019.

1.3. Building Code of Australia

This report is based on the Deemed-to-Satisfy Provisions of the National Construction Code Series Volume One – Building Code of Australia, 2019 Edition (BCA) Amendment 1 incorporating the State variations where applicable. Please note that the version of the BCA applicable to new building works is the version applicable at the time of the lodgement of the Construction Certificate (CC) application to the Accredited Certifying Authority. The BCA is updated generally on a three-yearly cycle, starting from the 1st of May 2016.

1.4. Limitations

This report does not include nor imply any detailed assessment for design, compliance or upgrading for:

(a) the structural adequacy or design of the building;

(b) the inherent derived fire-resistance ratings of any proposed structural elements of the building (unless specifically referred to); and

(c) the design basis and/or operating capabilities of any proposed electrical, mechanical or hydraulic fire protection services.

This report does not include, or imply compliance with:

(a) the National Construction Code – Plumbing Code of Australia Volume 3;

(b) the Disability Discrimination Act 1992;

(c) The deemed-to-satisfy provisions of Part D3 and Clause F2.4 of the BCA (refer to separate Access Report)

(d) Demolition Standards not referred to by the BCA;

(e) Work Health and Safety Act 2011;

(f) Requirements of Australian Standards unless specifically referred to;

(g) Requirements of other Regulatory Authorities including, but not limited to, Telstra, Telecommunications Supply Authority, Water Supply Authority, Electricity Supply Authority, Work Cover, Roads and Maritime Services (RMS), Local Council, ARTC, Department of Planning and the like; and

1.5. Design Documentation

This report has been based on the Design plans and Specifications listed in Annexure A of this Report.

2 BUILDING DESCRIPTION

For the purposes of the Building Code of Australia (BCA) the development may be described as follows.

2.1. Rise in Storeys (Clause C1.2)

The building has a rise in storeys of one (1).

2.2. Classification (Clause A6.0)

The building has been classified as follows.

Table 1. Building Classification

Class	Level	Description
3	Ground	Sleeping pods
5	Ground	Offices, amenities, meeting and communal ancillary areas
7a	Ground	Plant room used for the parking of the ambulances

2.3. Effective Height (Clause A1.0)

The building is single storey and therefore the effective height is not applicable.

2.4. Type of Construction Required (Table C1.1)

The building is required to be of Type C Construction.

2.5. Floor Area and Volume Limitations (Table C2.2)

The building does not exceed the maximum floor area and volume limits of:-

Class 5	Maximum Floor Area	3 000m^2
	Maximum Volume	18 000m^3
Class 7a	Maximum Floor Area	2 000m^2
	Maximum Volume	12 000m^3

Note: There are no maximum floor area or volume limitations for Class 3 parts as these classifications are required to have fire rated bounding construction under Specification C1.1.

2.6. Fire Compartments

The building has the following fire compartments:

1. The plant room; and
2. The admin portion of the building (separated by a fire wall).

2.7. Exits

The following points in the building have been considered as the exits:

(a) The entrance door which is located adjacent to the gym.

(b) The main entrance door which is located adjacent to the office and admin rooms.

(c) Both external doorways in the plant room / covered parking area.

2.8. Location of Fire-source features

The fire source features for the subject development are:

North: The far side of Taylor Street.

South: The external wall of the Glen Innes District Hospital.

East: The far side of West Avenue.

West: The external wall of the Glen Innes District Hospital.

3 BCA ASSESSMENT

3.1. General

An assessment of the Architectural design documentation against the Deemed-to Satisfy Provisions of the Building Code of Australia, 2019 Amendment One (BCA) has been undertaken. It is important to note that only those items which are considered to be critical to the compliance of the proposed works have been discussed below. Any parts of the BCA2019 which have not been discussed are considered to be satisfied to an appropriate level and would readily be able to achieve compliance at Construction Certificate (CC) stage or are not applicable to the proposed development.

3.2. Dimensions and Tolerances

The BCA contains the minimum standards for building construction and safety, and therefore generally stipulates minimum dimensions which must be met. BCA Logic's assessment of the plans and specifications has been undertaken to ensure the minimum dimensions have been met.

The designer and builder should ensure that the minimum dimensions are met onsite and consideration needs to be given to construction tolerances for wall set outs, applied finishes and skirtings to corridors and bathrooms for example, tiling bed thicknesses and the like which can adversely impact on critical maters such as access for people with disabilities, stair and corridor widths and balustrade heights.

3.3. Section C – Fire Resistance

Clause C1.8 – Lightweight construction

Where lightweight construction is used for the fire rated walls, then the lightweight construction must comply with Clause C1.8 and Specification C1.8.

Clause C1.10 – Fire Hazard Properties

The fire hazard properties for the proposed internal linings throughout the building shall be further assessed at CC stage to determine compliance with Specification C1.10.

Clause C2.2 – Fire compartment limitations

The floor area and volume of the proposed building does not exceed the maximum limitations as specified for a Type C building with Class 3, 5 and 7a parts.

Clause C2.7 – Separation by Fire Walls

The building has a fire wall construction between the plant and admin portions of the building to separate the building for the purposes of Part E, therefore removing the need for a hydrant as the floor area of each building is less than 500m^2. The fire wall will be required to extend to the underside of the non-combustible roof covering as per the provisions of this clause.

Clause C2.8 – Separation of classifications in the same storey

The building is Type C Construction, therefore the FRL's for Class 3, 5 and 7a parts are generally the same, albeit the Class 3 sleeping pods will require FRL 60/60/60 bounding walls. Compliance is readily achievable, subject to fire compartment plans being provided at CC stage.

Clause C2.13 – Electrical supply systems

The building contains a main switch board, however it is assumed that the emergency equipment will have battery back-up and therefore no fire separation is required.

Clause C2.14 – Public corridors in Class 2 and 3 buildings

The Class 3 sleeping pods discharge onto a common corridor, however the corridor is less than 40 metres long, therefore no additional smoke separation is required.

Clause C3.3 – Separation of external walls and associated openings in different fire compartments

The external walls and any openings located within 4 metres of the fire wall must achieve an FRL of 60/60/60 and have any openings protected in accordance with Clause C3.4. Compliance is readily achievable at CC stage.

Clause C3.5 – Doorways in fire walls

The internal doorways that are located within the fire door must have self-closing -/90/30 fire doors installed. Compliance is readily achievable at CC stage.

Clause C3.11 – Bounding construction: Class 3 buildings

The building is Type C Construction, therefore the doorways from the Class 3 sleeping pods which open into the corridor must be protected with a self-closing, tight fitting, solid core door, not less than 35 mm thick.

Clause C3.15 – Openings for service installations:

Where services pass through fire rated elements, they must be protected in accordance with Specification C3.15.

Specification C1.1 – Fire Resisting Construction:

To satisfy the fire rating provisions of Type C Construction, the only elements required to achieve an FRL are the fire wall and bounding walls of the sleeping pods (including the common corridor). With regards to the fire wall, it will have to achieve an FRL of 90/90/90 whilst the bounding walls and adjacent corridor will have to achieve an FRL of 60/60/60 and extend to the underside of the non-combustible roof covering.

3.4. Section D1 & D2 – Provision for Escape & Construction of Exits

Clause D1.4 – Exit travel distances:

With reference to the designated exits outlined in section 2.7 of this report and Clause D1.4, all points throughout the Class 5 and 7a parts are located within 20 metres (Class 7a parts) or 30 metres (Class 5 parts) of an exit, or within 20 metres of a point from which travel in different directions to 2 exits is available, in which case the maximum distance to one of those exits does not exceed 40 metres. With regards to the travel distances from the Class 3 sleeping pods, the entry doors are located no further than 20 metres from a point of open space located along the northern pathway, therefore compliance with Clause D1.4 throughout the entire building is achieved.

Clause D1.5 – Distance between alternative exits:

Where alternative exits are relied upon throughout the Class 5 and 7a parts, the distance between the alternate exits does not exceed 60 metres, nor are they located within 9 metres of each other.

Clause D1.6 – Dimensions of exits and paths of travel to exits:

The unobstructed height throughout all exits and paths of travel to exits must be no less than 2 metres, except for a doorway where a height of 1980mm is permitted. Furthermore, all egress widths must maintain a clear distance of 1 metre, except doorways are permitted to have a reduced width of 750 mm (when the doorway is deemed non-accessible).

Clause D1.10 – Discharge from exits:

The exits throughout the building discharge to a point where occupants will be required to egress along a maximum 1:20 walkway to get to the street. Compliance is readily achievable, subject to further details being provided at CC stage. The exits that serve as alternate exits are considered to be located far enough apart as practical.

Clause D2.7 – Installations in exits and paths of travel:

Where there are electricity meters, distribution boards, central telecommunications distribution boards or equipment located in a required exit or along a path of travel to a required exit or corridor, then the services and/or equipment must be enclosed by non-combustible construction or a fire-protective covering with the doorways and other openings suitably smoke sealed in accordance with Clause D2.7.

Clause D2.15 – Thresholds:

The threshold of all doorways must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless the door opens to open space and the threshold is provided with a threshold ramp or step ramp in accordance with AS 1428.1-2009.

Clause D2.20 – Swinging doors:

All doorways that serve as required exits swing in the direction of egress and would comply with the provisions of this clause.

Clause D2.21 – Operation of latch:

All doorways that serve as a required exit or are located along a path of travel to a required exit, must be readily opened without a key from the side that faces a person seeking egress and be -

(i) a single hand downward action lever on a single device which is located between 900 mm and 1.1 metres from the floor and have a clearance between the handle and the back plate or door face of not less than 35 mm and not more than 45mm; or

(ii) a single hand pushing action on a single device which is located between 900 mm and 1.2 metres from the floor surface.

3.5. Section E – Services and equipment

Clause E1.3 – Fire Hydrants:

The building is separated with a fire wall, therefore under the provisions of Clause C2.7, the plant and admin parts can be treated as separate buildings. On this basis, each of these buildings will have a floor area less than 500m^2 and consequently no hydrant coverage is required.

Clause E1.4 – Fire hose reels:

The building is separated with a fire wall, therefore under the provisions of Clause C2.7, the plant and admin parts can be treated as separate buildings. On this basis, each of these buildings will have a floor area / fire compartment less than 500m^2 and consequently no hose reels are required in the Class 7a plant room.

Clause E1.6 – Portable fire extinguishers:

The building will be required to be protected with portable fire extinguishers in accordance with Clause E1.6 and AS 2444-2001. Further details to be provided at CC stage.

Clause E2.2 – General requirements (smoke detection):

The building contains a Class 3 part, therefore the building requires a smoke detection system in accordance with Clause E2.2a. To satisfy the provisions of Clause E2.2a and Specification E2.2a, the building will require either of the following detection systems:

(ii) A Clause 3 smoke alarm system throughout which is hardwired and powered from consumers main source and is in accordance with AS 3786 – 2014 and Clause 3 of Specification E2.2a; or

(iii) A Clause 4 smoke detection system throughout which has a Fire Indictor Panel (FIP) installed which alerts a building occupant warning system in accordance with Clause 7 of Specification E2.2a. The smoke detection system must be installed in accordance with Clause 4 of Specification E2.2a and AS 1670.1-2015. Note: Where a Clause 4 smoke detection is installed, then the fire rating of the main switch board may be required if the switch board sustains power to the FIP and there is no battery backup.

Clause E4.2 – Emergency lighting and exit sign requirements:

The building will require emergency lighting and illuminate exits and/or directional signs in accordance with BCA Clauses E4.2, E4.4, E4.5, E4.6 and E4.8 and AS 2293.1-2005.

3.6. Section F – Health and Amenity

Clause F1.0 Deemed-to-satisfy provisions (weatherproofing)

Performance Requirement FP1.4, for the prevention of the penetration of water through external walls, must be complied with. There are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls, therefore a performance solution will be required at CC stage.

Clause F1.1 – Stormwater drainage:

Stormwater drainage to comply with AS/NZS 3500.3:2018.

Clause F1.4 – External above ground membranes:

Waterproofing membranes for external above ground use to comply with AS 4654 Parts 1 and 2:2012.

Clause F1.5 – Roof coverings:

The plans show metal sheeting roofing. The metal sheet roofing must comply with AS 1562.1.

Clause F1.6 – Sarking:

Sarking-type materials used for weatherproofing must comply with AS/NZS 4200 Part 1 and 2:2017.

Clause F1.7 – Waterproofing of wet areas in buildings:

Wet areas must be constructed in accordance with AS 3740:2010 and Clause F1.7 of the BCA.

Clause F1.9 – Damp-proofing:

Moisture is to be prevented from reaching the walls above a damp-proof course, and the underside of the suspended floors. Where a damp-proof course is provided, it must consist of –

(i) a material that complies with AS/NZS 2904; or

(ii) impervious sheet material in accordance with AS 3660.1

Clause F1.10 – Damp-proofing of floors on the ground:

If a floor of a room is laid on the ground or on fill, moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870:2011.

Clause F1.13 – Glazed assemblies:

The following glazed assemblies in the external walls, must comply with AS 2047-2014 requirements for resistance to water penetration:

(i) Windows

(ii) Swinging glazed doors

(iii) Adjustable louvres

(iv) Window walls with one piece framing

Clause F1.1 Facilities in residential buildings:

The Class 3 sleeping pods will have access to the common area sanitary facilities.

Clause F2.3 – Facilities in Class 3 to 9 buildings:

The Class 5 and 7a parts have a proposed accessible sanitary compartment, as well as separate male and female bathrooms. The male and female bathrooms both contain one WC and two wash basins. In accordance with Table F2.3, these sanitary facilities will accommodate a total of 20 females and 20 males. It is noted that there is also a WC and shower provided adjacent to the sleeping pods, however this compartment is treated as a non-required compartment as the building does not have more than 40 staff members, therefore it is not included in the required occupancy calculations under Table F2.3.

Clause F3.1 – Height of rooms and other spaces:

The sections drawings show ceiling heights of 2.7 metres throughout which will achieve compliance with the provisions of this clause.

Clause F4.1 and F4.2 – Natural light:

Natural light is required to the Class 3 sleeping pods. The windows located in the eastern and northern elevations have an aggregate area greater than 10% of the floor area of the bedroom, therefore sufficient natural light is provided in accordance with Clause F4.2.

Clause F4.4 – Artificial lighting:

Artificial Lighting must be provided to all areas / rooms and be installed in accordance with AS/NZS 1680.0:2009.

Clause F4.5 – Ventilation of rooms:

All rooms must be provided with Clause F4.6 compliant natural ventilation **OR** a mechanical ventilation or air-conditioning system complying with AS 1668.2:2012. The plant room is considered to be an enclosed carpark, therefore this part of the building must be provided with mechanical ventilation complying with AS 1668.2; or a system of natural ventilation complying with Section 4 of AS 1668.4.

Part F5 – Sound Transmission and Insulation

The bounding walls of the Class 3 sleeping pods that are adjacent to corridor and WC will require an Rw (airborne) not less than 50 and the wall which separates the two sleeping pods will require an Rw + Ctr (airborne) not less than 50. The doorway in the sleeping pods which opens into the public corridor must achieve an Rw rating no less than 30.

3.7. Section J – Energy Efficiency

The separating wall between the plantroom and the conditioned spaces must comply with the building fabric provisions of J1 of the BCA2019. Where openings are constructed within the envelope of the conditioned part of the building, suitable seals shall be installed around the operable windows and external doors in accordance with the provisions of J3 of the BCA2019.

4 STATEMENT OF COMPLIANCE

The architectural design documentation as referred to in this report have been assessed against the applicable provisions of the Building Code of Australia, (BCA) and it is considered that such documentation either complies or is capable of complying with the relevant provisions of the BCA, for the purposes of a Review of Environmental Factors (REF).

ANNEXURE A DESIGN DOCUMENTATION

Annexure A – Design Documentation

This report has been based on the following design documentation.

Table 2. Architectural Plans

Architectural Plans Prepared by djrd architects			
Drawing Number	**Revision**	**Date**	**Title**
R31-AR-0000	C	18.05.2022	Cover Sheet
R31-AR-0100	C	18.05.2022	Site Analysis
R31-AR-0101	C	18.05.2022	Proposed Site Plan
R31-AR-0103	C	18.05.2022	Proposed Demolition Plan
R31-AR-1101	C	18.05.2022	Ground Floor General Arrangement Plan
R31-AR-1102	C	18.05.2022	Roof Plan
R31-AR-2001	C	18.05.2022	Elevations
R31-AR-2501	C	18.05.2022	Sections
R31-AR-9001	B	18.05.2022	Render
R31-AR-9003	C	18.05.2022	Axonometric

ANNEXURE B ESSENTIAL SERVICES

Annexure B - Essential Services

The following fire safety measures are required to be installed in the building. The following table may be required to be updated as the design develops and options for compliance are confirmed.

Item	Essential Fire and Other Safety Measures	Standard of Performance
Fire Resistance (Floors – Walls – Doors – Shafts)		
1.	Fire seals protecting openings in fire resisting components of the building	**BCA2019 C3.15** (Openings for service installations) **BCA2019 Spec C3.15** AS1530.4:2014 & AS4072.1-2005
2.	Lightweight construction > FRL 60/60/60 fire rated bounding walls around the sleeping pods and adjacent corridor extended to the underside of the non-combustible roof covering > FRL 90/90/90 Fire Wall (if lightweight).	**BCA2019 C1.1, Spec. C1.1** **BCA2019 C1.8, Spec C1.8** **BCA2019 C2.7** (Fire Walls) **BCA2019 C3.11** (Bounding Construction) AS1530.4:2014
3.	Solid core doors Type 'C' Construction	**BCA2019 Spec. C3.4** C3.11 (Bounding Construction)
4.	Doorways and windows > FRL -/90/30 internal fire doors within the fire wall	**BCA2019 Clause C3.5**
General		
5.	Portable fire extinguishers	**BCA2019 E1.6** AS 2444–2001
General Egress		
6.	Warning & operational signs	**BCA2019 D3.6** (Braille Exit Signs) (Note: E4.5 (Exit Signs))
Electrical Services		
7.	Automatic fire detection & alarm: > Clause 3 – AS 3786:2014 Smoke Alarm systems powered from consumer mains in accordance with AS 3786-2014; or > Clause 4 – AS 1670.1:2018 system throughout the building/part connected to a Clause 7 building occupant warning system.	**BCA2019 E2.2**, NSW Table E2.2a, **Spec E2.2a** **Spec E2.2a** - Clause 3 (Smoke alarm system) **Spec E2.2a** - Clause 4 (Smoke detection system)
8.	Emergency lighting	**BCA2019 E4.2, E4.4** AS/NZS 2293.1:2018
9.	Exit signs	**BCA2019 E4.5** (Exit Signs)

Item	Essential Fire and Other Safety Measures	Standard of Performance
		BCA2019 E4.6 (Direction Signs) **BCA2019 E4.8** (Design and Operation - Exits) AS/NZS 2293.1:2018
Mechanical Services		
10.	1. Mechanical ventilation to carpark (if natural ventilation cannot be achieved)	**BCA2019 E2.2, Table E2.2a** **Spec E2.2a**

Access Assessment Report

Lot 2: DP 1208729 Taylor Street, Glen Innes

Project:	Lot 2: DP 1208729 Taylor Street, Glen Innes
Reference No:	113737:12b-Access-r3
Date:	23 May 2022
Client:	DJRD Architects
Client Contact:	DBeekwilder@djrd.com.au
BCA Logic Contact:	Jarryd Beckman
Direct:	8484 4094
Email:	jbeckman@bcalogic.com.au

Document Control

Revision	Date	Description	
113737:12b-Access-r1	21 April 2022	REF Stage Access Assessment Report	
113737:12b-Access-r2	26 April 2022	Fire wall added	
113737:12b-Access-r3	23 May 2022	Fire Wall Location Changed	
		Prepared by	Verified by
		Jarryd Beckman	Matthew Kemp
		Registered Certifier Grade A1, No. BDC 3126 Building Regulations Consultant	Registered Certifier Grade A1, No. BDC 0208 Senior Building Regulations Consultant Access Institute Qualified Access Consultant

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1 BASIS OF ASSESSMENT

1.1. Location

The building development, the subject of this report, is located at Lot 2: DP 1208729 Taylor Street, Glen Innes. The proposed development is located on the Glen Innes District Hospital site and comprises the construction of a new single storey Ambulance station which will include an enclosed plant room used for ambulance parking, external public parking, amenities, sleeping pods and general office / communal areas.

The main pedestrian access into the building is from the northern boundary via the 1:20 walkway, while the main vehicular access is from the northern and eastern driveway entrances.

Photo sourced from DJRD Architectural Plans

1.2. Purpose

The purpose of this report is to assess the proposed building against the documents and their relevant Deemed to Satisfy requirements. The report is intended to clearly outline those areas where compliance is not achieved and provide recommendations to achieve compliance:

- Disability Discrimination Act 1992 (DDA);
- Disability Access to Premises Standards 2010 (Premises Standards);
- Building Code of Australia 2019 (BCA2019) Volume 1 Amendment 1 – Part D3 and F2.4; and
- Applicable Australian Standards AS1428.1:2009, and AS2890.6:2009.

1.3. Limitations

This report is limited to an assessment of the access and amenity provisions for people with a disability against the documents as outlined in 1.2 above. It is not an assessment of the proposal against all provisions of the BCA2019 and if this is required, a separate report will be necessary.

This report does not include nor imply any detailed assessment for design, compliance or upgrading for:

- The structural adequacy or design of the building;
- The inherent derived fire-resistance ratings of any existing or proposed structural elements of the building (unless specifically referred to); and
- The design basis and/or operating capabilities of any existing or proposed electrical, mechanical or hydraulic fire protection services.

This report does not include, or imply compliance with:

- The Disability Discrimination Act (it cannot be guaranteed that that a complaint under the DDA will not be made, however should the building comply with BCA2019 and the Premises Standard then those responsible for the building cannot be subject to a successful complaint);
- BCA2019 Sections B, C, E, F, G, H, I, J, Parts D1 and D2;
- Demolition Standards not referred to by the BCA2019;
- Work Health and Safety Act;
- Construction Safety Act;
- Requirements of other Regulatory Authorities including, but not limited to, Telecommunications Supply Authority, Water Supply Authority, Electricity Supply Authority, Work Cover, Roads and Maritime Services (RMS), Local Council, ARTC, Department of Planning and the like; and
- This report does not assess the safety of the particular aspects of the building but merely the minimum standards called up by the documents outlined in Part 1.2 of this report.

1.4. Federal Disability Discrimination Act (DDA)

Disability is broadly defined and includes disabilities which are physical, intellectual, psychiatric, neurological, cognitive or sensory (a hearing or vision impairment), learning difficulties, physical disfigurement and the presence in the body of disease causing organisms.

All organisations have a responsibility, under the DDA, to provide equitable, dignified access to goods and services and to premises used by the public. Premises are broadly defined and would include all areas included within the subject development.

The DDA applies nationally and is complaint based. While the Disability (Access to Premises – Buildings) Standards 2010 and the BC2019 are recognised as a design standard to satisfy certain aspects of the DDA, compliance with the BCA2019 and the referenced standards does not guarantee that a complaint will not be lodged.

1.5. Disability Access to Premises Standards (Premises Standards)

The Premises Standards intend to provide certainty for the building industry in relation to meeting the requirements for access in new and upgraded buildings. They only apply to elements addressed within the Standards. All other elements related to premises will still be subject to the existing provisions of the DDA.

The Premises Standards generally align with the BCA2019 and reference a range of Australian Standards relating to access and other associated matters.

They do not apply to existing buildings that are not undergoing upgrade, however they introduce the concept of the "Affected Part". This means that new works need to be connected to the building's Principal Pedestrian Entrance by an accessible path of travel. This can mean that upgrade to the building may be necessary even where none is proposed.

1.6. Design Documentation

This report has been based on the Design plans and Specifications listed in Annexure A of this Report.

1.7. Definitions

Accessible

Having features to enable use by people with a disability.

Accessway

A continuous accessible path of travel (as defined in AS 1428.1) to, into or within a building.

Continuous Accessible Path of Travel

An uninterrupted path of travel to, into or within a building providing access to all access facilities.

Luminance Contrast

The light reflected from one surface or component, compared to the light reflected from another surface or component.

Ramp

An inclined surface on a continuous accessible path of travel between two landings with a gradient steeper than 1 in 20 but not steeper than 1 in 14.

2 KEY COMPLIANCE CONSIDERATION

2.1. General

The following is a summary of all the individual elements that relate directly to the ability of a person with a disability to access all the portions of the building required to be accessible.

Accessibility has been assessed against the documents outlined in Part 1.2 of this Report. The Annexure of this report provides a detailed assessment of the proposal against ALL relevant Deemed-to-Satisfy Provisions and prescriptive requirements.

Note: It is important that the Annexure is to be read in conjunction with the items below, as some matters may not have had sufficient information provided to allow a detailed assessment to be undertaken.

The abbreviations outlined below have been used in the following tables.

2.2. Classification

Under the provisions of Parts A6 of BCA2019 and Part A4 of the Access Code, the building has been classified as follows:

Table 1. Building Classification

Class	Level	Description
3	Ground	Sleeping pods (sole occupancy unit)
5	Ground	Offices, amenities, meeting and communal ancillary areas
7a	Ground	Plant room used for the parking of ambulances

Note: The Sleeping pods have been classified as a Class 3 part, on the basis that the rooms will be a common place of transient living for a number of unrelated occupants i.e. operational ambulance staff.

2.3. Dimensions and Tolerances

The Premises Standards and BCA contains the minimum standards for building construction and safety, and therefore generally stipulates minimum dimensions which must be met. BCA Logic's assessment of the plans and specifications has been undertaken to ensure the minimal dimensions have been met.

The designer and builder should ensure that the minimum dimensions are met onsite and consideration needs to be given to construction tolerances for wall set outs, applied finishes and skirtings to corridors and bathrooms for example, tiling bed thicknesses and the like which can adversely impact on critical maters such as access for people with disabilities, stair and corridor widths and balustrade heights.

2.4. Areas Required to be Accessible

The following areas of the building are required to be accessible:

Table 2. Areas Required to be Accessible

Area / Room	Description
Class 3 Sleeping pods	An exemption under Clause D3.4 has been assumed, on the basis that the occupants of the sleeping pods will be operational ambulance employees. It is readily assumed that the operational ambulance workers will be able-bodied persons who will not require the room to have accessible features.
Class 5 Offices, amenities, meeting and communal ancillary areas	To and within all areas normally used by the occupants
Class 7a Plant room used for the parking of the ambulances	There are no accessible carparking spaces in the plantroom, however there is an accessible sanitary compartment provided in the plant room and therefore an accessway shall be provided to this compartment. Furthermore, there is an accessible carparking space located in the external public parking area, therefore access from this space to the building must be provided.

Note: The limitations and exemptions of Clauses D3.2, D3.3 and D3.4 of the BCA2019 and Access Code been considered where applicable in the process of developing the above table.

3 STATEMENT OF COMPLIANCE

The design documentation as referred to in this report has been assessed against the applicable provisions for Accessibility as outlined in Part 1.2 of this report. It is considered that such documentation complies or is capable of complying (as outlined in Part 2 of this Report) with those documents, for the purposes of a Review of Environmental Factors (REF).

Annexure A – Design Documentation

This report has been based on the following design documentation.

Table 3. Architectural Plans

Architectural Plans Prepared by djrd architects			
Drawing Number	**Revision**	**Date**	**Title**
R31-AR-0000	C	18.05.2022	Cover Sheet
R31-AR-0100	C	18.05.2022	Site Analysis
R31-AR-0101	C	18.05.2022	Proposed Site Plan
R31-AR-0103	C	18.05.2022	Proposed Demolition Plan
R31-AR-1101	C	18.05.2022	Ground Floor General Arrangement Plan
R31-AR-1102	C	18.05.2022	Roof Plan
R31-AR-2001	C	18.05.2022	Elevations
R31-AR-2501	C	18.05.2022	Sections
R31-AR-9001	B	18.05.2022	Render
R31-AR-9003	C	18.05.2022	Axonometric

Annexure B - Premises Standards & BCA Assessment

N/A	Not Applicable. The Deemed-to-Satisfy clause is not applicable to the proposed design.
Complies	The relevant provisions of the Deemed-to-Satisfy clause have been satisfied by the proposed design.
CRA – Refer Annexure C	'COMPLIANCE READILY ACHIEVABLE'. It is considered that there is not enough information included in the documentation to accurately determine strict compliance with the individual clause requirements. However, with further design development, compliance can readily be achievable. This item is to be read in conjunction with the BCA Specification included within Annexure C of this report.
FI	Further Information is necessary to determine the compliance potential of the building design.
PS	Performance Solution with respect to this Deemed-to-Satisfy Provision is necessary to satisfy the relevant Performance Requirements.
DNC	Does Not Comply.
Noted	BCA Clause simply provides a statement not requiring specific design comment or confirmation.

Building Code of Australia 2019 Assessment Summary (BCA2019) / Premises Standards (Access Code)

Table 4. BCA 2019 Summary

Clause	Clause Requirements	Comment	Status
Section D: Access and Egress			
Part D3 – Access for People with a Disability			
D3.0: Deemed-to-Satisfy Provisions	Informational	Informational	Noted
D3.1: General Building Access Requirements	The building or parts are required to be accessible. Accessible meaning having the features necessary to permit its use by persons with a disability. **Class 3 –** From a pedestrian entrance to at least 1 floor containing SOU's, to the entrance doorway of each SOU located on that level, and any other level served by a passenger lift or an accessible ramp. To and within not less than 1 of each type of room or space for use in common by the residents To and within at least 1 SOU's **Class 5 –** To and within all areas normally used by the occupants. **Class 7 –** To and within any level containing accessible carparking spaces.	**Class 3 parts –** An exemption under Clause D3.4 has been assumed, on the basis that the occupants of the sleeping pods will be operational ambulance employees. It is readily assumed that the operational ambulance workers will be able-bodied persons who will not require the room to have accessible features. **Class 5 parts –** Disabled access is capable of being achieved to and within the Class 5 parts of the building. Dimensioned details shall be provided at CC stage to confirm the door widths and circulation zones. **Class 7a –** Access is provided throughout the plantroom to the accessible sanitary compartment. Access from the external disabled carparking space to and within the building is capable of achieving compliance.	CRA – Refer Annexure C CRA – Refer Annexure C CRA – Refer Annexure C
D3.2: Access to Buildings	(a) An accessway must be provided to a building required to accessible – (i) from the main points of a pedestrian entry at the allotment boundary; and	The accessway from the street to the principle pedestrian entrance will utilise a walkway which is no steeper than 1:20, enabling occupants to travel from Taylor street to the main entrance door. The accessway is capable of	CRA – Refer Annexure C

Section D: Access and Egress			
	(ii) from any required accessible carparking space on the allotment. (b) In a building required to be accessible, an accessway must be provided through the principal pedestrian entrance, and – (i) through not less than 50% of all pedestrian entrances including the principal pedestrian entrance; and (ii) in a building with a total floor area more than 500 m2, a pedestrian entrance which is not accessible must not be located more than 50 m from an accessible pedestrian entrance, except for pedestrian entrances serving only areas exempted by D3.4. (c) For the purposes of (c)— (i) an accessible pedestrian entrance with multiple doorways is considered to be one pedestrian entrance where— (A) all doorways serve the same part or parts of the building; and (B) the distance between each doorway is not more than the width of the widest doorway at that pedestrian entrance (see Figure D3.2); and a doorway is considered to be the clear, unobstructed opening created by the opening of one or more door leaves (see Figure D3.2).	achieving compliance with the relevant provisions of AS 1428.1-2009. The accessway from the external accessible carparking space will utilise the driveway and pathways that provide access to the principal pedestrian entrance. The accessway is capable of achieving compliance with AS 1428.1-2009. The entrance doors will readily achieve the required unobstructed clearance of 850mm and wheelchair circulation clearances of AS 1428.1.	CRA – Refer Annexure C Complies
D3.3: Parts of Buildings to be Accessible	> Walkways and ramps must comply with clause 10 of AS 1428.1-2009. > Non-fire-isolated stairways must comply with Clause 11 of AS 1428.1-2009.	<u>Walkways and ramps</u> The building has a walkway that is no steeper than 1:20 located in the front setback of the site. This walkway is capable of achieving compliance with AS 1428.1-2009.	CRA – Refer Annexure C

Section D: Access and Egress			
	> Fire-isolated stairways must comply with clause 11 (f) & (g) of AS 1428.1-2009. The accessways must be provided with: > Passing spaces (1800x2000mm) complying with AS1428.1 at 20m max. intervals where direct line of sight is not available. > Turning spaces (1540x2070mm) complying with AS1428.1 within 2m of the end of accessways (including corridors or the like); and at 20m max. intervals along an accessway. > An intersection of accessways satisfies the spatial requirements for a passing and turning space.	Non-fire-isolated stairs The building does not have any non-fire-isolated stairs. Fire-isolated stairways The building does not have any fire-isolated stairs. Turning spaces The internal corridors throughout the building allow sufficient space for a wheelchair to make a 180- degree turn by achieving a minimum space of 1540mm x 2070mm.	N/A N/A Complies
D3.4: Exemptions	Certain areas can be exempted under this clause if pose a health and safety risk for people with disability and /or access would be inappropriate because the particular purpose for which this area is used (e.g. plant rooms, service areas, heavy / toxic item storage, etc.)	The following areas within this development have been identified as potential excepted areas, subject to certifier's approval: > The Class 3 sleeping pods are considered to receive a concession, on the basis that the occupants of the sleeping pods will be operational ambulance employees and it is readily assumed that the operational ambulance workers will be able-bodied persons who will not require the room to have accessible features. > The Delivery room.	Noted
D3.4: Accessible Car Parking	Accessible carparking spaces to be in compliance with this Clause and AS2890.6 in the proportion required by BCA2019.	There is an accessible carparking space provided in the external public parking area. The space will require an adjacent shared zone with bollard as per the requirements of AS 2890.6. Compliance is readily achievable at CC stage.	CRA – Refer Annexure C
D3.6: Signage	> Braille and tactile signage complying with Specification D3.6 and incorporating the international symbol of access, or deafness as appropriate, must identify each:	Signage details are to be provided at CC stage for the accessible sanitary compartment and the ambulant compartment. Compliance is readily achievable.	CRA – Refer Annexure C

Section D: Access and Egress			
	○ sanitary facility; and ○ identify each door required by E4.5 to be provided with an exit sign and state "Exit" and "Level" and either: (aa) the floor level number; or (bb) a floor level descriptor; or (cc) a combination of (aa) and (bb) > Signage to accessible sanitary facilities must identify if the facility is suitable for left or right handed use; and > Signage to identify an ambulant accessible facility in accordance with AS 1428.1 must be located on the door of the facility. Where a bank of facilities is not provided with an accessible unisex sanitary facility, directional signage incorporating the international symbol of access in accordance with AS 1428.1 must be places at the location of the sanitary facilities that are not accessible, to direct a person to the location of the nearest accessible unisex facility.		
D3.7: Hearing Augmentation	N/A	N/A	N/A
D3.8: Tactile Indicators	N/A	The building does not have any ramps, stairways or head height clearances less than 2 m which would require tactiles.	N/A
D3.9: Wheelchair seating spaces in Class 9b Assembly Buildings	N/A	N/A	N/A
D3.10: Swimming Pools	N/A	N/A	N/A

Section D: Access and Egress			
D3.11: Ramps	On an accessway a series of connected ramps must not have a combined vertical rise of 3.6m and a landing for a step ramp must no overlap a landing for another step ramp or ramp.	The building does not have any ramps with a combined rise more than 3.6 m.	Complies
D3.12: Glazing on an Accessway	On an accessway, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.	Compliance is readily achievable, subject to a detailed window/door schedule being provided at CC stage to confirm the colour and location of the glazing strips on the fully glazed doorways and sidelights located along an accessway. The glazing strips shall achieve a minimum 30% luminance contrast to the floor surface on the adjoining side of the doorway.	CRA – Refer Annexure C

Section F: Healthy and Amenity			
Part F2 – Sanitary and Other Facilities			
F2.0: Deemed-to-Satisfy Provisions	Informational	Informational	Noted
F2.4: Accessible Sanitary Facilities (including Table F2.4)	In a building required to be accessible— (a) accessible unisex sanitary compartments must be provided in accessible parts of the building in accordance with Table F2.4(a); and (b) accessible unisex showers must be provided in accordance with Table F2.4(b); and (c) at each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment at that bank of toilets, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1 must be provided for use by males and females; and (d) an accessible unisex sanitary compartment must contain a closet pan, washbasin, shelf or bench	There is an accessible sanitary compartment proposed in the building which is accessed from the admin area. Based off scaled measurements, the compartment is capable of achieving a clear floor area of 2300mm x 2630mm which will allow sufficient space for a compliant WC, wash basin, shower and other fixtures and fittings to be installed in accordance with AS 1428.1-2009. In addition, both of the single WC's in the male and female bathrooms are shown as ambulant compartments with grabrails and circulation spaces in front of the pans. Compliance with AS 1428.1-2009 at CC stage is readily achievable. Note: there is also a WC and shower provided adjacent to the sleeping pods, however this compartment is treated as a non-required compartment as the building does not have more than 40 staff members, therefore it	CRA – Refer Annexure C CRA – Refer Annexure C Noted

Section F: Healthy and Amenity			
	top and adequate means of disposal of sanitary towels; and (e) the circulation spaces, fixtures and fittings of all accessible sanitary facilities provided in accordance with Table F2.4(a) and Table F2.4(b) must comply with the requirements of AS 1428.1; and (f) an accessible unisex sanitary facility must be located so that it can be entered without crossing an area reserved for one sex only; and (g) where male sanitary facilities are provided at a separate location to female sanitary facilities, accessible unisex sanitary facilities are only required at one of those locations.	is not included in the required occupancy calculations under Table F2.3.	
F2.9: Accessible adult change facilities	N/A	N/A	N/A

Annexure C - Compliance Specification

Design Certification

Further due to the level of detail provided at this stage the following items are to form part of a design statement or specification:

General

1. On an accessway where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights or glazing capable of being mistaken for a doorway or opening will be clearly marked and comply with Clause 6.6 of AS1428.1-2009. A solid non-transparent contrasting line not less than 75mm wide is to extend across the full width of the glazing panel. The lower edge of the contrasting line is to be located between 900-1000mm above the plane of the finished floor level. The contrasting line is to provide a minimum of 30% luminance contrast when viewed against the floor surface or surfaces within 2 metres of the glazing on the opposite side.
2. All doorways will have a minimum luminance contrast of 30% in accordance with Clause 13.1 of AS1428.1-2009.
3. Fixtures and fittings in accessible sanitary facilities will be provided and installed in accordance Clause 15 of AS1428.1-2009.
4. Fixtures and fittings in ambulant facilities will be provided and installed in accordance Clause 16 of AS1428.1-2009.
5. Walkways will comply with Clause 10 of AS1428.1-2009.
6. For the walkways, the floor or ground surface abutting the sides of the walkway will be firm and level of a different material to that of the walkway at the same level and follow the grade of the walkway and extend horizontally for a minimum of 600mm, or be provided with a kerb or kerb rail in accordance with Clause 10.2 of AS1428.1-2009.
7. Grabrails will comply with Clause 17 of AS1428.1-2009.
8. Accessible car spaces will achieve compliant headroom clearances in accordance with Clause 2.4 of AS2890.6-2009.
9. Demarcation will be provided in the accessible car space and adjacent shared zone in accordance with Clause 3.1 and 3.2 of AS2890.6. Refer to Annexure B1 for a diagrammatic explanation.
10. Bollards will be provided in the shared disabled car space area in accordance with Clause 2.2.1(e) of AS2890.6-2009. Refer to Annexure B1 for a diagrammatic explanation.
11. Switches and power points will comply with Clause 14 of AS1428.1-2009.
12. Floor and ground floor surfaces on accessible paths and circulation spaces including the external areas will comply with Clause 7 of AS1428.1-2009. Any level difference over 3mm must be ramped according AS1428.1 Clause 10.5.
13. Braille and tactile signage will comply with BCA2019 Clause D3.6.
14. Signage will have to comply with Clause 8 of AS1428.1-2009.
15. Door handles and the like, will be in accordance with Clause 13.5 of AS1428.1-2009.

Glen Innes RAIR Ambulance Station ~ Return Brief

1. Reference Documents

This return brief has been prepared to suit the targeted staffing capacity & outlined for year 2031 based on the following Reference Documents;

a. RAIR Glen Innes Population, Demand and Capacity Assessment
b. RAIR Staff Ratio Appendix - FTE vs Station Requirements

2. Outline of Requirements

Ambulance Station

To be typically based on the Rural Ambulance Station Facilities Design Guidelines / Revision L / Medium Station Template M-01 / 02.1AR1101 - modified to suit required FTE staff levels in accordance with RAIR Staff Ratio Appendices Spreadsheet V5

Staffing			
	Full Time Equivalent Staff	**24**	*As per NSWA Correspondence*
	DOM	**1**	
Provision for Staff			*As per RAIR Staff Ratio Appendix*
	Locker Room – provision for	**30**	Lockers *(24x 1.23 FTE)*
	Common Area Lounge – provision for	**8**	Staff
	Common Area Dining – provision for	**10**	Staff
	Admin Space (Peak by half) – provision for	**3**	staff
Equipment			*As per RAIR Staff Ratio Appendix*
	Computers – provision for	**3**	pcs in admin area
	Basic Printer – provision for	**1**	Basic printer in admin area
Amenities Male			*As per RAIR Staff Ratio Appendix*
	WC	**1**	
	Shower	**1**	
	Change Cubicle	**1**	
Amenities Female			*As per RAIR Staff Ratio Appendix*
	WC	**1**	
	Shower	**1**	
	Change Cubicle	**1**	
Accessible Amenities			*As per RAIR Staff Ratio Appendix*
	Combined Accessible WC + Shower	**1**	*in accordance with AS1428*

Additional Modules		*As per RAIR Design Guidelines*
Zone & Sector Management Module	**1**	Tier 1 – 1 x shared DOM office – 12m2 and 1 x 9m2 S/O office
Fleet Maintenance		Tier 1 as noted in Plant Room below
Relief Quarters Module	**1**	Required 1 bed
Education Module	**1**	Tier 2 –30m^2
Gym Space Module	**1**	Approx. 12m2 – may be internal or external protected from the elements

Plant Room

To be typically based on the Rural Ambulance Station Facilities Design Guidelines / Revision L / Medium Station Template M-01 / 02.1AR1101 – modified to suit site as follows;
1. to suit required # of parking bays as outlined on the RAIR Endorsement sheet
2. to suit endorsed schedule of accommodation in approved Return Brief
3. to suit site size & geometry

Internal Vehicles		*As per NSWA Correspondence*
Ambulance	**6**	Internal bays
Fleet Maintenance Bay	**Included**	Tier 1
Total Internal Vehicles	**(6) 6 ambulance bays**	

External Vehicles (Covered)		*As per RAIR Design Guidelines*
DOM Bay	**1**	Operation Frontline Vehicle (Car) – 2.7x5.4m Large Car Park
Relief	**1**	
External Wash Bay	**1**	
Total External (Covered) Vehicles	**(3) 1 DOM bay + 1 Relief bay + Wash bay**	

Other Parking (Not Covered)		*Standard Car Parking Bay size: 5.4x2.4m*
Accessible Parking Bay + Circulation Area	**1**	statutory requirement in accordance with AS2890.6
Parking bays	**6**	*As per RAIR Staff Ratio Appendix*
Total	**(7) 1 acc. + 6 parking bays**	

Indicative Schedule of Areas				
Ambulance Station				
1	x	3 staff	Admin	To suit required number of staff
1	x	30 m²	Combined Medical Equipment Store	*As per RAIR Staff Ratio Appendix*
1	x	> 7m²	Comms Cupboard	To suit NSWA ITC Reqs
1	x	4m²	Cleaner's Sink / Store	
1	x	9m²	Office	
1	x	12m²	DOM Office	Shared Office
		-	Circulation	
			Amenities	
1	x	8 staff	Common Room	To suit required number of staff
1	x	10 staff	Meals	To suit required number of staff
1	x	7 m²	Accessible WC with shower	
1	x	14 m²	Male WC	
1	x	incl	Male Shower	
1	x	incl	Male Change	
1	x	14 m²	Female WC	
1	x	incl	Female Shower	
1	x	incl	Female Change	
1	x	30 lockers	Locker Room	To suit required number of lockers
1	x	11 m²	Charge	
1	x	12m2	Gym	
Bolt On Module: T2 Education				
1	x	30m²	Multi-purpose Classroom	
Bolt On Module: Relief Quarter				
1	x	29m²	Relief incl. WC	
Associated External Spaces				
1	x	28m²	Outdoor Area	Adjacent to common room
1	x	7m²	Services	Confirm if Bolton Modules require this to be larger
1	x	6m²	Waste	Confirm if Bolton Modules require this to be larger
Vehicle Plant Room				
1	x	Variable	Plant Room	Drive through configuration to suit 5 SEV
1	x	8m²	Delivery	
1	x	4m²	Main Switchboard	
1	x	2m²	Oil Separator	
Parking Allocation Covered				
1	x		Relief Bay	*2.7x5.4m Large Car Park*
1	x		DOM Bay	*2.7x5.4m Large Car Park* TBC
1	x	50m2	Wash Bay	External Wash Bay
Parking Allocation Not Covered				
1	x		Accessible Parking Bay + Circulation	*Standard Car Parking Bay size: 5.4x2.4m*
6	x		Parking Bays – Ambulance Station	*Standard Car Parking Bay size: 5.4x2.4m*

REPORT TO

NSW HEALTH INFRASTRUCTURE

ON

PRELIMINARY (STAGE 1) AND DETAILED (STAGE 2) SITE INVESTIGATION (PSI/DSI)

FOR

PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

AT

94 TAYLOR STREET, GLEN INNES, NSW

Date: 25 May 2022
Ref: E34948PTrpt

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DOCUMENT REVISION RECORD

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a) JKE's proposal in respect of the work covered by the Report;
b) The limitations defined in the client's brief to JKE; and
c) The terms of contract between JKE and the Client, including terms limiting the liability of JKE.

If the Client, or any person, provides a copy of this Report to any third party, such third party must not rely on this Report, except with the express written consent of JKE which, if given, will be deemed to be upon the same terms, conditions, restrictions and limitations as apply by virtue of (a), (b), and (c) above.

Any third party who seeks to rely on this Report without the express written consent of JKE does so entirely at their own risk and to the fullest extent permitted by law, JKE accepts no liability whatsoever, in respect of any loss or damage suffered by any such third party.

Executive Summary

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to undertake a Preliminary (Stage 1) and Detailed (Stage 2) Site Investigation (PSI/DSI) for the proposed rural ambulance infrastructure reconfiguration (RAIR2) development at 94 Taylor Street, Glen Innes, NSW ('the site'). The purpose of the investigation was to make an assessment of site contamination. The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2.

This report has been prepared to support the lodgement of a Development Application (DA) for the proposed RAIR2 development, with regards to State Environmental Planning Policy (Resilience and Hazards) 2021[1] (formerly known as SEPP55). The proposed development will likely include construction of a one to two storey building across the eastern portion of the site with a large section of on-grade pavement and car parking on the western portion, and associated landscaping in the remaining areas. Based on the limited information provided, it has been assumed that the proposed development will be constructed close to existing ground level, with minimal excavations for services required.

A geotechnical investigation was undertaken in conjunction with this PSI/DSI by JK Geotechnics (JKG). The results of the geotechnical investigation are presented in a separate report (Ref: 34948RFrpt)[2]. This report should be read in conjunction with the JKG report.

The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make an assessment of the soil and groundwater contamination conditions. The objectives were to:

- Provide an appraisal of the past site use(s) based on a review of historical records;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil and groundwater contamination conditions within the nominated site area (as shown on Figure 2 in Appendix A) via implementation of a sampling and analysis program;
- Prepare a conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

The scope of work included the following:

- Review of site information, including background and site history information from various sources outlined in the report;
- Preparation of a CSM;
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

The investigation included a review of historical information, soil sampling from four boreholes and five test pits, and installation and groundwater sampling from three monitoring wells. Imported fill was identified as a potential contamination source. The historical information indicated that the site has formed part of the hospital land and has remained undeveloped.

[1] *State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW) (referred to as SEPP Resilience and Hazards 2021)

[2] JKG, (2022). *Report to NSW Health Infrastructure on Geotechnical Investigation for Proposed Rural Ambulance Infrastructure Reconfiguration (RAIR2) at 94 Taylor Street, Glen Innes, NSW*. (referred to as JKG report)

The boreholes generally encountered fill materials to depths of approximately 0.1m below ground level (BGL) to 0.6mBGL, underlain by natural residual clayey soils. The fill contained inclusions of igneous and ironstone gravel, brick (whole and fragments), sand, ash and root fibres.

A selection of soil and groundwater samples were analysed for the CoPC identified in the CSM. Elevated concentrations of the CoPC were not encountered above the adopted health or ecological-based SAC in any of the soil samples analysed. Elevated concentrations of zinc were encountered in one groundwater sample. However, this is considered to be a regional issue and not considered to pose a risk to site receptors.

Based on the findings of the DSI, JKE is of the opinion that the site is suitable for the proposed development described in Section 1.1. Remediation is not required. An unexpected finds protocol is included in Section 10.4 of this report to manage any unexpected finds during the development.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of this report.

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Appendix A: Report Figures
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Abbreviations

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Above-Ground Storage Tank	**AST**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Bureau of Meteorology	**BOM**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Development Application	**DA**
Dial Before You Dig	**DBYD**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Detailed Site Investigation	**DSI**
Ecological Investigation Level	**EIL**
Ecological Screening Level	**ESL**
Environmental Management Plan	**EMP**
Excavated Natural Material	**ENM**
Environment Protection Authority	**EPA**
Environmental Site Assessment	**ESA**
Fibre Cement Fragment(s)	**FCF**
General Approval of Immobilisation	**GAI**
Health Investigation Level	**HILs**
Health Screening Level	**HSL**
Health Screening Level-Site Specific Assessment	**HSL-SSA**
International Organisation of Standardisation	**ISO**
JK Environments	**JKE**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Potential ASS	**PASS**
Polychlorinated Biphenyls	**PCBs**
Per-and Polyfluoroalkyl Substances	**PFAS**
Photo-ionisation Detector	**PID**
Protection of the Environment Operations	**POEO**
Practical Quantitation Limit	**PQL**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**

Relative Percentage Difference	**RPD**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
Site Audit Statement	**SAS**
Site Audit Report	**SAR**
State Environmental Planning Policy	**SEPP**
Site Specific Assessment	**SSA**
Source, Pathway, Receptor	**SPR**
Specific Contamination Concentration	**SCC**
Standard Penetration Test	**SPT**
Standing Water Level	**SWL**
Trip Blank	**TB**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRH**
Trip Spike	**TS**
Upper Confidence Limit	**UCL**
United States Environmental Protection Agency	**USEPA**
Underground Storage Tank	**UST**
Virgin Excavated Natural Material	**VENM**
Volatile Organic Compounds	**VOC**
World Health Organisation	**WHO**
Work Health and Safety	**WHS**

Units

Litres	**L**
Metres BGL	**mBGL**
Metres	**m**
Millivolts	**mV**
Millilitres	**ml or mL**
Milliequivalents	**meq**
micro Siemens per Centimetre	**µS/cm**
Micrograms per Litre	**µg/L**
Milligrams per Kilogram	**mg/kg**
Milligrams per Litre	**mg/L**
Parts Per Million	**ppm**
Percentage	**%**
Percentage weight for weight	**%w/w**

1 INTRODUCTION

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to undertake a Preliminary (Stage 1) and Detailed (Stage 2) Site Investigation (PSI/DSI) for the proposed rural ambulance infrastructure reconfiguration (RAIR2) development at 94 Taylor Street, Glen Innes, NSW ('the site'). The purpose of the investigation was to make an assessment of site contamination. The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2.

This report has been prepared to support the lodgement of a Development Application (DA) for the proposed RAIR2 development, with regards to State Environmental Planning Policy (Resilience and Hazards) 2021[3] (formerly known as SEPP55).

A geotechnical investigation was undertaken in conjunction with this PSI/DSI by JK Geotechnics (JKG). The results of the geotechnical investigation are presented in a separate report (Ref: 34948RFrpt)[4]. This report should be read in conjunction with the JKG report.

1.1 Proposed Development Details

The proposed development will likely include construction of a one to two storey building across the eastern portion of the site with a large section of on-grade pavement and car parking on the western portion, and associated landscaping in the remaining areas. Based on the limited information provided, it has been assumed that the proposed development will be constructed close to existing ground level, with minimal excavations for services required.

1.2 Aims and Objectives

The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make an assessment of the soil and groundwater contamination conditions. The objectives were to:

- Provide an appraisal of the past site use(s) based on a review of historical records;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil and groundwater contamination conditions within the nominated site area (as shown on Figure 2 in Appendix A) via implementation of a sampling and analysis program;
- Prepare a conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

[3] *State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW) (referred to as SEPP Resilience and Hazards 2021)

[4] JKG, (2022). *Report to NSW Health Infrastructure on Geotechnical Investigation for Proposed Rural Ambulance Infrastructure Reconfiguration (RAIR2) at 94 Taylor Street, Glen Innes, NSW*. (referred to as JKG report)

1.3 Scope of Work

The investigation was undertaken generally in accordance with a JKE proposal (Ref: EP56062PT) of 1 March 2022 and written acceptance from the client of 17 March 2022. The scope of work included the following:

- Review of site information, including background and site history information from various sources outlined in the report;
- Preparation of a CSM;
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[5], other guidelines made under or with regards to the Contaminated Land Management Act (1997)[6] and SEPP Resilience and Hazards 2021. A list of reference documents/guidelines is included in the appendices.

[5] National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* (referred to as NEPM 2013)

[6] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

2 SITE INFORMATION

2.1 Site Identification

Table 2-1: Site Identification

Current Site Owner (certificate of title):	Health Administration Corporation
Site Address:	94 Taylor Street, Glen Innes, NSW
Lot & Deposited Plan:	Lot 2 in DP1208729
Current Land Use:	Vacant corner of wider hospital grounds
Proposed Land Use:	Ambulance station (commercial)
Local Government Authority:	Glen Innes Severn Shire Council
Current Zoning:	R1 – General Residential
Site Area (m^2) (approx.):	2,700
Geographical Location (decimal degrees) (approx.):	Latitude: -29.733063 Longitude: 151.732899
Site Plans:	Appendix A

2.2 Site Location and Regional Setting

The site is located in the north-east corner of the wider Glen Innes Hospital grounds and in a predominantly residential area of Glen Innes. The site itself is bound by Taylor Street to the north and West Avenue to the east. The site is located approximately 130m to the west of Rocky Ponds Creek.

2.3 Topography

The site is located in undulating regional topography with the site itself located, on the lower slopes of a hill, and slopes towards the north-east at approximately 5-6°.

2.4 Site Inspection

A walkover inspection of the site was undertaken by JKE on 7 April 2022. The inspection was limited to accessible areas of the site and immediate surrounds. Selected site photographs obtained during the inspection are attached in the appendices.

A summary of the inspection findings is outlined in the following subsections:

2.4.1 Current Site Use and/or Indicators of Former Site Use

At the time of the inspection, the site comprised a vacant grass covered garden/landscaped area of the wider hospital grounds.

2.4.2 Buildings, Structures and Roads

A brick fence approximately 1m in height ran the length of the northern boundary and continued along the wider hospital property. No other buildings, structures or roads were present on-site.

2.4.3 Boundary Conditions, Soil Stability and Erosion

The site was unfenced to the east, south and west. No evidence of erosion was observed during the site inspection.

2.4.4 Presence of Drums/Chemical Storage and Waste

No drums/chemical storage or waste was observed on the site during the inspection.

2.4.5 Evidence of Cut and Fill

Fill material (i.e. igneous gravels) observed at the site surface along the interface with the brick fence indicated that some filling, at least as a surface stabiliser, had occurred onsite. However overall, the site levels appeared to be in keeping with the surrounds and there was no evidence of significant cut or fill works observed on site during the inspection.

2.4.6 Visible or Olfactory Indicators of Contamination (odours, spills etc)

No visible or olfactory indicators of contamination were identified during the site inspection.

2.4.7 Drainage and Services

Surface water would be expected to infiltrate the site surface. Excess surface water runoff is expected to flow towards the north-east, keeping with the site topography. Stormwater drains were observed along Taylor Street and West Avenue to the north and east of the site respectively.

2.4.8 Sensitive Environments

Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds.

2.4.9 Landscaped Areas and Visible Signs of Plant Stress

The site was predominantly grass covered with minimal areas of exposed soil at the surface. Small to large trees were located in the central section of the site. The vegetation generally appeared to be in good

condition based on a cursory inspection with no obvious signs of die-back or saline conditions noted (i.e. scaling).

2.5 Surrounding Land Use

During the site inspection, JKE observed the following land uses in the immediate surrounds:

- North – Taylor Street with residential beyond;
- South – Glen Innes Hospital grounds, with Glen Innes and District Historical Society and museum beyond;
- East – West Avenue with Coronation Park beyond (public recreational use); and,
- West – Glen Innes Hospital and grounds.

JKE did not observe any land uses in the immediate surrounds that were identified as potential contamination sources for the site.

2.6 Underground Services

The 'Dial Before You Dig' (DBYD) plans were reviewed for the investigation in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway for contamination migration. Major services were not identified that would be expected to act as preferential pathways for contamination migration.

2.7 Section 10.7 Planning Certificate

The section 10.7 (2 and 5) planning certificates were reviewed for the investigation. Copies of the certificates are attached in the appendices. A summary of the relevant information is outlined below:

- The land is not deemed to be: significantly contaminated; subject to a management order; subject of an approved voluntary management proposal; or subject to an on-going management order under the provisions of the CLM Act 1997;
- The land is not the subject of a Site Audit Statement (SAS);
- The land is not affected by a policy that restricts development of the land due to the likelihood of acid sulfate soil risk; and
- The land does not include critical habitat or an item of environmental heritage, and is not in a conservation area.

We note that the Section 10.7 planning certificate refers to the site as 85 Taylor Street.

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

Regional geological information was reviewed for the investigation. The information was sourced from the Lotsearch report attached in the appendices. The report indicates that the site is underlain by Cainozoic aged deposits of basalt flows, minor basaltic volcaniclastics; basaltic vents and breccias include alkali dolerite, basaltic diatreme breccia, which are all undifferentiated.

3.2 Acid Sulfate Soil (ASS) Risk and Planning

The site is not located in an ASS risk area according to the risk maps prepared by the Department of Land and Water Conservation.

ASS information presented in the Lotsearch report indicated that the site is not located within an ASS risk area.

3.3 Hydrogeology

Hydrogeological information presented in the Lotsearch report indicated that the regional aquifer on-site and in the areas immediately surrounding the site includes fractured or fissured, extensive aquifers of low to moderate productivity. There was a total of 71 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 287m from the site. This was utilised for stock purposes;
- The majority of the bores were registered for monitoring or domestic purposes, with the closest domestic bore located approximately 555m upgradient of the site; and
- The drillers log information from the closest registered bores typically identified fill and/or sandy clay soil to depths of 1.5-3.5m, underlain by basalt bedrock. Standing water levels (SWLs) in the bores ranged from 1.0mBGL to 14.0mBGL.

The information reviewed for the investigation indicates that the subsurface conditions at the site are likely to consist of relatively low permeability (residual) soils overlying shallow bedrock. Groundwater is utilised as a resource in the areas surrounding the site, primarily for stock watering. Use of groundwater is not proposed as part of the development.

It is understood based on the Glenn Innes Severn Council Drinking Water Management System (2019)[7] that under normal operating conditions, the Glen Innes drinking water supply system's primary water sources are Beardy Waters Weir and Red Range Road Bore. The Red Range Road bore draws water from 56m and 85m below ground.

Considering the local topography and surrounding land features, JKE anticipate groundwater to flow towards the north-east.

[7] Glenn Innes Severn Council, (2019). *Glenn Innes Severn Council Drinking Water Management System*

3.4 Receiving Water Bodies

The site location and regional topography indicates that excess surface water flows have the potential to enter the Rocky Ponds Creek. Rocky Ponds Creek is located approximately 130m east of the site at its closest point, with the closest down-gradient section of the creek located approximately 215m to the north-east of the site. This water body is a potential receptor.

4 SITE HISTORY INFORMATION

4.1 Review of Historical Aerial Photographs

Historical aerial photographs were reviewed for the investigation. The information was sourced from the Lotsearch report. JKE has reviewed the photographs, and summarised relevant information in the following table:

Table 4-1: Summary of Historical Aerial Photographs

Year	Details
1955	**On-site:** The site appeared to be grass covered and vacant of buildings, structures or roads, however was part of a wider property. The wider property included numerous buildings generally positioned to the south and south-west of the site and included a u-shaped driveway to the west of the site (consistent with the current hospital driveway). **Off-site:** The surrounds to the north and east appeared to include low density residential and public parkland including tennis courts respectively. Further to the east a creek line was visible running in a north south direction (consistent with Rocky Ponds Creek).
1964	**On-site:** Some scouring of the western site surface was visible, and a fence line ran the length of the southern boundary extending into the wider hospital property site, otherwise the site appeared generally similar to the previous photograph. **Off-site:** The surrounds were generally consistent with the previous photograph. A swimming pool was observed to the north east of the site, and the public park to the east was further developed. Further residential development of the surrounding area to the north and north-west was also evident.
1985 1993 2006 2013 2021	The site and surrounding features appeared generally similar to the previous photograph.

4.2 Review of Historical Land Title Records

Historical land title records were reviewed for the investigation. The record search was undertaken by InfoTrack. Copies of the title records are attached in the appendices. The title records indicate that the site was dedicated for hospital grounds in 1877. Since then, the site has been held by trustees, The State of New South Wales or by the current proprietor, Health Administration Corporation.

The historical land title records did not identify any particular land uses which could have resulted in significant contamination.

4.3 SafeWork NSW Records

SafeWork NSW records in relation to the registered storage of dangerous goods were reviewed for the investigation. Copies of relevant documents are attached in the appendices. The search did not identify any licences to store dangerous goods including underground fuel storage tanks (USTs), above ground storage tanks (ASTs) or chemicals at the site.

4.4 NSW EPA and Department of Defence Records

A review of the NSW EPA and Department of Defence databases was undertaken for the investigation. Information from the following databases were sourced from the Lotsearch report:

- Records maintained in relation to contaminated land under Section 58 of the CLM Act 1997;
- Records of sites notified in accordance with the Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)[8];
- Licensed activities under the Protection of the Environment Operations Act (1997)[9];
- Sites being investigated under the NSW EPA per-and polyfluoroalkyl substances (PFAS) investigation program;
- Sites being investigated by the Department of Defence for PFAS contamination; and
- Sites being managed by the Department of Defence for PFAS contamination.

The search included the site and surrounding areas in the report buffer. A summary of the information is provided below:

Table 4-2: NSW EPA and Department of Defence Records

Records	On-site	Off-site
Records under Section 58 of the CLM Act 1997	None	None
Records under the Duty to Report Contamination under Section 60 of the CLM Act 1997	None	There were six properties listed in the report buffer. Five of these properties were service stations and the sixth was an ambulance station. All properties were located over 450m from the site with four considered to be upgradient. However due to the regional topography and distance from the site, none of the properties are considered to represent off-site sources of contamination.
Licences under the POEO Act 1997	The site and wider hospital property are listed under a delicenced activity for waste generation or storage. This activity is considered unlikely to pose a contamination risk to the site or represent a source of contamination in the context of the PSI.	Current and historical licenses were identified for several properties within the report buffer, including railway systems activities and the application of herbicides along waterways. However, these activities are considered unlikely to pose a contamination risk to the site or represent an off-site source of contamination.

[8] NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997.* (referred to as Duty to Report Contamination)

[9] Protection of the Environment Operations Act 1997 (NSW) (referred to as POEO Act 1997)

Records	On-site	Off-site
Records relating to the NSW EPA PFAS Investigation Program	None	None
Records relating to the Department of Defence PFAS management and investigation programs	None	None

4.5 Historical Business Directory and Additional Lotsearch Information

Historical business records and other relevant information were reviewed for the investigation. The information was sourced from the Lotsearch report and summarised in the following table:

Table 4-3: Historical Business Directory and other Records

Records	On-site	Off-site
Historical dry cleaners, motor garages and service stations	None	There were five service station businesses listed within 500m of the site. Only one of these was upgradient of the site, and none were closer than 290m. The upgradient service station was previously discussed in Table 4-2 above and is not considered to represent an off-site source of contamination.
Other historical businesses that could represent potential sources of contamination	The hospital has been listed on the site and wider property since 1950. This is not considered to pose a contamination risk to the site or represent a source of contamination in the context of the PSI/DSI.	None
National waste management site database	None	None
National liquid fuel facilities	None	Three facilities were identified within the report buffer. The closest of these facilities was located approximately 360m upgradient of the site to the south-west. Due to the distance and regional topography none of these facilities are considered to represent off-site sources of contamination.

Records	On-site	Off-site
Mapped heritage items	The Land of the Beardies Museum (former hospital complex) was listed onsite. This listing is likely connected to the Glen Innes & District Historical Society, located to the south of the site and is not considered to have any relevance in the context of the PSI/DSI objectives.	Various heritage items were mapped in the report buffer. These are not considered to have any relevance in the context of the PSI/DSI objectives.
Mapped ecological constraints	None	One ecological item was mapped within the report buffer. This item is not considered to have any relevance in the context of the PSI/DSI objectives.
Mapped naturally occurring asbestos	None	None

4.6 Summary of Site History Information

A time line summary of the historical land uses and activities is presented in the following table. The information presented in the table is based on a weight of evidence assessment of the site history documentation and observations made by JKE.

Table 4-4: Summary of Historical Land Uses / Activities

Year(s)	On-site - Potential Land Use / Activities	Off-site - Potential Land Use / Activities
1887-2022	• Hospital grounds; and • Minor filling/stabilisation of site surface during hospital construction.	• Hospital grounds; • Public parkland; and • Low density residential.

4.7 Integrity of Site History Information

The majority of the site history information was obtained from government organisations as outlined in the relevant sections of this report. The veracity of the information from these sources is considered to be relatively high. A certain degree of information loss can be expected given the lack of specific land use details over time. JKE has relied upon the Lotsearch report and have not independently verified any information contained within. However, it is noted that the Lotsearch report is generated based on databases maintained by various government agencies and is expected to be reliable.

5 CONCEPTUAL SITE MODEL

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is presented in the following sub-sections and is based on the site information (including the site inspection information) and the review of site history information. Reference should also be made to the figures attached in the appendices.

A review of the CSM in relation to source, pathway and receptor (SPR) linkages has been undertaken as part of the Tier 1 risk assessment process, as outlined in Section 10.

5.1 Potential Contamination Sources/AEC and CoPC

The potential contamination sources/AEC and CoPC are presented in the following table:

Table 5-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
Fill material – Minor historical filling is likely to have occurred to achieve the existing levels. The fill may have been imported from various sources and could be contaminated. During the inspection evidence of fill (igneous gravel) was observed at the site surface.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos.

5.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The mechanisms for contamination, affected media, receptors and exposure pathways relevant to the potential contamination sources/AEC are outlined in the following CSM table:

Table 5-2: CSM

Potential mechanism for contamination	The potential mechanisms for contamination are most likely to include 'top-down' impacts (placement of fill material). There is a potential for sub-surface releases to have occurred if deep fill (or other buried industrial infrastructure) is present, although this is considered to be the least likely mechanism for contamination.
Affected media	Soil and groundwater have been identified as potentially affected media.
Receptor identification	Human receptors include site occupants/users (including adults), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users (including adults and children in a sensitive land use scenario). Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas), and freshwater ecology in Rocky Ponds Creek.

Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX). The potential for exposure would typically be associated with the construction and excavation works, and future use of the site. Potential exposure pathways for ecological receptors include primary/direct contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings. Potential exposure pathways to groundwater (for human receptors) would be via vapour intrusion, or potential primary/secondary contact with groundwater entering the nearby water course which could be utilised for recreation. Exposure to ecological receptors could also occur in the water course, however the groundwater to surface water relationship is not known at this stage. Exposure to shallow groundwater via the drinking water supply is not considered to be a plausible exposure pathway. However, we have considered the groundwater data in relation to drinking water guidelines for screening purposes.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the proposed building or into service trenches (either from soil contamination or volatilisation of contaminants from groundwater); • Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; and • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems and those being used for recreation.
Presence of preferential pathways for contaminant movement	Local services (i.e. those not shown on the DBYD plans) such as stormwater pipe trenches could act as preferential pathways for contaminant migration. This could occur through fill soil and/or via groundwater/seepage. This would be dependent on the contaminant type and transport mechanisms.

6 SAMPLING, ANALYSIS AND QUALITY PLAN

6.1 Data Quality Objectives (DQO)

Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013). The seven-step DQO approach for this project is outlined in the following sub-sections.

The DQO process is validated in part by the Data Quality Assurance/Quality Control (QA/QC) Evaluation. The Data (QA/QC) Evaluation is summarised in Section 8.1 and the detailed evaluation is provided in the appendices.

6.1.1 Step 1 - State the Problem

The CSM identified potential sources of contamination/AEC at the site that may pose a risk to human health and the environment. Investigation data is required to assess the contamination status of the site, assess the risks posed by the contaminants in the context of the proposed development/intended land use, and assess whether remediation is required. This information will be considered by the consent authority in exercising its planning functions in relation to the development proposal.

A waste classification is required prior to off-site disposal of excavated soil/bedrock.

6.1.2 Step 2 - Identify the Decisions of the Study

The objectives of the investigation are outlined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Did the site inspection, or does the historical information identify potential contamination sources/AEC at the site?
- Are any results above the SAC?
- Do potential risks associated with contamination exist, and if so, what are they?
- Is remediation required?
- Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

6.1.3 Step 3 - Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

- Site information, including site observations and site history documentation;
- Sampling of potentially affected media, including soil and groundwater;
- Observations of sub-surface variables such as soil type, photo-ionisation detector (PID) concentrations, odours and staining, and groundwater physiochemical parameters;
- Laboratory analysis of soils and groundwater for the CoPC identified in the CSM; and
- Field and laboratory QA/QC data.

6.1.4 Step 4 - Define the Study Boundary

The sampling will be confined to the site boundaries as shown in Figure 2 and will be limited vertically to a depth of 6.9mBGL (spatial boundary). The sampling was completed between 5 and 7 May 2022 (temporal boundary). The assessment of potential risk to adjacent land users has been made based on data collected within the site boundary.

6.1.5 Step 5 - Develop an Analytical Approach (or Decision Rule)

6.1.5.1 Tier 1 Screening Criteria

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC), as outlined in Section 7. Exceedances of the SAC do not necessarily indicate a requirement for remediation or a risk to human health and/or the environment. Exceedances are considered in the context of the CSM and valid SPR-linkages.

For this investigation, the following decision rules will apply:

- If all CoPC (with the exception of asbestos) concentrations are below the SAC, then the data will be compared directly to the SAC without statistical analysis;
- For soil data, if any individual CoPC (with the exception of asbestos) concentration is above the SAC, then statistical analysis will be undertaken. This will include calculation of the 95% upper confidence limit (UCL) value for the data set, with regards to the NEPM (2013) framework and other relevant guidelines made under the CLM Act 1997. The UCL will be considered acceptable where the UCL is below the SAC, the standard deviation of the data is less than 50% of the SAC and none of the individual concentrations are more than 250% of the SAC;
- If asbestos concentrations are encountered above the SAC or in the top 100mm of soil, then asbestos will be deemed a contaminant of concern for remediation purposes; and
- Groundwater data will be compared directly to the SAC and evaluated with regards to valid/complete SPR-linkages.

6.1.5.2 Field and Laboratory QA/QC

Field QA/QC included analysis of inter-laboratory duplicates, intra-laboratory duplicates, trip spike, trip blank and rinsate samples. Further details regarding the sampling and analysis undertaken, and the acceptable limits adopted, is provided in the Data Quality (QA/QC) Evaluation in the appendices.

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the attached laboratory reports. These criteria were developed and implemented in accordance with the laboratory's National Association of Testing Authorities, Australia (NATA) accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence are reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, JKE typically adopt the most conservative concentration reported (or in some cases, consider the data from the affected sample as an estimate).

6.1.5.3 Appropriateness of Practical Quantitation Limits (PQLs)

The PQLs of the analytical methods are considered in relation to the SAC to confirm that the PQLs are less than the SAC. In cases where the PQLs are greater than the SAC, a discussion of this is provided.

6.1.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results is undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected.

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. For this investigation, the null hypothesis (H_0) is that the 95% UCL for the CoPC is greater than the SAC. The alternative hypothesis (H_A) is that the 95% UCL for the CoPC is less than the SAC. Alternative considerations are made regarding asbestos based on an assessment of multiple lines of evidence.

Potential outcomes include Type I and Type II errors as follows:

- Type I error of determining that the soil is acceptable for the proposed land use when it is not (wrongly rejects true H_0), includes an alpha (α) risk of 0.05; and
- Type II error of determining that the soil is unacceptable for the proposed land use when it is (wrongly accepts false H_0), includes beta (β) risk of 0.2.

Statistical analysis will not apply to asbestos or groundwater data, therefore these data will be assessed based on a multiple lines of evidence and risk-based approach.

Data Quality Indicators (DQI) for laboratory QA/QC samples are defined in the QA/QC Data Evaluation in the appendices. An assessment of the DQI's was made in relation to precision, accuracy, representativeness, completeness and comparability.

6.1.7 Step 7 - Optimise the Design for Obtaining Data

The most resource-effective design will be used in an optimum manner to achieve the investigation objectives. Adjustment of the investigation design can occur following consultation or feedback from project stakeholders. For this investigation, the design was optimised via consideration of the various lines of evidence used to select the sample locations, the media being sampled, and also by the way in which the data were collected.

The sampling plan and methodology are outlined in the following sub-sections.

6.2 Soil Sampling Plan and Methodology

The soil sampling plan and methodology adopted for this investigation is outlined in the table below:

Table 6-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	Samples were obtained from nine locations as shown on the attached Figure 2. This number of locations met the minimum sampling density for hotspot identification, as outlined in the NSW EPA Contaminated Sites Sampling Design Guidelines (1995)[10]. Based on the above density, the following hotspot diameters have been calculated: • Circular hotspot diameter with a 95% confidence level (K value of 0.59) – 10.6m; and • Elliptical hotspot diameter with a 95% confidence level (K value of 0.9) – 32.4m along the long axis and 16.2 along the short axis.
Sampling Plan	The sampling locations were generally placed on a systematic plan with a grid spacing of approximately 18m between sampling location, although we note that two locations were moved slightly due to site constraints. This introduced some bias into the sampling plan and results in minor discrepancies in the calculated hotspot areas for those locations, however, this is not considered to be significant in overall context of the investigation. A systematic plan was considered suitable to identify hotspots to a 95% confidence level.
Set-out and Sampling Equipment	Sampling locations were set out using a tape measure. In-situ sampling locations were checked for underground services by an external contractor prior to sampling. Samples were collected from BH1 to BH4 using a 4-wheel drive mounted drill rig equipped with spiral flight augers (100mm diameter). Soil samples were obtained directly from the auger. Samples were collected from TP5 to TP9 using an excavator. Samples were obtained from the test pit walls or directly from the bucket by hand. Where sampling occurred from the bucket, JKE collected samples from the central portion of large soil clods, or from material that was unlikely to have come into contact with the bucket.
Sample Collection and Field QA/QC	Soil samples were obtained between 5 and 6 April 2022 in accordance with our standard field procedures. Soil samples were collected from the fill and natural profiles based on field observations. The sample depths are shown on the logs attached in the appendices. Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis. The field splitting procedure included alternately filling the sampling containers to obtain a representative split sample.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp was used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by JKE.

[10] NSW EPA, (1995), *Contaminated Sites Sampling Design Guidelines.* (referred to as EPA Sampling Design Guidelines 1995)

Aspect	Input
	The field screening for asbestos quantification included the following: • A representative 10L sample was collected from fill at 1m intervals, or from each distinct fill profile. The bulk sample intervals are shown on the attached borehole/test pit logs; • Each 10L sample was weighed using an electronic scale; • Each bulk sample was passed through a sieve with a 7.1mm aperture and inspected for the presence of fibre cement; • The condition of fibre cement or any other suspected asbestos materials was noted on the field records; and • If observed, any fragments of fibre cement in the 10L sample were collected, placed in a zip-lock bag and assigned a unique identifier. Calculations for asbestos content were undertaken based on the requirements outlined in Schedule B1 of NEPM (2013), as summarised in Section 7.1. A calibration/check of the accuracy of the scale used for weighing the fibre cement fragments was undertaken using a set of calibration weights. Calibration/check records are maintained on file by JKE. The scale used to weigh the 10L samples was not calibrated, however this is not considered significant as this method of providing a weight for the bulk sample is considered to be considerably more accurate than applying a nominal soil density conversion.
Decontami-nation and Sample Preservation	Sampling personnel used disposable nitrile gloves during sampling activities. Re-usable sampling equipment was decontaminated using Decon and potable water. Soil samples were preserved by immediate storage in an insulated sample container with ice. On completion of the fieldwork, the samples were stored temporarily in fridges in the JKE warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

6.3 Groundwater Sampling Plan and Methodology

The groundwater sampling plan and methodology is outlined in the table below:

Table 6-2: Groundwater Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Groundwater monitoring wells were installed in BH1 (MW1), BH2 (MW2) and BH3 (MW3). The wells were positioned to gain a snap-shot of the groundwater conditions. Considering the topography and the location of the nearest down-gradient water body, MW3 was considered to be in the up-gradient area of the site and would be expected to provide an indication of groundwater flowing onto (beneath) the site from the south-west. MW1 and MW2 were considered to be in the intermediate to down-gradient areas of the site and would be expected to provide an indication of groundwater flowing across (beneath) the site and beyond the down-gradient site boundary.
Monitoring Well Installation Procedure	The monitoring well construction details are documented on the appropriate borehole logs attached in the appendices. The monitoring wells were installed to depths of approximately 2mBGL to 5.7mBGL below ground level. The wells were generally constructed as follows: • 50mm diameter Class 18 PVC (machine slotted screen) was installed in the lower section of the well to intersect groundwater; • 50mm diameter Class 18 PVC casing was installed in the upper section of the well (screw

Aspect	Input
	fixed); • A 2mm sand filter pack was used around the screen section for groundwater infiltration; • A hydrated bentonite seal/plug was used on top of the sand pack to seal the well; and • A gatic cover was installed at the surface with a concrete plug to limit the inflow of surface water.
Monitoring Well Development	The monitoring wells were developed on 5 April 2022 using a submersible electrical pump. Due to the hydrogeological conditions, groundwater inflow into the wells was relatively low, therefore the wells were pumped until they were effectively dry. The field monitoring records and calibration data are attached in the appendices.
Groundwater Sampling	The monitoring wells were allowed to recharge for approximately 48 hours after development. Groundwater samples were obtained on 7 April 2022. Prior to sampling, the monitoring wells were checked for the presence of Light Non-Aqueous Phase Liquids (LNAPLs) using an inter-phase probe electronic dip meter. The monitoring well head space was checked for VOCs using a calibrated PID unit. The samples were obtained using a peristaltic pump. During sampling, the following parameters were monitored using calibrated field instruments: • SWL using an electronic dip meter; and • pH, temperature, electrical conductivity (EC), dissolved oxygen (DO) and redox potential (Eh) using a YSI Multi-probe water quality meter. Steady state conditions were considered to have been achieved when the difference in the pH measurements was less than 0.2 units, the difference in conductivity was less than 10%, and when the SWL was not in drawdown. Steady state conditions were not achieved in MW2 due to the hydrological conditions encountered in this well. Groundwater samples were obtained directly from the single use PVC tubing and placed in the sample containers. Duplicate samples were obtained by alternate filling of sample containers. This technique was adopted to minimise disturbance of the samples and loss of volatile contaminants associated with mixing of liquids in secondary containers, etc. The field monitoring record and calibration data are attached in the appendices.
Decontaminant and Sample Preservation	During development, the pump was flushed between monitoring wells with potable water (single-use tubing was used for each well). The pump tubing was discarded after each sampling event and replaced therefore no decontamination procedure was considered necessary. The samples were preserved with reference to the analytical requirements and placed in an insulated container with ice or ice bricks. On completion of the fieldwork, the samples were temporarily stored in a fridge at the JKE office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

6.3.1 Laboratory Analysis

Samples were analysed by an appropriate, NATA Accredited laboratory using the analytical methods detailed in Schedule B(3) of NEPM 2013. Reference should be made to the laboratory reports attached in the appendices for further details.

Table 6-3: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blanks, trip spikes and field rinsate samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	293064, 293078, and 293078-A
Inter-laboratory duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	30890

7 SITE ASSESSMENT CRITERIA (SAC)

The SAC were derived from the NEPM 2013 and other guidelines as discussed in the following sub-sections. The guideline values for individual contaminants are presented in the attached report tables and further explanation of the various criteria adopted is provided in the appendices.

7.1 Soil

Soil data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013) as outlined below.

7.1.1 Human Health

- Health Investigation Levels (HILs) for a 'commercial/industrial' land use exposure scenario (HIL-D);
- Health Screening Levels (HSLs) for a 'commercial/industrial' land use exposure scenario (HSL-D). HSLs were calculated based on conservative assumptions including a 'sand' type and a depth interval of 0m to 1m;
- HSLs for direct contact presented in the CRC Care Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)[11]; and
- Asbestos was assessed on the basis of presence/absence and against the HSL-D criteria. A summary of the asbestos HSL criteria is provided in the table below:

Table 7-1: Details for Asbestos in soil SAC

Guideline	Applicability
Asbestos in Soil	The HSL-D criteria were adopted for the assessment of asbestos in soil. The SAC adopted for asbestos were derived from the NEPM 2013 and are based on WA DoH (2009) guidance. The SAC include the following: • No visible asbestos at the surface/in the top 10cm of soil; • <0.05% w/w bonded asbestos containing material (ACM) in soil; and • <0.001% w/w asbestos fines/fibrous asbestos (AF/FA) in soil.

7.1.1 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for a 'commercial/industrial' land use exposure scenario. These have only been applied to the top 2m of soil as outlined in NEPM (2013). The criterion for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the Canadian Soil Quality Guidelines[12];
- ESLs were adopted based on the soil type; and
- EILs for selected metals were calculated based on the most conservative added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013) and published ambient background concentration (ABC) values presented in the document titled Trace Element Concentrations in Soils

[11] Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care), (2011). Technical Report No. 10 - *Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document*

[12] Canadian Council of Ministers of the Environment, (1999). *Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)* (referred to as the Canadian Soil Quality Guidelines)

from Rural and Urban Areas of Australia (1995)[13]. This method is considered to be adequate for the Tier 1 screening.

7.1.2 Management Limits for Petroleum Hydrocarbons

Management limits for petroleum hydrocarbons (as presented in Schedule B1 of NEPM 2013) were considered.

7.1.3 Waste Classification

Data for the waste classification assessment were assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)[14] as outlined in the following table:

Table 7-2: Waste Categories

Category	Description
General Solid Waste (non-putrescible)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; and • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as general solid waste.
Restricted Solid Waste (non-putrescible)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as restricted solid waste; and • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as restricted solid waste.
Hazardous Waste	• If SCC > CT2 then TCLP not needed to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following: • That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • That does not contain sulfidic ores or other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

7.2 Groundwater

Groundwater data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013), following an assessment of environmental values in accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (2007)[15]. Environmental values for this investigation include aquatic ecosystems, human uses, and human-health risks in non-use scenarios.

[13] Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4*. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission

[14] NSW EPA, (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

[15] NSW Department of Environment and Conservation, (2007). *Guidelines for the Assessment and Management of Groundwater Contamination.*

7.2.1 Human Health

- The NEPM (2013) HSLs were not strictly applicable for this project as the groundwater was recorded at depths shallower than 2m in two of the three wells. Bedrock was also shallower than 2m in some areas. This means that the standard assumptions used in deriving the NEPM (2013) HSLs are not applicable. Although the SWL may be indicative of a potentiometric water level rather than the true groundwater level, a conservative approach for the screening has occurred for the assessment. On this basis a combination of both HSLs and a site-specific assessment (SSA) for the Tier 1 screening of human health risks posed by volatile contaminants in groundwater has been undertaken. HSLs for a 'commercial/industrial' land use exposure scenario (HSL-D) HSLs were calculated based on the soil type and the observed depth to groundwater;
- For the SSA, the assessment included selection of alternative Tier 1 criteria that were considered suitably protective of human health. These criteria are based on drinking water guidelines and have been referred to as HSL-SSA. The criteria were based on the following (as shown in the attached report tables):
    - Australian Drinking Water Guidelines 2011 (updated 2018) for BTEX compounds and selected VOCs;
    - World Health Organisation (WHO) document titled Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality (2008) for petroleum hydrocarbons; and
    - USEPA Region 9 screening levels for naphthalene (threshold value for tap water);
- ADWG 2011 were multiplied by a factor of 10 to assess potential risks associated with incidental/recreational-type exposure to groundwater (e.g. within down-gradient water bodies used for recreational purposes or with bore water used for stock). These have been deemed as 'recreational' SAC; and
- ADWG 2011 were adopted as screening criteria for consumption of groundwater.

7.2.2 Environment (Ecological - aquatic ecosystems)

Groundwater Investigation Levels (GILs) for 95% protection of freshwater species were adopted based on the Default Guideline Values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[16]. The 99% trigger values were adopted where required to account for bioaccumulation. Low and moderate reliability trigger values were also adopted for some contaminants where high-reliability trigger values don't exist.

[16] Australian and New Zealand Governments (ANZG), (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (referred to as ANZG 2018)

8 RESULTS

8.1 Summary of Data (QA/QC) Evaluation

The data evaluation is presented in the appendices. In summary, JKE is of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

8.2 Subsurface Conditions

A summary of the subsurface conditions encountered during the investigation is presented in the following table. Reference should be made to the borehole/testpit logs attached in the appendices for further details.

Table 8-1: Summary of Subsurface Conditions

Profile	Description
Fill	Fill was encountered at the surface in all boreholes/test pits and extended to depths of approximately 0.2m to 0.6mBGL. The fill typically comprised sandy clay, silty clayey sand, silty clay, or gravelly clay with inclusions of igneous and ironstone gravel, brick (whole and fragments), sand, ash and root fibres. Neither staining nor odours were observed in the fill material during the field work. No suspected asbestos containing materials were encountered in the fill material during the field work.
Natural Soil	Natural silty clay residual soils were encountered beneath the fill in all locations and extended to a depth of between 0.4mBGL to 2.4mBGL. Neither staining nor odours were observed in the natural soils during the field work.
Bedrock	Basalt bedrock was encountered beneath the natural soils in BH1 to BH4 from depths of 1.6mBGL to 2.4mBGL and extended to the maximum depth of the investigation at 6.9mBGL. Neither staining nor odours were observed in the natural soils during the field work.
Groundwater	Groundwater seepage was encountered in boreholes BH2 and BH3 during drilling at depths of between 4.5m and 5mBGL. Standing water was recorded in TP6 at 0.3mBGL and TP8 at the termination depth of 0.5mBGL.

8.3 Field Screening

A summary of the field screening results is presented in the following table:

Table 8-2: Summary of Field Screening (AQA bulk field results go here)

Aspect	Details
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. All results were 0ppm isobutylene equivalents which indicates a lack of PID detectable VOCs.
Bulk Screening for Asbestos	The bulk field screening results are summarised in the attached report Table S5. All results were below the SAC. Suspected ACM was not identified in any sample.

<table>
<tr><th>Aspect</th><th>Details</th></tr>
<tr><td>Groundwater Depth & Flow</td><td>Groundwater seepage was encountered in boreholes BH2 and BH3 during drilling at depths of approximately 4.5mBGL to 5mBGL. A SWL was measured in BH3, TP6, and TP8 at depths of between 0.3mBGL and 3.8mBGL a short time after completion of drilling/excavation. The remaining boreholes and test pits were dry during and a short time after completion.

SWLs measured in the monitoring wells installed at the site ranged from 0.87mBGL to 2.57mBGL. Groundwater RLs were calculated based on the measured SWL and survey data obtained by JKG, as summarised below:

<table>
<tr><th>MW ref</th><th>RL (mAHD)</th><th>SWL (mBGL)</th><th>GW RL (mAHD)</th></tr>
<tr><td>MW1</td><td>1059.5</td><td>0.87</td><td>1058.63</td></tr>
<tr><td>MW2</td><td>1057.9</td><td>0.94</td><td>1056.96</td></tr>
<tr><td>MW3</td><td>1063.0</td><td>2.57</td><td>1060.43</td></tr>
</table>

The groundwater RLs are considered to be indicative only. The final development design is yet to be confirmed. Based on the groundwater RLs, excavation in the western portion of the site may intercept groundwater. However, this should be assessed when final design details are available for the site.

A contour plot was prepared for the groundwater levels using Surfer v8.08 (Surface Mapping Program) as shown on Figure 4. Groundwater flow generally occurs in a down gradient direction perpendicular to the groundwater elevation contours. The contour plot indicates that groundwater generally flows towards the north-east which is consistent with expectations based on the topography and nearest down gradient water bodies.</td></tr>
<tr><td>Groundwater Field Parameters</td><td>Field measurements recorded during sampling were as follows:
- pH ranged from 6.31 to 7;
- EC ranged from 173µS/cm to 3,208µS/cm;
- Eh ranged from -5.8mV to 1mV; and
- DO ranged from 3.4mg/L to 5.5mg/L.

The PID well headspace readings are presented in attached field sheets and the COC documents attached in the appendices. All results were 0ppm isobutylene equivalents during sampling which indicates a lack of PID detectable VOCs.</td></tr>
<tr><td>LNAPLs petroleum hydrocarbons</td><td>Phase separated product (i.e. LNAPL) were not detected using the interphase probe during groundwater sampling.</td></tr>
</table>

8.4 Soil Laboratory Results

The soil laboratory results were assessed against the SAC presented in Section 7.1. Individual SAC are shown in the report tables attached in the appendices. A summary of the results is presented below:

8.4.1 Human Health and Environmental (Ecological) Assessment

Table 8-3: Summary of Soil Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	12	23	0	0	-
Cadmium	12	<0.4	0	NSL	-
Chromium (total)	12	220	0	0	-
Copper	12	48	0	0	-
Lead	12	29	0	0	-
Mercury	12	1.3	0	NSL	-
Nickel	12	59	0	0	-
Zinc	12	64	0	0	-
Total PAHs	12	0.07	0	NSL	-
Benzo(a)pyrene	12	0.07	NSL	0	-
Carcinogenic PAHs (as BaP TEQ)	12	<0.5	0	NSL	-
Naphthalene	12	<1	0	NSL	-
DDT+DDE+DDD	9	<0.1	0	NSL	-
DDT	9	<0.1	NSL	0	-
Aldrin and dieldrin	9	<0.1	0	NSL	-
Chlordane	9	<0.1	0	NSL	-
Heptachlor	9	<0.1	0	NSL	-
Chlorpyrifos (OPP)	9	<0.1	0	NSL	-
PCBs	9	<0.1	0	NSL	-

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
TRH F1	12	<25	0	0	-
TRH F2	12	<50	0	0	-
TRH F3	12	<100	0	0	-
TRH F4	12	<100	0	0	-
Benzene	12	<0.2	0	0	-
Toluene	12	<0.5	0	0	-
Ethylbenzene	12	<1	0	0	-
Xylenes	12	<1	0	0	-
Asbestos (in soil) (%w/w)	9	<0.01 ACM <0.001 AF/FA	0	NA	Asbestos was not detected in any of the samples analysed.

Notes:

N: Total number (primary samples)

NSL: No set limit

NL: Not limiting

8.4.2 Waste Classification Assessment

The laboratory results were assessed against the criteria presented in Section 7.1.3. summary of the results is presented in the following table:

Table 8-4: Summary of Soil Laboratory Results Compared to CT and SCC Criteria

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Arsenic	12	0	0	-
Cadmium	12	0	0	-
Chromium	12	2	0	Chromium concentrations exceeded the CT1 criterion in one fill sample collected from TP7 (0.3-0.5m) and one natural sample collected from BH1 (0.3-0.5m). The maximum chromium concentration was 220mg/kg.
Copper	12	NSL	NSL	-
Lead	12	0	0	-
Mercury	12	0	0	-

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Nickel	12	2	0	Nickel concentrations exceeded the CT1 criterion in one fill sample collected from TP7 (0.3-0.5m) and one natural sample collected from BH1 (0.3-0.5m). The maximum nickel concentration was 59mg/kg.
Zinc	12	NSL	NSL	-
TRH (C_6-C_9)	12	0	0	-
TRH (C_{10}-C_{36})	12	0	0	-
BTEX	12	0	0	-
Total PAHs	12	0	0	-
Benzo(a)pyrene	12	0	0	-
OCPs & OPPs	9	0	0	-
PCBs	9	0	0	-
Asbestos	9	-	-	Asbestos was not detected in the samples analysed.

N: Total number (primary samples)
NSL: No set limit

8.5 Groundwater Laboratory Results

The soil laboratory results were assessed against the SAC presented in Section 7.1.1. Individual SAC are shown in the report tables attached in the appendices. A summary of the results is presented below:

Table 8-5: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	3	<1	0	0	-
Cadmium	3	<0.1	0	0	-
Chromium (total)	3	<1	0	0	-
Copper	3	<1	0	0	-
Lead	3	<1	0	0	-
Mercury	3	<0.05	0	0	-
Nickel	3	10	0	0	-

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Zinc	3	12	0	1	The zinc concentrations of 9µg and 12µg/L in the field duplicate from MW1 (WDUP1) and the primary sample from MW1, exceeded the ecological SAC of 8µg/L.
Total PAHs	3	<0.1/<0.2	0	0	-
Benzo(a)pyrene	3	<0.1	0	0	-
Naphthalene	3	<0.2	0	0	-
TRH F1	3	<10	0	NSL	-
TRH F2	3	<50	0	NSL	-
TRH F3	3	<100	NSL	NSL	-
TRH F4	3	<100	NSL	NSL	-
Benzene	3	<1	0	0	-
Toluene	3	<1	0	0	-
Ethylbenzene	3	<1	0	0	-
m+p-Xylene	3	<2	0	0	-
o-Xylene	3	<1	0	0	-
Total Xylenes	3	<1	0	0	-
VOCs 4-isopropyl toluene	3	2	NSL	NSL	A detection of 4-isopropyl toluene was encountered in MW3.
pH	3	7.3			-
EC	3	3,700			

Notes:

^: Primary samples

N: Total number

NSL: No set limit

NL: Not limiting

9 WASTE CLASSIFICATION ASSESSMENT

9.1 Waste Classification of Fill

Based on the results of the waste classification assessment, and at the time of reporting, the fill material and some natural soil at the site are classified under the following waste streams:

- **Restricted Solid Waste (non-putrescible)**. Applies to the fill and some natural soil in the vicinity of BH1 and TP7, in the north-west corner of the site. This is due to the chromium and nickel concentrations reported >CT1 (and in the absence of TCLP tests); and
- **General Solid Waste (non-putrescible)**. Applies to the remaining fill at the site, outside the RSW area.

Once final design levels are known, additional sampling and analysis should be undertaken to confirm the above classifications prior to off-site disposal. It is considered likely that TCLP analysis of the fill and natural material in the vicinity of BH1 and TP7, where elevated chromium and nickel concentrations occurred >CT1 thresholds, would result in a General Solid Waste (non-putrescible) classification for the fill.

9.2 Classification of Natural Soil

Based on the scope of work undertaken for this assessment, and at the time of reporting, it is possible that that the natural soil at the site could meet the definition of **VENM** for off-site disposal or re-use purposes. However, additional sampling and analysis are required to confirm this in regards to chromium and nickel.

10 DISCUSSION

10.1 Contamination Sources/AEC and Potential for Site Contamination

Based on the scope of work undertaken for this investigation, JKE identified fill as a potential contamination source/AEC. Considering this, and based on a qualitative assessment of various lines of evidence as discussed throughout this report, JKE is of the opinion that there is a potential for site contamination. The preliminary soil and groundwater data collected for the investigation is discussed further in the following subsection, as part of the Tier 1 risk assessment.

10.2 Tier 1 Risk Assessment and Review of CSM

For a contaminant to represent a risk to a receptor, the following three conditions must be present:

1. Source – The presence of a contaminant;
2. Pathway – A mechanism or action by which a receptor can become exposed to the contaminant; and
3. Receptor – The human or ecological entity which may be adversely impacted following exposure to contamination.

If one of the above components is missing, the potential for adverse risks is relatively low.

10.2.1 Soil

Elevated concentrations of the CoPC were not encountered above the adopted SAC in any of the soil samples analysed. On this basis, the risk of widespread soil contamination associated with fill is considered to be low.

No evidence of former buildings or structures being present or demolished onsite was identified. However, due to the occurrence of whole and brick fragment inclusions in the fill material, the potential exists for unexpected, asbestos-related finds during soil disturbance. Recommendations have been made to reflect this.

10.2.2 Groundwater

One of the groundwater samples (MW1) encountered zinc concentrations marginally above the ANZG-Fresh criteria. This elevation is shown on Figure 3 attached in the appendices. The source of the heavy metal (zinc) in the groundwater is considered likely to be a regional issue for the following reasons:

- The reported concentrations across the entire monitoring well network were relatively consistent;
- Elevated heavy metal concentrations associated with leaking water infrastructure and surface water runoff are typically encountered in urban groundwater; and
- Significantly elevated heavy metals concentrations (i.e. above the health-based or ecological-based SAC) were not encountered in the fill soil at the site, therefore fill is not considered to be a point source.

Elevated concentrations of the remaining CoPC were not encountered above the adopted SAC in any of the groundwater samples analysed during the DSI.

It is noted that there was a detection of 4-isopropyl toluene reported in one sample (MW3). Generally used with other solvents and hydrocarbons, 4-isopropyl toluene is known to be used as a thinner for lacquers and varnishes. MW3 was the upgradient well and the 4-isopropyl toluene was not detected in the remaining down-gradient wells, which suggested that it is unlikely to be from an on-site sources. Notwithstanding, the concentration was only marginally over the detection limit and is not considered to pose a risk to the receptors.

10.3 Decision Statements

The decision statements are addressed below:

Did the site inspection, or does the historical information identify potential contamination sources/AEC at the site?

Yes, as noted in Section 10.1.

Are any results above the SAC?

Yes, zinc concentrations in groundwater exceeded the ANZG-Fresh GIL.

Do potential risks associated with contamination exist, and if so, what are they?

JKE is of the opinion that potential risks associated with the elevated concentrations of zinc in the groundwater at the site are low in the context of the proposed development and are not indicative of site contamination. There were no complete SPR-linkages identified.

Is remediation required?

Based on the results, remediation is not considered to be required.

Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

JKE is of the opinion that the site is suitable for the proposed development outlined in Section 1.1. An unexpected finds protocol (outlined in Section 10.4) is to be implemented during the proposed development works.

10.4 Unexpected Finds Protocol

As part of the implementation of this protocol, a suitably qualified contaminated land consultant[17] should be engaged to inspect the site during development works in the event that there are unexpected finds. Unexpected finds may include stained or odorous soil, and/or fill that appears different to that recorded on

[17] JKE recommend that the consultancy engaged for the work be a member of the Australian Contaminated Land Consultants Associated (ACLCA), and/or the individual undertaking the works be certified under one of the NSW EPA endorsed certified practitioner schemes

the borehole or test pit logs and that has other indicators of contamination such as fibre cement, ash or slag etc Where an inspection is triggered, a letter should be prepared by the consultant to document the findings of the inspection(s) and provide further commentary on assessing/managing potential contamination and the unexpected find.

The following should be implemented in the event of an unexpected find:

- All work in the immediate vicinity should cease, and the contaminated land consultant should be contacted immediately to inspect and document the find. The project manager/client must also be contacted and advised of the find;
- Temporary barricades should be erected to isolate the area;
- The consultant should develop and implement a strategy to assess the issue and provide guidance on the appropriate course of action;
- Review and update the waste classification for the off-site disposal of the suspect material; and
- Any actions should be implemented and validated to demonstrate that there are no unacceptable risks to the receptors.

11 CONCLUSIONS AND RECOMMENDATIONS

The investigation included a review of historical information, soil sampling from four boreholes and five test pits, and installation and groundwater sampling from three monitoring wells. Imported fill was identified as a potential contamination source.

The boreholes generally encountered fill materials to depths of approximately 0.1mBGL to 0.6mBGL, underlain by natural residual clayey soils. The fill contained inclusions of igneous and ironstone gravel, brick (whole and fragments), sand, ash and root fibres.

A selection of soil and groundwater samples were analysed for the CoPC identified in the CSM. Elevated concentrations of the CoPC were not encountered above the adopted health or ecological-based SAC in any of the soil samples analysed. Elevated concentrations of zinc were encountered in one groundwater sample. However, this is considered to be a regional issue and not considered to pose a risk to site receptors.

Based on the findings of the DSI, JKE is of the opinion that the site is suitable for the proposed development described in Section 1.1. Remediation is not required. An unexpected finds protocol is included in Section 10.4 of this report to manage any unexpected finds during the development.

JKE consider that the report objectives outlined in Section 1.2 have been addressed.

12 LIMITATIONS

The report limitations are outlined below:

- JKE accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the JKE proposal; and terms of contract between JKE and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- JKE accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- JKE have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. JKE should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Important Information About This Report

These notes have been prepared by JKE to assist with the assessment and interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors
This report has been prepared in response to specific project requirements as stated in the JKE proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of basement levels; or
- Ownership of the site changes.

JKE will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the investigation. If the subject site is sold, ownership of the investigation report should be transferred by JKE to the new site owners who will be informed of the conditions and limitations under which the investigation was undertaken. No person should apply an investigation for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions
Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an investigation report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data
Site investigations identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an investigation indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Investigation Limitations
Although information provided by a site investigation can reduce exposure to the risk of the presence of contamination, no environmental site investigation can eliminate the risk. Even a rigorous professional investigation may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Site Investigations by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an investigation report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Investigation Report

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the investigation. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the investigation. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete investigation should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely

Because an environmental site investigation is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site investigation, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

Appendix A: Report Figures

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

This plan should be read in conjunction with the Environmental report.

Title: **SITE LOCATION PLAN**

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Project No: E34948PT

Figure No: 1

JKEnvironments

PLOT DATE: 28/03/2022 10:12:43 AM DWG FILE: K:\5C EIS JOBS 34000'S E34948PT GLEN INNES CAD E34948PT.DWG

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LEGEND

	APPROXIMATE SITE BOUNDARY
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
TP(Fill Depth)	TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 4 8 12 16 20

SCALE 1:400 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SAMPLE LOCATION PLAN**

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Project No: E34948PT

Figure No: 2

JKEnvironments

PLOT DATE: 13/04/2022 11:35:17 AM DWG FILE: S: 5 EIS 5C EIS JOBS 34000 S E34948PT GLEN INNES CAD E34948PT.DWG

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LEGEND

	APPROXIMATE SITE BOUNDARY
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
TP(Fill Depth)	TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)
SAMPLE ID / CHEMICAL	- / CONCENTRATION (g/L) — GROUNDWATER SAMPLE EXCEEDANCE
	GROUNDWATER CONTAMINATION ABOVE SAC

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 4 8 12 16 20

SCALE 1:400 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SAC EXCEEDANCES PLAN**

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Project No: E34948PT

Figure No: 3

JKEnvironments

PLOT DATE: 23/05/2022 10:33:30 AM DWG FILE: S: 5 EIS 5C EIS JOBS 34000 S E34948PT GLEN INNES CAD E34948PT.DWG

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LEGEND

	APPROXIMATE SITE BOUNDARY
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
TP(Fill Depth)	TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)
1063	GROUNDWATER CONTOUR INTERVALS (m)
	INFERRED GROUNDWATER FLOW DIRECTION

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 4 8 12 16 20

SCALE 1:400 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **GROUNDWATER CONTOUR PLOT**

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Project No: E34948PT

Figure No: 4

JKEnvironments

PLOT DATE: 23/05/2022 10:33:47 AM DWG FILE: S: 5 EIS 5C EIS JOBS 34000 S E34948PT GLEN INNES CAD E34948PT.DWG

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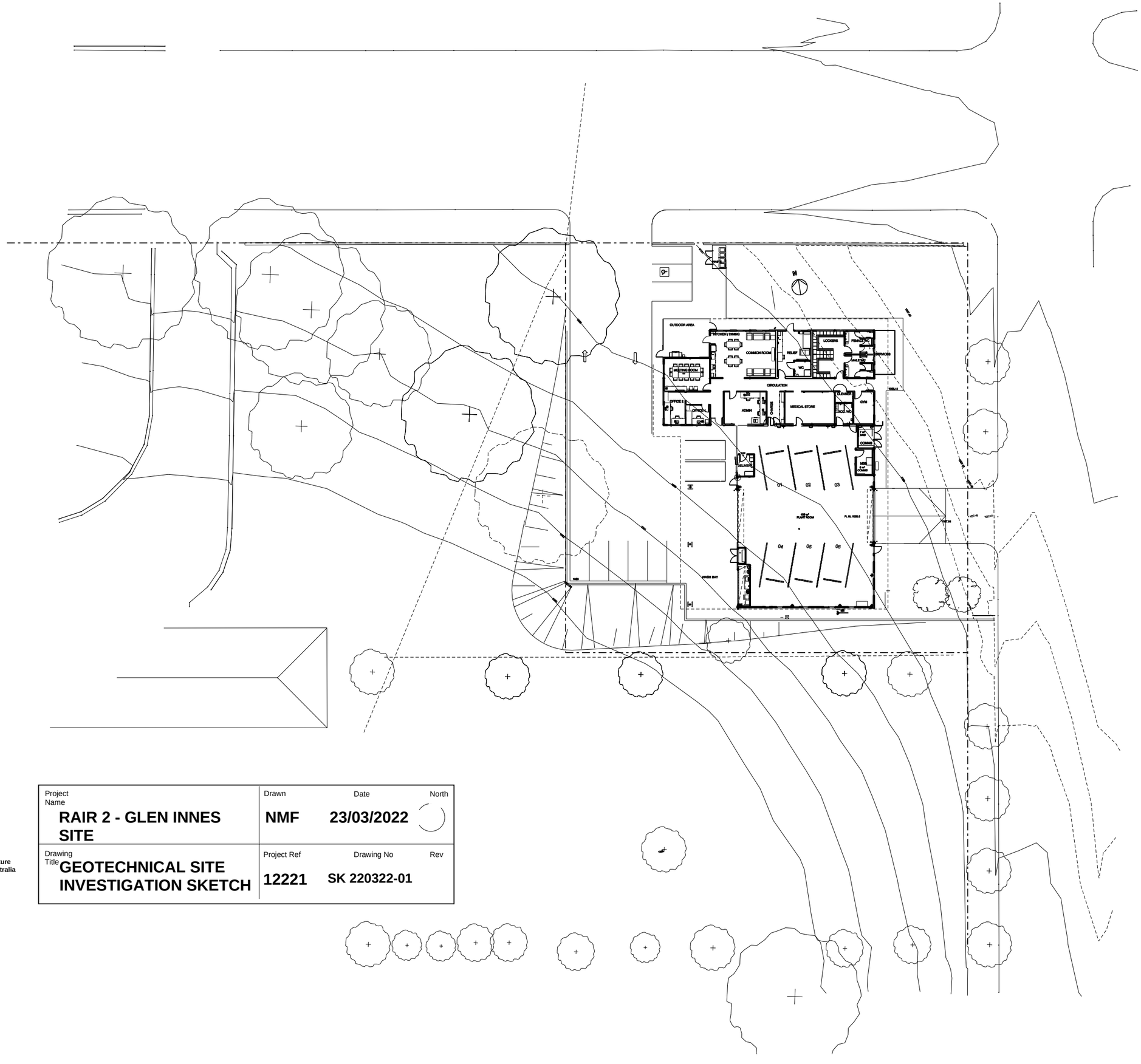
Appendix B: Site Information and Site History

Proposed Development Plans



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www.bonaccigroup.com

Project Name	Drawn	Date	North
RAIR 2 - GLEN INNES SITE	**NMF**	**23/03/2022**	
Drawing Title **GEOTECHNICAL SITE INVESTIGATION SKETCH**	Project Ref **12221**	Drawing No **SK 220322-01**	Rev

Selected Site Photos

Project Ref: E34948PT
Site Address: 94 Taylor Street, Glen Innes, NSW
Selected Site Photos Dated: 4 April 2022

Photograph 1: Looking west across northern portion of site. Brick fence observed in right background of photograph.

Photograph 2: Looking north along eastern boundary of site.

Photographs 3: Trees in the central section of the site.

Lotsearch Environmental Risk and Planning Report

LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 28 Mar 2022 14:12:16

Reference: LS030519 EP

Address: 94 Taylor Street, Glen Innes, NSW 2370

Disclaimer:
The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.
You should obtain independent advice before you make any decision based on the information within the report.
The detailed terms applicable to use of this report are set out at the end of this report.

Dataset Listing

Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Finance, Services & Innovation	04/01/2022	04/01/2022	Quarterly	-	-	-	-
Topographic Data	NSW Department of Finance, Services & Innovation	25/06/2019	25/06/2019	Annually	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	16/03/2022	10/03/2022	Monthly	1000m	0	0	6
Contaminated Land Records of Notice	Environment Protection Authority	03/03/2022	03/03/2022	Monthly	1000m	0	0	0
Former Gasworks	Environment Protection Authority	02/03/2022	14/07/2021	Quarterly	1000m	0	0	0
National Waste Management Facilities Database	Geoscience Australia	12/05/2021	07/03/2017	Annually	1000m	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	15/02/2021	13/07/2012	Annually	1000m	0	0	3
EPA PFAS Investigation Program	Environment Protection Authority	28/03/2022	14/07/2021	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Department of Defence	03/03/2022	03/03/2022	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Department of Defence	03/03/2022	03/03/2022	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	02/03/2022	02/03/2022	Monthly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	03/03/2022	03/03/2022	Quarterly	2000m	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority	16/02/2022	13/12/2018	Annually	1000m	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	03/03/2022	03/03/2022	Monthly	1000m	0	0	1
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority	03/03/2022	03/03/2022	Monthly	1000m	1	1	1
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	03/03/2022	03/03/2022	Monthly	1000m	0	0	3
UBD Business Directories (Premise & Intersection Matches)	Hardie Grant			Not required	150m	4	11	12
UBD Business Directories (Road & Area Matches)	Hardie Grant			Not required	150m	-	15	19
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500m	0	0	17
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500m	-	0	5
Points of Interest	NSW Department of Finance, Services & Innovation	19/08/2021	19/08/2021	Quarterly	1000m	0	5	51
Tanks (Areas)	NSW Department of Customer Service - Spatial Services	19/08/2021	19/08/2021	Quarterly	1000m	0	0	0
Tanks (Points)	NSW Department of Customer Service - Spatial Services	19/08/2021	19/08/2021	Quarterly	1000m	0	0	0
Major Easements	NSW Department of Finance, Services & Innovation	19/08/2021	19/08/2021	Quarterly	1000m	0	0	1
State Forest	Forestry Corporation of NSW	25/02/2021	14/02/2021	Annually	1000m	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	10/02/2022	31/12/2021	Annually	1000m	0	0	0
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000m	1	1	1
Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018	NSW Department of Planning, Industry and Environment	28/03/2022	23/02/2018	Annually	1000m	0	0	0
Groundwater Boreholes	NSW Dept. of Primary Industries - Water NSW; Commonwealth of Australia (Bureau of Meteorology)	24/07/2018	23/07/2018	Annually	2000m	0	0	71

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Geological Units 1:250,000	NSW Department of Planning, Industry and Environment	20/08/2014		Annually	1000m	1	1	2
Geological Structures 1:250,000	NSW Department of Planning, Industry and Environment	20/08/2014		Annually	1000m	0	0	0
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	1000m	0	0	0
Atlas of Australian Soils	Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES)	19/05/2017	17/02/2011	As required	1000m	1	1	2
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning, Industry and Environment	07/01/2022	17/12/2021	Monthly	500m	0	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000m	1	1	1
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	1000m	0	0	0
Mining Subsidence Districts	NSW Department of Customer Service - Subsidence Advisory NSW	19/08/2021	05/08/2021	Quarterly	1000m	0	0	0
Current Mining Titles	NSW Department of Industry	11/03/2022	11/03/2022	Monthly	1000m	0	0	0
Mining Title Applications	NSW Department of Industry	11/03/2022	11/03/2022	Monthly	1000m	0	0	0
Historic Mining Titles	NSW Department of Industry	11/03/2022	11/03/2022	Monthly	1000m	5	5	6
Environmental Planning Instrument SEPP State Significant Precincts	NSW Department of Planning, Industry and Environment	15/11/2021	07/12/2018	Monthly	1000m	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning, Industry and Environment	15/11/2021	05/11/2021	Monthly	1000m	1	2	20
Commonwealth Heritage List	Australian Government Department of the Agriculture, Water and the Environment	18/05/2021	20/11/2019	Annually	1000m	0	0	1
National Heritage List	Australian Government Department of the Agriculture, Water and the Environment	18/05/2021	20/11/2019	Annually	1000m	0	0	0
State Heritage Register - Curtilages	NSW Department of Planning, Industry and Environment	19/08/2021	25/06/2021	Quarterly	1000m	0	0	2
Environmental Planning Instrument Local Heritage	NSW Department of Planning, Industry and Environment	07/01/2022	17/12/2021	Monthly	1000m	1	1	124
Bush Fire Prone Land	NSW Rural Fire Service	21/03/2022	08/12/2021	Weekly	1000m	0	0	2
Eastern Bushland Database (North Region)	NSW Office of Environment & Heritage	24/07/2016	01/01/1991	None planned	1000m	0	0	0
Ramsar Wetlands of Australia	Australian Government Department of Agriculture, Water and the Environment	28/03/2022	19/03/2020	Annually	1000m	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	14/08/2017	15/05/2017	Annually	1000m	0	0	1
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000m	0	0	1
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	28/03/2022	28/03/2022	Weekly	10000m	-	-	-

Site Diagram

94 Taylor Street, Glen Innes, NSW 2370

Legend

- Site Boundary
- Internal Parcel Boundaries

Total Area: 2795m²

Total Perimeter: 212m

Disclaimers:

Measurements are approximate only and may have been simplified or smaller lengths removed for readability.

Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.

Scale: 0 5 10 Meters

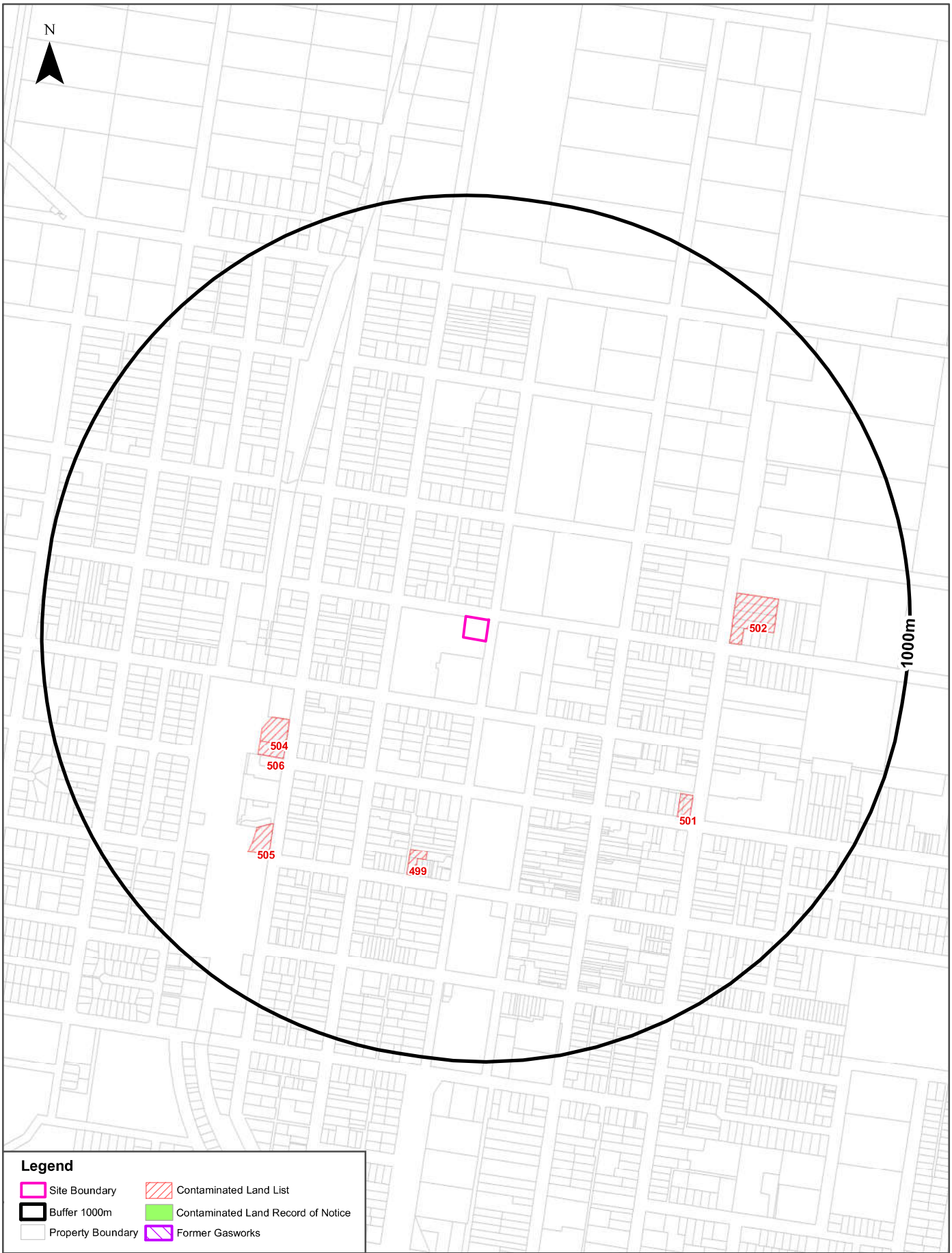
Data Sources: Aerial Imagery:
© NSW Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 28 March 2022

Contaminated Land

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Contaminated Land

94 Taylor Street, Glen Innes, NSW 2370

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist	Direction
504	Former Caltex Depot, Glen innes	Lot 1 DP785636 Lambeth Street	Glen Innes	Other Petroleum	Regulation under CLM Act not required	Current EPA List	Premise Match	456m	South West
506	Telstra Depot Glen Innes	126 Lambeth Street	Glen Innes	Unclassified	Regulation under CLM Act not required	Current EPA List	Premise Match	491m	South West
499	Ambulance Station	106 Bourke Street	Glen Innes	Unclassified	Regulation under CLM Act not required	Current EPA List	Premise Match	516m	South
502	Caltex Service Station	Cnr Taylor Street & Church Street	Glen Innes	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	572m	East
501	Caltex Glen Innes Service Station	Meade Street, corner Church STREET	Glen Innes	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	587m	South East
505	Former Shell Depot	Lambeth Street	Glen Innes	Other Petroleum	Regulation under CLM Act not required	Current EPA List	Premise Match	630m	South West

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.

EPA site management class	Explanation
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Contaminated Land

94 Taylor Street, Glen Innes, NSW 2370

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority
Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit
http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm

Former Gasworks

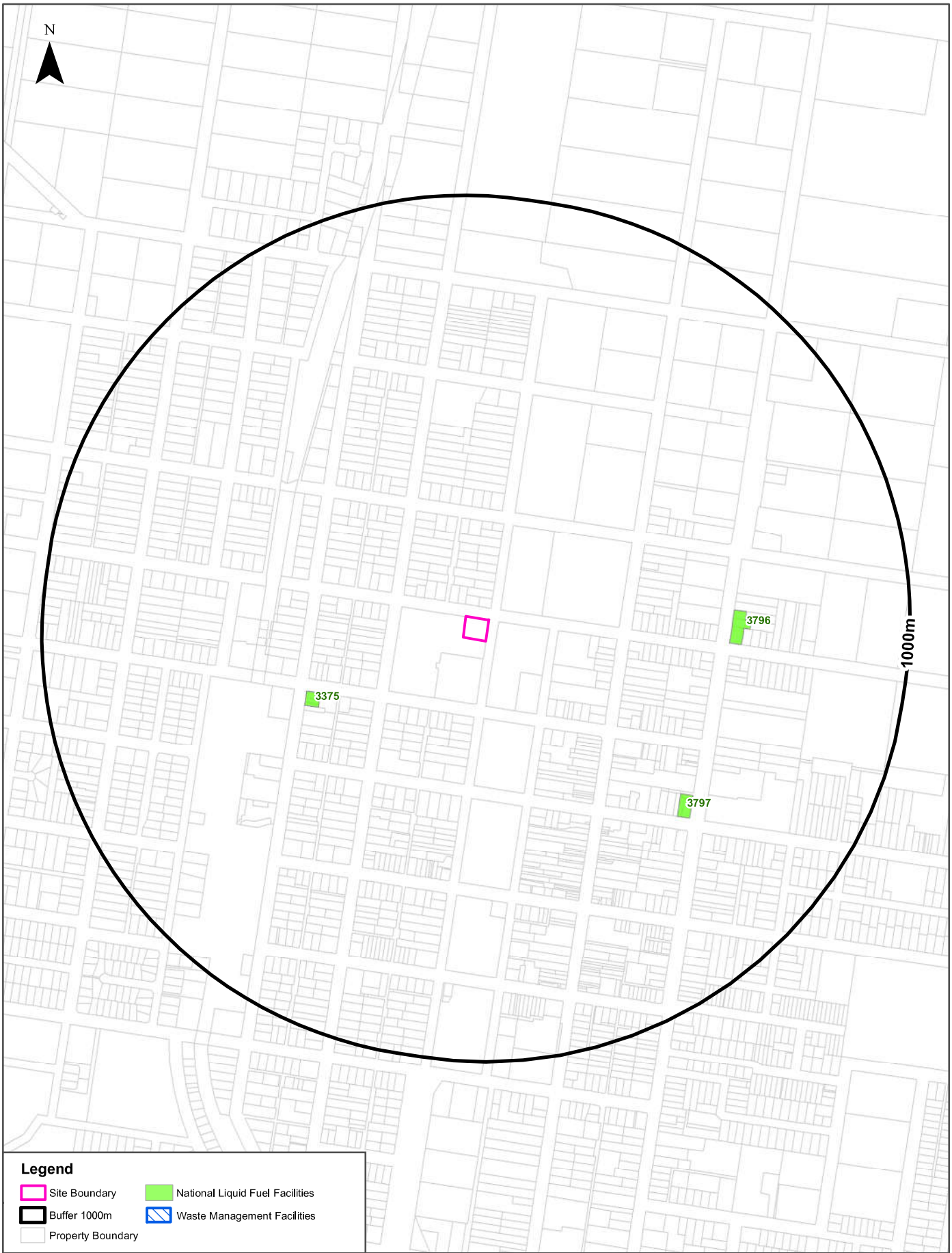
Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Waste Management & Liquid Fuel Facilities

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Waste Management & Liquid Fuel Facilities

94 Taylor Street, Glen Innes, NSW 2370

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

National Liquid Fuel Facilities

National Liquid Fuel Facilties within the dataset buffer:

Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist	Direction
3375	Shell	West End	143-145 Lambeth Street	Glen Innes	Petrol Station	Operational		25/07/2011	Premise Match	363m	South West
3796	Caltex	Woolworths Caltex Glen Innes	150-152 Taylor Street	Glen Innes	Petrol Station	Operational		25/07/2011	Premise Match	572m	East
3797	Caltex	Caltex Glen Innes	140-142 Meade Street	Glen Innes	Petrol Station	Operational		25/07/2011	Premise Match	587m	South East

National Liquid Fuel Facilities Data Source: Geoscience Australia
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PFAS Investigation & Management Programs

94 Taylor Street, Glen Innes, NSW 2370

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Map ID	Site	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Defence PFAS Investigation Program

Sites being investigated by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation Program Data Custodian: Department of Defence, Australian Government

Defence PFAS Management Program

Sites being managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

94 Taylor Street, Glen Innes, NSW 2370

Defence 3 Year Regional Contamination Investigation Program

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
N/A	No records in buffer					

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

EPA Other Sites with Contamination Issues

94 Taylor Street, Glen Innes, NSW 2370

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasminco Lead Abatement Strategy Area

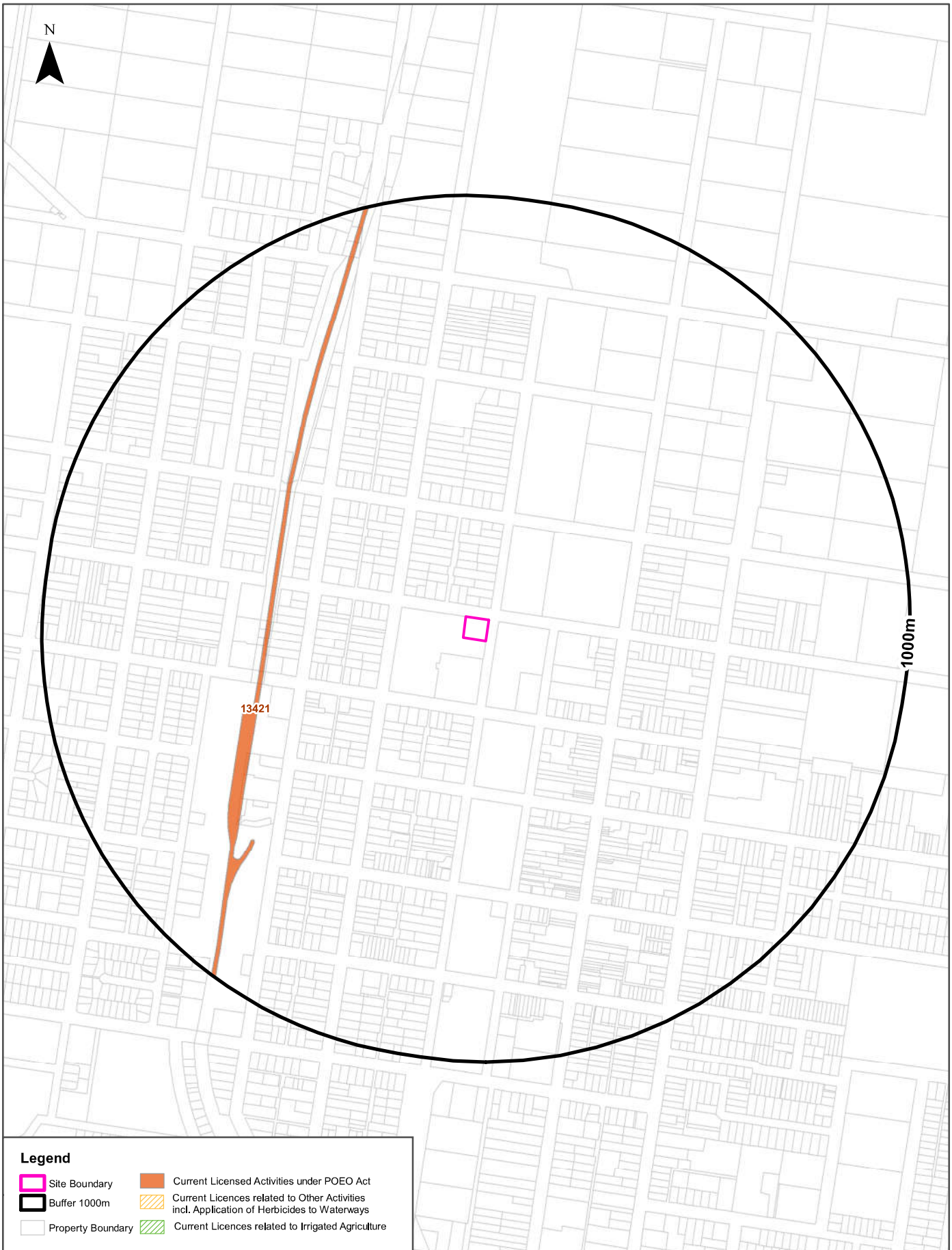
Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Current EPA Licensed Activities

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

EPA Activities

94 Taylor Street, Glen Innes, NSW 2370

Licensed Activities under the POEO Act 1997

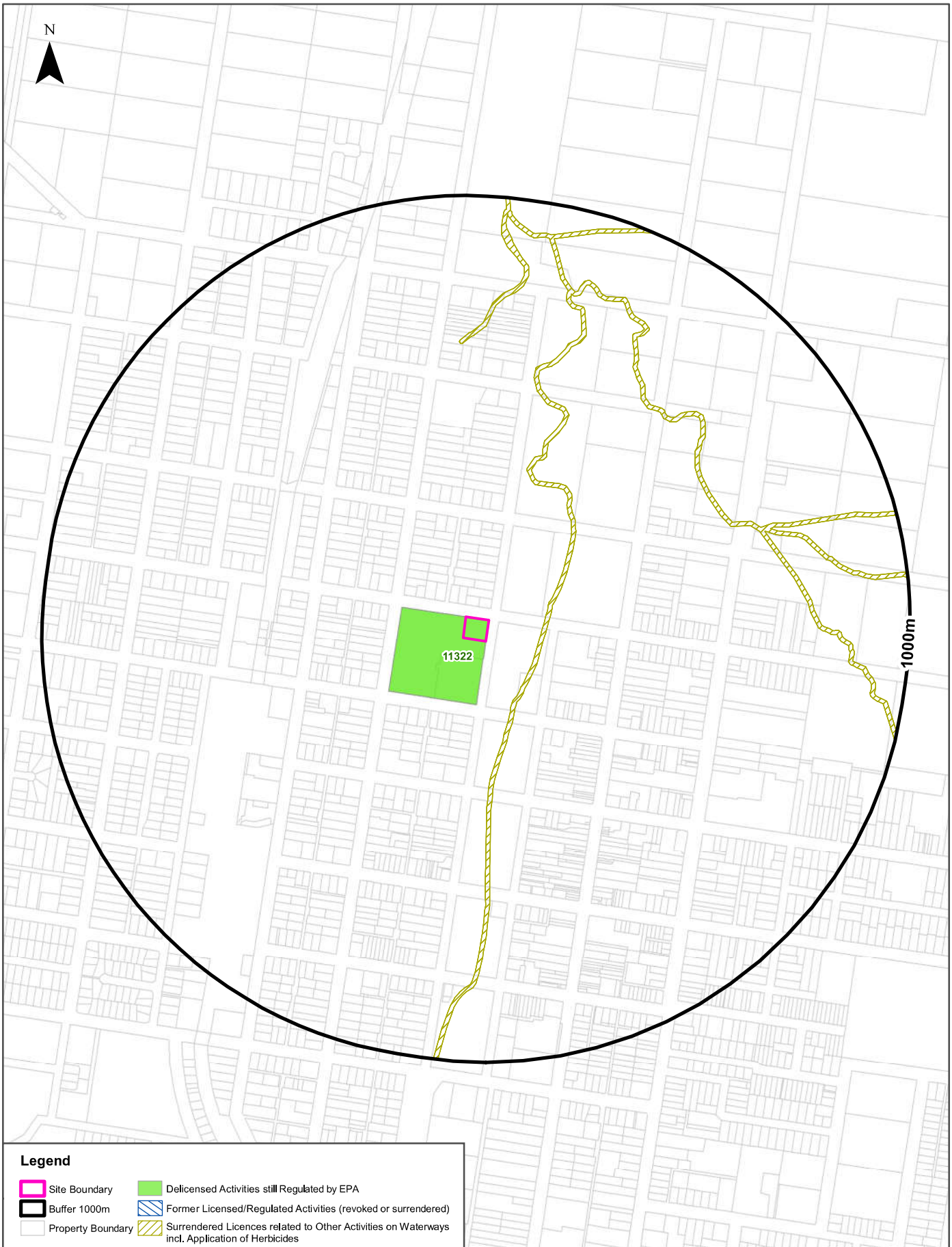
Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
13421	UGL REGIONAL LINX PTY LTD		COUNTRY REGIONAL NETWORK, ORANGE, NSW 2800		Railway systems activities	Network of Features	455m	West

POEO Licence Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Delicensed & Former Licensed EPA Activities

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 100 200 400 600 Meters

Property Boundary Data Source:
© Department Finance, Services & Innovation 2022

Coordinate System:
GDA 1994 MGA Zone 56

Date: 28 March 2022

EPA Activities

94 Taylor Street, Glen Innes, NSW 2370

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
11322	HUNTER AND NEW ENGLAND AREA HEALTH SERVICE	GLEN INNES HOSPITAL	TAYLOR STREET	GLEN INNES	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	0m	On-site

Delicensed Activities Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	121m	North East
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered	07/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	121m	North East
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered	09/11/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	121m	North East

Former Licensed Activities Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Historical Business Directories

94 Taylor Street, Glen Innes, NSW 2370

Legend

- Site Boundary
- Buffer 150m
- Property Boundary
- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- Business directory records mapped to a road corridor
- Business directory records mapped to a general area

Scale: 0 30 60 90 120 Meters

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018
Property Boundaries © NSW Department Finance, Services & Innovation 2022

Historical Business Directories

94 Taylor Street, Glen Innes, NSW 2370

Business Directory Records 1950-1991
Premise or Road Intersection Matches

Universal Business Directory records from years 1991, 1982, 1970, 1961 & 1950, mapped to a premise or road intersection within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
1	HOSPITALS &/OR HEALTH CENTRES	Glen Innes District Hospital, Taylor St., Glen Innes 2370	100096	1982	Premise Match	0m	On-site
	HOSPITALS &HEALTH CENTRES	Glen Innes District Hospital, Taylor St., Glen Innes 2370	649064	1970	Premise Match	0m	On-site
	HOSPITALS & HEALTH CENTRES	Glen innes District Hospital, Taylor St., Glen Innes	151165	1961	Premise Match	0m	On-site
	HOSPITALS	Glen Innes District Hospital, Macquarie St., Glen Innes	182199	1950	Premise Match	0m	On-site
2	PLUMBERS, GASFITTERS & DRAINLAYERS	Sleigh, H. J., 75 Manns Lane, Glen Innes 2370	649240	1970	Premise Match	70m	North
	PLUMBERS, GASFITTERS & DRAINLAYERS	Sleigh, H. J., 75 Manns Lane, Glen Innes	151354	1961	Premise Match	70m	North
	PLUMBERS, GASFITTERS & DRAINLAYERS	Sleigh, H. J., 75 Manns Lane, Glen Innes	183530	1950	Premise Match	70m	North
3	BUILDERS & BUILDING CONTRACTORS	Zeller, C. A., 180 West Ave., Glen Innes 2370	648925	1970	Premise Match	70m	North
4	FLOOR SANDING &/OR POLISHING CONTRACTORS	McKenzie, C. E., 182 West Ave., Glen Innes 2370	649016	1970	Premise Match	90m	North
	FRENCH POLISHERS	McKenzie, C. E., 182 West Ave., Glen Innes 2370	649020	1970	Premise Match	90m	North
	TILE FIXERS-FLOOR & WALL	McKenzie, C. E., 182 West Ave., Glen Innes 2370	649329	1970	Premise Match	90m	North
5	BUILDERS &/OR BUILDING CONTRACTORS	Zeller, C. A. & Co., 135 Macquarie St., Glen Innes 2370	99930	1982	Premise Match	138m	North West

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Business Directory Records 1950-1991
Road or Area Matches

Universal Business Directory records from years 1991, 1982, 1970, 1961 & 1950, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
6	ASSOCIATIONS &/OR SOCIETIES,	Amateur Swimming Club, West Ave., Glen Innes 2370	99839	1982	Road Match	0m
	ASSOCIATIONS &/OR SOCIETIES,	Glen Innes District Tennis Association, West Ave., Glen Innes 2370	99856	1982	Road Match	0m
	INSURANCE BROKERS	Samuel, Richard Insurance Broker, West Ave., Glen Innes 2370	100104	1982	Road Match	0m
	SHEARING CONTRACTORS	Callaghan, J., West Ave., Glen Innes	151399	1961	Road Match	0m
	CARRIERS & CARTAGE CONTRACTORS	Fenton, A., 166 West St., Glen Innes	182034	1950	Road Match	0m
	CARRIERS & CARTAGE CONTRACTORS	Kiehne, R., West Ave., Glen Innes	182041	1950	Road Match	0m
	TIMBER MERCHANTS	Mangleson and Son, West Ave., Glen Innes	183614	1950	Road Match	0m
7	MOTOR BUS SERVICES	Black & White Motor Services, Taylor St., Glen Innes 2370	100168	1982	Road Match	0m
	CARRIERS &/OR CARTAGE CONTRACTORS	McLeans Transport, Taylor St., Glen Innes 2370	99966	1982	Road Match	0m
	ROAD TRANSPORT SERVICES - INTERSTATE	McLeans Transport, Taylor St., Glen Innes 2370	100297	1982	Road Match	0m
	ROAD TRANSPORT SERVICES - INTRASTATE	McLeans Transport, Taylor St., Glen Innes 2370	100300	1982	Road Match	0m
	MOTOR BUS SERVICES	Black & White Motor Services, Taylor St., Glen Innes 2370	649152	1970	Road Match	0m
	BUILDERS & CONTRACTORS	Marr, Hardy Construction Co., Taylor St., Glen Innes	150974	1961	Road Match	0m
	INSURANCE AGENTS	Smith, L. B., Taylor St., Glen Innes	151192	1961	Road Match	0m
	MILK VENDORS	Stiles, K., Taylor St., Glen Innes	151235	1961	Road Match	0m
8	ASSOCIATIONS &/OR SOCIETIES,	Town & Country Club, East Ave., Glen Innes 2370	99886	1982	Road Match	144m
	MOTOR BUS SERVICES	Black & White Motor Services, East Ave., Glen Innes	151261	1961	Road Match	144m
	MOTOR OIL & SPIRIT DEPOTS	Total Oil Co., East Ave., Glen Innes	151297	1961	Road Match	144m
	MOTOR CAR & TRUCK DEALERS	Boughton, T. J., East Ave., Glen Innes	182273	1950	Road Match	144m

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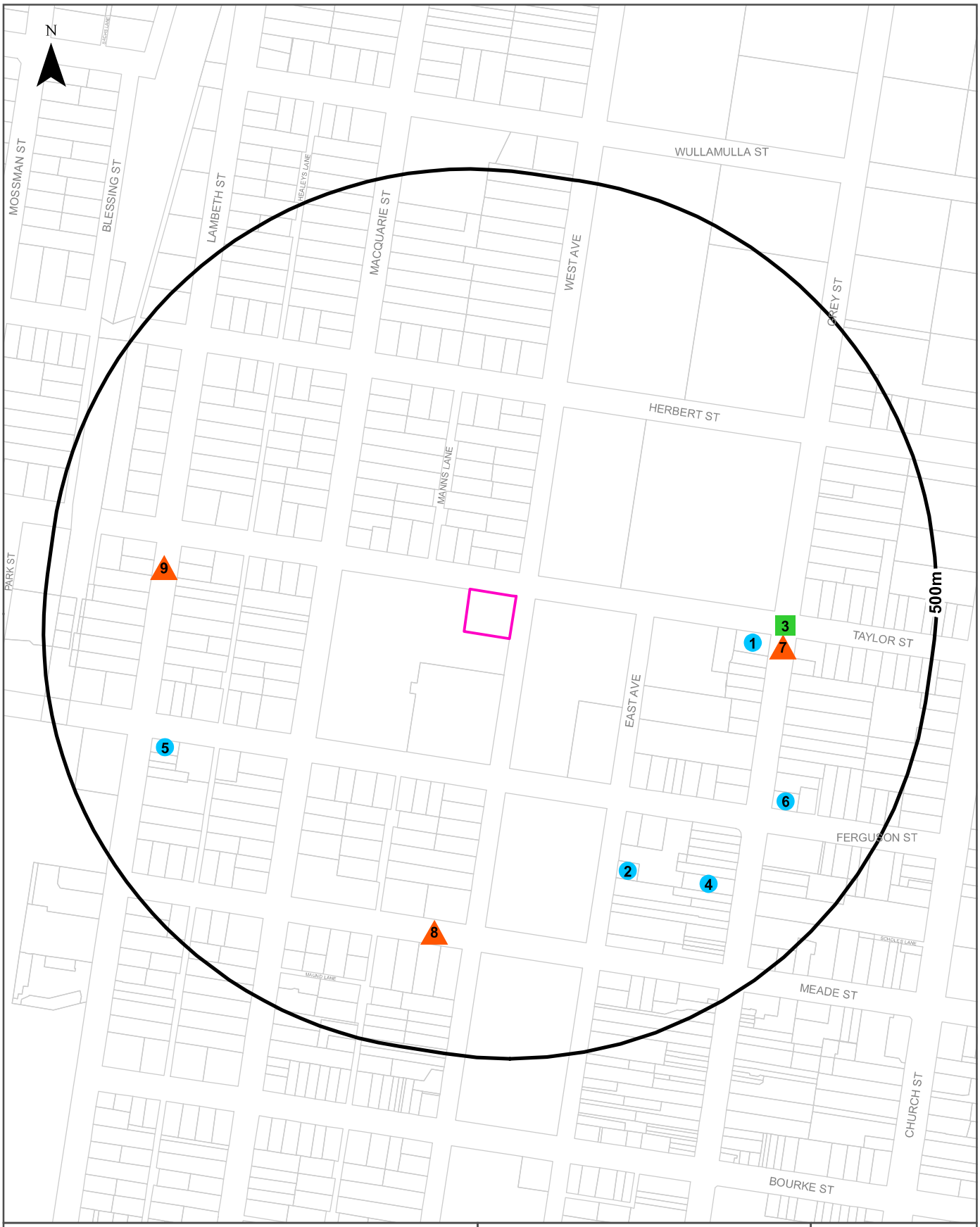
Dry Cleaners, Motor Garages & Service Stations

94 Taylor Street, Glen Innes, NSW 2370



Legend

- Site Boundary
- Buffer 500m
- Property Boundary
- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- Business directory records mapped to a road corridor
- Business directory records mapped to a general area

Scale: 0 80 160 240 320 Meters

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018
Property Boundaries © NSW Department Finance, Services & Innovation 2022

Historical Business Directories

94 Taylor Street, Glen Innes, NSW 2370

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
1	MOTOR GARAGES & ENGINEERS	Byrne Motors, 404 Grey St., Glen Innes	151280	1961	Premise Match	265m	East
2	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Halliday's Toyota, 65 East St., Glen Innes 2370	100197	1982	Premise Match	294m	South East
	MOTOR GARAGES & ENGINEERS	Boughton, T. J., 65 East Ave., Glen Innes	182280	1950	Premise Match	294m	South East
	MOTOR GARAGES & ENGINEERS	Wharton's Garage, 65 East Ave., Glen Innes	182294	1950	Premise Match	294m	South East
3	MOTOR GARAGES & ENGINEERS	Currie, D. H., Cnr. Grey & Taylor Sts., Glen Innes 2370	649176	1970	Road Intersection	322m	East
4	MOTOR GARAGES & ENGINEERS	Dunns Garage, 352 Grey St., Glen Innes	151282	1961	Premise Match	347m	South East
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Dunns Garage, 352 Grey St., Glen Innes	151303	1961	Premise Match	347m	South East
	MOTOR GARAGES & ENGINEERS	Dunn's Garage, 352 Grey St., Glen Innes	182283	1950	Premise Match	347m	South East
5	MOTOR GARAGES & SERVICE STATIONS.	Shell West End Service Station., 203 Ferguson St., Glen Innes	207268	1991	Premise Match	363m	West
	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	BP West End Service Station, 203 Ferguson St., Glen Innes 2370	100188	1982	Premise Match	363m	West
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	West End Service Station, Cnr. Ferguson & Lambeth Sts., Glen Innes 2370	649208	1970	Premise Match	363m	West
	MOTOR GARAGES & ENGINEERS	Rendell, D. E., 145 Lambeth St., Glen Innes	182293	1950	Premise Match	363m	West
6	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	BP Elm Service Station, 373 Grey St., Glen Innes 2370	100186	1982	Premise Match	363m	South East
	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	BP Elm Service Station, 373 Grey St., Glen Innes 2370	649197	1970	Premise Match	363m	South East
	MOTOR GARAGES & ENGINEERS	Elm Service Station, 373 Grey St., Glen Innes	151283	1961	Premise Match	363m	South East
	MOTOR GARAGES & ENGINEERS	Elm Service Station, 373 Grey St., Glen Innes	182284	1950	Premise Match	363m	South East
	MOTOR GARAGES & ENGINEERS	Morton, J., 373 Grey St., Glen Innes	182292	1950	Premise Match	363m	South East

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Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
7	MOTOR GARAGES & ENGINEERS	Boughton, T. J., Grey St., Glen Innes	151279	1961	Road Match	307m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Boughton, T. J., Grey St., Glen Innes	151302	1961	Road Match	307m
8	MOTOR SERVICE STATIONS-PETROL, OIL, ETC.	B.P. Glen Service Station, Meade St., Glen Innes 2370	649198	1970	Road Match	344m
	MOTOR GARAGES & ENGINEERS	Alcocks Garage and Service Station, Meade St, Glen Innes	182278	1950	Road Match	344m
9	MOTOR SERVICE STATIONS	Phill Archer's Free Shell Delivery Service, Lambeth Street, Glen Innes 2370	649213	1970	Road Match	346m

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Aerial Imagery 2021

94 Taylor Street, Glen Innes, NSW 2370

Scale:
0 25 50 75 100
Meters

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Coordinate System:
GDA 1994 MGA Zone 56

Date: 28 March 2022

Aerial Imagery 2013

94 Taylor Street, Glen Innes, NSW 2370

Scale: 0 25 50 75 100 Meters

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Coordinate System: GDA 1994 MGA Zone 56

Date: 24 March 2022

Aerial Imagery 2006

94 Taylor Street, Glen Innes, NSW 2370

Scale: 0 25 50 75 100 Meters

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Coordinate System: GDA 1994 MGA Zone 56

Date: 24 March 2022

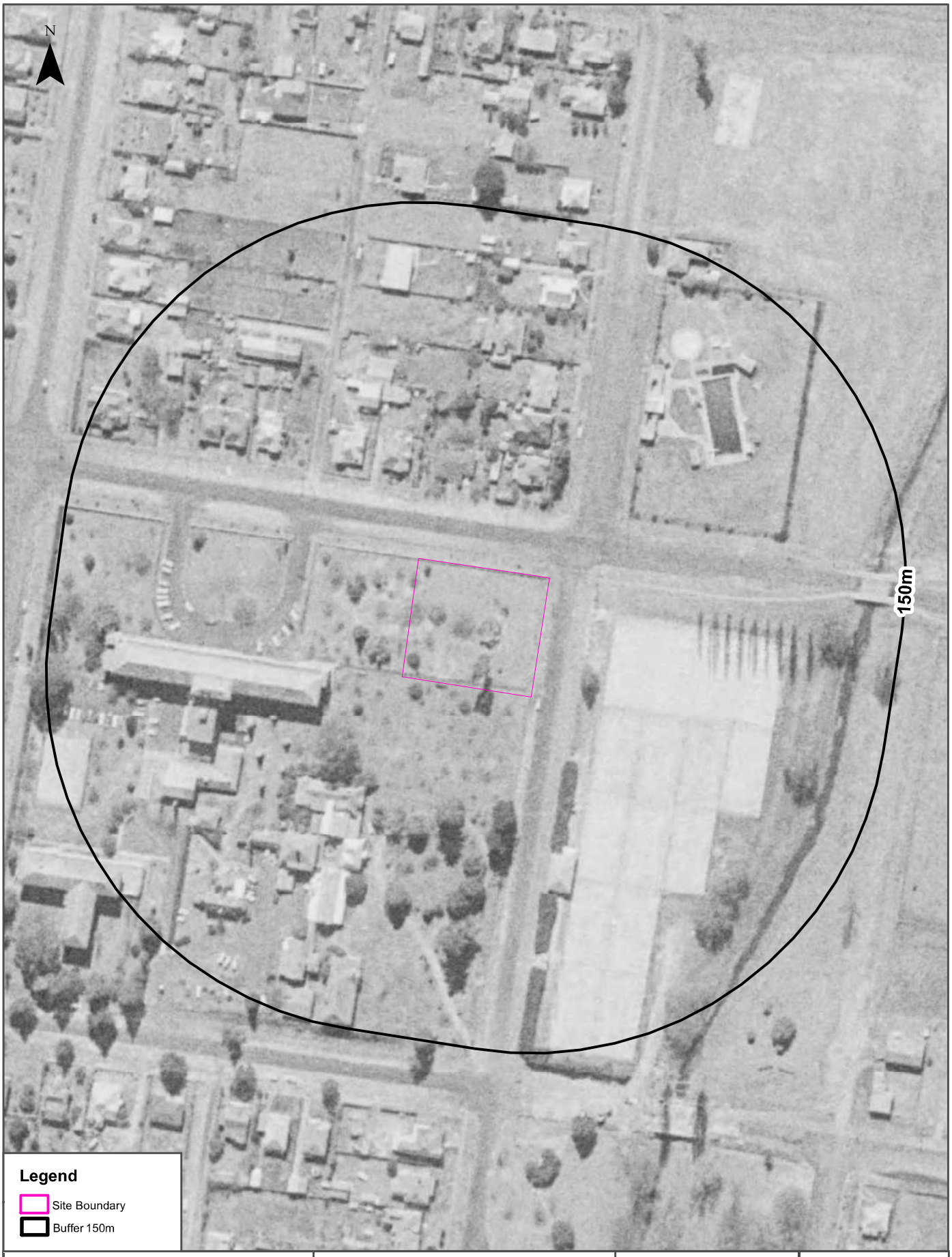
Aerial Imagery 1993

94 Taylor Street, Glen Innes, NSW 2370

Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 24 March 2022
0 25 50 75 100 Meters	© NSW Department of Customer Service	GDA 1994 MGA Zone 56	

Aerial Imagery 1985

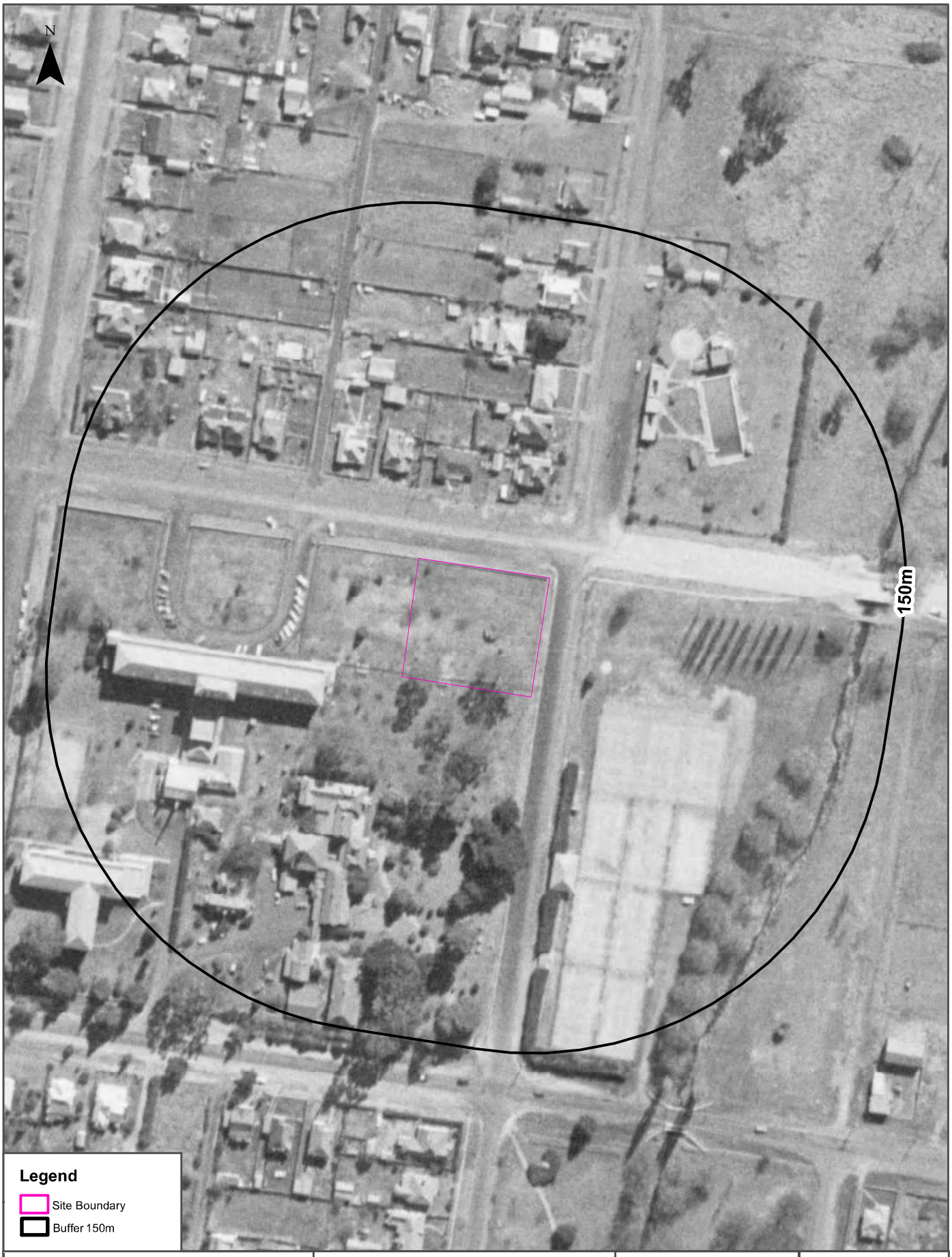
94 Taylor Street, Glen Innes, NSW 2370



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 24 March 2022
0 25 50 75 100 Meters	© NSW Department of Customer Service	GDA 1994 MGA Zone 56	

Aerial Imagery 1974

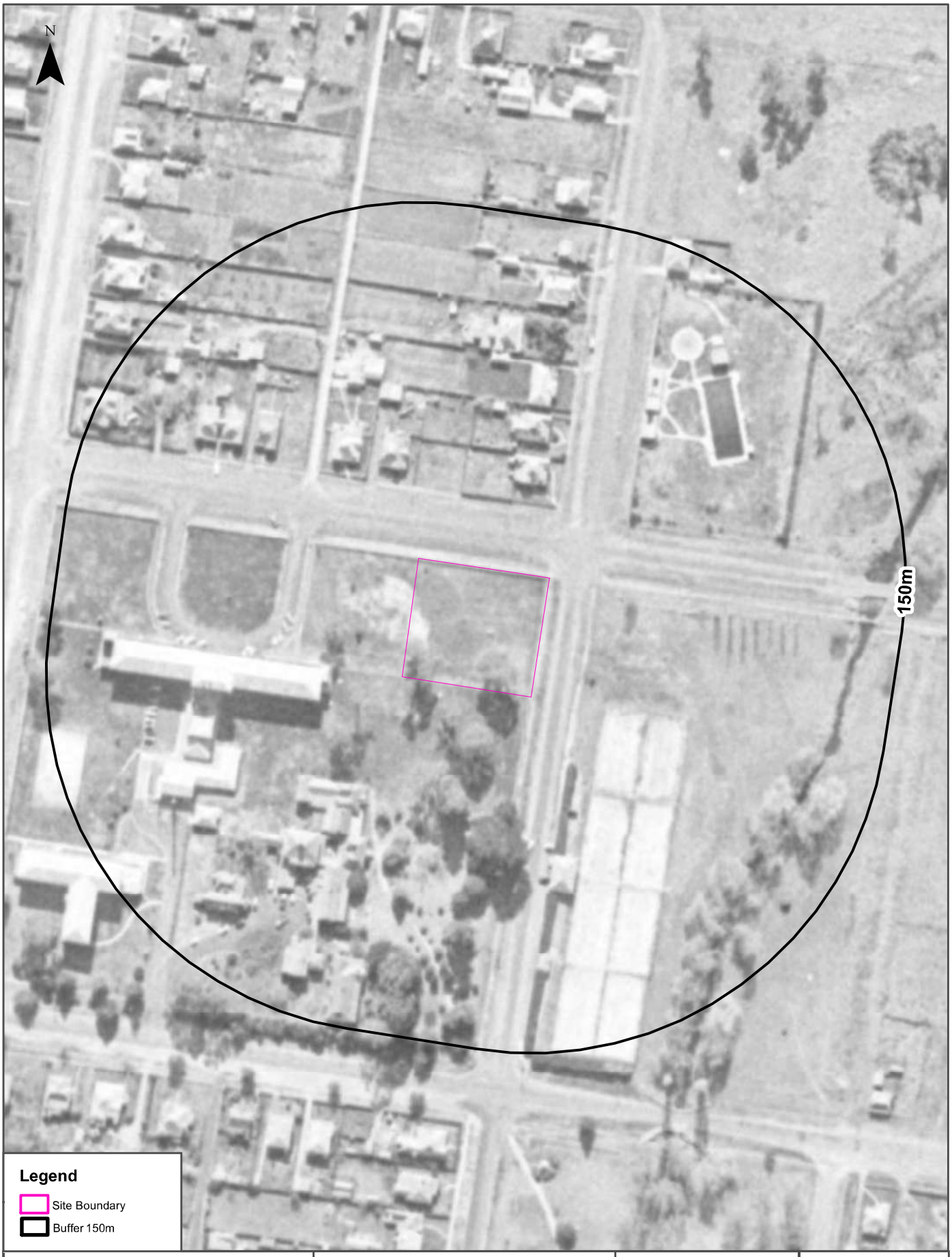
94 Taylor Street, Glen Innes, NSW 2370



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 24 March 2022
0 25 50 75 100 Meters	© NSW Department of Customer Service	GDA 1994 MGA Zone 56	

Aerial Imagery 1964

94 Taylor Street, Glen Innes, NSW 2370



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 24 March 2022
0 25 50 75 100 Meters	© NSW Department of Customer Service	GDA 1994 MGA Zone 56	

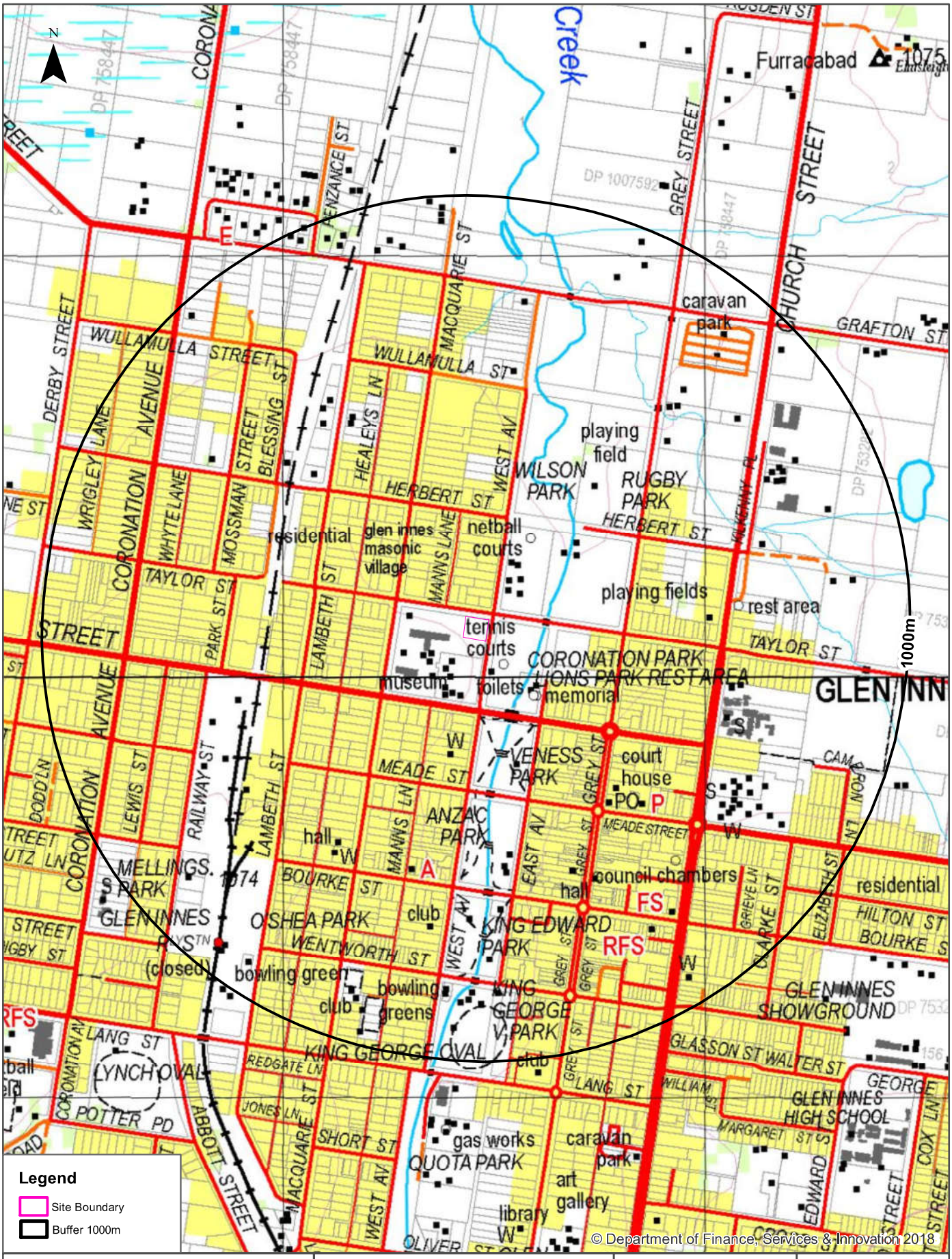
Aerial Imagery 1955

94 Taylor Street, Glen Innes, NSW 2370

Scale:	Data Source Aerial Imagery: ©2022 Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 56	Date: 24 March 2022
0 25 50 75 100 Meters			

Topographic Map 2015

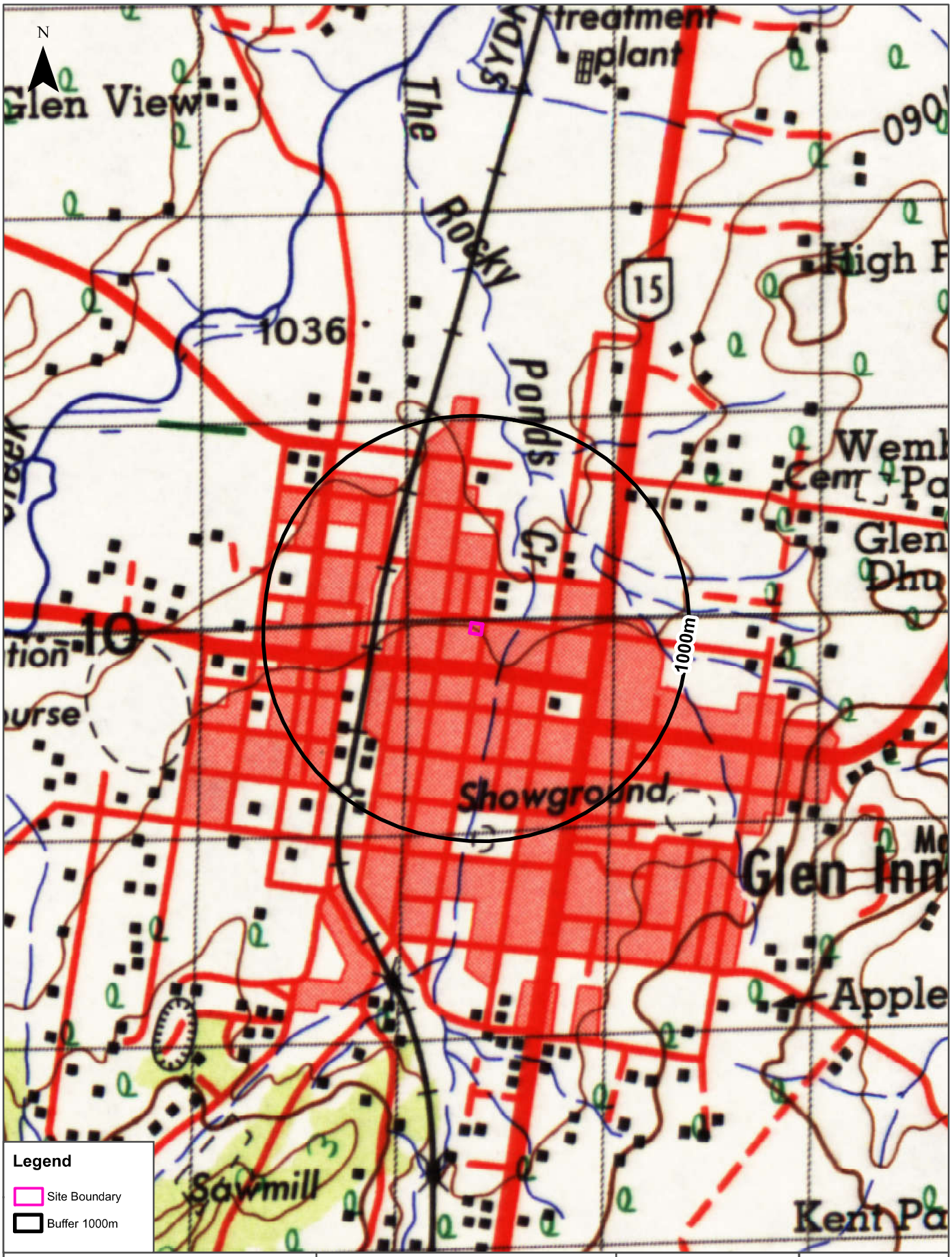
94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 140 280 420 560 Meters	Data Sources: Topographic Map Data © NSW Land and Property Information	Coordinate System: GDA 1994 MGA Zone 56	Date: 28 March 2022

Historical Map 1973

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 200 400 800 1,200 Metres

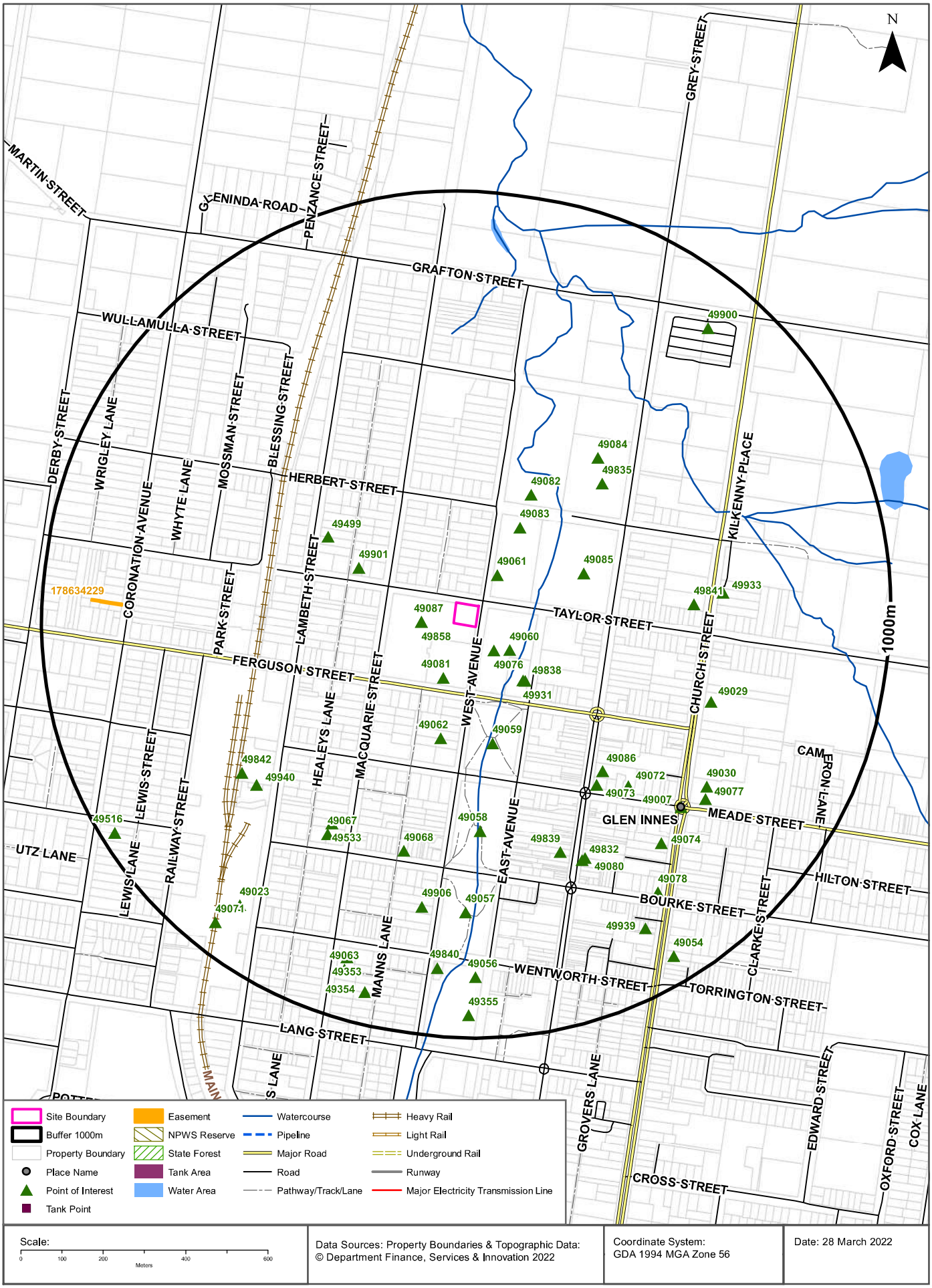
Data Sources: NATMAP 1:100,000 Topographic Maps Geoscience Australia

Coordinate System: GDA 1994 MGA Zone 56

Date: 25 March 2022

Topographic Features

94 Taylor Street, Glen Innes, NSW 2370



Site Boundary	Easement	Watercourse	Heavy Rail
Buffer 1000m	NPWS Reserve	Pipeline	Light Rail
Property Boundary	State Forest	Major Road	Underground Rail
Place Name	Tank Area	Road	Runway
Point of Interest	Water Area	Pathway/Track/Lane	Major Electricity Transmission Line
Tank Point			

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Topographic Features

94 Taylor Street, Glen Innes, NSW 2370

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
49076	Sports Court	TENNIS COURTS	72m	South East
49087	Integrated Health Service	GLEN INNES DISTRICT HEALTH SERVICE	77m	West
49858	Community Medical Centre	GLEN INNES DHS COMMUNITY HEALTH CENTRE	77m	West
49061	Swimming Pool Facility	Swimming Pool Facility	87m	North East
49060	Park	CORONATION PARK	100m	South East
49081	Museum	LAND OF THE BEARDIES MUSEUM	135m	South
49931	Roadside Rest Area	LIONS PARK REST AREA	174m	South East
49838	Monument	DECEASED LIONS MONUMENT	178m	South East
49083	Sports Court	NETBALL COURTS	215m	North East
49901	Retirement Village	GLENWOOD GARDENS	251m	North West
49085	Sports Field	PLAYING FIELDS	267m	East
49062	Place Of Worship	HOLY TRINITY ANGLICAN CHURCH	281m	South
49059	Park	VENESS PARK	286m	South
49082	Sports Field	WILSON PARK	299m	North East
49499	Community Home	RFBI GLEN INNES MASONIC VILLAGE	351m	North West
49835	Sports Field	RUGBY PARK	423m	North East
49084	Sports Field	PLAYING FIELD	462m	North East
49086	Court House	GLEN INNES COURT HOUSE	467m	South East
49073	Post Office	GLEN INNES POST OFFICE	483m	South East
49058	Park	ANZAC PARK	496m	South
49841	Community Facility	GLEN INSPORTS ARENA	522m	East
49072	Police Station	GLEN INNES POLICE STATION	536m	South East
49068	Ambulance Station	GLEN INNES AMBULANCE STATION	566m	South
49533	Community Facility	CAMERON MEMORIAL HALL	569m	South West
49839	Community Facility	GLEN INNES AND DISTRICT COMMUNITY CENTRE	585m	South
49933	Roadside Rest Area	REST AREA	593m	East
49067	Place Of Worship	CAMERON MEMORIAL UNITING CHURCH	597m	South West
49029	Primary School	GLEN INNES PUBLIC SCHOOL	600m	East
49940	Firestation - Bush	GLEN INNES SEVERN FIRE CONTROL CENTRE	619m	South West
49080	Local Government Chambers	GLEN INNES SEVERN COUNCIL	622m	South East
49832	Community Facility	GLEN INNES TOWN HALL	623m	South East

Map Id	Feature Type	Label	Distance	Direction
49842	Community Facility	NORTHSKATE GLEN INNES SKATING RINK	629m	South West
49007	Town	GLEN INNES	664m	South East
49030	Primary School	ST JOSEPH'S PRIMARY SCHOOL	682m	South East
49906	Club	NEW ENGLAND CLUB (THE)	692m	South
49074	Tourist Information Centre	GLEN INNES VISITOR INFORMATION CENTRE	692m	South East
49057	Park	KING EDWARD PARK	694m	South
49077	Place Of Worship	ST PATRICKS CATHOLIC CHURCH	697m	South East
49078	Fire Station	GLEN INNES FIRE STATION	782m	South East
49840	Community Facility	GLEN INNES SCOUTS	834m	South
49939	Community Facility	GLEN INNES RESCUE SQUAD	841m	South East
49056	Park	KING GEORGE V PARK	851m	South
49353	Sports Field	BOWLING GREEN	852m	South
49023	Park	O'SHEA PARK	860m	South West
49900	Tourist Park / Home Village	BLUE SAPPHIRE VILLAGE	875m	North East
49063	Club	GLEN INNES BOWLING CLUB	881m	South
49354	Sports Field	BOWLING GREENS	922m	South
49071	Railway Station	GLEN INNES RAILWAY STATION	929m	South West
49054	Place Of Worship	GLEN INNES BAPTIST CHURCH	934m	South East
49355	Sports Field	KING GEORGE OVAL	944m	South
49516	Park	MELLINGS PARK	967m	South West

Topographic Data Source: © Land and Property Information (2015)
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Topographic Features

94 Taylor Street, Glen Innes, NSW 2370

Tanks (Areas)

What are the Tank Areas located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
N/A	No records in buffer					

Tanks (Points)

What are the Tank Points located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
N/A	No records in buffer					

Tanks Data Source: © Land and Property Information (2015)
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Major Easements

What Major Easements exist within the dataset buffer?
Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
178634229	Primary	Right of way	6 & 5.5 wide	805m	West

Easements Data Source: © Land and Property Information (2015)
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Topographic Features

94 Taylor Street, Glen Innes, NSW 2370

State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

State Forest Data Source: © NSW Department of Finance, Services & Innovation (2018)
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National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the dataset buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N/A	No records in buffer				

NPWS Data Source: © NSW Department of Finance, Services & Innovation (2018)
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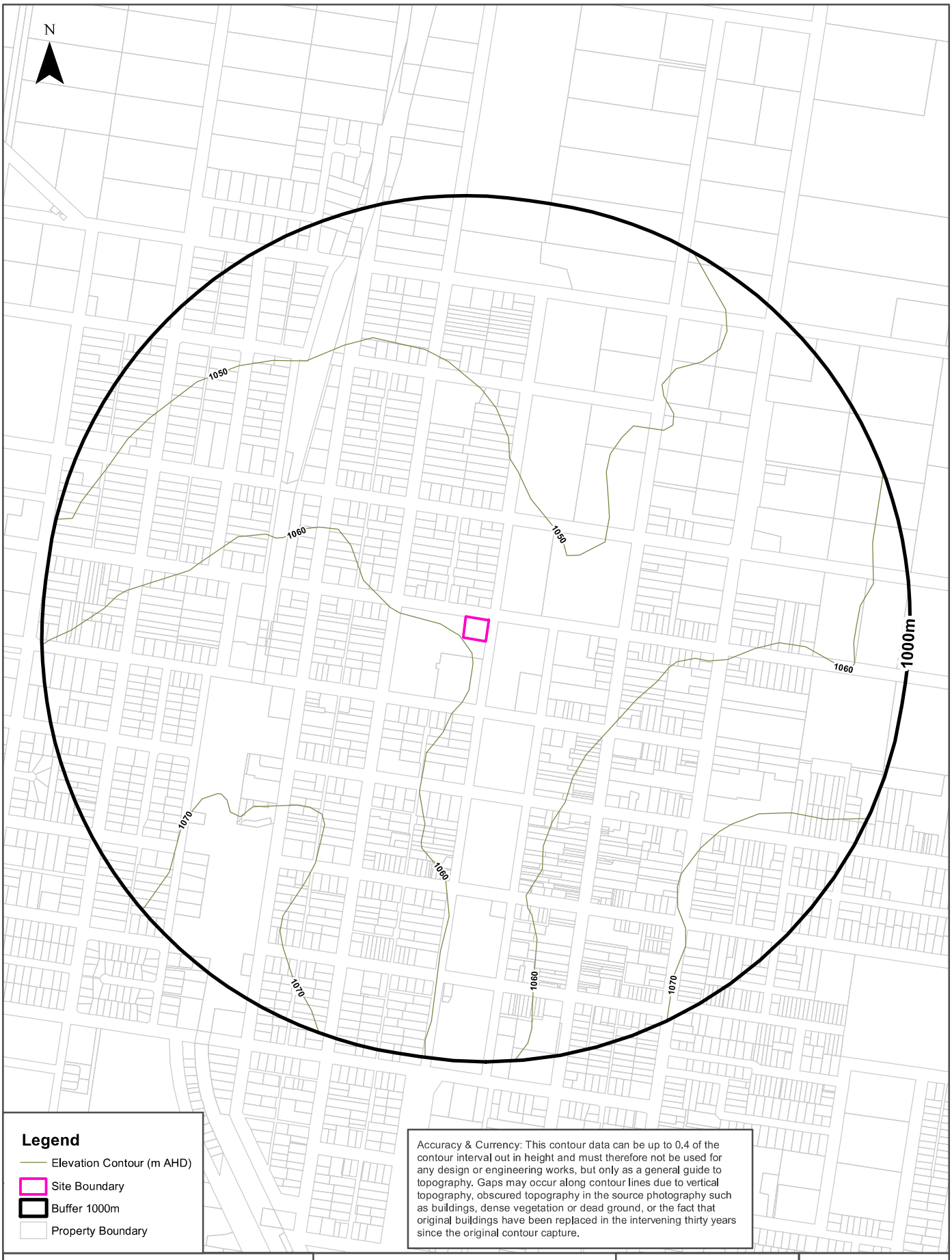
Elevation Contours (m AHD)

94 Taylor Street, Glen Innes, NSW 2370



Legend

- Elevation Contour (m AHD)
- Site Boundary
- Buffer 1000m
- Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale: 0 100 200 400 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Hydrogeology & Groundwater

94 Taylor Street, Glen Innes, NSW 2370

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Fractured or fissured, extensive aquifers of low to moderate productivity	0m	On-site

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)
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Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018

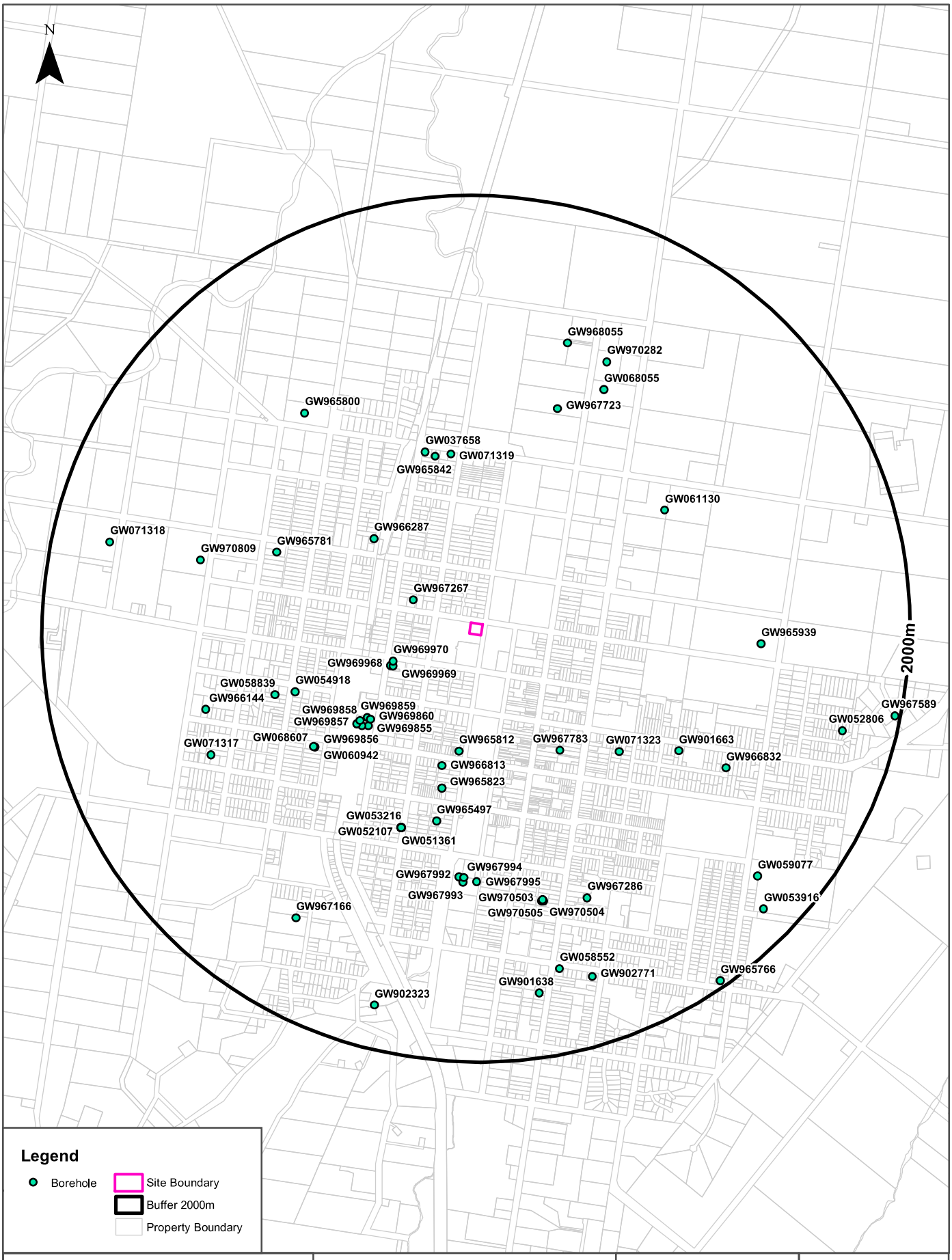
Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

Prohibition Area No.	Prohibition	Distance	Direction
N/A	No records in buffer		

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 Data Source : NSW Department of Primary Industries

Groundwater Boreholes

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 100 200 400 600 800 1,000 1,200 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Hydrogeology & Groundwater

94 Taylor Street, Glen Innes, NSW 2370

Groundwater Boreholes

Boreholes within the dataset buffer:

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m bgl)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW967267	90BL150342, 90WA825559	Bore	Private	Stock	Stock									287m	North West
GW969970	90BL252676	Bore	Private	Test Bore	Monitoring Bore		10/04/2005	9.00	9.00			4.300		378m	West
GW969969	90BL252675	Bore	Private	Monitoring Bore	Monitoring Bore		10/04/2005	9.00	9.00			4.300		386m	South West
GW969968	90BL252675	Bore	Private	Monitoring Bore	Monitoring Bore		10/04/2005	9.00	9.00		4.30			398m	South West
GW965812	90BL251079, 90WA825993	Bore	Private	Domestic	Domestic		31/10/2002	32.00	32.00		5.00	2.260		555m	South
GW966287	90BL154883, 90WA825647	Bore		Domestic, Stock	Domestic, Stock		15/06/1994	36.00	36.00					598m	North West
GW969860	90BL255273	Bore	Private	Monitoring Bore	Monitoring Bore		25/09/2009	9.00	9.00		3.50			614m	South West
GW969859	90BL255273	Bore	Private	Monitoring Bore	Monitoring Bore		25/09/2009	9.00	9.00		3.70			619m	South West
GW966813	90BL251693, 90WA826076	Bore	Private	Domestic	Domestic, Stock		09/10/2003	42.00	42.00		3.00	0.500		635m	South
GW969855	90BL255273	Bore	Private	Monitoring Bore	Monitoring Bore		25/09/2009	9.00	9.00		3.60			642m	South West
GW967783	90BL253540, 90BL254151	Bore		Commercial, Industrial (low Security), Test Bore	Test Bore		11/08/2006	47.00	47.00		11.00			656m	South East
GW969858	90BL255273	Bore	Private	Monitoring Bore	Monitoring Bore		24/09/2009	9.00	9.00		3.70			656m	South West
GW969856	90BL255273	Bore	Private	Monitoring Bore	Monitoring Bore		23/09/2009	9.00	9.00		3.50			664m	South West
GW969857	90BL255273	Bore	Private	Monitoring Bore	Monitoring Bore		24/09/2009	9.00	9.00		3.50			677m	South West
GW965823	90BL251048, 90WA825987	Bore		Domestic	Domestic		05/08/2002	23.00	23.00		6.00	1.134		738m	South
GW071319	90BL152602, 90WA825599	Bore - Artesian Licence		Domestic, Stock	Domestic		29/06/1993	21.00	21.00	350				793m	North
GW965842	90BL251103, 90WA825996	Bore	Private	Domestic	Domestic, Stock		10/11/2002	55.00	55.00		1.00	2.520		794m	North
GW037658		Well	Private		Domestic, Stock			10.60						826m	North
GW071323	90BL152581, 90WA825596	Bore		Domestic			01/01/1993	51.00	51.00		13.00	0.160		848m	South East

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m bgl)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW054 918	90BL118 524, 90WA82 5089	Bore open thru rock	Private	Domestic	General Use		01/02/1982	39.60	39.60	Good				859m	West
GW965 497	90BL248 422, 90WA82 6808	Bore		Recreation (groundwater)	Recreation (groundwater)		28/01/1997	44.00	44.00					894m	South
GW060 942	90BL132 448, 90WA82 5305	Bore	Private	Domestic, Stock	Domestic, Stock		01/03/1985	53.30						896m	South West
GW068 607	90BL141 873, 90WA82 5463	Bore	Private	Domestic	Domestic			0.00						902m	South West
GW058 839	90BL124 217, 90WA82 5232	Bore open thru rock	Private	Domestic	Domestic		01/11/1982	25.90	25.90	Good				953m	West
GW965 781	90BL251 078, 90WA82 5992	Bore	Private	Domestic	Domestic		18/10/2002	32.00	32.00		7.00	2.520		964m	West
GW051 361	90BL112 974, 90WA82 4895	Bore	Private	Domestic, Stock	Not Known			54.30						965m	South
GW052 012	90BL116 130, 90WA82 5005	Bore open thru rock	Private	Domestic	Irrigation		01/11/1980	70.00	70.00	Fresh				965m	South
GW052 107	90BL118 572, 90WA82 5098	Bore	Private	Domestic	General Use		01/02/1981	67.00						965m	South
GW052 338	90BL118 590, 90WA82 5101	Bore	Private	Domestic	General Use		01/02/1981	21.30	21.30					965m	South
GW052 406	90BL117 555, 90WA82 5060	Bore	Private	Domestic	General Use		01/01/1981	18.90	18.90	Good				965m	South
GW052 610	90BL119 091, 90WA82 5121	Well	Private	Domestic	Not Known			12.20		Hard				965m	South
GW053 020	90BL116 968, 90BL133 839, 90WA82 5319	Bore	Private	Domestic, Irrigation, Stock	Irrigation		01/11/1980	25.20	25.20	501-1000 ppm				965m	South
GW053 216	90BL118 639, 90WA82 6808	Bore	Private	Recreation (groundwater)	Irrigation		01/02/1981	44.20	44.20	Good				965m	South
GW053 336	90BL120 626, 90CA82 6752	Bore	Private	Domestic, Irrigation, Stock	Recreation (groundwater)		01/02/1981	66.80	66.80					965m	South
GW054 440	90BL116 092, 90WA82 5000	Bore	Private	Domestic, Stock	General Use		01/10/1980	19.80	19.80	0-500 ppm				965m	South
GW054 447	90BL116 128, 90WA82 5004	Bore	Private	Domestic	General Use		01/01/1981	13.70	13.70	Good				965m	South
GW054 909	90BL118 501, 90WA82 5083	Spear Filter Pack	Private	Domestic	General Use		01/02/1981	20.10	20.10	Good				965m	South

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m bgl)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW054916	90BL118523, 90WA825088	Bore	Private	Domestic, Stock	Domestic, Stock		01/04/1981	44.50	44.50	Good				965m	South
GW054925	90BL118552, 90WA825095	Bore open thru rock	Private	Domestic	Domestic		01/02/1981	16.80	16.80	Good				965m	South
GW070905	90BL152736, 90BL249173, 90WA825856	Bore		Domestic, Industrial, Stock	Industrial		20/06/1993	11.00		270			1070.00	965m	South
GW061130	90BL132821, 90WA825309	Bore	Private	Farming, Stock	Stock		01/04/1985	25.90	25.90					1005m	North East
GW967723	90BL253556	Bore		Domestic, Stock	Domestic, Stock		23/09/2006	30.00	30.00					1069m	North
GW901663	90BL249414, 90WA825869	Bore		Domestic	Domestic		18/02/1999	30.00	30.00	Good	12.00	0.875		1073m	South East
GW967992	90BL254222	Bore	Private	Monitoring Bore	Monitoring Bore		15/01/2007	5.80	5.80		3.50			1138m	South
GW967994	90BL254222	Bore	Private	Monitoring Bore	Monitoring Bore		12/06/2007	7.50	7.50		4.50			1140m	South
GW967995	90BL254222	Bore	Private	Monitoring Bore	Monitoring Bore		17/01/2007	6.50	6.50		3.50			1157m	South
GW967993	90BL254222	Bore	Private	Monitoring Bore	Monitoring Bore		16/01/2007	7.50	7.50		5.50			1162m	South
GW068055	90BL139724, 90WA825410	Bore	Private	Domestic, Stock			24/05/1989	36.10	36.10		5.24	1.071		1237m	North East
GW965800	90BL251102, 90WA825995	Bore	Private	Domestic	Domestic		28/10/2002	32.00	32.00		1.00	1.890		1250m	North West
GW970505		Bore	Private		Monitoring Bore	Fossiker CP - MW3	14/11/2011	6.00	6.00					1273m	South
GW970503		Bore	Private		Monitoring Bore	Fossiker CP - MW1	14/11/2011	10.00	10.00					1279m	South
GW970504		Bore	Private		Monitoring Bore	Fossiker CP - MW2	14/11/2011	8.50	8.50					1281m	South
GW966144	90BL251763, 90WA826087	Bore		Domestic, Stock	Domestic		24/11/2003	32.00	32.00		3.00	2.520		1283m	West
GW970809	90WA832356	Bore	Private	Domestic, Stock	Domestic, Stock		17/02/2014	30.00	30.00		5.70	1.500		1296m	West
GW966832	90BL247642, 90WA825774	Bore		Domestic	Domestic		09/10/1995	35.00	35.05					1306m	South East
GW965939	90BL251118, 90WA825999	Bore	Private	Domestic	Domestic		11/11/2002	32.00	32.00		6.30	0.490		1308m	East
GW967286	90BL252844, 90WA826232	Bore		Domestic	Domestic		26/07/2005	54.00	54.00		14.00	1.134		1328m	South
GW071317	90BL152604, 90WA825601	Bore		Domestic, Stock	Domestic		30/06/1993	25.00	25.00	500				1335m	South West
GW970282	90WA819364	Bore	Private	Domestic, Stock	Domestic, Stock		09/03/2012	23.00	23.00		4.00	3.150		1359m	North East
GW968055	90BL254028	Bore	Private	Domestic, Stock	Domestic, Stock		27/04/2007	19.00	19.00		6.00	1.260		1374m	North

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m bgl)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW967166	90BL252469, 90WA826165	Bore		Domestic, Stock	Domestic, Stock		21/07/2005	32.00	32.00		6.00			1561m	South West
GW058552	90BL125130, 90WA825246	Bore	Private	Domestic	Domestic		01/04/1982	21.90	21.90	Good				1607m	South
GW902771	90BL247676, 90WA825775	Bore	Private	Domestic, Stock	Domestic		30/09/1995	48.00	48.00	0.36				1683m	South
GW901638	90BL248963, 90WA825841	Bore		Domestic	Domestic, Stock		22/05/1998	30.50	30.50	Potable	9.20	0.630		1699m	South
GW059077	90BL126990, 90CA826806	Bore	Private	Domestic, Irrigation, Stock	Irrigation		01/11/1982	43.00	43.00	Good				1720m	South East
GW071318	90BL152603, 90WA825600	Bore		Domestic, Stock	Domestic, Stock		28/06/1993	48.00	48.00	250				1728m	West
GW052806	90BL113993, 90WA824929	Bore open thru rock	Private	Domestic	General Use		01/07/1980	75.30	75.30	0-500 ppm				1750m	East
GW902323	90BL246714	Bore	Private	Domestic	Domestic		22/03/1995	50.30	50.30			0.015		1799m	South
GW053916	90BL117223, 90CA826806	Bore open thru rock	Private	Domestic, Irrigation, Stock	Irrigation		01/10/1980	42.70	42.70	Fresh				1845m	South East
GW965766	90BL251046, 90WA825986	Bore	Private	Domestic	Domestic		15/09/2002	106.00	106.00					1970m	South East
GW967589	90BL250463, 90WA825954	Bore		Domestic, Stock	Domestic, Stock		08/03/2002	112.20	112.20					1974m	East

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores © Commonwealth of Australia (Bureau of Meteorology) 2015. Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

Hydrogeology & Groundwater

94 Taylor Street, Glen Innes, NSW 2370

Driller's Logs

Drill log data relevant to the boreholes within the dataset buffer:

Groundwater No	Drillers Log	Distance	Direction
GW969970	0.00m-3.50m Sandy Clay 3.50m-5.50m Basalt, weathered, grey 5.50m-9.00m Basalt, fresh, hard	378m	West
GW969969	0.00m-3.50m Sandy Clay, hard, dry 3.50m-5.50m Basalt, weathered 5.50m-9.00m Basalt, grey, fresh	386m	South West
GW969968	0.00m-3.50m Sandy Clay, hard, dry 3.50m-5.50m Basalt, weathered 5.50m-9.00m Basalt, grey, fresh	398m	South West
GW965812	0.00m-3.00m topsoil/black 3.00m-8.00m clay/brown 8.00m-15.00m fractured basalt 15.00m-24.00m basalt/dark 24.00m-31.00m basalt/water bearing 31.00m-32.00m sand	555m	South
GW966287	0.00m-1.00m TOPSOIL 1.00m-6.00m RED CLAY 6.00m-9.00m BASALT 9.00m-13.00m CLAY 13.00m-18.00m BASALT 18.00m-20.00m BASALT 20.00m-28.00m BASALT 28.00m-30.00m BASALT 30.00m-36.00m BASALT	598m	North West
GW969860	0.00m-1.00m Gravel, grey, medium grained, firmly packed 1.00m-1.50m Clay, dark brown, soft, with red mottles 1.50m-2.50m Clay, dark brown, soft 2.50m-4.00m Clay, Gravelly; dark brown, medium grained 4.00m-9.00m Basalt/Volcanic, dark brown, weathered, highly fractured	614m	South West
GW969859	0.00m-1.50m Clay, brown, <10% medium grained gravel, soft clay 1.50m-5.50m Clay, grey, soft 5.50m-9.00m Basalt/Volcanic, dark green, very hard, fractured	619m	South West
GW966813	0.00m-0.30m topsoil 0.30m-10.00m clay 10.00m-18.00m basalt 18.00m-30.00m basalt 30.00m-42.00m basalt	635m	South
GW969855	0.00m-1.50m Fill; darkg rey to light brown clay, some gravel 1.50m-3.00m Fill; stiff brown clay, with medium grained 3.00m-4.00m Silty Clay, stiff, dark brown 4.00m-4.50m Silty Clay, dark brown, very fine grained 4.50m-6.00m Gravel, Clayey; dark brown, coarse grained weathered rock 6.00m-9.00m Rock, angular, weathered	642m	South West
GW967783	0.00m-3.00m topsoil 3.00m-15.00m basalt 15.00m-16.00m basalt 16.00m-17.00m water bearing basalt 17.00m-30.00m basalt 30.00m-33.00m grey clay /basalt 33.00m-35.00m basalt 35.00m-41.00m water bearing basalt 41.00m-47.00m basalt	656m	South East
GW969858	0.00m-1.00m Clay, grey, fine grained, soft 1.00m-1.80m Clay, dark brown, very fine grained 1.80m-2.30m Clay, grey, firm 2.30m-3.50m Clay, Gravelly; brown, medium grained 3.50m-5.50m Basalt, dark brown, fractured, some coarse gravel 5.50m-9.00m Basalt, dark brown, highly fractured	656m	South West
GW969856	0.00m-4.00m Clay, dark brown, very fine, soft, <10% subrounded gravel 4.00m-9.00m Clay, Gravelly; brown, medium grained, fine clay	664m	South West
GW969857	0.00m-1.00m Clay, brown, very fine grained, soft 1.00m-2.50m Clay, grey, very fine grained, <10% gravel 2.50m-4.50m Clay, Gravelly; dark grey, medium grained, soft clay, mottled 4.50m-5.50m Clay, Gravelly; as above, no more mottles 5.50m-9.00m Basalt/Westhered Rock/ dark brown/grey, fractured	677m	South West

Groundwater No	Drillers Log	Distance	Direction
GW965823	0.00m-2.00m top soil black 2.00m-6.00m clay/brown 6.00m-15.00m clay/sandy soft 15.00m-17.00m basalt/soft porous 17.00m-23.00m basalt/water bearing	738m	South
GW071319	0.00m-1.00m TOPSOIL & CLAY 1.00m-4.00m BROWN STONEY CLAY 4.00m-9.00m BLACK BROKEN BASALT 9.00m-15.00m FRESH BLACK BASALT 15.00m-18.00m BROKEN BASALT 18.00m-21.00m FRESH BLACK BASALT	793m	North
GW965842	0.00m-2.00m topsoil/black 2.00m-18.00m caly/soft red 18.00m-52.00m basalt/hard dark 52.00m-55.00m sand/ water	794m	North
GW054918	0.00m-0.91m Topsoil 0.91m-4.87m Clay Stoney 4.87m-18.59m Basalt 18.59m-18.89m Basalt Soft Water Supply 18.89m-20.12m Driller 20.12m-34.13m Basalt 34.13m-34.72m Basalt Porous Water Supply 34.72m-39.62m Rock	859m	West
GW058839	0.00m-0.91m Topsoil 0.91m-8.22m Basalt Broken 8.22m-24.07m Basalt Hard 24.07m-24.38m Basalt Soft Water Bearing 24.38m-25.90m Basalt Hard	953m	West
GW965781	0.00m-4.00m top soil/black 4.00m-8.00m basalt/brown 8.00m-18.00m basalt/medium 18.00m-25.00m basalt/softer 25.00m-26.00m sandy bar 26.00m-32.00m basalt/porous	964m	West
GW052012	0.00m-2.00m Topsoil 2.00m-15.00m Clay 15.00m-20.00m Basalt Decomposed 20.00m-70.00m Basalt	965m	South
GW052338	0.00m-0.40m Topsoil 0.40m-0.90m Clay Black 0.90m-4.20m Clay 4.20m-9.70m Basalt 9.70m-10.90m Basalt Loose Clay 10.90m-14.60m Basalt Loose Water Supply 14.60m-21.30m Basalt	965m	South
GW052406	0.00m-0.60m Topsoil 0.60m-5.18m Rock Yellow 5.18m-5.48m Basalt Broken 5.48m-11.58m Basalt 11.58m-11.89m Basalt Broken Coloured Water Supply	965m	South
GW053020	0.00m-0.50m Topsoil 0.50m-2.00m Gravel Clay 2.00m-4.00m Basalt 4.00m-8.50m Clay Red Buff 8.50m-12.50m Basalt 12.50m-24.00m Clay Yellow Gritty Water Supply 24.00m-25.15m Sandstone Water Supply	965m	South
GW053216	0.00m-0.60m Topsoil 0.60m-7.01m Basalt 7.01m-7.31m Basalt Soft 7.31m-17.06m Basalt Hard 17.06m-17.37m Basalt Soft Water Bearing 17.37m-42.06m Basalt Hard 42.06m-42.36m Basalt Soft 42.36m-44.19m Basalt Hard	965m	South
GW053336	0.00m-0.30m Topsoil 0.30m-0.90m Clay 0.90m-4.50m Basalt 4.50m-7.30m Clay 7.30m-9.10m Basalt 9.10m-12.80m Basalt Decomposed 12.80m-17.30m Clay Gravel 17.30m-18.80m Conglomerate 18.80m-22.80m Basalt Water Supply 22.80m-25.90m Clay 25.90m-41.30m Clay Basalt Water Supply 41.30m-66.80m Granite Water Supply	965m	South

Groundwater No	Drillers Log	Distance	Direction
GW054440	0.00m-0.60m Topsoil 0.60m-6.10m Rock Broken 6.10m-9.40m Basalt Clay Bands Water Supply 9.40m-19.80m Basalt Water Supply	965m	South
GW054447	0.00m-0.91m Topsoil 0.91m-4.57m Basalt Decomposed 4.57m-8.83m Basalt Soft 8.83m-9.44m Basalt Soft Broken Water Supply 9.44m-10.66m Basalt Hard 10.66m-11.58m Basalt Soft Water Supply 11.58m-12.49m Basalt Hard 12.49m-13.71m Clay Red	965m	South
GW054909	0.00m-1.21m Topsoil 1.21m-11.58m Basalt Hard 11.58m-13.71m Basalt Soft 13.71m-14.02m Clay Yellow 14.02m-14.32m Sand Water Supply 14.32m-20.11m Clay Red	965m	South
GW054916	0.00m-0.60m Topsoil 0.60m-1.52m Clay 1.52m-5.18m Basalt Broken 5.18m-15.54m Basalt Hard 15.54m-15.84m Basalt Soft Water Supply 15.84m-24.68m Basalt Hard 24.68m-24.99m Basalt Soft Water Supply 24.99m-44.49m Basalt Hard	965m	South
GW054925	0.00m-0.91m Topsoil 0.91m-8.22m Basalt 8.22m-14.63m Basalt Soft 14.63m-15.54m Basalt Porous Water Supply 15.54m-16.76m Basalt	965m	South
GW070905	0.00m-1.00m topsoil/clay 1.00m-5.00m black clay 5.00m-6.00m gravelly clay 6.00m-11.00m coarse gravel mix	965m	South
GW061130	0.00m-3.05m Topsoil 3.05m-15.24m Clay Red Yellow Grey Water Bearing 15.24m-18.29m Shale Water Bearing 18.29m-25.91m Rock Black Hard	1005m	North East
GW967723	0.00m-5.00m topsoil 5.00m-7.00m brown clay 7.00m-8.00m basalt 8.00m-21.00m grey clay 21.00m-25.00m water bearing basalt 25.00m-26.00m grey clay 26.00m-27.00m sandstone 27.00m-29.00m brown clay 29.00m-30.00m sand	1069m	North
GW901663	0.00m-30.00m (	1073m	South East
GW967992	0.00m-0.60m Sand 0.60m-5.80m Clay	1138m	South
GW967994	0.00m-0.30m Silt 0.30m-7.50m Clay	1140m	South
GW967995	0.00m-0.30m Silt 0.30m-0.70m Sand 0.70m-6.50m Clay	1157m	South
GW967993	0.00m-0.40m Gravel 0.40m-7.50m Clay	1162m	South
GW068055	0.00m-12.40m Black Mud 12.40m-13.40m Rotten Rock 13.40m-36.10m Black Basalt Even Broken From 32.14 - 33.45	1237m	North East
GW965800	0.00m-1.00m topsoil/brown 1.00m-6.00m clay/brown 6.00m-20.00m basalt/dark 20.00m-30.00m clay/grey 30.00m-32.00m sand/fine - water	1250m	North West
GW970505	0.00m-0.50m Silt, Gravelly; trace roots, brown, dry 0.50m-1.50m Silty Clay; brown, dry, @ 1m trace roots 1.50m-4.50m Silty Clay; brown, dry 4.50m-5.50m Silt, Clayey; light brown, dry, @ 5m trace gravel, brown 5.50m-6.00m Silt, Gravelly; trace clay, brown, dry	1273m	South
GW970503	0.00m-0.50m Fill; Concrete 0.50m-1.00m Sand, Silty; brown, moist 1.00m-7.00m Silty Clay; brown, moist, @ 2m wet, @ 3m moist, @ 5.5m light brown, @ 6m trace sand 7.00m-10.00m Silty Clay; brown, dry, @ 9.5m trace gravel, @ 10m silty Gravel, difficult penetration	1279m	South

Groundwater No	Drillers Log	Distance	Direction
GW970504	0.00m-0.50m Silt, Clayey; brown, trace gravel, dry 0.50m-5.00m Silty Clay; brown, slightly moist 5.00m-6.00m Silt, Clayey; light brown, trace sand, dry 6.00m-7.50m Silt, Sandy; trace clay, tight brown, dry 7.50m-8.50m Gravel, silty; trace clay, light brown, dry	1281m	South
GW966144	0.00m-10.00m clay/soft brown 10.00m-17.00m basalt/black 17.00m-26.00m basalt/water bearing porous 26.00m-32.00m basalt/fractured dark	1283m	West
GW970809	0.00m-0.50m Topsoil 0.50m-3.00m Clay 3.00m-13.00m Clay, & Basalt, soak 13.00m-22.00m Basalt 22.00m-23.00m Basalt; broken 23.00m-26.00m Clay 26.00m-30.00m Basalt	1296m	West
GW966832	0.00m-0.30m topsoil 0.30m-1.80m clay 1.80m-6.70m rock and clay 6.70m-12.10m basalt 12.10m-28.00m basalt 28.00m-29.50m basalt 29.50m-35.05m basalt	1306m	South East
GW965939	0.00m-0.30m Top soil 0.30m-6.00m clay 6.00m-12.40m basalt rocks 12.40m-13.70m water bearing basalt 13.70m-19.80m basalt 19.80m-20.70m water bearing basalt 20.70m-23.10m caly white 23.10m-32.00m basalt	1308m	East
GW967286	0.00m-2.00m topsoil 2.00m-4.00m fractured basalt 4.00m-6.00m brown clay 6.00m-12.00m fractured basalt 12.00m-47.00m basalt 47.00m-50.00m basalt 50.00m-52.00m water bearing basalt 52.00m-54.00m red clay	1328m	South
GW071317	0.00m-1.00m TOPSOIL & CLAY 1.00m-4.00m CLAYEY WEATHERED BASALT 4.00m-6.00m BROWN WEATHERED BASALT 6.00m-14.00m BLACK BASALT 14.00m-22.00m FRACTURED BASALT 22.00m-25.00m BLACK BASALT	1335m	South West
GW970282	0.00m-4.00m Topsoil, black 4.00m-12.00m Clay, brown 12.00m-18.00m Basalt, weathered/fractured 18.00m-21.00m Basalt, hard, dark 21.00m-23.00m Basalt, porous, dark	1359m	North East
GW968055	0.00m-5.00m Topsoil, black 5.00m-11.00m Fractured Basalt 11.00m-13.00m Fractured Basalt, large, black, water bearing 13.00m-19.00m Basalt, even drilling, dark	1374m	North
GW967166	0.00m-6.00m topsoil 6.00m-7.00m gravel 7.00m-12.00m basalt 12.00m-14.00m basalt 14.00m-17.00m clay 17.00m-30.00m basalt 30.00m-32.00m clay	1561m	South West
GW058552	0.00m-0.91m Topsoil 0.91m-6.70m Clay Stoney 6.70m-18.28m Basalt 18.28m-19.50m Basalt Soft 19.50m-20.42m Basalt Porous Water Supply 20.42m-21.94m Basalt Hard	1607m	South
GW902771	0.00m-6.00m Red brown clay 6.00m-15.00m Brown weathered basalt 15.00m-23.00m Black basalt 23.00m-24.00m Brown weathered basalt 24.00m-38.00m Black basalt 38.00m-40.00m Brown weathered basalt 40.00m-48.00m Black basalt	1683m	South
GW901638	0.00m-0.30m topsoil 0.30m-15.80m basalt - broken 15.80m-30.50m basalt	1699m	South

Groundwater No	Drillers Log	Distance	Direction
GW059077	0.00m-1.00m Topsoil 1.00m-12.00m Clay Coloured 12.00m-14.00m Basalt Decomposed Water Bearing 14.00m-32.00m Basalt Hard 32.00m-33.00m Basalt Porous Water Bearing 33.00m-43.00m Basalt Hard	1720m	South East
GW071318	0.00m-1.00m IRONSTONE 1.00m-2.00m BROWN CLAY 2.00m-5.00m BROWN/YELLOW CLAY 5.00m-11.00m GREY/ BLACK BASALT 11.00m-19.00m BROWN /RED CLAY 19.00m-23.00m GREY SOFT BASALT 23.00m-48.00m BLACK BASALT	1728m	West
GW052806	0.00m-15.24m Soft 15.24m-16.76m Basalt 16.76m-18.29m Clay Red Yellow Volcanic Wet Interlayere 18.29m-27.43m Basalt Soft Patchy 27.43m-60.96m Stones Or Basalt 60.96m-75.29m Basalt Water Bearing	1750m	East
GW902323	0.00m-0.60m Sandy Topsoil 0.60m-1.21m Grey Clay 1.21m-6.09m Weathered Basalt & Gravel 6.09m-16.76m Soft Weathered Basalt 16.76m-32.01m Dark Basalt 32.01m-50.30m Hard Dark Basalt	1799m	South
GW053916	0.00m-0.61m Topsoil 0.61m-6.10m Clay 6.10m-10.67m Basalt Decomposed 10.67m-42.67m Basalt Water Supply	1845m	South East
GW965766	0.00m-2.00m top soil/brown 2.00m-13.00m basalt/decomposed 13.00m-18.00m basalt/hard 18.00m-29.00m clay/brown 29.00m-49.00m basalt/med.drilling 49.00m-62.00m clay/dk. brown 62.00m-68.00m basalt/dk.hard 68.00m-82.00m basalt/porous - 0.151@water 82.00m-93.00m basalt/dk. hard 93.00m-95.00m basalt/water bearing - 0.44@water 95.00m-100.00m basalt/med. hard 100.00m-105.00m basalt/porous 105.00m-106.00m sand/fine - 2.25@water	1970m	South East
GW967589	0.00m-0.30m TOPSOIL 0.30m-12.20m BASALT 12.20m-15.20m BASALT 15.20m-46.30m RED CLAY 46.30m-112.20m BASALT	1974m	East

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp
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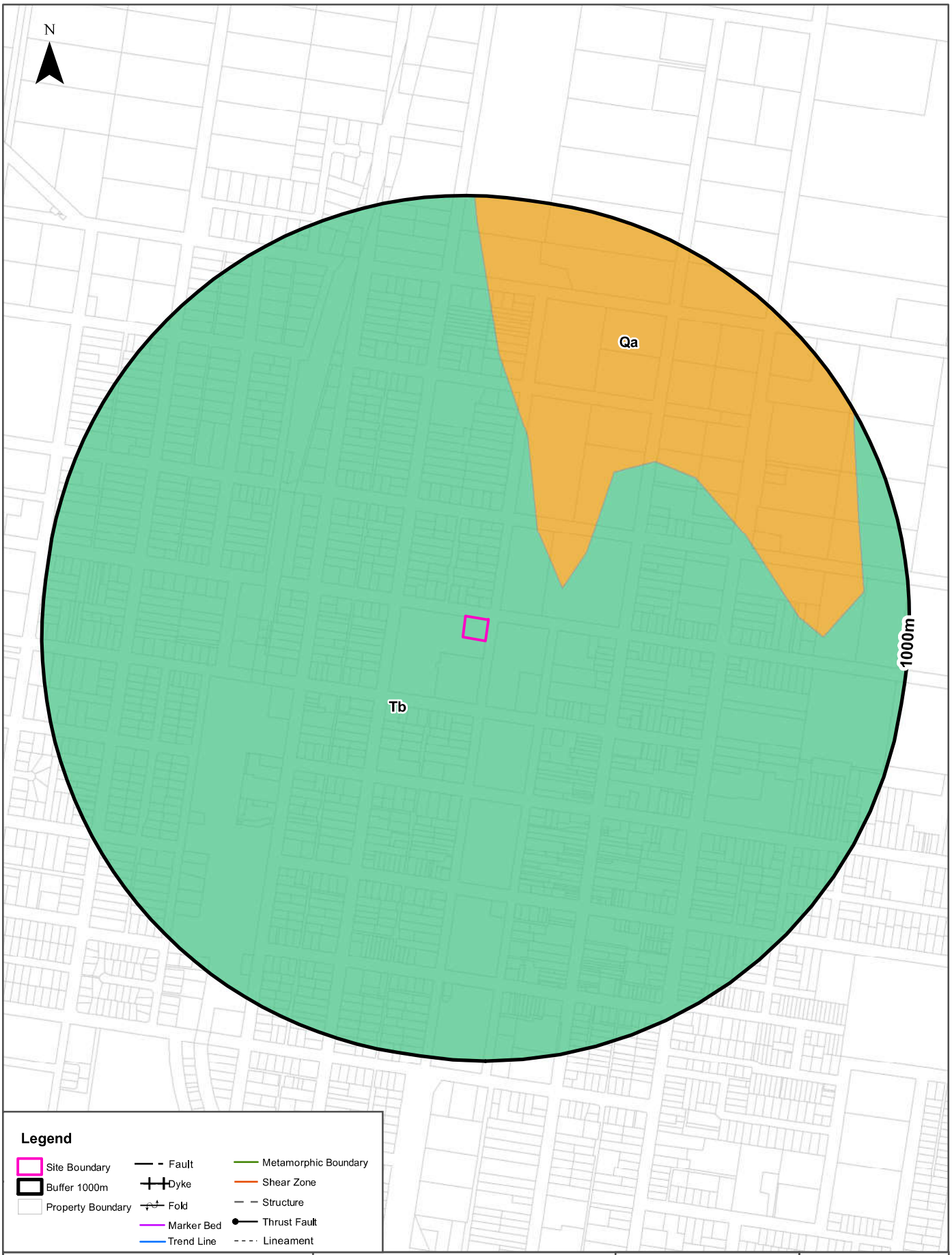
Geology

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Geology

94 Taylor Street, Glen Innes, NSW 2370

Geological Units 1:250,000

What are the Geological Units within the dataset buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dist	Dir
Tb	Basalt flows, minor basaltic volcaniclastics; basaltic vent & breccias includes alkali dolerite, basaltic diatreme breccia, all undifferentiated				Cainozoic	0m	On-site
Qa	Undifferentiated alluvial deposits; sand, silt, clay and gravel; some residual and colluvial deposits. Includes some channel, levee, lacustrine, flooplain and swamp deposits. May include some higher level Tertiary terraces				Cainozoic	190m	North East

Geological Structures 1:250,000

What are the Geological Structures within the dataset buffer?

Feature	Name	Description	Map Sheet	Distance	Direction
N/A	No records in buffer				

Geological Data Source : NSW Department of Industry, Resources & Energy
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Naturally Occurring Asbestos Potential

94 Taylor Street, Glen Innes, NSW 2370

Naturally Occurring Asbestos Potential

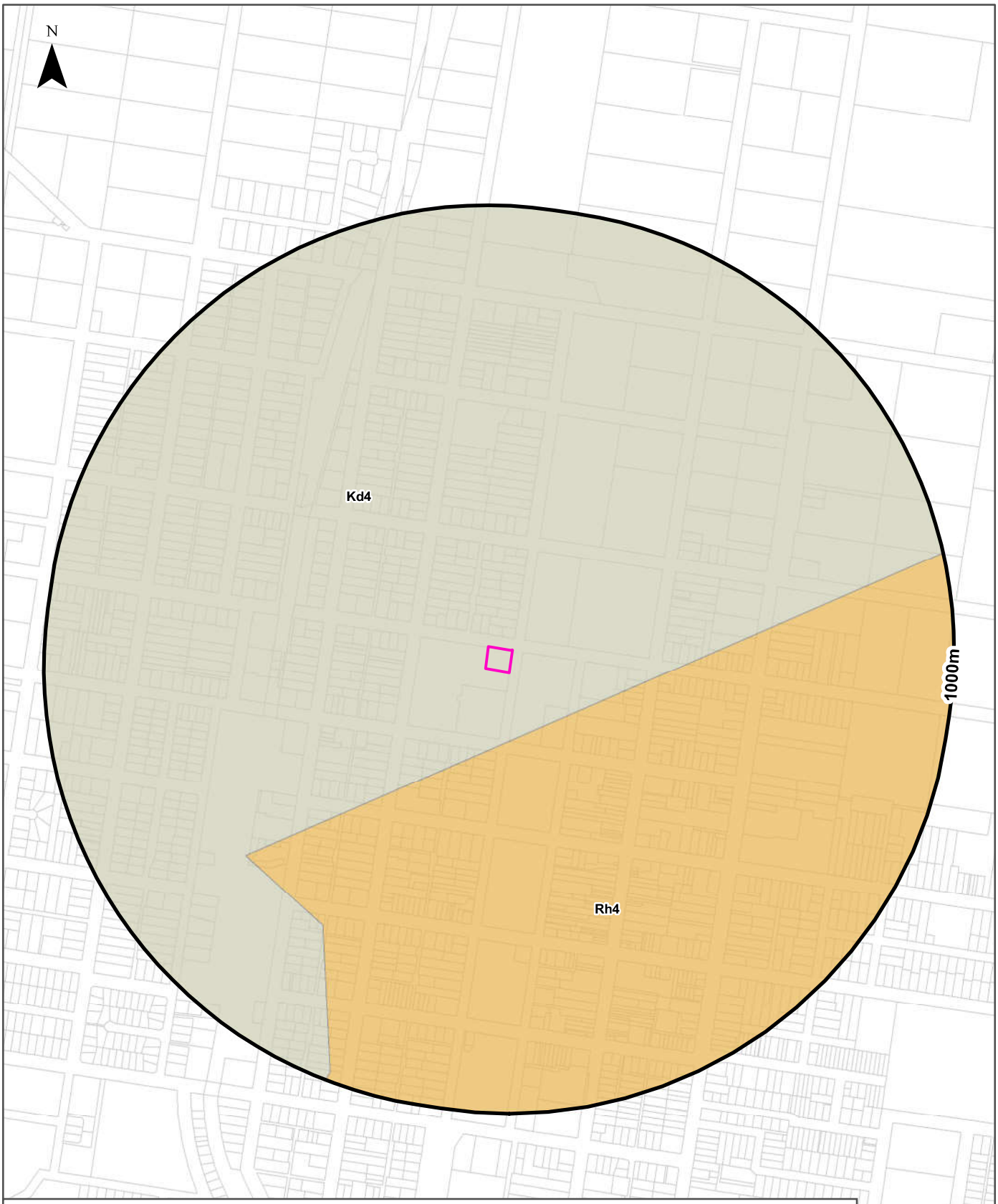
Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Naturally Occurring Asbestos Potential Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy

Atlas of Australian Soils

94 Taylor Street, Glen Innes, NSW 2370



Legend

- Site Boundary
- Buffer 1000m
- Property Boundary

Australian Soil Classification Orders

Anthroposol	Dermosol	Kandosol	Podosol	Tenosol	No Data
Calcarosol	Ferrosol	Kurosol	Rudosol	Vertosol	
Chromosol	Hydrosol	Organosol	Sodosol	Lake	

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Soils

94 Taylor Street, Glen Innes, NSW 2370

Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance	Direction
Kd4	Vertosol	Valley plains of dark cracking clays (Ug5.15 and Ug5.16). Associated are hillocks and valley side slopes of (Dr2) and (Dy3) soils; and soils locally peculiar to the various adjoining units. As mapped, the size of some areas of this unit tends to be exaggerated.	0m	On-site
Rh4	Chromosol	Dissected basaltic plateau--undulating to low hilly: chief soils are friable brown soils (Db3.12) with (Dr4.12) and shallow variants of (Gn3.12) on ridge crests, slopes, and undulating areas. Associated are (i) (Um6.2) soils on ridges; (ii) cracking clays such as (Ug5.13 and Ug5.14) on flanking slopes of ridges; and (iii) various (D) soils, such as (Dy3.2) and (Db1.2) often containing ironstone gravels, on the flatter areas. As mapped, areas of unit Kd4 are included.	142m	South East

Atlas of Australian Soils Data Source: CSIRO
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Acid Sulfate Soils

94 Taylor Street, Glen Innes, NSW 2370

Environmental Planning Instrument - Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

Soil Class	Description	EPI Name
N/A		

If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	EPI Name	Distance	Direction
N/A				

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Atlas of Australian Acid Sulfate Soils

94 Taylor Street, Glen Innes, NSW 2370

Legend

- Site Boundary
- Buffer 1000m
- Property Boundary

Probability of occurrence of Acid Sulfate Soils

- A. High (>70%)
- B. Low (6-70%)
- C. Extremely Low (1-5%)
- D. No Chance (0%)
- No Data

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28March 2022

Acid Sulfate Soils

94 Taylor Street, Glen Innes, NSW 2370

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance	Direction
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m	On-site

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO
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Dryland Salinity

94 Taylor Street, Glen Innes, NSW 2370

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

No

Is there Dryland Salinity - National Assessment data within the dataset buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A		

Dryland Salinity Data Source : National Land and Water Resources Audit
The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.
In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Mining

94 Taylor Street, Glen Innes, NSW 2370

Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

Mining Subsidence District Data Source: © Land and Property Information (2016)
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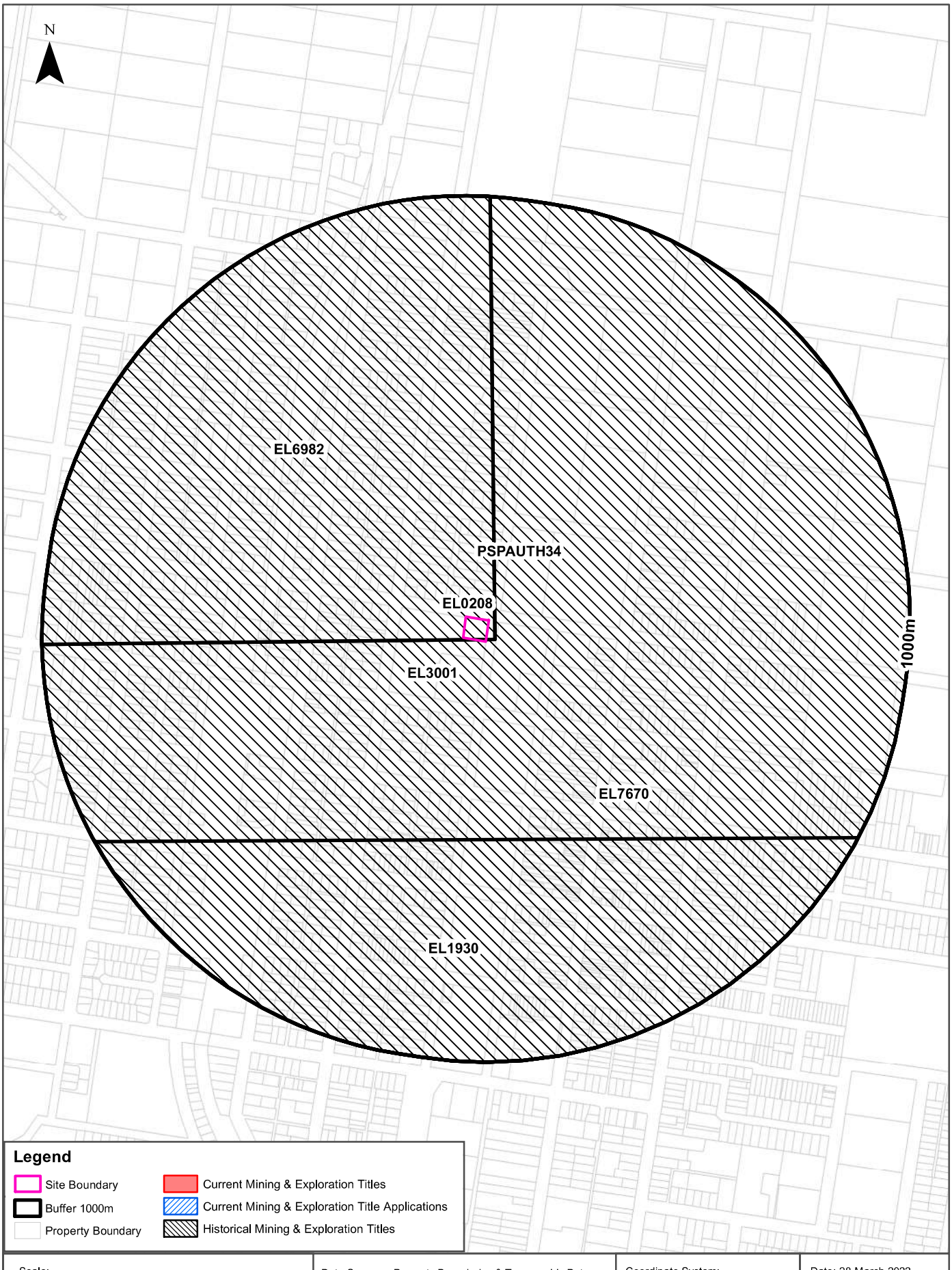
Mining & Exploration Titles

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Mining

94 Taylor Street, Glen Innes, NSW 2370

Current Mining & Exploration Titles

Current Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Grant Date	Expiry Date	Last Renewed	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer								

Current Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

Current Mining & Exploration Title Applications

Current Mining & Exploration Title Applications within the dataset buffer:

Application Ref	Applicant	Application Date	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer						

Current Mining & Exploration Title Applications Data Source: © State of New South Wales through NSW Department of Industry

Mining

94 Taylor Street, Glen Innes, NSW 2370

Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Start Date	End Date	Resource	Minerals	Dist	Dir
EL6982	AUSTRALIAN GEMSTONE RESOURCES PTY LTD	11 Dec 2007	26 Sep 2011	MINERALS	Sapphire	0m	On-site
EL0208	AUSTRALIAN OIL & GAS CORPORATION LIMITED	01 Oct 1969	01 Dec 1972	MINERALS	Mo Bi Sn W	0m	On-site
PSPAUTH34	PANGAEA OIL & GAS PTY LIMITED	11/11/2009	11/11/2010	PETROLEUM	Petroleum	0m	On-site
EL3001	MINSTOCK EXPLORATION LTD	15 Jan 1988	14 Jan 1994	MINERALS	Sapphire	0m	On-site
EL7670	PARNOSA PTY LTD	15 Nov 2011	16 Dec 2014	MINERALS	Sapphire Corundum Diamond Gemstone	0m	On-site
EL1930	AMAX IRON ORE CORPORATION	01 Sep 1982	01 Jun 1984	MINERALS	Sn	471m	South

Historical Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

State Environmental Planning Policy

94 Taylor Street, Glen Innes, NSW 2370

State Significant Precincts

What SEPP State Significant Precincts exist within the dataset buffer?

Map Id	Precinct	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
N/A	No records in buffer							

State Environment Planning Policy Data Source: NSW Crown Copyright - Planning & Environment
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EPI Planning Zones

94 Taylor Street, Glen Innes, NSW 2370

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022
Planning: NSW Crown Copyright - Planning & Environment

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Environmental Planning Instrument

94 Taylor Street, Glen Innes, NSW 2370

Land Zoning

What EPI Land Zones exist within the dataset buffer?

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
R1	General Residential		Glen Innes Severn Local Environmental Plan 2012	05/04/2019	05/04/2019	05/04/2019	Amendment No 3	0m	On-site
RE1	Public Recreation		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		23m	East
B2	Local Centre		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		166m	South East
IN1	General Industrial		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		328m	South West
IN1	General Industrial		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		419m	South West
B6	Enterprise Corridor		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		438m	East
SP2	Infrastructure	Railway Infrastructure Facilities	Glen Innes Severn Local Environmental Plan 2012	15/05/2015	15/05/2015	05/04/2019	Amendment No 2	449m	North West
IN1	General Industrial		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		480m	West
IN2	Light Industrial		Glen Innes Severn Local Environmental Plan 2012	15/05/2015	15/05/2015	05/04/2019	Amendment No 2	486m	South West
R1	General Residential		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		492m	West
B4	Mixed Use		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		556m	South West
IN1	General Industrial		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		581m	West
RE2	Private Recreation		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		647m	South
RU1	Primary Production		Glen Innes Severn Local Environmental Plan 2012	15/05/2015	15/05/2015	05/04/2019	Amendment No 2	776m	North
IN1	General Industrial		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		795m	North
RE2	Private Recreation		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		826m	South
IN1	General Industrial		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		894m	North West
IN1	General Industrial		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		896m	West
RE1	Public Recreation		Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	05/04/2019		920m	South West
IN1	General Industrial		Glen Innes Severn Local Environmental Plan 2012	15/05/2015	15/05/2015	05/04/2019	Amendment No 2	984m	North West

Environmental Planning Instrument Data Source: NSW Crown Copyright - Planning & Environment
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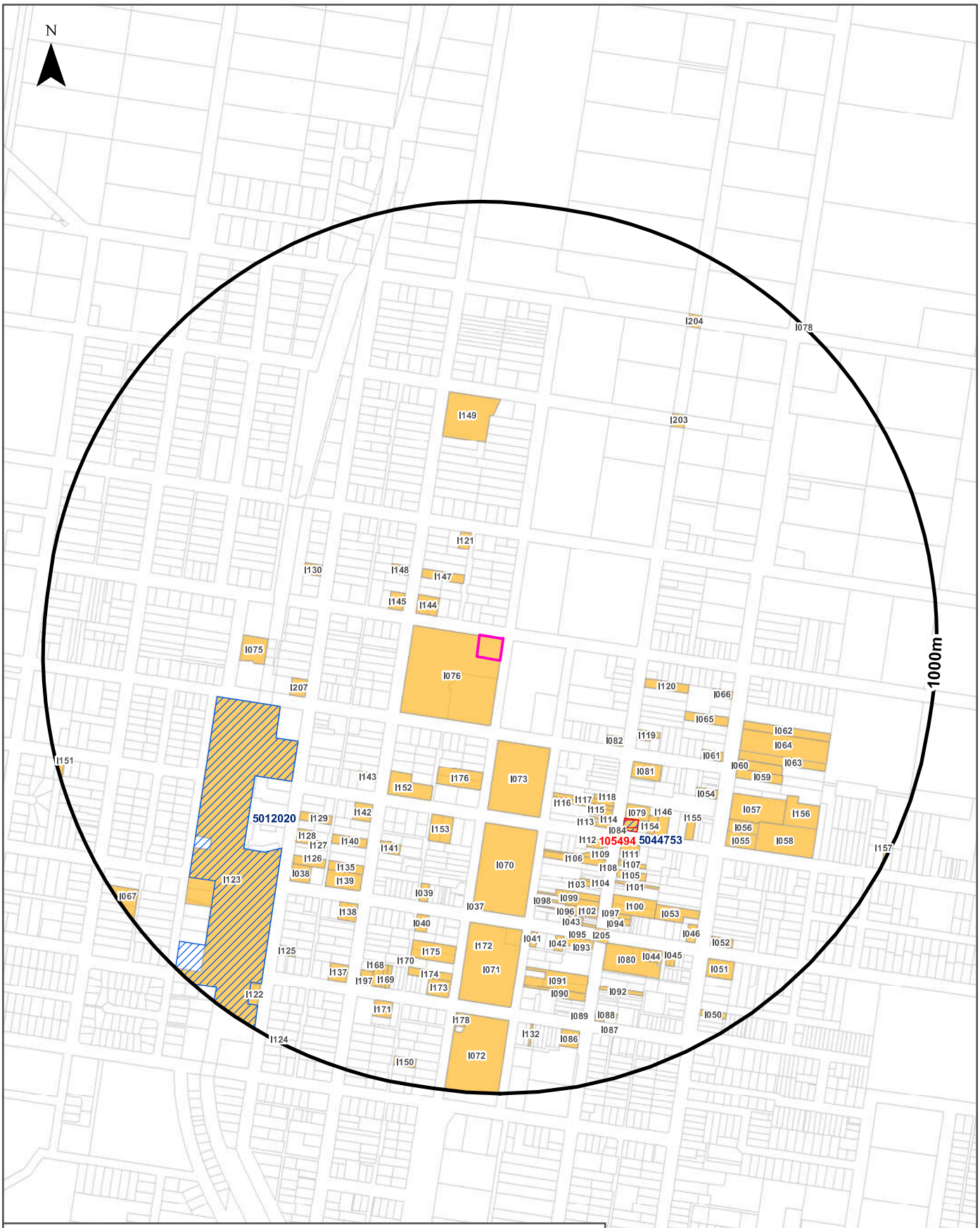
Heritage Items

94 Taylor Street, Glen Innes, NSW 2370



Legend

- Property Boundary
- Site Boundary
- Buffer 1000m
- Commonwealth Heritage List
- National Heritage List
- State Heritage Items
- EPI Heritage Items

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022
Heritage - NSW Crown Copyright - Planning & Environment

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Heritage

94 Taylor Street, Glen Innes, NSW 2370

Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
105494	Glen Innes Post Office	319 Grey St, Glen Innes NSW	1/02/152/0008	Historic	Listed place	08/11/2011	464m	South East

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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National Heritage List

What are the National Heritage List Items located within the dataset buffer?
Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
5012020	Glen Innes Railway station	Main Northern railway, Glenn Innes	GLEN INNES SEVERN	02/04/1999	01149	2780	455m	South West
5044753	Glen Innes Post and Telegraph Office	Grey Street, Glen Innes	GLEN INNES SEVERN	23/06/2000	01406	3115	464m	South East

Heritage Data Source: NSW Crown Copyright - Office of Environment & Heritage
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Environmental Planning Instrument - Heritage

What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I076	Land of the Beardies Museum (former hospital complex)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	0m	On-site
I144	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	108m	North West

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I147	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	124m	North West
I073	Veness Park	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	184m	South
I145	House -'Doonayr'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	186m	North West
I121	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	200m	North
I148	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	214m	North West
I176	Church	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	263m	South
I082	Commercial building-Boot Factory	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	299m	South East
I152	Anglican Vicarage	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	310m	South West
I117	Commercial building	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	329m	South East
I120	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	337m	East
I116	Commercial building -'Meyers Bakery Building'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	338m	South East
I119	House -'San Karo'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	355m	South East
I143	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	355m	South West
I153	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	374m	South
I070	Anzac Park	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	375m	South
I118	Commercial building	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	377m	South East
I081	Royal Hotel	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	384m	South East
I130	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	391m	North West
I207	Cottage	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	17/04/2020	17/04/2020	17/04/2020	393m	West
I115	Commercial building (former Pastures Protection Board)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	398m	South East
I113	Imperial Hotel	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	406m	South East
I114	Commercial building -'Milners Building'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	414m	South East
I142	House - 'Doonee'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	417m	South West
I079	Court house	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	441m	South East

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I065	House -'Lochiel'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	442m	East
I149	Highwood Garden	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	445m	North
I109	Shop	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	446m	South East
I106	Shop	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	449m	South
I123	Glen Innes Railway Station Group	Item - General	State	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	456m	South West
I112	Commercial building (former Bank of NSW)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	457m	South East
I084	Boer War Memorial	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	463m	South East
I083	Glen Innes Post and Telegraph Office	Item - General	State	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	464m	South East
I141	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	467m	South West
I075	Glen Innes Butter Factory	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	482m	West
I140	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	490m	South West
I066	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	494m	East
I154	Police station	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	495m	South East
I129	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	496m	South West
I146	Commercial building	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	502m	South East
I111	Central Hotel	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	505m	South East
I061	Residential flats	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	508m	South East
I110	Victorian shop	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	520m	South East
I108	The Central Building-offices	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	532m	South East
I104	Commercial building -'Supreme building'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	535m	South East
I103	Commercial building -bank	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	535m	South
I107	Shop and office - 'Healey's Building'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	536m	South East
I039	St John's Ambulance Station	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	537m	South
I054	Masonic Hall	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	539m	South East

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I099	Commercial School of Arts	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	540m	South
I135	Christina Cameron Memorial Hall	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	547m	South West
I127	Shop and house	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	549m	South West
I128	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	551m	South West
I105	Commercial building-bank	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	552m	South East
I098	Commercial building	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	554m	South
I155	House -'Dunvegan'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	562m	South East
I037	Memorial gates	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	564m	South
I139	Church	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	17/04/2020	17/04/2020	17/04/2020	566m	South West
I096	Shop and residence (former 'Paragon Cafe')	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	570m	South
I101	Shops	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	573m	South East
I062	Glen Innes Public School - assembly hall	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	579m	East
I064	Glen Innes Public School-infants building	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	581m	East
I102	Commercial building (former stationers)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	582m	South
I126	Former 'Glen Innes Boxing & Fitness Gymnasium'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	583m	South West
I063	Glen Innes Public School	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	589m	East
I060	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	594m	South East
I059	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	600m	South East
I100	Town Hall	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	17/04/2020	17/04/2020	17/04/2020	600m	South East
I040	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	607m	South
I071	King Edward VII Park	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	608m	South
I043	Commercial building - 'Glen Innes Examiner'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	610m	South
I038	The Railway Tavern	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	615m	South West
I057	St Joseph's Sisters of Mercy Convent	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	618m	South East

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I203	Grey Street Culvert	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	17/04/2020	17/04/2020	17/04/2020	625m	North East
I041	Former laundry	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	629m	South
I138	Uniting Church Manse	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	633m	South West
I097	Bank	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	635m	South East
I095	Commercial building - 'Hutchison's Buildings'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	635m	South
I056	St Patrick's Chapel	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	642m	South East
I094	Commercial building-bank	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	644m	South East
I042	Shop and residence	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	646m	South
I055	St Patrick's Church	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	654m	South East
I205	Underground Brick Culvert	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	17/04/2020	17/04/2020	17/04/2020	655m	South
I172	Rotunda Bandstand	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	655m	South
I093	Commercial building-bank	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	656m	South
I175	New England Club (former house)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	667m	South
I053	Old Power Station	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	668m	South East
I080	Commercial building-Mackenzie Mall	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	698m	South East
I058	St Joseph's School	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	703m	South East
I091	Shop -'Kwong Sing & Co Emporium'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	708m	South
I174	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	730m	South
I156	Roman Catholic Presbytery	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	731m	South East
I170	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	738m	South
I169	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	739m	South
I168	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	740m	South
I046	Glen Innes Fire Station	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	747m	South East
I173	House - 'Terrichuel'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	748m	South

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I044	The Old Mill - stone grist mill	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	749m	South East
I090	Shops -'Phoenix Buildings'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	749m	South
I197	Queenswood	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	17/04/2020	17/04/2020	17/04/2020	763m	South
I137	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	770m	South West
I045	Former Severn Shire Council Chambers	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	775m	South East
I092	Shop	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	785m	South
I125	House -'Glenburn'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	790m	South West
I052	Chapel Theatre (former Methodist Chapel)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	801m	South East
I072	King George V Park	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	819m	South
I178	Grandstand	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	819m	South
I171	Private home (former CWA Mountain Home)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	821m	South
I089	Commercial building (former Grand Cinema)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	834m	South
I204	Grey Street Culvert	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	17/04/2020	17/04/2020	17/04/2020	836m	North East
I051	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	837m	South East
I088	Shops	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	838m	South
I132	Memorial Gate	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	842m	South
I087	Butcher shop	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	848m	South
I086	Club Hotel	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	862m	South
I122	House (former Stationmaster's cottage)	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	904m	South West
I050	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	929m	South East
I150	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	939m	South
I067	Glen Innes West Public School	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	946m	South West
I151	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	977m	West
I157	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	984m	South East

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I124	House	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	989m	South West
I078	House -'Balnagowen'	Item - General	Local	Glen Innes Severn Local Environmental Plan 2012	14/09/2012	14/09/2012	17/04/2020	991m	North East

Heritage Data Source: NSW Crown Copyright - Planning & Environment
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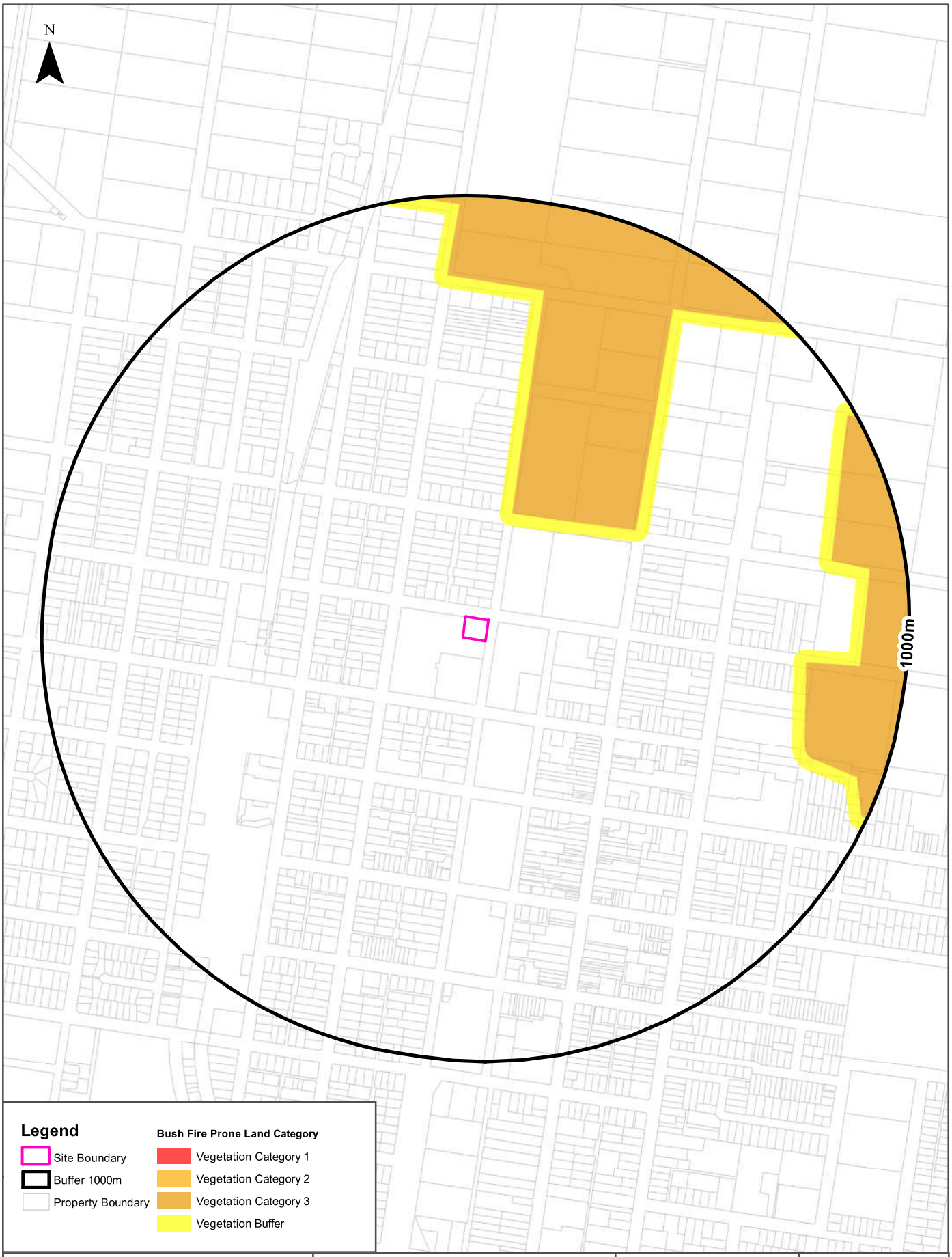
Natural Hazards - Bush Fire Prone Land

94 Taylor Street, Glen Innes, NSW 2370



Scale: 0 100 200 400 600 Meters

Data Sources: Bush Fire Prone Land: © NSW Rural Fire Service 2022. Property Boundaries: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Natural Hazards

94 Taylor Street, Glen Innes, NSW 2370

Bush Fire Prone Land

What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	231m	North East
Vegetation Category 3	261m	North East

NSW Bush Fire Prone Land - © NSW Rural Fire Service under Creative Commons 4.0 International Licence

Ecological Constraints

94 Taylor Street, Glen Innes, NSW 2370

Vegetation - Eastern Bushland Database (North Region)

What Vegetation exists within the dataset buffer?

Veg Code	Veg Desc	NVISCode	NVISDesc	Distance	Direction
N/A	No records in buffer				

Vegetation Eastern Bushland Database Data Source: NSW Office of Environment and Heritage
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Ramsar Wetlands

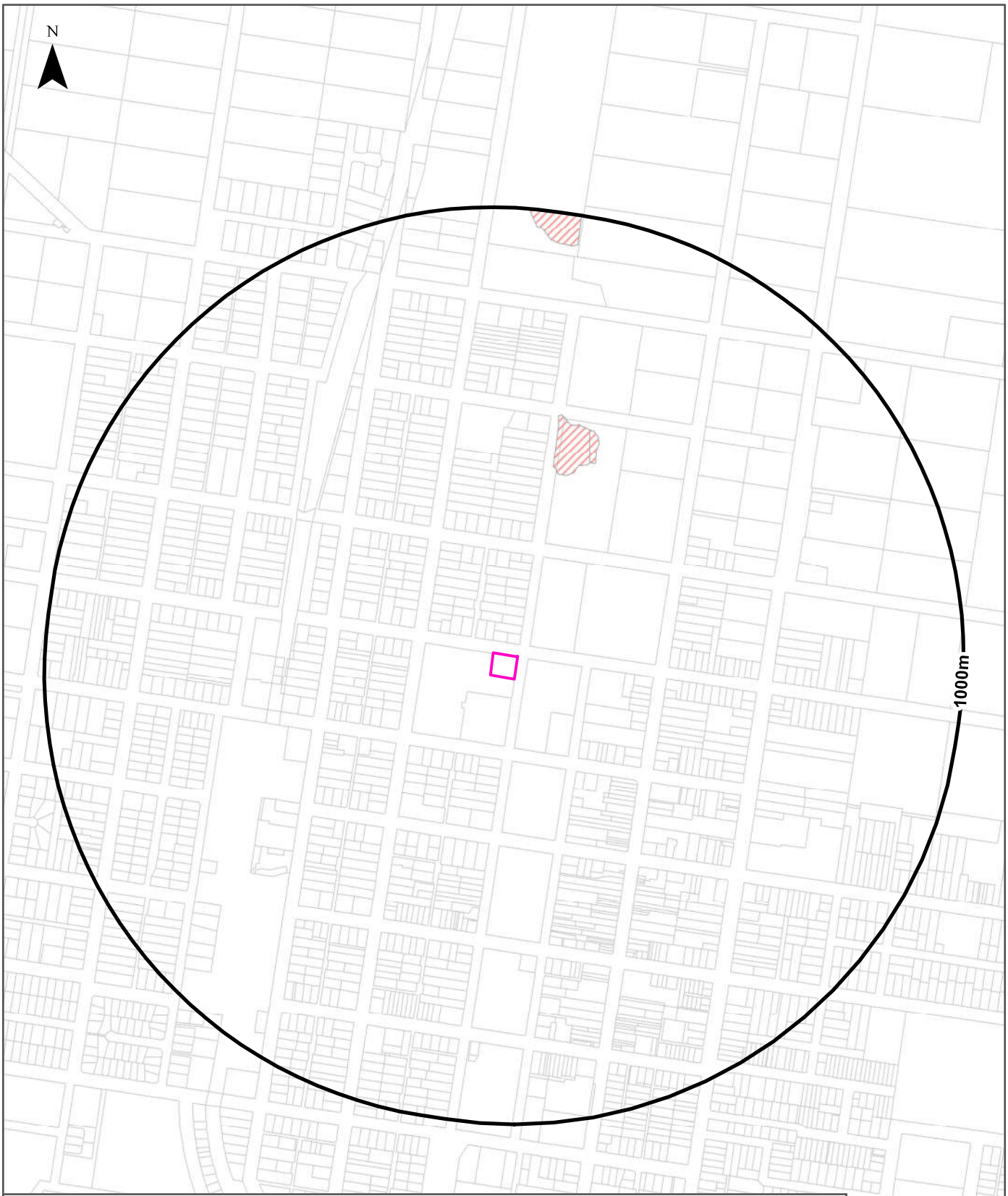
What Ramsar Wetland areas exist within the dataset buffer?

Map Id	Ramsar Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

Ramsar Wetlands Data Source: © Commonwealth of Australia - Department of Agriculture, Water and the Environment

Ecological Constraints - Groundwater Dependent Ecosystems Atlas

94 Taylor Street, Glen Innes, NSW 2370



Legend

- Site Boundary
- Buffer 1000m
- Property Boundaries
- High potential GDE - from national assessment
- High potential GDE - from regional studies
- Moderate potential GDE - from national assessment
- Moderate potential GDE - from regional studies
- Low potential GDE - from national assessment
- Low potential GDE - from regional studies
- Known GDE - from regional studies
- Unclassified potential GDE - from national assessment
- Unclassified potential GDE - from regional studies

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 28 March 2022

Ecological Constraints

94 Taylor Street, Glen Innes, NSW 2370

Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	High potential GDE - from regional studies	Undulating granitic plateau with higher residuals including basalt cappings.	Vegetation		419m	North

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology
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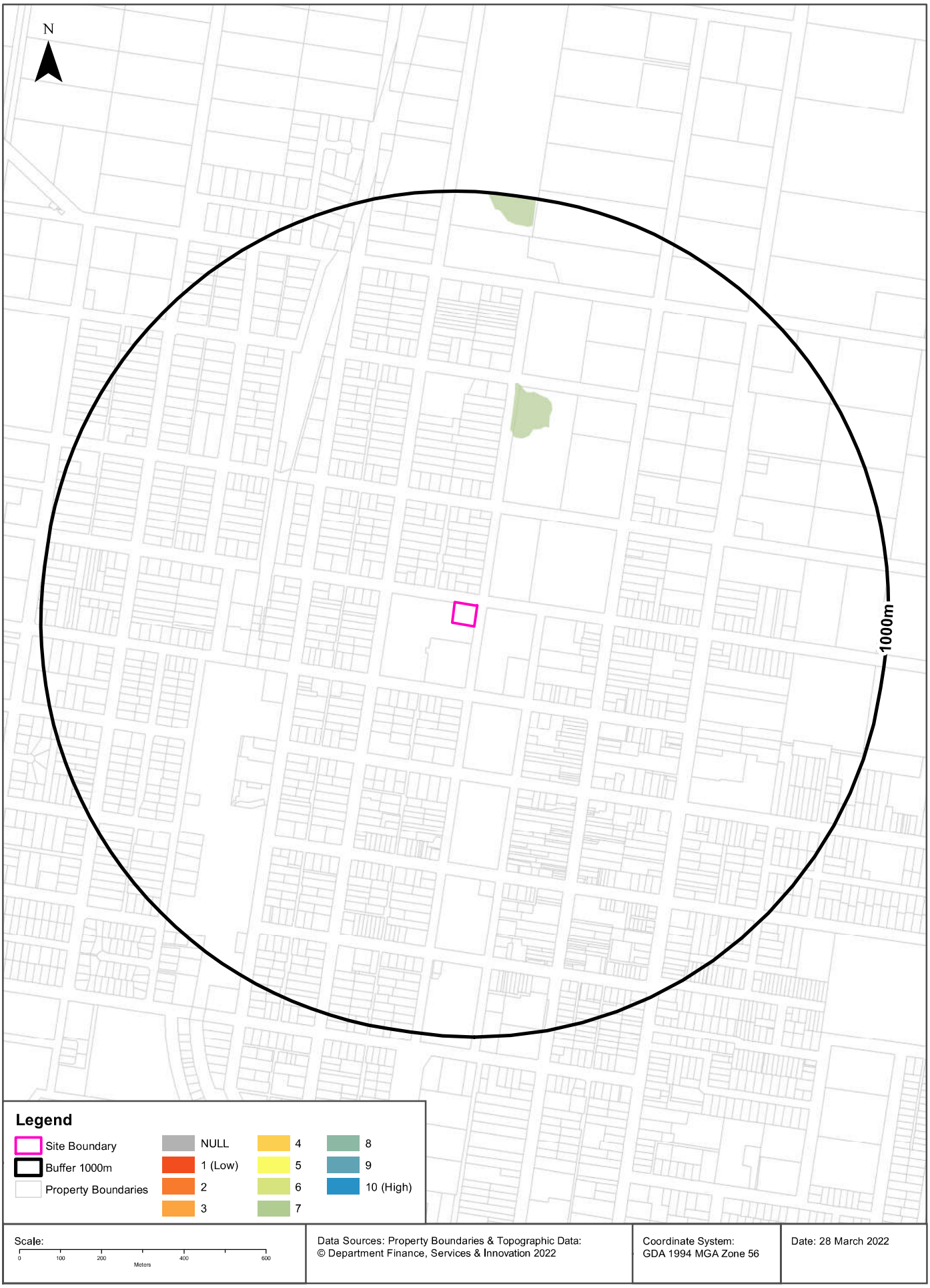
Ecological Constraints - Inflow Dependent Ecosystems Likelihood

94 Taylor Street, Glen Innes, NSW 2370



Ecological Constraints

94 Taylor Street, Glen Innes, NSW 2370

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	7	Undulating granitic plateau with higher residuals including basalt cappings.	Vegetation		419m	North

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology
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Ecological Constraints

94 Taylor Street, Glen Innes, NSW 2370

NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Calidris melanotos	Pectoral Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Calyptorhynchus banksii samueli	Red-tailed Black-Cockatoo (inland subspecies)	Vulnerable	Category 2	Not Listed	
Animalia	Aves	Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Gallinago hardwickii	Latham's Snipe	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Oxyura australis	Blue-billed Duck	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus magnificus	Wompoo Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Tringa stagnatilis	Marsh Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Mammalia	Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	Myuchelys bellii	Western Sawshelled Turtle, Bell's Turtle	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Dichanthium setosum	Bluegrass	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Thesium australe	Austral Toadflax	Vulnerable	Not Sensitive	Vulnerable	

Data does not include NSW category 1 sensitive species.
NSW BioNet: © State of NSW and Office of Environment and Heritage

Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

LC Code	Location Confidence
Premise Match	Georeferenced to the site location / premise or part of site
Area Match	Georeferenced to an approximate or general area
Road Match	Georeferenced to a road or rail corridor
Road Intersection	Georeferenced to a road intersection
Buffered Point	A point feature buffered to x metres
Adjacent Match	Land adjacent to a georeferenced feature
Network of Features	Georeferenced to a network of features
Suburb Match	Georeferenced to a suburb boundary
As Supplied	Spatial data supplied by provider

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Land Title Records

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Address: - 94 Taylor Street, Glen Innes

Description: - Part of Lot 2 D.P. 1208729

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
15.06.1877	Dedicated for Hospital Site	Gazette
26.06.1882 (1882 to 2009)	George Martin James Martin Frederick William Long (Trustees for Public Hospital)	Volume 601 Folio 210 (Grant) Now 1/1126060
17.07.2009 (2009 to 2009)	Health Administration Corporation	1/1126060 Now 2/1208729
24.12.2009	Recission of Resumption by Health Administration Corporation	Gazette
	Dedicated for Hospital Site reinstated	
	The State of New South Wales	2/1208729
11.12.2015 (2015 to date)	# Health Administration Corporation	2/1208729

 # Denotes current registered proprietor

Leases: - NIL

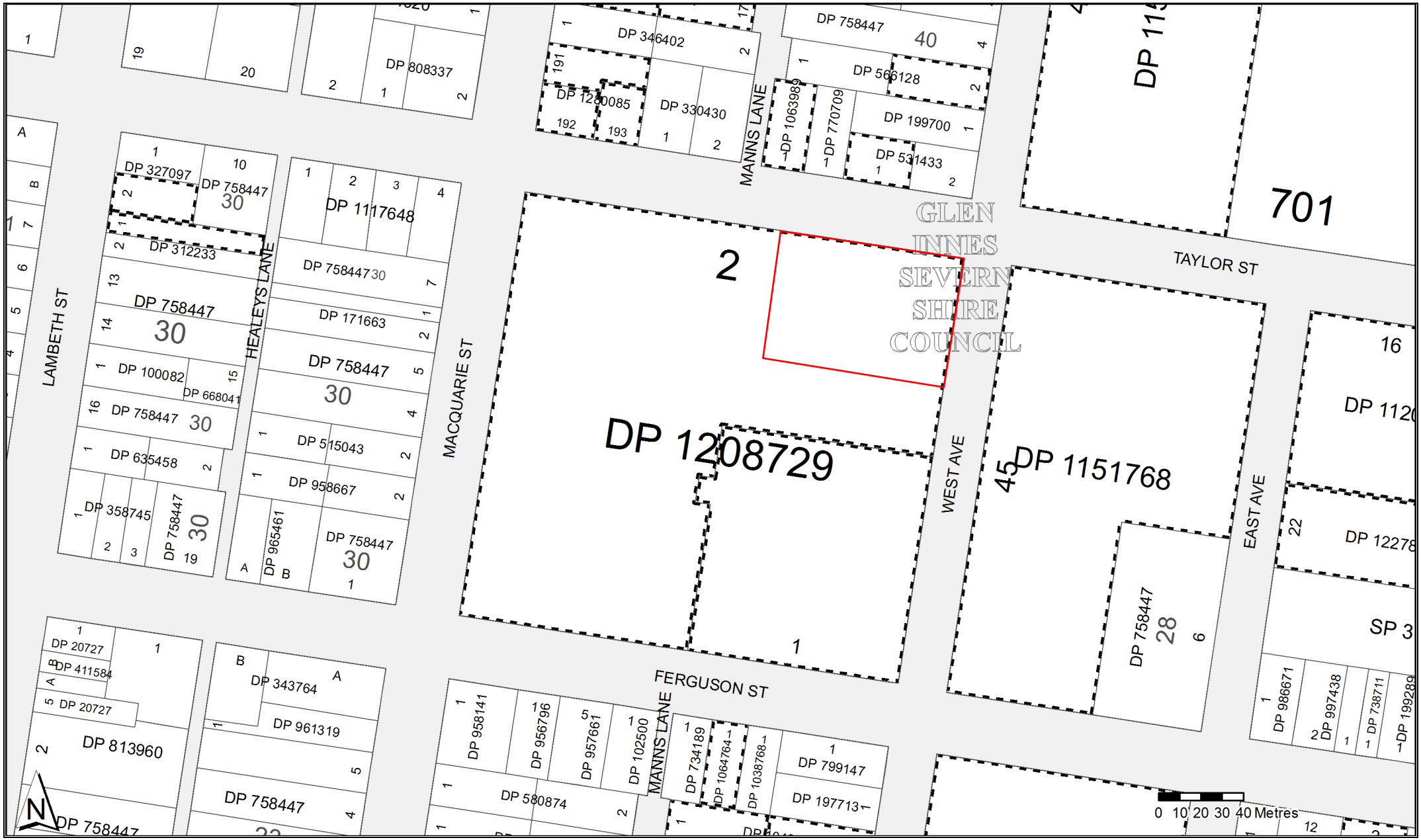
Easements: - NIL

Yours Sincerely,
Mark Groll
19 May 2022

Cadastral Records Enquiry Report : Lot 2 DP 1208729

Ref : 94 Taylor Street, GLEN INNES

Locality : GLEN INNES
Parish : GLEN INNES
LGA : GLEN INNES SEVERN
County : GOUGH



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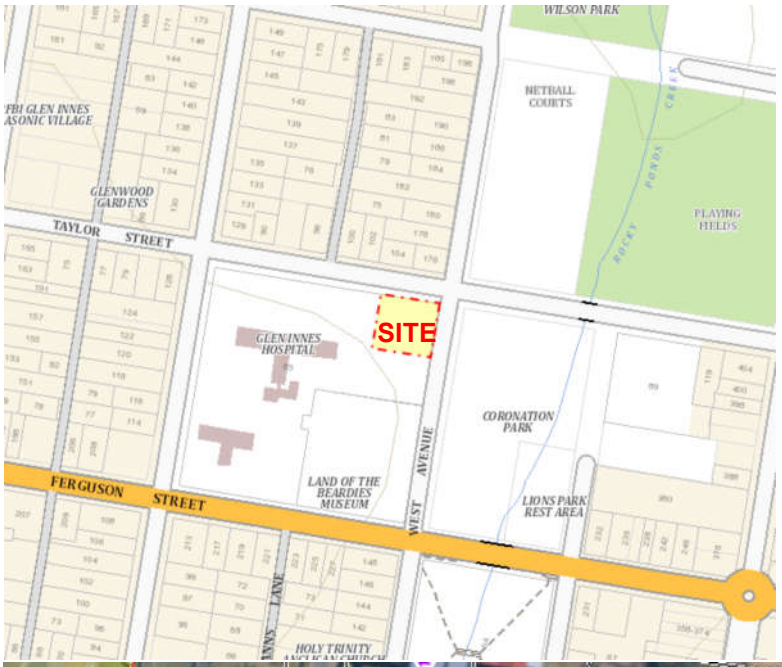

Title:	**SITE LOCATION PLAN**
Location:	94 TAYLOR STREET, GLEN INNES, NSW
Project No: E34948PT	Figure No: 1
	JK ENVIRONMENTS

Notes: Reference should be made to the report text for a full understanding of this plan.

Image Sources: https://maps.six.nsw.gov.au/ and UBD on disk v7.0.0

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DP 1126060

Registered : 29/04/2008

Title System : TORRENS

Purpose : DEPARTMENTAL

Ref. Map : GLEN INNES SHT 6

Last Plan : 1.1484

PLAN OF LAND COMPRISED IN

VOL. 601 FOL. 210

BEING SECTION 29 TOWN OF

GLEN INNES

Lengths are in metres. Reduction Ratio - NTS
LPI Ref. : TCB34

Sheet 1 of 1 sheets

L.G.A. : GLEN INNES SEVERN

LOCALITY: GLEN INNES

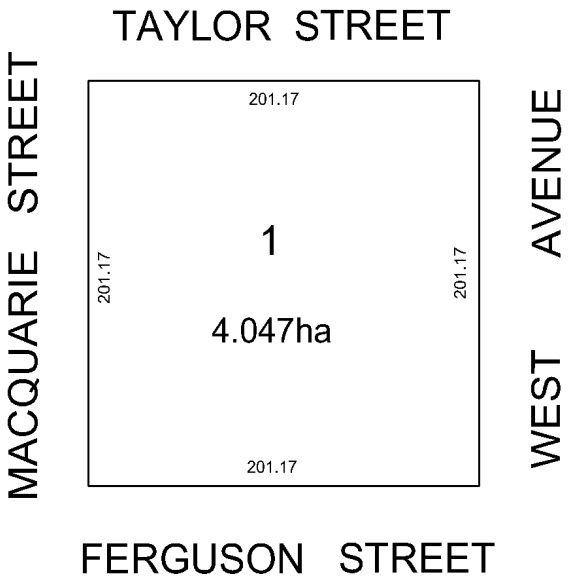
PARISH: GLEN INNES

COUNTY: GOUGH

LOT	PRIOR IDENTITY

THIS PLAN HAS BEEN PREPARED TO PROVIDE AN UNIQUE IDENTITY FOR THE LAND IN THE CERTIFICATE OF TITLE REFERRED TO ABOVE.

IT IS NOT A CURRENT PLAN IN THE TERMS OF 7A OF THE CONVEYANCING ACT, 1919.



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Design for the Town of GLEN INNES

PARISH OF in the GLEN INNES

County of Gough

NEW ENGLAND

1852

Boundaries of the Town of Glen Innes Proclaimed 22nd May 1865 (Gaz. No 106-63 fol. 1181) under the provisions of the Towns Police Acts 11 Vic. No 2, XIV Vic. No 11 and XXV Vic. No 10 are shewn thus

For survey of Glen Innes Population Res. see No 1363

Approval conveyed by Col. Sec. Let 52/157 - 21 July

Clerk of the Council

Notified 2nd May 1882

Notified 3rd May 1880

Notified 9th January 1882

Vide Misc. 79-9359 Vesting the Temporary Common in the Municipal Council of Glen Innes

Notified 9th December 1878

Approved as site for Hospital

Reserved Square

R. 1263 for Public Park

TEMPORARY COMMON

West Extension of Suburban Lands Notified 31st March 1879

East Extension of Suburban Lands Notified 31st March 1879

Part of Res for Road on the West of Allots in Secs 4, 13, 16, 25, and 28 Canc. for Road Gaz: 18th June 83 to be called "Wolsley St."

Dedicated 15th June 1877 Vide Misc 82-4250 appointing Geo Martin, James Martin & Frederick Long Trustees of Land dedicated as a site for Hospital

CANCELLED

N LD G. 1. 1484

HEALTH ADMINISTRATION ACT 1982

LAND ACQUISITION (JUST TERMS COMPENSATION) ACT 1991

Notice of Acquisition of land by Compulsory Process for the purposes of the Health Administration Act 1982

PURSUANT to section 10 of the Health Administration Act 1982 and section 19(1) of the Land Acquisition (Just Terms Compensation) Act 1991, the Health Administration Corporation by its delegate declares, with the approval of the Governor, that the land described in the Schedule below is by this notice acquired by compulsory process for the purposes of the Health Administration Act 1982.

Signed at Sydney this 30th day of June 2009.

DAVID GATES,
Chief Procurement Officer
Department of Health
a duly authorised delegate of the
Health Administration Corporation

SCHEDULE

Land

ALL THAT piece or parcel of Crown land situated at Tenterfield in the Tenterfield Local Government Area, Parish of Tenterfield, County of Clive shown as Lot 1 of Section 46 in Deposited Plan 758959.

HEALTH ADMINISTRATION ACT 1982

LAND ACQUISITION (JUST TERMS COMPENSATION) ACT 1991

Notice of Acquisition of land by Compulsory Process for the purposes of the Health Administration Act 1982

PURSUANT to section 10 of the Health Administration Act 1982 and section 19(1) of the Land Acquisition (Just Terms Compensation) Act 1991, the Health Administration Corporation by its delegate declares, with the approval of the Governor, that the land described in the Schedule below is by this notice acquired by compulsory process for the purposes of the Health Administration Act 1982.

Signed at Sydney this 30th day of June 2009.

DAVID GATES,
Chief Procurement Officer
Department of Health
a duly authorised delegate of the
Health Administration Corporation

SCHEDULE

Land

ALL THAT piece or parcel of Crown land situated at Glen Innes in the Glen Innes Severn Local Government Area, Parish of Glen Innes, County of Gough shown as Lot 1 in Deposited Plan 1126060.

HOMEBUSH MOTOR RACING AUTHORITY

Homebush Motor Racing (Sydney 400) Act 2008

NOTIFICATION OF CHANGE OF TITLE

IN pursuance of section 35 of the Homebush Motor Racing (Sydney 400) Act 2008, notice is hereby given that the approved title of the annual Homebush V8 Motor Race, formerly known as the Sydney 400, is now the Sydney Telstra 500.

IAN MACDONALD, M.L.C.,
Minister for State Development

LOCAL GOVERNMENT ACT 1993

Proclamation

I, Professor Marie Bashir AC, CVO, Governor of the State of New South Wales, with the advice of the Executive Council, and in pursuance of section 206 of the Local Government Act 1993, do hereby constitute the area of Auburn as the City of Auburn.

Signed and sealed at Sydney, this 24th day of June 2009.

By Her Excellency's Command,

BARBARA PERRY, M.P.,
Minister for Local Government

GOD SAVE THE QUEEN!

NATIONAL PARKS AND WILDLIFE ACT, 1974

Proclamation

I, Professor MARIE BASHIR, A.C., C.V.O, Governor of the State of New South Wales, with the advice of the Executive Council and in pursuance of the powers vested in me under Section 68 of the National Parks and Wildlife Act, 1974, with the consent of every owner and occupier do, on the recommendation of the Director-General of the Department of Environment and Climate Change, by this my Proclamation declare the lands described hereunder to be a wildlife refuge for the purposes of the abovementioned Act.

To be known as "Waanyarra Wildlife Refuge"

Signed and sealed at Sydney this first day of July 2009.

MARIE BASHIR,
Governor

By Her Excellency's Command

CARMEL TEBBUTT, M.P.,
Minister for Climate Change and the Environment

GOD SAVE THE QUEEN!

Description

Land District – Cooma;
Council – Cooma-Monaro

County of Beresford ,Parish of Abercrombie, 109.27 hectares, being lot 30 DP 750521. DECC FIL09/25603.

NATIONAL PARKS AND WILDLIFE ACT, 1974

Proclamation

I, Professor MARIE BASHIR, A.C., C.V.O, Governor of the State of New South Wales, with the advice of the Executive Council and in pursuance of the powers vested in me under Section 68 of the National Parks and Wildlife Act, 1974, with the consent of every owner and occupier do, on the recommendation of the Director-General of the Department of Environment and Climate Change, by this my Proclamation declare the lands described hereunder to be a wildlife refuge for the purposes of the abovementioned Act.

To be known as "Burrawang Wildlife Refuge"

Signed and sealed at Sydney this first day of July 2009.

MARIE BASHIR,
Governor

By Her Excellency's Command

CARMEL TEBBUTT, M.P.,
Minister for Climate Change and the Environment

GOD SAVE THE QUEEN!

DISTRICT COURT CRIMINAL PRACTICE NOTE 8

STANDARD CASE MANAGEMENT DIRECTIONS

THIS Practice Note is to take effect upon the commencement of the Criminal Procedure Amendment (Case Management) Act 2009.

Unless the Court makes a specific direction pursuant to section 136 or waives the requirement to do so, the standard directions that are to apply at the first mention of proceedings following a committal for trial are:

1. The prosecution is to give the accused notice of the prosecution case pursuant to section 137 no later than 3 weeks before the trial date.
2. The defence is to respond pursuant to section 138 within 7 days of receipt of the notice.
3. The defence must provide notice of alibi within the period prescribed in section 150.

Dated: 18 December 2009.

The Hon. Justice R. O. BLANCH,
Chief Judge

DISTRICT COURT CRIMINAL PRACTICE NOTE 9

Standard Case Management Directions

THIS Practice Note is to take effect upon the commencement of the Criminal Procedure Amendment (Case Management) Act 2009.

Unless the Court makes a specific direction pursuant to section 136 or waives the requirement to do so, the standard directions that are to apply at the first mention of proceedings following a committal for trial are:

1. The prosecution is to give the accused notice of the prosecution case pursuant to section 137 no later than 3 weeks before the trial date.
2. The defence is to respond pursuant to section 138 within 7 days of receipt of the notice.
3. The defence must provide notice of alibi within the period prescribed in section 150.

Dated: 18 December 2009.

The Hon. Justice R. O. BLANCH,
Chief Judge

HEALTH ADMINISTRATION ACT 1982

Rescission of Resumption

THE notification appearing in the *New South Wales Government Gazette* No. 105 on 17 July 2009, Folio 4111, under the heading "Health Administration Act 1982" and under the subheading "Land Acquisition (Just Terms Compensation) Act 1991" is hereby rescinded and should be disregarded.

Signed at Sydney this 16th day of December 2009.

DAVID GATES,
Chief Procurement Officer,
Department of Health
a duly authorised delegate of
the Health Administration Corporation

LOCAL GOVERNMENT ACT 1993

PROCLAMATION

Marie Bashir AC, CVO, Governor

I, Professor Marie Bashir AC, CVO, Governor of the State of New South Wales, with the advice of the Executive Council, and in pursuance of sections 255, 256 and 736 of the Local Government Act 1993, do, by this Proclamation, declare that the Proclamation published in Government Gazette No. 29 of 4 March 2008, at page 1427, declaring all civic offices of Wollongong City Council vacant is amended by omitting Clause (b) from the said Proclamation and inserting instead:

(b) appoint Dr Colin Gellatly, Mr Robert McGregor and Mr Richard Colley as Administrators of the Wollongong City Council;

Signed and sealed at Sydney, this 16 day of December 2009.

By Her Excellency's Command,

BARBARA PERRY, M.P.,
Minister for Local Government

GOD SAVE THE QUEEN!

PRACTICE NOTE SC CL 2

Supreme Court Common Law Division –
Criminal Proceedings

Commencement

1. This Practice Note commences 1 February 2010.

Application

2. This Practice Note applies to committals for trial or sentence and ex-officio indictments in the Criminal List of the Common Law Division.

Definitions

3. None applicable.

Introduction

4. The purpose of this Practice Note is:
   - to ensure that criminal proceedings are dealt with in a timely way; and
   - to assist an accused person to take advantage of legislation which provides for a discount in sentence where an early plea of guilty is entered.

Listing for arraignment

5. Arraignments are held on the first Friday of each month in Sydney.
6. When committing an accused person for trial or sentence to the Supreme Court, the magistrate will direct the person to appear at the next arraignment, not less than 4 weeks after the date of the committal. If this practice would result in a January date, the matter will be listed on the first Friday in February.
7. Ex-officio criminal prosecutions will be listed by the registry in the same way.

Arraignment procedures

8. On the day fixed for the arraignment, the Director of Public Prosecutions shall present an indictment to the Court and shall provide copies of the indictment for each accused person.

LAND REGISTRY SERVICES Historical Search InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/5/2022 1:02PM

FOLIO: 1/1126060

First Title(s): VOL 601 FOL 210
Prior Title(s): VOL 601 FOL 210

Recorded	Number	Type of Instrument	C.T. Issue
29/4/2008	DP1126060	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
		LINK FOLIO: VOL 601 FOL 210	
28/7/2009	AE859813	DEPARTMENTAL DEALING	
10/9/2009	AE894819	RESUMPTION APPLICATION	EDITION 1
14/10/2015	DP1208729	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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Received: 18/05/2022 13:02:20

LAND REGISTRY SERVICES

Title Search

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

WARNING: ***** FOLIO CANCELLED *****

FOLIO: 1/1126060

SEARCH DATE	TIME	EDITION NO	DATE
18/5/2022	1:02 PM	1	10/9/2009

LAND

LOT 1 IN DEPOSITED PLAN 1126060
AT GLEN INNES
LOCAL GOVERNMENT AREA GLEN INNES SEVERN
PARISH OF GLEN INNES COUNTY OF GOUGH
TITLE DIAGRAM DP1126060

FIRST SCHEDULE

HEALTH ADMINISTRATION CORPORATION (RA AE894819)

SECOND SCHEDULE (1 NOTIFICATION)

* 1 DP1208729 ********** FOLIO CANCELLED ********** NEW FOLIOS HAVE BEEN CREATED FOR LOT(S) 1-2 IN DP1208729

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

94 Taylor Street, GLEN INNES PRINTED ON 18/5/2022

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 18/05/2022 13:02:45

Req:R843713 /Doc:DL AJ674237 /Rev:20-Oct-2015 /NSW LRS /Pgs:ALL /Prt:18-May-2022 12:37 /Seq:1 of 7
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Form: 11R
Release: 4·1

REQUEST

New South Wales
Real Property Act 1900

AJ674237C

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

(A) **STAMP DUTY** — If applicable. Office of State Revenue use only

(B) **TORRENS TITLE** — 1/1126060

(C) **REGISTERED DEALING** — Number: | Torrens Title:

(D) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any	CODE
469S	NSW Trade & Investment, Crown Lands 437 Hunter Street, Newcastle NSW 2300 Ph: 6883 3326 Reference: AE03R6 LLPN:123334F	R

(E) **APPLICANT** — THE STATE OF NEW SOUTH WALES

(F) **NATURE OF REQUEST** — AMENDMENTS TO FIRST AND SECOND SCHEDULES
CROWN LANDS ACT, 1989

(G) **TEXT OF REQUEST**

1. Reinstate THE STATE OF NEW SOUTH WALES in the First Schedule. This action is ~~supported by Governemnt Gazettes attached dated 17 July 2009 (Folio 4111)~~ showing Acquisition by HEALTH ADMINISTRATION CORPORATION and following Gazette dated 24 December 2009 (Folio 6525) showing "Rescission of Resumption".
2. Reinstate Second Schedule notations as outlined below:
Item 1: DEDICATED FOR HOSPITAL SITE, GAZETTE 15 JUNE 1877.
Item 2: LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989).
Item 3: THE LAND IS A RESERVE WITHIN THE MEANING OF PART 5 OF THE CROWN LANDS ACT 1989 AND THERE ARE RESTRICTIONS ON TRANSFER AND OTHER DEALINGS IN THE LAND UNDER THAT ACT, WHICH MAY REQUIRE CONSENT OF THE MINISTER.
Item 4: THE LAND IS DEDICATED FOR A PUBLIC PURPOSE.

By delegation pursuant to section 180 of the Crown Lands Act 1989 and with authority under section 13L of the Real Property Act 1900 from the Minister administering the Crown Lands Act 1989 on behalf of the State of New South Wales

DATE 03 July 2015

(H) I certify that I am an eligible witness and that an authorised officer of the applicant signed this dealing in my presence. [See note* below].

Signature of witness:

Name of witness: ANNA MARIA HISCOX
Address of witness: 109 GOONOO GOONOO RD TAMWORTH 2340

Certified correct for the purposes of the Real Property Act 1900 by the authorised officer named below.

Signature of authorised officer:

Authorised officer's name: DAVID BABER
Authority of officer: PROJECTS MANAGER WEST
Signing on behalf of: NSW TRADE & INVESTMENT

(I) *This section is to be completed where a notice of sale is required and the relevant data has been forwarded through eNOS.*

The applicant certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. Full name: Signature:

* *s117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.*

ALL HANDWRITING MUST BE IN BLOCK CAPITALS

1303

Req:R843713 /Doc:DL AJ674237 /Rev:20-Oct-2015 /NSW LRS /Pgs:ALL /Prt:18-May-2022 12:37 /Seq:2 of 7
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Trade & Investment
Crown Lands

Substitution request: Please substitute with matter under Requisition AJ674237.

Status Branch Document Lodgement Request Cover Sheet

Lodgement Number	**123762 (REQUISITION AJ674237)**
CLID Account	**510007**
Office	**Armidale**
Case Officer	**Felicity Foster**
Date Raised	**3 July 2015**
File Reference	**AE03R6**
Documents Submitted	**CL45-11 in reference to Requisition affecting DP1208729**
Attachments Included	**Copy of Gazette Notice 4 February 2005 (folio 292-293) and Plan DP94704.**
QA & Lodgement Approved	**David Baber on 16 September 2015**

Company Code		**General Ledger Account**		**Cost Centre**
1 0 0 0		**6 2 0 1 0 0**		**5 0 0 1 7 8 41**

For Completion By LPI

Dealing Number	

Note:

Please direct all Crown Land dealing email enquiries and notifications to lodgements@lands.nsw.gov.au

Req:R843713 /Doc:DL AJ674237 /Rev:20-Oct-2015 /NSW LRS /Pgs:ALL /Prt:18-May-2022 12:37 /Seq:3 of 7
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CL45 - 11
[13APR2006]

Department of Lands

DRAFT PREPD	

	ISSUED ON	PURPOSE	SEQUENCE	PLAN NUMBER	CHECK DIGIT	NUMBERS	
						SECTION	LOT
DRFT	DP No 1208729	NEW	of	DP 1208729			Lots 1 & 2

	TYPE	DETAILS
EST	FS	

	FIRST TITLE REFERENCES
FRST	THIS FOLIO

	PRIOR TITLE REFERENCES
PREF	CROWN LAND

	LOCALITY	M S C	LOCAL GOVERNMENT AREA	LGA OTHER
LAND	GLEN INNES		GLEN INNES SEVERN	N

	PARISH	COUNTY	Ph / Co OTHER	TITLE DIAGRAM
LAND	GLEN INNES	GOUGH	N	

SET	OWNED BY GOVERNMENT OG	Y	LEASED BY GOVERNMENT LG	N	CROWN GRANT RESERVATIONS GR	N	CROWN GRANT RESERVATIONS AND EXCEPTION OF MINERALS GR	N
SET	MEMORANDUM S700000A SA	N	MEMORANDUM S700000B SB	N	MEMORANDUM S700000C SC	N	MEMORANDUM S700000D SD	N

	FIRST SCHEDULE
S	THE STATE OF NEW SOUTH WALES

Req:R843713 /Doc:DL AJ674237 /Rev:20-Oct-2015 /NSW LRS /Pgs:ALL /Prt:18-May-2022 12:37 /Seq:4 of 7
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SECOND SCHEDULE DIRECTIONS

LOTS AFFECTED	DIRECTION	NOTIFICATION CODE	DEALING NUMBER	DETAILS
PL 1 & 2	ON	XB	Item 1	LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
1	ON	RV	Item 2	THE LAND IS A RESERVE WITHIN THE MEANING OF PART 5 OF THE CROWN LANDS ACT 1989 AND THERE ARE RESTRICTIONS ON TRANSFER AND OTHER DEALINGS IN THE LAND UNDER THAT ACT, WHICH MAY REQUIRE CONSENT OF THE MINISTER (REFER TO NSW GOVERNMENT GAZETTE OF 4 FEBRUARY 2005 FOLIO 292-293)
2	ON	RV	Item 2	PART OF THE LAND IS A RESERVE WITHIN THE MEANING OF PART 5 OF THE CROWN LANDS ACT 1989 AND THERE ARE RESTRICTIONS ON TRANSFER AND OTHER DEALINGS IN THE LAND UNDER THAT ACT, WHICH MAY REQUIRE CONSENT OF THE MINISTER (BEING THAT PART FORMERLY IN LOT 701 DP94704)
2	ON		Item 3	PART OF THE LAND IS DEDICATED FOR HOSPITAL SITE, GAZETTE 15 JUNE 1877 (BEING THAT PART FORMERLY IN LOT 702 DP94704)

FORMAT: CT

DELIVERY DIRECTIONS

LOTS AFFECTED	BOX No.	INSTRUCTIONS/DETAILS/ADDRESS
Lot 1 & 2		NO CT TO ISSUE

DISTICT OFFICE .....ARMIDALE..... FILE REFERENCE ....AE03R6.....

AUTHORISED OFFICER ..... DATE ..... 16th September 2015

Req:R843713 /Doc:DL AJ674237 /Rev:20-Oct-2015 /NSW LRS /Pgs:ALL /Prt:18-May-2022 12:37 /Seq:5 of 7
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Department of Lands

ARMIDALE OFFICE

108 Faulkner Street, Armidale NSW 2350
Phone: (02) 6772 5488 Fax (02) 6771 5348

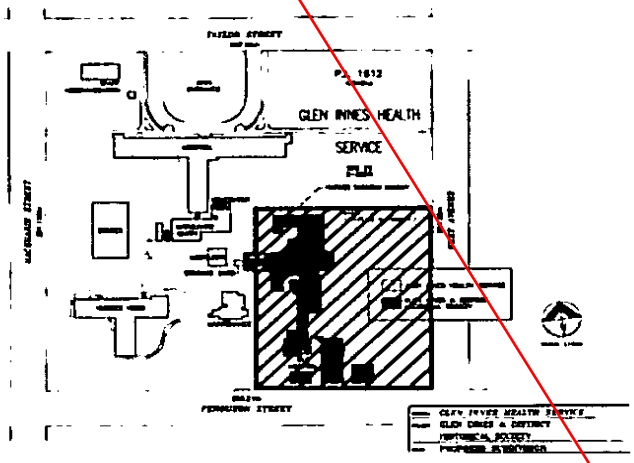
REVOCATION OF DEDICATION OF CROWN LAND

PURSUANT to section 84 of the Crown Lands Act 1989, the dedication of Crown land specified in Column 1 of the Schedule hereunder is revoked to the extent specified opposite thereto in Column 2 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE

COLUMN 1	*COLUMN 2*
Land District: Glen Innes Local Government Area: Glen Innes Severn Council Locality: Glen Innes Dedication No.:510007 Public Purpose: Hospital Site Date Notified: 15 June 1877 folio 2300 File Reference: AE03 R 6	Part being affected by Part Lot 702 in D.P. 94704 (area hatched on diagram below) Parish: Glen Innes County: Gough of an area of 1.054 Hectares



ESTABLISHMENT OF RESERVE TRUST

PURSUANT to section 92 (1) of the Crown Lands Act, 1989, the reserve trust specified in Column 1 of the Schedule hereunder is established under the name stated in that Column and is appointed as trustee of the reserve specified opposite thereto in Column 2 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE 1

COLUMN 1	*COLUMN 2*
Land Of The Beardies Reserve Trust	Reserve No. 1010628 for the purpose of Community Purposes. Notified: This day. File No.: AE03 R 6

APPOINTMENT OF CORPORATION TO MANAGE RESERVE TRUST

PURSUANT to section 95 of the Crown Lands Act 1989, the corporation specified in Column 1 of the Schedule hereunder is appointed to manage the affairs of the reserve trust specified opposite thereto in Column 2, which is trustee of the reserve referred to in Column 3 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE 1

COLUMN 1	*COLUMN 2*	*COLUMN 3*
Glen Innes & District Historical Society Inc	Land Of The Beardies Reserve Trust	Reserve No. 1010628 Public Purpose: Community Purposes Notified: This day File No.: AE03 R 6

Commencing this day.

ORDER SPECIFYING ADDRESS FOR SERVICE OF NOTICES ON RESERVE TRUST

PURSUANT to the provisions of section 97 (1) of the Crown Lands Act 1989, I order that the address for service of documents on the reserve trust specified in Column 1 of the Schedule hereunder, which is trustee of the reserve referred to opposite thereto in Column 2, is the address specified opposite the name of the reserve trust in Column 3 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE

COLUMN 1	*COLUMN 2*	*COLUMN 3*
Land Of The Beardies Reserve Trust	Reserve No. 1010628 Public Purpose: Community Purposes Notified: This day File No.: AE03 R 6	Land Of The Beardies Reserve Trust C/- Glen Innes & District Historical Society Inc. Corner West Avenue & Ferguson Street (PO Box 371) GLEN INNES NSW 2370

RESERVATION OF CROWN LAND

PURSUANT to section 87 of the Crown Lands Act 1989, the Crown land specified in Column 1 of the Schedule hereunder is reserved as specified opposite thereto in Column 2 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE 1

COLUMN 1	*COLUMN 2*
Land District: Glen Innes Local Government Area: Glen Innes Severn Council Parish: Glen Innes County: Gough Locality: Glen Innes	Reserve No. 1010628 Public Purpose: Community Purposes

Department of Lands

ARMIDALE OFFICE
108 Faulkner Street, Armidale NSW 2350
Phone: (02) 6772 5488 Fax (02) 6771 5348

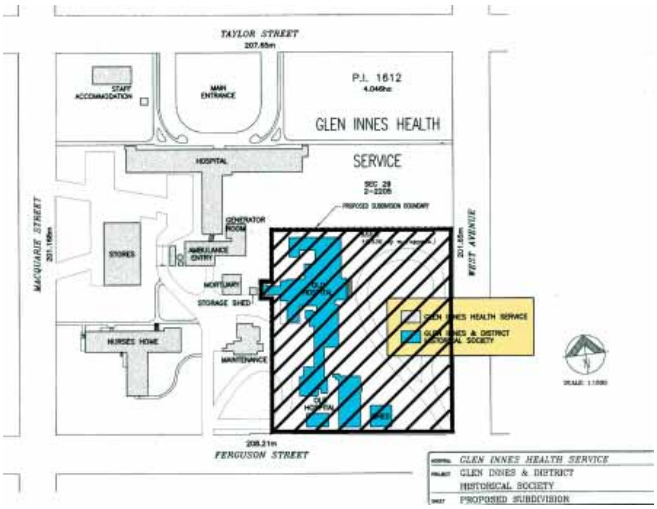
REVOCATION OF DEDICATION OF CROWN LAND

PURSUANT to section 84 of the Crown Lands Act 1989, the dedication of Crown land specified in Column 1 of the Schedule hereunder is revoked to the extent specified opposite thereto in Column 2 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE

COLUMN 1	*COLUMN 2*
Land District: Glen Innes Local Government Area: Glen Innes Severn Council Locality: Glen Innes Dedication No.:510007 Public Purpose: Hospital Site Date Notified: 15 June 1877 folio 2300 File Reference: AE03 R 6	Part being affected by Part Lot 702 in D.P. 94704 (area hatched on diagram below) Parish: Glen Innes County: Gough of an area of 1.054 Hectares



ESTABLISHMENT OF RESERVE TRUST

PURSUANT to section 92 (1) of the Crown Lands Act, 1989, the reserve trust specified in Column 1 of the Schedule hereunder is established under the name stated in that Column and is appointed as trustee of the reserve specified opposite thereto in Column 2 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE 1

COLUMN 1	*COLUMN 2*
Land Of The Beardies Reserve Trust	Reserve No. 1010628 for the purpose of Community Purposes. Notified: This day. File No.: AE03 R 6

APPOINTMENT OF CORPORATION TO MANAGE RESERVE TRUST

PURSUANT to section 95 of the Crown Lands Act 1989, the corporation specified in Column 1 of the Schedule hereunder is appointed to manage the affairs of the reserve trust specified opposite thereto in Column 2, which is trustee of the reserve referred to in Column 3 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE 1

COLUMN 1	*COLUMN 2*	*COLUMN 3*
Glen Innes & District Historical . Society Inc	Land Of The Beardies Reserve Trust	Reserve No. 1010628 Public Purpose: Community Purposes Notified: This day File No.: AE03 R 6

Commencing this day.

ORDER SPECIFYING ADDRESS FOR SERVICE OF NOTICES ON RESERVE TRUST

PURSUANT to the provisions of section 97 (1) of the Crown Lands Act 1989, I order that the address for service of documents on the reserve trust specified in Column 1 of the Schedule hereunder, which is trustee of the reserve referred to opposite thereto in Column 2, is the address specified opposite the name of the reserve trust in Column 3 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE

COLUMN 1	*COLUMN 2*	*COLUMN 3*
Land Of The Beardies Reserve Trust	Reserve No. 1010628 Public Purpose: Community Purposes Notified: This day File No.: AE03 R 6	Land Of The Beardies Reserve Trust C/- Glen Innes & District Historical Society Inc. Corner West Avenue & Ferguson Street (PO Box 371) GLEN INNES NSW 2370

RESERVATION OF CROWN LAND

PURSUANT to section 87 of the Crown Lands Act 1989, the Crown land specified in Column 1 of the Schedule hereunder is reserved as specified opposite thereto in Column 2 of the Schedule.

TONY KELLY, M.L.C.,
Minister for Lands

SCHEDULE 1

COLUMN 1	*COLUMN 2*
Land District: Glen Innes Local Government Area: Glen Innes Severn Council Parish: Glen Innes County: Gough Locality: Glen Innes	Reserve No. 1010628 Public Purpose: Community Purposes

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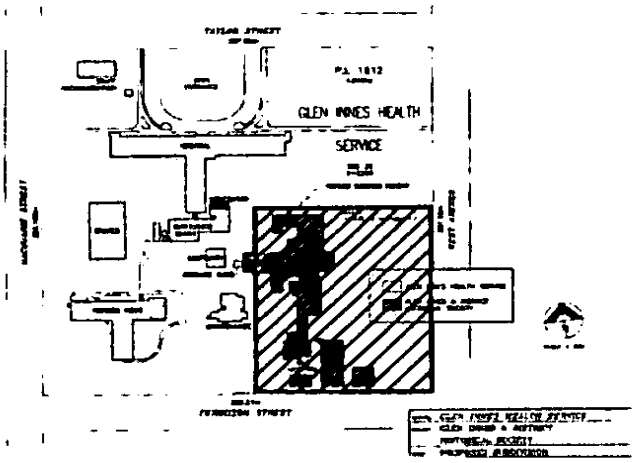
Lot: Part Lot 702, DP 94704
(area hatched on diagram below)
Area: 1.054 Hectares.
File Reference: AE03 R 6



Req:R843713 /Doc:DL AJ674237 /Rev:20-Oct-2015 /NSW LRS /Pgs:ALL /Prt:18-May-2022 12:37 /Seq:7 of 7
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Req:R337653 /Doc:DP 0094704 P /Rev:15-Dec-1998 /Sts:OK.OK /Prt:16-Sep-2015 13:24 /Pgs:ALL /Seq:1 of 1
Ref:CRV Enquiry System /Src:S

PLAN OF CROWN LAND SHOWING FORMER ARTIFICIAL ID

480/701/29/758447/13505 483/702/29/758447/510007

Shire/City GLEN INNES

Town/Locality GLEN INNES

Parish GLEN INNES

County GOUGH

Not to Scale

DP 94704

Registered 4-12-1998

Title System CROWN LAND

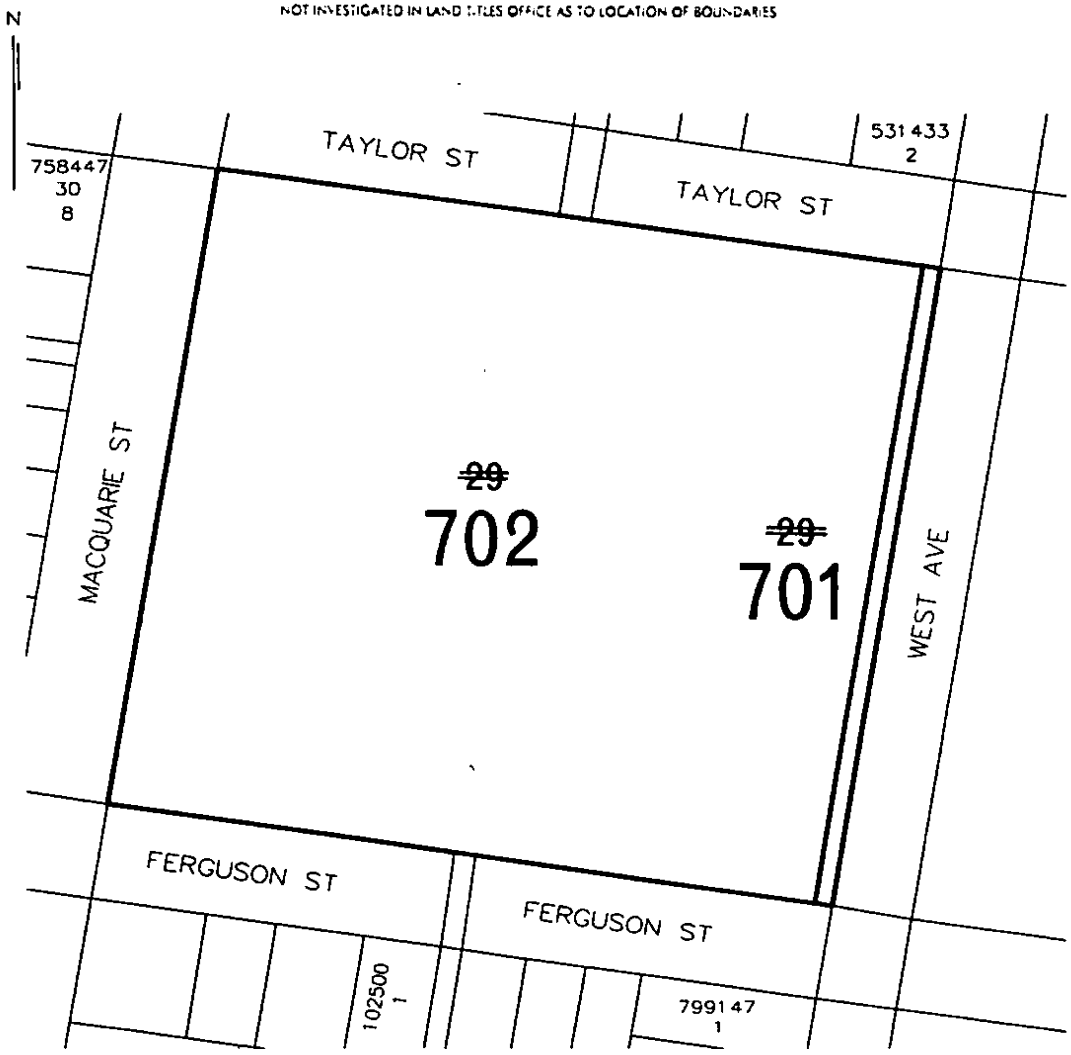
Purpose DEPARTMENTAL

Reference Map GLEN INNES SH. 6 #

DCDB Partition GNNMS

Last Plan -

DIAGRAM FOR IDENTIFICATION PURPOSES ONLY - NOT TO BE USED FOR FOLIO CREATION
THIS IS NOT A SUBDIVISION OF THE CROWN ESTATE STATUS MAY NEED TO BE VERIFIED
NOT INVESTIGATED IN LAND TITLES OFFICE AS TO LOCATION OF BOUNDARIES



PLAN AMENDED IN L.T.O. 4.12.1998

LAND REGISTRY SERVICES Historical Search InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/5/2022 12:36PM

FOLIO: 2/1208729

First Title(s): VOL 601 FOL 210 THIS FOLIO
Prior Title(s): 1/1126060 CROWN LAND

Recorded	Number	Type of Instrument	C.T. Issue
14/10/2015	DP1208729	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
14/10/2015	AJ674237	REQUEST	
8/1/2016	AK108382	DEPARTMENTAL DEALING	
18/1/2016	AK111074	REQUEST	EDITION 1

*** END OF SEARCH ***

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Form: 11R
Release: 4·1

(1)

REQUEST

New South Wales
Real Property Act 1900

AK111074X

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the R by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

(A) **STAMP DUTY**

If applicable. Office of State Revenue use only

~~Office of State Revenue~~
NSW Treasury
Client No: 120350770 3607
Duty: EXEMPT Trans No: 8480664-001
Asst details: S.308

(B) **TORRENS TITLE**

2/1208729

(C) **REGISTERED DEALING**

Number	Torrens Title

(D) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any	CODE
41B	LLPN123283V TRAVERS & CO Suite A, Level 3, 215-217 Clarence St Sydney NSW 2000 DX 590 SYDNEY Mobile: 0415 206 800 Reference: DOH JV.	R

(E) **APPLICANT**

HEALTH ADMINISTRATION CORPORATION

(F) **NATURE OF REQUEST**

Issue of certificate of title

(G) **TEXT OF REQUEST**

The Lot described above was acquired by compulsory process by the Health Administration Corporation as described in the attached Government Gazette Notice (TAB A) dated 11 December 2015, Folio 4042 and it is hereby requested that the Certificate of Title be issued in the name of the Health Administration Corporation.

DATE

(H) I certify that I am an eligible witness and that an authorised officer of the applicant signed this dealing in my presence. [See note* below].

Signature of witness:

Name of witness: Jacob Vince
Address of witness: 73 Miller Street
North Sydney NSW 2060

Certified correct for the purposes of the Real Property Act 1900 by the authorised officer named below.

Signature of authorised officer:

Authorised officer's name: Bryson Wilson
Authority of officer: Delegate
Signing on behalf of: Health Administration Corporation

(I) *This section is to be completed where a notice of sale is required and the relevant data has been forwarded through eNOS.*

The applicant certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. 977283 Full name: JACOB VINCE Signature:

* *s117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.*

ALL HANDWRITING MUST BE IN BLOCK CAPITALS

1303

Req:R843714 /Doc:DL AK111074 /Rev:22-Jan-2016 /NSW LRS /Pgs:ALL /Prt:18-May-2022 12:37 /Seq:2 of 2
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GEOGRAPHICAL NAMES ACT 1966

Pursuant to the provisions of section 8 of the *Geographical Names Act 1966*, the Geographical Names Board hereby notifies that it proposes to assign the name:

Newcastle Interchange for a new station located near Station Street and Charles Street in the suburb of Wickham in the Newcastle LGA.

The position and extent for this feature is recorded and shown within the Geographical Names Register of New South Wales. The proposal can also be viewed and submissions lodged on the Geographical Names Board website at www.gnb.nsw.gov.au from 11 December 2015 to 15 January 2016, alternatively written submissions may be lodged with the Secretary, Geographical Names Board, 346 Panorama Ave, Bathurst, NSW 2795.

In accordance with section 9 of the *Geographical Names Act 1966* all submissions lodged may be subject to a freedom of information application and may be viewed by third party to assist the Board in considering this proposal.

D MOONEY
Chairman
Geographical Names Board

GEOGRAPHICAL NAMES ACT 1966

Pursuant to the provisions of section 8 of the *Geographical Names Act 1966*, the Geographical Names Board hereby notifies that it proposes to assign the name:

Walter Williamson Park for a reserve located on the corner of Cooper and Storey Streets Maroubra.

The position and extent for this feature is recorded and shown within the Geographical Names Register of New South Wales. The proposal can also be viewed and submissions lodged on the Geographical Names Board website at www.gnb.nsw.gov.au from 15 December 2015 to 15 January 2016, alternatively written submissions may be lodged with the Secretary, Geographical Names Board, 346 Panorama Ave, Bathurst, NSW 2795.

In accordance with section 9 of the *Geographical Names Act 1966* all submissions lodged may be subject to a freedom of information application and may be viewed by third party to assist the Board in considering this proposal.

D MOONEY
Chairman
Geographical Names Board

HEALTH ADMINISTRATION ACT 1982

LAND ACQUISITION (JUST TERMS COMPENSATION) ACT 1991

Notice of Acquisition of Land by Compulsory Process for the Purposes of the Health Administration Act 1982

Pursuant to section 10 of the *Health Administration Act 1982* and section 19 (1) of the *Land Acquisition (Just Terms Compensation) Act 1991*, the Health Administration Corporation by its delegate declares, with the approval of the Governor, that the land described in the Schedule below is by this notice acquired by compulsory process for the purposes of the *Health Administration Act 1982*.

Signed at Sydney this 9th day of December 2015.

BRYSON WILSON
Manager, Asset Services
NSW Ministry of Health
a duly authorised delegate of the
Health Administration Corporation

Schedule

Land

All that piece or parcel of land situated at Glen Innes in the Severn Local Government Area, Parish of Glen Innes, County of Gough comprising Lot 2 in DP 1208729.

INFRASTRUCTURE NSW ACT 2011

Project Authorisation Order

I, Michael Baird, Premier:

1. Nominate the Northern Region Correctional Centre Project at Grafton as a major infrastructure project for the purposes of the *Infrastructure NSW Act 2011*, as I am of the opinion that it is a special project requiring oversight or co-ordination by Infrastructure NSW; and
2. In pursuance of sections 30 and 32 of the *Infrastructure NSW Act 2011*, do, by this Order declare Infrastructure NSW to be responsible for the functions of the Department of Justice in relation to the carrying out of the Northern Region Correctional Centre Project at Grafton.

Dated this 31st day of October 2015.

The Hon MICHAEL BAIRD, MP
Premier

LAND REGISTRY SERVICES

Title Search

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/1208729

SEARCH DATE	TIME	EDITION NO	DATE
18/5/2022	12:36 PM	1	18/1/2016

LAND

LOT 2 IN DEPOSITED PLAN 1208729
AT GLEN INNES
LOCAL GOVERNMENT AREA GLEN INNES SEVERN
PARISH OF GLEN INNES COUNTY OF GOUGH
TITLE DIAGRAM DP1208729

FIRST SCHEDULE

HEALTH ADMINISTRATION CORPORATION (R AK111074)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989) WITHIN THE PART(S) SHOWN SO INDICATED IN THE TITLE DIAGRAM

2 NOTIFICATION IN GOVERNMENT GAZETTE DATED 15.6.1877 FOL 2300 PART OF THE LAND IS DEDICATED FOR HOSPITAL SITE AS REGARDS THE PART FORMERLY IN 702/94704

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 18/05/2022 12:36:37

Section 10.7 Certificates

GLEN INNES SEVERN COUNCIL

PO Box 61, Glen Innes, 2370
Ph: 02 6730 2350

PLANNING CERTIFICATE

Issued under Section 10.7(2) of the
Environmental Planning and Assessment Act 1979, as amended

APPLICANT DETAILS		***CERTIFICATE DETAILS***	
JK Environments Pty Ltd PO Box 976 NORTH RYDE BC NSW 1670		***Certificate Number:***	350/21-22
		Certificate Date:	8/4/2022
PROPERTY DETAILS		***Your Reference:***	E34948PT
Property Details:	85 Taylor Street Glen Innes NSW 2370	***Fee:***	$53.00
Legal Description:	Lot 2 DP1208729 Parish Glen Innes	***Receipt Number:***	238893

1 Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

Glen Innes Severn Local Environmental Plan 2012 – Gazetted 14 September 2012.

For a list of all State Environmental Planning Policies applicable to this land refer to Annexure 1.

(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the Council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

There are no current draft planning proposals for the Glen Innes Severn local government area.

(3) The name of each development control plan that applies to the carrying out of development on the land.

Glen Innes Severn Development Control Plan 2014.

Please Note*: A full copy of the Glen Innes Severn Development Control Plan 2014 is available from Council, or alternatively is available from Council's website – www.gisc.nsw.gov.au.*

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

There is no draft planning proposal on Public Exhibition for the Glen Innes Severn local government area.

2 Zoning and land use under relevant LEPs

For each local environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP).

(a) the identity of the zone, whether by reference to a name (such as "Residential Zone" or "Heritage Area") or by reference to a number (such as "Zone No 2 (a)"),

Current Zone under Glen Innes Severn Local Environmental Plan 2012:

Zone R1 General Residential

Objectives of zone

- To provide for the housing needs of the community.
- To provide for a variety of housing types and densities.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.

(b) the purposes for which the instrument provides that development may be carried out within the zone without the need for development consent,

Environmental protection works; Home-based child care; Home occupations.

(c) the purposes for which the instrument provides that development may not be carried out within the zone except with development consent,

Attached dwellings; Boarding houses; Building identification signs; Business identification signs; Child care centres; Community facilities; Dwelling houses; Group homes; Home industries; Hostels; Multi dwelling housing; Neighbourhood shops; Places of public worship; Plant nurseries; Residential flat buildings; Respite day care centres; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Waste or resource transfer stations; Any other development not specified in item 2 or 4.

(d) the purposes for which the instrument provides that development is prohibited within the zone,

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Backpackers' accommodation; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Car parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Extractive industries; Farm buildings; Farm stay accommodation; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Industrial retail outlets; Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Public administration buildings; Recreation facilities (major); Registered clubs; Research stations; Restricted premises; Rural industries; Rural workers' dwellings; Service stations; Sewage treatment systems; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water recycling facilities; Water treatment facilities; Wholesale supplies.

(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed,

The development standards applying to minimum lot size are listed in the *Glen Innes Severn Local Environmental Plan 2012. Clause 4.1 – Minimum subdivision lot size* applies to any land shown on the Lot Size Map.
The land to which this certificate applies is shown on the Lot Size Map as having a minimum lot size of 450m^2.

(f) whether the land includes or comprises critical habitat,

No, however the property may be affected by other threatened species matters. Separate enquiries should be made to Heritage NSW.

(g) whether the land is in a conservation area (however described),

No

(h) whether an item of environmental heritage (however described) is situated on the land.

No

Please Note: *A full copy of the Glen Innes Severn Local Environmental Plan 2012 (as amended) is available from Council, or alternatively is available from the NSW Government's legislation website – http://www.legislation.nsw.gov.au/ or Council's web site – www.gisc.nsw.gov.au*
Applicants should refer to the Glen Innes Severn Local Environmental Plan 2012 and the Glen Innes Severn Development Control Plan 2008 for further details of local development controls applicable to the property.

2A Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the SEPP), or
(b) A Precinct Plan (within the meaning of the 2006 SEPP), or
(c) A proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act,
The particulars referred to in clause 2(a)-(h) in relation to that land (with a reference to "the instrument" in any of those paragraphs being read as a reference to part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).

Not applicable to this property.

3 Complying development

(1) Whether or not the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (c) and (d) and 1.19 of that Policy of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
(2) If complying development may not be carried out on that land because of the provisions of clauses 1.17A (c) and (d) and 1.19 of that Policy, the reasons why it may not be carried out under that clause.

The State Environmental Planning Policy (Exempt and Complying Development Codes) Clause 1.17A and Clause 1.19 Considerations

Complying development under the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*, **may** be carried out on the land as it complies with Clause 1.17A and clause 1.19.

General Housing Code

Complying development under the General Housing Code **may** be carried out on the land.

Rural Housing Code

Complying development under the Rural Housing Code **may not** be carried out on the land as the land is not in a specified zone RU1, RU3 and R5.

Housing Alterations Code

Complying development under the Housing Alterations Code **may** be carried out on the land.

General Development Code

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

Commercial and Industrial (New building and Additions) Code

Complying development under the Commercial and Industrial Alterations Code **may not** be carried out on the land as the land is affected by specific land exemptions as identified in Clause 5A.1 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code **may not** be carried out on the land as the land is not in a specified zone B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3.

Subdivisions Code

Complying development under the Subdivisions Code **may** be carried out on the land.

Demolition Code

Complying development under the Demolition Code **may** be carried out on the land.

Fire Safety Code

Complying development under the Fire Safety Code **may** be carried out on the land.

4 Coastal protection

Whether or not the land is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Public Works.

Not Applicable to this property.

4A Certain information relating to beaches and coasts

(1) Whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of the Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

(2) (a) whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of the Act) have been placed on the land (or on public land adjacent to that land), and

(b) if works have been so placed – whether council is satisfied that the works have been removed and the land restored in accordance with that Act.

(3) Such information (if any) as is required by the regulations under section 56B of the Coastal Protection Act 1979 to be included in the planning certificate and of which council has been notified pursuant to those regulations.

Not Applicable to this property.

4B Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 196B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Note: *"Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.*

Not Applicable to this property.

5 Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

No

6 Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under:

(a) Division 2 of Part 3 of the Roads Act 1993, or

For information please consult with the Roads and Maritime Services and / or your title deeds.

(b) any environmental planning instrument, or

No

(c) any resolution of the council.

No

7 Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(a) adopted by the council, or

No.

(b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council.

No.

7A Flood related development controls information

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.

No.

(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls.

No.

8 Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 make provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

No.

9 Contributions plans

The name of each contributions plan applying to the land.

Glen Innes Severn Section 94A Contributions Plan.

Please Note: *For further details please see Council's website – www.gisc.nsw.gov.au.*

9A Biodiversity certified land

If the land is biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016, a statement to that effect.

Note. Biodiversity certified land includes land certified under Part 7AA of the Threatened Species Conservation Act 1995 that is taken to be certified under Part 8 of the Biodiversity Conservation Act 2016.

No

10 Biodiversity stewardship sites

If the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016, a statement to that effect (but only if the council has been notified of the existence of the agreement by the Chief Executive of Heritage NSW).

Note. Biodiversity stewardship agreements include biobanking agreements under Part 7A of the Threatened Species Conservation Act 1995 that are taken to be biodiversity stewardship agreements under Part 5 of the Biodiversity Conservation Act 2016.

No.

10A Native vegetation clearing set asides

If the land contains a set aside area under section 60ZC of the Local Land Services Act 2013, a statement to that effect (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section).

Council has not been notified that this land is affected by a set aside area under the *Local Land Services Act 2013.*

11 Bush fire prone land

If any of the land is bush fire prone land (as defined in the Act), a statement that all or, as the case may be, some of the land is bush fire prone land.

If none of the land is bush fire prone land, a statement to that effect.

The land is not identified in the certified Bush Fire Prone Land map for the Glen Innes Severn area.

12 Property vegetation plans

If the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies, a statement to that effect (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act).

Council has not been notified that this land is affected by a property vegetation plan under the *Native Vegetation Act 2003*.

13 Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land (but only if the council has been notified of the order).

No.

14 Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.

No such direction applies to the land.

15 Site compatibility certificates and conditions for seniors housing

If the land is land to which State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 applies:

(a) a statement of whether there is a current site compatibility certificate (of which the council is aware), issued under clause 25 of that Policy in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(i) the period for which the certificate is current, and

(ii) that a copy may be obtained from the head office of the Department of Planning & Infrastructure, and

(b) a statement setting out any terms of a kind referred to in clause 18 (2) of that Policy that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.

Not applicable to this property.

16 Site compatibility certificates for infrastructure

A statement of whether there is a valid site compatibility certificate (of which the council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(a) the period for which the certificate is valid, and

(b) that a copy may be obtained from the head office of the Department of Planning & Infrastructure.

Not applicable to this property.

17 Site compatibility certificates for conditions for affordable rental housing

(1) A statement of whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(a) the period for which the certificate is valid, and

(b) that a copy may be obtained from the head office of the Department of Planning & Infrastructure.

Council is not aware of a site compatibility certificate for affordable rental housing being applicable to this property.

(2) A statement setting out any terms of a kind referred to in clause 17(1) or 38(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

Not applicable to this property.

18 Paper Subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

Not applicable to this property.

(2) The date of any subdivision order that applies to the land.

Not applicable to this property.

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

Not applicable to this property.

19 Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:

(a) the matter certified by the certificate, and

Note. A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

(b) the date on which the certificate ceases to be current (if any), and

(c) that a copy may be obtained from the head office of the Department.

Council is not aware of a site verification certificate being applicable to this property.

20 Loose-fill asbestos insulation

If the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division, a statement to that effect.

Council is not aware of any residential premises applicable to this property being listed on the register.

21 Affected building notices and building product rectification orders

(1) A statement of whether there is any affected building notice of which the council is aware that is in force in respect of the land

Council is not aware of any affected building notice applicable to this property being listed on the register.

(2) A statement of:

(a) Whether there is any building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with, and

(b) Whether any notice of intention to make a building product rectification order of which the council is aware has been given in respect of the land and is outstanding

(3) **In this clause:**

Affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017

Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017

(a) Council is not aware of any building product rectification order that is in force in respect of the land and that has not been fully complied with.

(b) Council is not aware of any notice of intention to make a building rectification order in respect of the land and that is outstanding.

ADDITIONAL MATTERS TO BE SPECIFIED IN PLANNING CERTIFICATE

Additional matters are pursuant to Schedule 4 of the

Environmental Planning And Assessment Regulation 2000, as amended

Contaminated Land Management Act 1997

The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act—if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

Not Applicable

(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,

Not Applicable

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act—if it is the subject of such an approved proposal at the date when the certificate is issued,

Not Applicable

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,

Not Applicable

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act—if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

Not Applicable

Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009

Section 26 of this Act provides that advice about any exemption under section 23 or authorisation under section 24 of that Act is to be included in this certificate, if the council is provided with a copy of the exemption or authorisation by the Co-ordinator General under that Act.

Not Applicable to this Property

Kathleen Taminiau
Town Planner

Date: 8 April 2022

ANNEXURE 1

STATE ENVIRONMENTAL PLANNING POLICIES APPLICABLE AT DATE OF ISSUE OF THIS CERTIFICATE

(INFORMATION IS PROVIDED TO EXTENT THAT COUNCILHAS BEEN NOTIFIED BY THE NSW DEPARTMENT OF PLANNING & INFRASTRUCTURE)

SEPP (Affordable Rental Housing) 2009
The aims of this Policy are as follows—
(a) to provide a consistent planning regime for the provision of affordable rental housing,
(b) to facilitate the effective delivery of new affordable rental housing by providing incentives by way of expanded zoning permissibility, floor space ratio bonuses and non-discretionary development standards,
(c) to facilitate the retention and mitigate the loss of existing affordable rental housing,
(d) to employ a balanced approach between obligations for retaining and mitigating the loss of existing affordable rental housing, and incentives for the development of new affordable rental housing,
(e) to facilitate an expanded role for not-for-profit-providers of affordable rental housing,
(f) to support local business centres by providing affordable rental housing for workers close to places of work,
(g) to facilitate the development of housing for the homeless and other disadvantaged people who may require support services, including group homes and supportive accommodation.

SEPP Building Sustainability Index: BASIX 2004
This SEPP operates in conjunction with *Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004* to ensure the effective introduction of BASIX in NSW. The SEPP ensures consistency in the implementation of BASIX throughout the State by overriding competing provisions in other environmental planning instruments and development control plans, and specifying that SEPP 1 does not apply in relation to any development standard arising under BASIX. The draft SEPP was exhibited together with draft *Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004*.

SEPP (Exempt and Complying Development Codes) 2008
This policy commences from 27 February 2009. It aims to provide streamlined assessment processes for development that complies with specified development standards by:
(a) providing exempt and complying development codes that have State-wide application, and
(b) identifying, in the General Exempt Development Code, types of development that are of minimal environmental impact that may be carried out without the need for development consent, and
(c) identifying, in the General Housing Code, types of complying development that may be carried out in accordance with a complying development certificate as defined in the *Environmental Planning and Assessment Act 1979*, and
(d) enabling the progressive extension of the types of development in this Policy, and
(e) providing transitional arrangements for the introduction of the State-wide codes, including the amendment of other environmental planning instruments.

SEPP (Housing for Seniors or People with a Disability) 2004
Aims to increase the supply and choice of housing for older people or people with a disability. Such housing is permitted, with council consent, wherever houses, flats, hospitals or certain 'special uses' are permitted in or adjoining urban areas, except for some environmentally sensitive lands. The policy contains development standards and matters a council and the Department of Planning & Infrastructure must consider when determining development applications. For example, future residents must have reasonable access to services they require, taking into account convenience, affordability and the type and scale of housing. Relevant Government Circulars should be read in conjunction with this Policy.

SEPP (Infrastructure) 2007
Provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. The SEPP supports greater flexibility in the location of infrastructure and service facilities along with improved regulatory certainty and efficiency.

SEPP Koala Habitat Protection 2020
Encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range. The policy applies to 107 local government areas. Local councils cannot approve development in an area affected by the policy without an investigation of core koala habitat. The policy provides the state-wide approach needed to enable appropriate development to continue, while ensuring there is ongoing protection of koalas and their habitat.

SEPP (Mining, Petroleum Production and Extractive Industries) 2007
This Policy aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State. The Policy establish appropriate planning controls to encourage ecologically sustainable development.

SEPP No. 21 – Caravan Parks
The aim of this Policy is to encourage—
(a) the orderly and economic use and development of land used or intended to be used as a caravan park catering exclusively or predominantly for short-term residents (such as tourists) or for long-term residents, or catering for both, and
(b) the proper management and development of land so used, for the purpose of promoting the social and economic welfare of the community, and
(c) the provision of community facilities for land so used, and
(d) the protection of the environment of, and in the vicinity of, land so used.

SEPP No. 33 - Hazardous and Offensive Development
Provides new definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The new definitions enable decisions to approve or refuse a development to be based on the merit of proposal. The consent authority must careful consider the specifics the case, the location and the way in which the proposed activity is to be carried out. The policy also requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy. For example, any application to carry out a potentially hazardous or potentially offensive development is to be advertised for public comment, and applications to carry out potentially hazardous development must be supported by a preliminary hazard analysis (PHA). The policy does not change the role of councils as consent authorities, land zoning, or the designated development provisions of the Environmental Planning and Assessment Act 1979.

SEPP No. 36 - Manufactured Home Estates
Helps establish well-designed and properly serviced manufactured home estates (MHEs) in suitable locations. Affordability and security of tenure for residents are important aspects. The policy applies to Gosford, Wyong and all local government areas outside the Sydney Region. To enable the immediate development of estates, the policy allows MHEs to be located on certain land where caravan parks are permitted. There are however, criteria that a proposal must satisfy before the local council can approved development. The policy also permits, with consent, the subdivision of estates either by community title or by leases of up to 20 years. A section 117 direction issued in conjunction with the policy guides councils in preparing local environmental plans for MHEs, enabling them to be excluded from the policy.

SEPP No. 55 - Remediation of Land
Introduces state-wide planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals. To assist councils and developers, the Department, in conjunction with the Environment Protection Authority, has prepared Managing Land Contamination: Planning Guidelines.

SEPP No. 64 - Advertising and Signage
Aims to improve the amenity of urban and natural settings by managing the impact of outdoor advertising. The policy responds to growing concerns from the community, the advertising industry and local government that existing controls and guidelines were not effective. SEPP No. 64 offers the comprehensive provisions and consistent approach needed. SEPP 64 – Advertising and Signage: Explanatory Information should be read in conjunction with the policy.

SEPP No. 65 – Design Quality of Residential Flat Development
This SEPP highlights 10 design quality principles to guide architects designing residential flats and to assist councils in assessing these developments. The principles relate to key design issues such as:

- the context for design – the locality and streetscape
- scale, form and density of the building
- measures to achieve resource, energy and water efficiency
- landscape design to create useful outdoor spaces for residents
- safety and security, including ensuring public areas are safe, visible and well lit at night.

Aims to improve the design quality of flats of three or more storeys with four or more dwellings. The policy sets out a series of design principles for local councils or other consent authorities to consider when assessing development proposals for flats. It also creates a role for special design review panels and registered architects in the design and approval

SEPP No. 70 Affordable Housing (Revised Schemes)
This Policy:
(a) identifies that there is a need for affordable housing across the whole of the State, and
(b) describes the kinds of households for which affordable housing may be provided, and
(c) makes a requirement with respect to the imposition of conditions relating to the provision of affordable housing.

SEPP (Primary Production and Rural Development) 2019
The aims of this Policy are as follows—
(a) to facilitate the orderly economic use and development of lands for primary production,
(b) to reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources,
(c) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,
(d) to simplify the regulatory process for smaller-scale low risk artificial waterbodies, and routine maintenance of artificial water supply or drainage, in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts,
(e) to encourage sustainable agriculture, including sustainable aquaculture,
(f) to require consideration of the effects of all proposed development in the State on oyster aquaculture,
(g) to identify aquaculture that is to be treated as designated development using a well-defined and concise development assessment regime based on environment risks associated with site and operational factors.

SEPP (State and Regional Development) 2011
The aims of this Policy are as follows—
(a) to identify development that is State significant development,
(b) to identify development that is State significant infrastructure and critical State significant infrastructure,
(c) to identify development that is regionally significant development.

SCHEDULE OF DRAFT STATE ENVIRONMENTAL PLANNING POLICIES OF WHICH COUNCIL HAS BEEN MADE AWARE AT DATE OF ISSUE OF CERTIFICATE

Please Note*: The NSW Department of Planning & Infrastructure has issued Circular PS 08-013 to Councils on 13 November 2008. From 1 March 2009, Councils are directed not to consider draft environmental planning instruments that were exhibited prior to 1 March 2006 and not yet gazetted for the purpose of assessing development applications under Section 79C(a)(ii) of the Environmental Planning and Assessment Act 1979.*
Nil Current

GLEN INNES SEVERN COUNCIL

PO Box 61, Glen Innes, 2370
Ph: 02 6730 2350

SECTION 10.7(5) CERTIFICATE

Information supplied pursuant to s149(5) of the

Environmental Planning And Assessment Act 1979 ,as amended

APPLICANT DETAILS		***CERTIFICATE DETAILS***	
Katrina Taylor JK Environments Pty Ltd PO Box 976 NORTH RYDE BC NSW 1670		***Certificate Number:***	350/21-22
		Certificate Date:	8 April 2022
PROPERTY DETAILS		***Your Reference:***	E:34948PT
Property Details:	85 Taylor Street Glen Innes NSW 2370	***Fee:***	$80.00
Legal Description:	Lot 2 DP1208729	***Receipt Number:***	238893

(a) Has development consent under the Environmental Planning and Assessment Act 1979, as amended been issued for a use of the land within the past five years? If so, what conditions of consent apply?

No

(b) Is the land affected by a Tree Preservation Order?

No

The above information has been taken from Council's records but Council cannot accept responsibility for any omission or inaccuracy.

Please Note:

- *Prospective purchasers should consult their legal advisers concerning any easements or restrictions on the title of the property.*
- *Council does not incur any liability in respect of advice provided in good faith pursuant to s149(5) in accordance with s149(6) of the Environmental Planning and Assessment Act 1979, as amended.*
- *Information on any outstanding notices or orders pertaining to this property can be obtained through a Certificate available from Council pursuant to s121ZP of the Environmental Planning as Assessment Act 1979 and s735A of the Local Government Act 1993.*

Kathleen Taminiau
Town Planner

Date: 8 April 2022

SafeWork NSW Records

Katrina Taylor

From: Licensing <licensing@safework.nsw.gov.au>
Sent: Wednesday, 30 March 2022 10:42 AM
To: Katrina Taylor
Subject: SafeWork NSW: 00680722 –Site Search application – Result not found [ref:_ 00D281hl6J._5004a7mgtf:ref]

Security Classification: Sensitive Personal
Please do not amend the subject line of this email

Dear Katrina

Re: Site Search for Schedule 11 Hazardous Chemicals on premises Application – Result not found

I refer to your application for a Site Search for Schedule 11 Hazardous Chemicals on premises for the following site: 94 Taylor Street, Glen Innes.

A search of the records held by SafeWork NSW has not located any records pertaining to the above-mentioned premises.

If you have any further information or if you have any questions, please use one of the following options, quoting the SafeWork NSW enquiry reference number: 00680722

- Email: licensing@safework.nsw.gov.au
- Phone: 13 10 50

Kind regards

Gabriela Draper
Licensing Representative
SafeWork NSW | Better Regulation Division
Department of Customer Service
p- 13 10 50
e- licensing@safework.nsw.gov.au | www.customerservice.nsw.gov.au
Level 3, 32 Mann Street, Gosford, NSW 2250

We are always looking for ways that we can improve our services. You may be contacted by email in the next few weeks to complete a short survey and provide us with your feedback on what we did well and where we can improve. If you do not wish to participate in our surveys, please email us at: licensingQA@customerservice.nsw.gov.au and we will ensure that you are not contacted.

Appendix C: Laboratory Results Summary Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC: Ambient Background Concentration
ACM: Asbestos Containing Material
ADWG: AustralianDrinking Water Guidelines
AF: Asbestos Fines
ANZG Australian and New Zealand Guidelines
B(a)P: Benzo(a)pyrene
CEC: Cation Exchange Capacity
CRC: Cooperative Research Centre
CT: Contaminant Threshold
EILs: Ecological Investigation Levels
ESLs: Ecological Screening Levels
FA: Fibrous Asbestos
GIL: Groundwater Investigation Levels
GSW: General Solid Waste
HILs: Health Investigation Levels
HSLs: Health Screening Levels
HSL-SSA: Health Screening Level-SiteSpecific Assessment
kg/L kilograms per litre
NA: Not Analysed
NC: Not Calculated
NEPM: National Environmental Protection Measure
NHMRC: National Health and Medical Research Council
NL: Not Limiting
NSL: No Set Limit
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PAHs: Polycyclic Aromatic Hydrocarbons
%w/w: weight per weight
ppm: Parts per million
PCBs: Polychlorinated Biphenyls
PCE: Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
pH_{KCL} : pH of filtered 1:20, 1M KCL extract, shaken overnight
pH_{ox} : pH of filtered 1:20 1M KCl after peroxide digestion
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
RSW: Restricted Solid Waste
SAC: Site Assessment Criteria
SCC: Specific Contaminant Concentration
S_{Cr}: Chromium reducible sulfur
S_{POS}: Peroxide oxidisable Sulfur
SSA: Site Specific Assessment
SSHSLs: Site Specific Health Screening Levels
TAA: Total Actual Acidity in 1M KCL extract titrated to pH6.5
TB: Trip Blank
TCA: 1,1,1 Trichloroethane (methyl chloroform)
TCE: Trichloroethylene (Trichloroethene)
TCLP: Toxicity Characteristics Leaching Procedure
TPA: Total Potential Acidity, 1M KCL peroxide digest
TS: Trip Spike
TRH: Total Recoverable Hydrocarbons
TSA: Total Sulfide Acidity (TPA-TAA)
UCL: Upper Level Confidence Limit on Mean Value
USEPA United States Environmental Protection Agency
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also refered to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with low traffic have been quoted).

QA/QC Table:

- Field blank, Inter and Intra laboratory duplicate results are reported in mg/kg.
- Trip spike results are reported as percentage recovery.
- Field rinsate results are reported in µg/L.

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TABLE S1
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-D: 'Commercial/Industrial'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			3000	900	3600	240000	1500	730	6000	400000	4000	40	80	2000	2500	45	530	3600	50	2000	7	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0-0.1	F: sandy clay	**13**	<0.4	**64**	**16**	**19**	<0.1	**18**	**30**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH1 - [LAB_DUP]	0-0.1	F: sandy clay	**11**	<0.4	**65**	**18**	**20**	<0.1	**20**	**29**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH1	0.3-0.5	Silty clay	<4	<0.4	**220**	**42**	**11**	<0.1	**52**	**26**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0-0.2	F: silty clay	**8**	<0.4	**36**	**11**	**16**	<0.1	**13**	**30**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH3	0-0.1	F: silty clay	**8**	<0.4	**29**	**13**	**19**	<0.1	**15**	**30**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH3	0.3-0.5	F: gravelly clay	**4**	<0.4	**50**	**25**	**22**	**0.1**	**29**	**34**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3 - [LAB_DUP]	0.3-0.5	F: gravelly clay	**5**	<0.4	**49**	**26**	**21**	<0.1	**24**	**32**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH4	0-0.1	F: sandy clay	**9**	<0.4	**27**	**8**	**13**	<0.1	**12**	**17**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP5	0-0.1	F: silty clay	**14**	<0.4	**26**	**6**	**14**	<0.1	**7**	**15**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP6	0-0.1	F: silty clay	**13**	<0.4	**51**	**10**	**18**	<0.1	**13**	**20**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP7	0-0.1	F: silty clay	**11**	<0.4	**35**	**13**	**18**	<0.1	**15**	**31**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP7	0.3-0.5	F: silty clay	<4	<0.4	**140**	**48**	**16**	**1.3**	**59**	**64**	**0.07**	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP8	0-0.1	F: silty clay	**5**	<0.4	**34**	**10**	**11**	<0.1	**13**	**32**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP8 - [LAB_DUP]	0-0.1	F: silty clay	**5**	<0.4	**29**	**10**	**11**	<0.1	**12**	**32**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP9	0-0.1	F: silty clay	**11**	<0.4	**63**	**11**	**15**	<0.1	**15**	**17**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SDup1	-	Fill	**9**	<0.4	**57**	**13**	**16**	<0.1	**12**	**23**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDup2	-	Fill	**23**	<0.4	**82**	**13**	**29**	<0.1	**19**	**26**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDup3	-	Fill	**7**	<0.4	**17**	**6**	**10**	<0.1	**7**	**15**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Total Number of Samples			18	18	18	18	18	18	18	18	18	18	14	14	14	14	14	14	14	14	14	9
Maximum Value			23	<PQL	220	48	29	1.3	59	64	0.07	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	Not Detected

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**

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TABLE S2
SOIL LABORATORY RESULTS COMPARED TO HSLs
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					**HSL-D: COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0-0.1	F: sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1 - [LAB_DUP]	0-0.1	F: sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1	0.3-0.5	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH2	0-0.2	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0-0.1	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0.3-0.5	F: gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0.3-0.5	F: gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH4	0-0.1	F: sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP5	0-0.1	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP6	0-0.1	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP7	0-0.1	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP7	0.3-0.5	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP8	0-0.1	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP8 - [LAB_DUP]	0-0.1	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP9	0-0.1	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDup1	-	Fill	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDup2	-	Fill	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDup3	-	Fill	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples					18	18	18	18	18	18	18	18
Maximum Value					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

Concentration above the SAC — **VALUE**
Concentration above the PQL — **Bold**
The guideline corresponding to the concentration above the SAC is highlighted in grey in the Site Assessment Criteria Table below

HSL SOIL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
BH1	0-0.1	F: sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
BH1 - [LAB_DUP]	0-0.1	F: sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
BH1	0.3-0.5	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
BH2	0-0.2	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
BH3	0-0.1	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
BH3	0.3-0.5	F: gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
BH3	0.3-0.5	F: gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
BH4	0-0.1	F: sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
TP5	0-0.1	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
TP6	0-0.1	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
TP7	0-0.1	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
TP7	0.3-0.5	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
TP8	0-0.1	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
TP8 - [LAB_DUP]	0-0.1	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
TP9	0-0.1	F: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDup1	-	Fill	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDup2	-	Fill	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDup3	-	Fill	0m to <1m	Sand	260	NL	3	NL	NL	230	NL

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TABLE S3
SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS
All data in mg/kg unless stated otherwise

			C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**COMMERCIAL/INDUSTRIAL**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH1	0-0.1	Fine	<25	<50	<100	<100
BH1 - [LAB_DUP]	0-0.1	Fine	<25	<50	<100	<100
BH1	0.3-0.5	Fine	<25	<50	<100	<100
BH2	0-0.2	Fine	<25	<50	<100	<100
BH3	0-0.1	Fine	<25	<50	<100	<100
BH3	0.3-0.5	Fine	<25	<50	<100	<100
BH3	0.3-0.5	Fine	<25	<50	<100	<100
BH4	0-0.1	Fine	<25	<50	<100	<100
TP5	0-0.1	Fine	<25	<50	<100	<100
TP6	0-0.1	Fine	<25	<50	<100	<100
TP7	0-0.1	Fine	<25	<50	<100	<100
TP7	0.3-0.5	Fine	<25	<50	<100	<100
TP8	0-0.1	Fine	<25	<50	<100	<100
TP8 - [LAB_DUP]	0-0.1	Fine	<25	<50	<100	<100
TP9	0-0.1	Fine	<25	<50	<100	<100
SDup1	-	Fine	<25	<50	<100	<100
SDup2	-	Fine	<25	<50	<100	<100
SDup3	-	Fine	<25	<50	<100	<100
Total Number of Samples			18	18	18	18
Maximum Value			<PQL	<PQL	<PQL	<PQL

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**

MANAGEMENT LIMIT ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Soil Texture**	C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
BH1	0-0.1	Fine	800	1000	5000	10000
BH1 - [LAB_DUP]	0-0.1	Fine	800	1000	5000	10000
BH1	0.3-0.5	Fine	800	1000	5000	10000
BH2	0-0.2	Fine	800	1000	5000	10000
BH3	0-0.1	Fine	800	1000	5000	10000
BH3	0.3-0.5	Fine	800	1000	5000	10000
BH3	0.3-0.5	Fine	800	1000	5000	10000
BH4	0-0.1	Fine	800	1000	5000	10000
TP5	0-0.1	Fine	800	1000	5000	10000
TP6	0-0.1	Fine	800	1000	5000	10000
TP7	0-0.1	Fine	800	1000	5000	10000
TP7	0.3-0.5	Fine	800	1000	5000	10000
TP8	0-0.1	Fine	800	1000	5000	10000
TP8 - [LAB_DUP]	0-0.1	Fine	800	1000	5000	10000
TP9	0-0.1	Fine	800	1000	5000	10000
SDup1	-	Fine	800	1000	5000	10000
SDup2	-	Fine	800	1000	5000	10000
SDup3	-	Fine	800	1000	5000	10000

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TABLE S4
SOIL LABORATORY RESULTS COMPARED T0 DIRECT CONTACT CRITERIA
All data in mg/kg unless stated otherwise

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		26,000	20,000	27,000	38,000	430	99,000	27,000	81,000	11,000	
Site Use		**COMMERCIAL/INDUSTRIAL - DIRECT SOIL CONTACT**									
Sample Reference	**Sample Depth**										
BH1	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH1 - [LAB_DUP]	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH1	0.3-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH2	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH3	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH3	0.3-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH3	0.3-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH4	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP5	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP7	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP7	0.3-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP8	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP8 - [LAB_DUP]	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP9	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDup1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDup2	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDup3	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples		18	18	18	18	18	18	18	18	18	18
Maximum Value		<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**

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TABLE S5
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HIL-D:Commercial/Industrial

FIELD DATA															LABORATORY DATA											
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.05**			**0.001**			**0.001**											**0.05**	**0.001**
5/04/2022	BH1	0-0.2	No	10	9,650	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	BH1	0-0.1	532.81	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
5/04/2022	BH2	0-0.2	No	10	10,260	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	BH2	0-0.2	599.38	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
5/04/2022	BH3	0-0.1	No	10	10,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	BH3	0-0.1	578.02	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
5/04/2022	BH3	0.3-0.5	NA	10	5,310	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5/04/2022	BH4	0-0.1	No	10	8,380	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	BH4	0-0.1	487.45	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
6/04/2022	TP5	0-0.2	No	10	10,150	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	TP5	0-0.1	707.8	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
6/04/2022	TP6	0-0.2	No	10	9,620	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	TP6	0-0.1	666.89	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
6/04/2022	TP7	0-0.2	No	10	11,320	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	TP7	0-0.1	629.3	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
6/04/2022	TP7	0.2-0.7	No	10	10,530	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6/04/2022	TP8	0-0.2	No	10	10,020	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	TP8	0-0.1	518.23	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
6/04/2022	TP9	0-0.2	No	10	10,680	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	293078	TP9	0-0.1	652.03	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001

Concentration above the SAC **VALUE**

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TABLE S6
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category				COMMERCIAL/INDUSTRIAL																		
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0-0.1	F: sandy clay	Fine	NA	NA	NA	**13**	**64**	**16**	**19**	**18**	**30**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH1 - [LAB_DUP]	0-0.1	F: sandy clay	Fine	NA	NA	NA	**11**	**65**	**18**	**20**	**20**	**29**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH1	0.3-0.5	Silty clay	Fine	NA	NA	NA	<4	**220**	**42**	**11**	**52**	**26**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH2	0-0.2	F: silty clay	Fine	NA	NA	NA	**8**	**36**	**11**	**16**	**13**	**30**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0-0.1	F: silty clay	Fine	NA	NA	NA	**8**	**29**	**13**	**19**	**15**	**30**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0.3-0.5	F: gravelly clay	Fine	NA	NA	NA	**4**	**50**	**25**	**22**	**29**	**34**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0.3-0.5	F: gravelly clay	Fine	NA	NA	NA	**5**	**49**	**26**	**21**	**24**	**32**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH4	0-0.1	F: sandy clay	Fine	NA	NA	NA	**9**	**27**	**8**	**13**	**12**	**17**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP5	0-0.1	F: silty clay	Fine	NA	NA	NA	**14**	**26**	**6**	**14**	**7**	**15**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP6	0-0.1	F: silty clay	Fine	NA	NA	NA	**13**	**51**	**10**	**18**	**13**	**20**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP7	0-0.1	F: silty clay	Fine	NA	NA	NA	**11**	**35**	**13**	**18**	**15**	**31**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP7	0.3-0.5	F: silty clay	Fine	NA	NA	NA	<4	**140**	**48**	**16**	**59**	**64**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.07**
TP8	0-0.1	F: silty clay	Fine	NA	NA	NA	**5**	**34**	**10**	**11**	**13**	**32**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP8 - [LAB_DUP]	0-0.1	F: silty clay	Fine	NA	NA	NA	**5**	**29**	**10**	**11**	**12**	**32**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP9	0-0.1	F: silty clay	Fine	NA	NA	NA	**11**	**63**	**11**	**15**	**15**	**17**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDup1	-	Fill	Fine	NA	NA	NA	**9**	**57**	**13**	**16**	**12**	**23**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDup2	-	Fill	Fine	NA	NA	NA	**23**	**82**	**13**	**29**	**19**	**26**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDup3	-	Fill	Fine	NA	NA	NA	**7**	**17**	**6**	**10**	**7**	**15**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
Total Number of Samples				0	0	0	18	18	18	18	18	18	18	14	18	18	18	18	18	18	18	18	18
Maximum Value				NA	NA	NA	23	220	48	29	59	64	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.07

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**
The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

EIL AND ESL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**	pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
BH1	0-0.1	F: sandy clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
BH1 - [LAB_DUP]	0-0.1	F: sandy clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
BH1	0.3-0.5	Silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	--	215	170	2500	6600	95	135	185	95	72
BH2	0-0.2	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
BH3	0-0.1	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
BH3	0.3-0.5	F: gravelly clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	--	215	170	2500	6600	95	135	185	95	72
BH3	0.3-0.5	F: gravelly clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	--	215	170	2500	6600	95	135	185	95	72
BH4	0-0.1	F: sandy clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
TP5	0-0.1	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
TP6	0-0.1	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
TP7	0-0.1	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
TP7	0.3-0.5	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	--	215	170	2500	6600	95	135	185	95	72
TP8	0-0.1	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
TP8 - [LAB_DUP]	0-0.1	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
TP9	0-0.1	F: silty clay	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
SDup1	-	Fill	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
SDup2	-	Fill	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72
SDup3	-	Fill	Fine	NA	NA	NA	160	320	100	1900	60	190	370	640	215	170	2500	6600	95	135	185	95	72

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TABLE S7
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled	PCBs	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0-0.1	F: sandy clay	**13**	<0.4	**64**	**16**	**19**	<0.1	**18**	**30**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH1 - [LAB_DU	0-0.1	F: sandy clay	**11**	<0.4	**65**	**18**	**20**	<0.1	**20**	**29**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH1	0.3-0.5	Silty clay	<4	<0.4	**220**	**42**	**11**	<0.1	**52**	**26**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH2	0-0.2	F: silty clay	**8**	<0.4	**36**	**11**	**16**	<0.1	**13**	**30**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH3	0-0.1	F: silty clay	**8**	<0.4	**29**	**13**	**19**	<0.1	**15**	**30**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH3	0.3-0.5	F: gravelly clay	**4**	<0.4	**50**	**25**	**22**	**0.1**	**29**	**34**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH3	0.3-0.5	F: gravelly clay	**5**	<0.4	**49**	**26**	**21**	<0.1	**24**	**32**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH4	0-0.1	F: sandy clay	**9**	<0.4	**27**	**8**	**13**	<0.1	**12**	**17**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP5	0-0.1	F: silty clay	**14**	<0.4	**26**	**6**	**14**	<0.1	**7**	**15**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP6	0-0.1	F: silty clay	**13**	<0.4	**51**	**10**	**18**	<0.1	**13**	**20**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP7	0-0.1	F: silty clay	**11**	<0.4	**35**	**13**	**18**	<0.1	**15**	**31**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP7	0.3-0.5	F: silty clay	<4	<0.4	**140**	**48**	**16**	**1.3**	**59**	**64**	**0.07**	**0.07**	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP8	0-0.1	F: silty clay	**5**	<0.4	**34**	**10**	**11**	<0.1	**13**	**32**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP8 - [LAB_DUI	0-0.1	F: silty clay	**5**	<0.4	**29**	**10**	**11**	<0.1	**12**	**32**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP9	0-0.1	F: silty clay	**11**	<0.4	**63**	**11**	**15**	<0.1	**15**	**17**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
SDup1	-	Fill	**9**	<0.4	**57**	**13**	**16**	<0.1	**12**	**23**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDup2	-	Fill	**23**	<0.4	**82**	**13**	**29**	<0.1	**19**	**26**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDup3	-	Fill	**7**	<0.4	**17**	**6**	**10**	<0.1	**7**	**15**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
Total Number of Samples			18	18	18	18	18	18	18	18	18	18	14	14	14	14	14	18	18	18	18	18	18	18	18	18	9
Maximum Value			23	<PQL	220	48	29	1.3	59	64	0.07	0.07	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	Not Detected

Concentration above the CT1	VALUE
Concentration above SCC1	VALUE
Concentration above the SCC2	VALUE
Concentration above PQL	**Bold**

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TABLE Q1
SOIL QA/QC SUMMARY

			TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene
	PQL Envirolab SYD		25	50	100	100	0.2	0.5	1	2	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.05	0.1	0.1	0.1
	PQL Envirolab VIC		25	50	100	100	0.2	0.5	1.0	2.0	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Intra laboratory duplicate	BH1	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	SDup1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra laboratory duplicate	TP9	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	SDup3	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter laboratory duplicate	TP6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	SDup2	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field Rinsate	FR-S1 6/04/22	µg/L	240	<50	<100	<100	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1
Trip Spike	TS-S1 5/04/22		-	-	-	-	99%	99%	100%	100%	99%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			HCB	alpha- BHC	gamma- BHC	beta- BHC	Heptachlor	delta- BHC	Aldrin	Heptachlor Epoxide	Gamma- Chlordane	alpha- chlordane	Endosulfan I	pp- DDE	Dieldrin	Endrin	pp- DDD	Endosulfan II	pp- DDT	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor	Azinphos-methyl (Guthion)	Bromophos-ethyl	Chlorpyriphos	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Total PCBS	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	4	0.4	1	1	1	0.1	1	1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	4.0	0.4	1.0	1.0	1.0	0.1	1.0	1.0
Intra laboratory duplicate	BH1	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	13	<0.4	64	16	19	<0.1	18	30
	SDup1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	9	<0.4	57	13	16	<0.1	12	23
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	11	nc	60.5	14.5	17.5	nc	15	26.5
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	36%	nc	12%	21%	17%	nc	40%	26%
Intra laboratory duplicate	TP9	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	11	<0.4	63	11	15	<0.1	15	17
	SDup3	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7	<0.4	17	6	10	<0.1	7	15
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	9	nc	40	8.5	12.5	nc	11	16
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	44%	nc	115%	59%	40%	nc	73%	13%
Inter laboratory duplicate	TP6	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	13	<0.4	51	10	18	<0.1	13	20
	SDup2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	23	<0.4	82	13	29	<0.1	19	26
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	18	nc	66.5	11.5	23.5	nc	16	23
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	56%	nc	47%	26%	47%	nc	38%	26%
Field Rinsate	FR-S1 6/04/22	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.01	<0.01	0.1	<0.03	<0.0005	<0.02	<0.02
Trip Spike	TS-S1 5/04/22		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Result outside of QA/QC acceptance criteria

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ADWG: AustralianDrinking Water Guidelines
ANZG Australian and New Zealand Guidelines
B(a)P: Benzo(a)pyrene
CRC: Cooperative Research Centre
ESLs: Ecological Screening Levels
GIL: Groundwater Investigation Levels
HILs: Health Investigation Levels
HSLs: Health Screening Levels
HSL-SSA: Health Screening Level-SiteSpecific Assessment
NA: Not Analysed
NC: Not Calculated
NEPM: National Environmental Protection Measure
NHMRC: National Health and Medical Research Council
NL: Not Limiting
NSL: No Set Limit
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PAHs: Polycyclic Aromatic Hydrocarbons
ppm: Parts per million
PCBs: Polychlorinated Biphenyls
PCE: Perchloroethylene (Tetrachloroethylene or Tetrachloroethene)
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
SAC: Site Assessment Criteria
SSA: Site Specific Assessment
SSHSLs Site Specific Health Screening Levels
TB: Trip Blank
TCA: 1,1,1 Trichloroethane (methyl chloroform)
TCE: Trichloroethylene (Trichloroethene)
TS: Trip Spike
TRH: Total Recoverable Hydrocarbons
UCL: Upper Level Confidence Limit on Mean Value
USEPA United States Environmental Protection Agency
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

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TABLE G1
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO ECOLOGICAL GILs SAC
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZG 2018 Fresh Waters	SAMPLES					
			MW1	MW1 LAB DUP	MW2	MW3	MW3 LAB DUP	WDup1
Inorganic Compounds and Parameters								
pH		6.5 - 8.5	6.9	NA	7.3	6.7	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**200**	NA	**380**	**3700**	NA	NA
Metals and Metalloids								
Arsenic (As III)	1	24	<1	NA	<1	<1	NA	<1
Cadmium	0.1	0.2	<0.1	NA	<0.1	<0.1	NA	<0.1
Chromium (SAC for Cr III adopted)	1	3.3	<1	NA	<1	<1	NA	<1
Copper	1	1.4	<1	NA	<1	<1	NA	<1
Lead	1	3.4	<1	NA	<1	<1	NA	<1
Total Mercury (inorganic)	0.05	0.06	<0.05	NA	<0.05	<0.05	NA	<0.05
Nickel	1	11	<1	NA	<1	**10**	NA	<1
Zinc	1	8	**12**	NA	<1	**4**	NA	**9**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)								
Benzene	1	950	<1	NA	<1	<1	<1	<1
Toluene	1	180	<1	NA	<1	<1	<1	<1
Ethylbenzene	1	80	<1	NA	<1	<1	<1	<1
m+p-xylene	2	75	<2	NA	<2	<2	<2	<2
o-xylene	1	350	<1	NA	<1	<1	<1	<1
Total xylenes	2	NSL	<2	NA	<2	<2	<2	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs								
Dichlorodifluoromethane	10	NSL	<10	NA	<10	<10	<10	NA
Chloromethane	10	NSL	<10	NA	<10	<10	<10	NA
Vinyl Chloride	10	100	<10	NA	<10	<10	<10	NA
Bromomethane	10	NSL	<10	NA	<10	<10	<10	NA
Chloroethane	10	NSL	<10	NA	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	NA	<10	<10	<10	NA
1,1-Dichloroethene	1	700	<1	NA	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	NSL	<1	NA	<1	<1	<1	NA
1,1-dichloroethane	1	90	<1	NA	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	NSL	<1	NA	<1	<1	<1	NA
Bromochloromethane	1	NSL	<1	NA	<1	<1	<1	NA
Chloroform	1	370	<1	NA	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dichloroethane	1	1900	<1	NA	<1	<1	<1	NA
1,1,1-trichloroethane	1	270	<1	NA	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	NA	<1	<1	<1	NA
Carbon tetrachloride	1	240	<1	NA	<1	<1	<1	NA
Benzene	1	950	<1	NA	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dichloropropane	1	900	<1	NA	<1	<1	<1	NA
Trichloroethene	1	330	<1	NA	<1	<1	<1	NA
Bromodichloromethane	1	NSL	<1	NA	<1	<1	<1	NA
trans-1,3-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA
cis-1,3-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA
1,1,2-trichloroethane	1	6500	<1	NA	<1	<1	<1	NA
Toluene	1	180	<1	NA	<1	<1	<1	NA
1,3-dichloropropane	1	1100	<1	NA	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	NA	<1	<1	<1	NA
Tetrachloroethene	1	70	<1	NA	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	NA
Chlorobenzene	1	55	<1	NA	<1	<1	<1	NA
Ethylbenzene	1	80	<1	NA	<1	<1	<1	NA
Bromoform	1	NSL	<1	NA	<1	<1	<1	NA
m+p-xylene	2	75	<2	NA	<2	<2	<2	NA
Styrene	1	NSL	<1	NA	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	400	<1	NA	<1	<1	<1	NA
o-xylene	1	350	<1	NA	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
Isopropylbenzene	1	30	<1	NA	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	NA	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,3-dichlorobenzene	1	260	<1	NA	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,4-dichlorobenzene	1	60	<1	NA	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	NA	<1	**2**	**2**	NA
1,2-dichlorobenzene	1	160	<1	NA	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	NA	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	85	<1	NA	<1	<1	<1	NA
Hexachlorobutadiene	1	NSL	<1	NA	<1	<1	<1	NA
1,2,3-trichlorobenzene	1	3	<1	NA	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	0.2	16	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Anthracene	0.1	0.01	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Fluoranthene	0.1	1	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**
GIL >PQL	Red

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TABLE G2
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO HUMAN CONTACT GILs
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	Recreational (10 x NHMRC ADWG)	SAMPLES					
			MW1	MW1 LAB DUP	MW2	MW3	MW3 LAB DUP	WDup1
Inorganic Compounds and Parameters								
pH		6.5 - 8.5	6.9	NA	7.3	6.7	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**200**	NA	**380**	**3700**	NA	NA
Metals and Metalloids								
Arsenic (As III)	1	100	<1	NA	<1	<1	NA	<1
Cadmium	0.1	20	<0.1	NA	<0.1	<0.1	NA	<0.1
Chromium (total)	1	500	<1	NA	<1	<1	NA	<1
Copper	1	20000	<1	NA	<1	<1	NA	<1
Lead	1	100	<1	NA	<1	<1	NA	<1
Total Mercury (inorganic)	0.05	10	<0.05	NA	<0.05	<0.05	NA	<0.05
Nickel	1	200	<1	NA	<1	**10**	NA	<1
Zinc	1	30000	**12**	NA	<1	**4**	NA	**9**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)								
Benzene	1	10	<1	NA	<1	<1	<1	<1
Toluene	1	8000	<1	NA	<1	<1	<1	<1
Ethylbenzene	1	3000	<1	NA	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	<2
o-xylene	1	NSL	<1	NA	<1	<1	<1	<1
Total xylenes	2	6000	<2	NA	<2	<2	<2	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs								
Dichlorodifluoromethane	10	NSL	<10	NA	<10	<10	<10	NA
Chloromethane	10	NSL	<10	NA	<10	<10	<10	NA
Vinyl Chloride	10	3	<10	NA	<10	<10	<10	NA
Bromomethane	10	NSL	<10	NA	<10	<10	<10	NA
Chloroethane	10	NSL	<10	NA	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	NA	<10	<10	<10	NA
1,1-Dichloroethene	1	300	<1	NA	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	600	<1	NA	<1	<1	<1	NA
1,1-dichloroethane	1	NSL	<1	NA	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	600	<1	NA	<1	<1	<1	NA
Bromochloromethane	1	2500	<1	NA	<1	<1	<1	NA
Chloroform	1		<1	NA	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dichloroethane	1	30	<1	NA	<1	<1	<1	NA
1,1,1-trichloroethane	1	NSL	<1	NA	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	NA	<1	<1	<1	NA
Carbon tetrachloride	1	30	<1	NA	<1	<1	<1	NA
Benzene	1	10	<1	NA	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
Trichloroethene	1	NSL	<1	NA	<1	<1	<1	NA
Bromodichloromethane	1	NSL	<1	NA	<1	<1	<1	NA
trans-1,3-dichloropropene	1	1000	<1	NA	<1	<1	<1	NA
cis-1,3-dichloropropene	1	1000	<1	NA	<1	<1	<1	NA
1,1,2-trichloroethane	1	NSL	<1	NA	<1	<1	<1	NA
Toluene	1	8000	<1	NA	<1	<1	<1	NA
1,3-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	NA	<1	<1	<1	NA
Tetrachloroethene	1	500	<1	NA	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	NA
Chlorobenzene	1	3000	<1	NA	<1	<1	<1	NA
Ethylbenzene	1	3000	<1	NA	<1	<1	<1	NA
Bromoform	1	NSL	<1	NA	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	NA
Styrene	1	300	<1	NA	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	NA
o-xylene	1	NSL	<1	NA	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
Isopropylbenzene	1	NSL	<1	NA	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	NA	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,3-dichlorobenzene	1	200	<1	NA	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,4-dichlorobenzene	1	400	<1	NA	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	NA	<1	**2**	**2**	NA
1,2-dichlorobenzene	1	15000	<1	NA	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	NA	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	300	<1	NA	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		<1	NA	<1	<1	<1	NA
Hexachlorobutadiene	1	7	<1	NA	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1

Concentration above the SAC	VALUE
Concentration above the PQL	**Bold**
GIL >PQL	Red

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TABLE G3
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO DRINKING WATER GILs
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	SAMPLES					
			MW1	MW1 LAB DUP	MW2	MW3	MW3 LAB DUP	WDup1
Inorganic Compounds and Parameters								
pH		6.5 - 8.5	6.9	NA	7.3	6.7	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**200**	NA	**380**	**3700**	NA	NA
Metals and Metalloids								
Arsenic (As III)	1	10	<1	NA	<1	<1	NA	<1
Cadmium	0.1	2	<0.1	NA	<0.1	<0.1	NA	<0.1
Chromium (total)	1	50	<1	NA	<1	<1	NA	<1
Copper	1	2000	<1	NA	<1	<1	NA	<1
Lead	1	10	<1	NA	<1	<1	NA	<1
Total Mercury (inorganic)	0.05	1	<0.05	NA	<0.05	<0.05	NA	<0.05
Nickel	1	20	<1	NA	<1	**10**	NA	<1
Zinc	1	3000	**12**	NA	<1	**4**	NA	**9**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)								
Benzene	1	1	<1	NA	<1	<1	<1	<1
Toluene	1	800	<1	NA	<1	<1	<1	<1
Ethylbenzene	1	300	<1	NA	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	<2
o-xylene	1	NSL	<1	NA	<1	<1	<1	<1
Total xylenes	2	600	<2	NA	<2	<2	<2	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs								
Dichlorodifluoromethane	10	NSL	<10	NA	<10	<10	<10	NA
Chloromethane	10	NSL	<10	NA	<10	<10	<10	NA
Vinyl Chloride	10	0.3	<10	NA	<10	<10	<10	NA
Bromomethane	10	NSL	<10	NA	<10	<10	<10	NA
Chloroethane	10	NSL	<10	NA	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	NA	<10	<10	<10	NA
1,1-Dichloroethene	1	30	<1	NA	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	60	<1	NA	<1	<1	<1	NA
1,1-dichloroethane	1	NSL	<1	NA	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	60	<1	NA	<1	<1	<1	NA
Bromochloromethane	1	250	<1	NA	<1	<1	<1	NA
Chloroform	1		<1	NA	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dichloroethane	1	3	<1	NA	<1	<1	<1	NA
1,1,1-trichloroethane	1	NSL	<1	NA	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	NA	<1	<1	<1	NA
Carbon tetrachloride	1	3	<1	NA	<1	<1	<1	NA
Benzene	1	1	<1	NA	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
Trichloroethene	1	NSL	<1	NA	<1	<1	<1	NA
Bromodichloromethane	1	NSL	<1	NA	<1	<1	<1	NA
trans-1,3-dichloropropene	1	100	<1	NA	<1	<1	<1	NA
cis-1,3-dichloropropene	1	100	<1	NA	<1	<1	<1	NA
1,1,2-trichloroethane	1	NSL	<1	NA	<1	<1	<1	NA
Toluene	1	800	<1	NA	<1	<1	<1	NA
1,3-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	NA	<1	<1	<1	NA
Tetrachloroethene	1	50	<1	NA	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	NA
Chlorobenzene	1	300	<1	NA	<1	<1	<1	NA
Ethylbenzene	1	300	<1	NA	<1	<1	<1	NA
Bromoform	1	NSL	<1	NA	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	NA
Styrene	1	30	<1	NA	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	NA
o-xylene	1	NSL	<1	NA	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	NA	<1	<1	<1	NA
Isopropylbenzene	1	NSL	<1	NA	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	NA	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,3-dichlorobenzene	1	20	<1	NA	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,4-dichlorobenzene	1	40	<1	NA	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	NA	<1	**2**	**2**	NA
1,2-dichlorobenzene	1	1500	<1	NA	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	NA	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	30	<1	NA	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		<1	NA	<1	<1	<1	NA
Hexachlorobutadiene	1	0.7	<1	NA	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Benzo(a)pyrene	0.1	0.01	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	NA	<0.1

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**
GIL >PQL	Red

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TABLE G4
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	
PQL - Envirolab Services				10	50	1	1	1	2	1	PID
NEPM 2013 - Land Use Category				**HSL-D: COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW1	3.87	2m to <4m	Clay	<10	<50	<1	<1	<1	<2	<1	0
MW1	3.87	2m to <4m	Clay	NA	<50	NA	NA	NA	NA	NA	NA
MW2	2.03	2m to <4m	Clay	<10	<50	<1	<1	<1	<2	<1	0
MW3	6.13	4m to <8m	Clay	<10	<50	<1	<1	<1	<2	<1	0
MW3	6.13	4m to <8m	Clay	<10	NA	<1	<1	<1	<2	<1	NA
WDup1	3.87	2m to <4m	Clay	<10	<50	<1	<1	<1	<2	<1	NA
Total Number of Samples				5	5	5	5	5	5	5	3
Maximum Value				<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0

Concentration above the SAC	**VALUE**
Site specific assesment (SSA) required	**VALUE**
Concentration above the PQL	**Bold**

The guideline corresponding to the elevated value is highlighted in grey in the Groundwater Assessment Criteria Table below

HSL GROUNDWATER ASSESSMENT CRITERIA

Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
MW1	3.87	2m to <4m	Clay	NL	NL	30000	NL	NL	NL	NL
MW1	3.87	2m to <4m	Clay	NA	NL	NA	NA	NA	NA	NA
MW2	2.03	2m to <4m	Clay	NL	NL	30000	NL	NL	NL	NL
MW3	6.13	4m to <8m	Clay	NL	NL	30000	NL	NL	NL	NL
MW3	6.13	4m to <8m	Clay	NL	NA	30000	NL	NL	NL	NL
WDup1	3.87	2m to <4m	Clay	NL	NL	30000	NL	NL	NL	NL

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TABLE G5
GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	SAMPLES					
					MW1	MW1 LAB DUP	MW2	MW3	MW3 LAB DUP	WDup1
Total Recoverable Hydrocarbons (TRH)										
C_6-C_9 Aliphatics (assessed using F1)	10	-	15000	-	<10	NA	<10	<10	<10	<10
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	100	-	<50	<50	<50	<50	NA	<50
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)										
Benzene	1	1	-	-	<1	NA	<1	<1	<1	<1
Toluene	1	800	-	-	<1	NA	<1	<1	<1	<1
Ethylbenzene	1	300	-	-	<1	NA	<1	<1	<1	<1
Total xylenes	2	600	-	-	<2	NA	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	1	-	-	6.1	<1	NA	<1	<1	<1	<1
Volatile Organic Compounds (VOCs), including chlorinated VOCs										
Dichlorodifluoromethane	10	-	-	-	<10	NA	<10	<10	<10	NA
Chloromethane	10	-	-	-	<10	NA	<10	<10	<10	NA
Vinyl Chloride	10	0.3	-	-	<10	NA	<10	<10	<10	NA
Bromomethane	10	-	-	-	<10	NA	<10	<10	<10	NA
Chloroethane	10	-	-	-	<10	NA	<10	<10	<10	NA
Trichlorofluoromethane	10	-	-	-	<10	NA	<10	<10	<10	NA
1,1-Dichloroethene	1	30	-	-	<1	NA	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	60	-	-	<1	NA	<1	<1	<1	NA
1,1-dichloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	60	-	-	<1	NA	<1	<1	<1	NA
Bromochloromethane	1	250	-	-	<1	NA	<1	<1	<1	NA
Chloroform	1		-	-	<1	NA	<1	<1	<1	NA
2,2-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA
1,2-dichloroethane	1	3	-	-	<1	NA	<1	<1	<1	NA
1,1,1-trichloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA
1,1-dichloropropene	1	-	-	-	<1	NA	<1	<1	<1	NA
Cyclohexane	1	-	-	-	<1	NA	<1	<1	<1	NA
Carbon tetrachloride	1	3	-	-	<1	NA	<1	<1	<1	NA
Benzene	1	1	-	-	<1	NA	<1	<1	<1	NA
Dibromomethane	1	-	-	-	<1	NA	<1	<1	<1	NA
1,2-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA
Trichloroethene	1	-	-	-	<1	NA	<1	<1	<1	NA
Bromodichloromethane	1	-	-	-	<1	NA	<1	<1	<1	NA
trans-1,3-dichloropropene	1	100	-	-	<1	NA	<1	<1	<1	NA
cis-1,3-dichloropropene	1	100	-	-	<1	NA	<1	<1	<1	NA
1,1,2-trichloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA
Toluene	1	800	-	-	<1	NA	<1	<1	<1	NA
1,3-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA
Dibromochloromethane	1	-	-	-	<1	NA	<1	<1	<1	NA
1,2-dibromoethane	1	-	-	-	<1	NA	<1	<1	<1	NA
Tetrachloroethene	1	50	-	-	<1	NA	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA
Chlorobenzene	1	300	-	-	<1	NA	<1	<1	<1	NA
Ethylbenzene	1	300	-	-	<1	NA	<1	<1	<1	NA
Bromoform	1	-	-	-	<1	NA	<1	<1	<1	NA
m+p-xylene	2	-	-	-	<2	NA	<2	<2	<2	NA
Styrene	1	30	-	-	<1	NA	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA
o-xylene	1	-	-	-	<1	NA	<1	<1	<1	NA
1,2,3-trichloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA
Isopropylbenzene	1	-	-	-	<1	NA	<1	<1	<1	NA
Bromobenzene	1	-	-	-	<1	NA	<1	<1	<1	NA
n-propyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA
2-chlorotoluene	1	-	-	-	<1	NA	<1	<1	<1	NA
4-chlorotoluene	1	-	-	-	<1	NA	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA
Tert-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA
1,3-dichlorobenzene	1	20	-	-	<1	NA	<1	<1	<1	NA
Sec-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA
1,4-dichlorobenzene	1	40	-	-	<1	NA	<1	<1	<1	NA
4-isopropyl toluene	1	-	-	-	<1	NA	<1	**2**	**2**	NA
1,2-dichlorobenzene	1	1500	-	-	<1	NA	<1	<1	<1	NA
n-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	30	-	-	<1	NA	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		-	-	<1	NA	<1	<1	<1	NA
Hexachlorobutadiene	1	7	-	-	<1	NA	<1	<1	<1	NA

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**
GIL >PQL	Red

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TABLE Q2
GROUNDWATER QA/QC SUMMARY

		TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene	Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD	*10*	*50*	*100*	*100*	*1*	*1*	*1*	*2*	*1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
	PQL Envirolab VIC	*10*	*50*	*100*	*100*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
Intra	MW1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	<1	12
laboratory	WDup1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	<1	9
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	10.5
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	29%
Trip	TS	-	-	-	-	86%	97%	109%	98%	107%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	7/04/2022																																

Result outside of QA/QC acceptance criteria Value

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Appendix D: Borehole / Test pit Logs

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BOREHOLE LOG

Borehole No. **1**

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: 34948RF **Method:** SPIRAL AUGER **R.L. Surface:** ≈ 1059.5m

Date: 5/4/22 **Datum:** AHD

Plant Type: RGS UTE **Logged/Checked by:** R.G.S./O.F.

Groundwater Record	SAMPLES ES	U50	DB	DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■				REFER TO DCP TEST RESULTS	0		-	FILL: Sandy clay, low plasticity, dark brown, root affected, fine to medium grained sand.	w>PL			TOPSOIL
	■			■				CI	Silty CLAY: medium plasticity, orange brown, trace of fine to medium grained sand and gravel.	w>PL	St - VSt	200	APPEARS POORLY COMPACTED RESIDUAL
						1		CL-CI	Gravelly CLAY: low to medium plasticity, dark brown and orange brown, fine to coarse grained angular gravel, iron staining.			320	
				■		2		-	Extremely Weathered basalt: gravelly CLAY, low to medium plasticity, fine to coarse grained angular gravel.	XW	Hd		TERTIARY VOLCANICS
						3			BASALT: grey and brown.	HW	L		
						4			END OF BOREHOLE AT 3.9m				'TC' BIT REFUSAL GROUNDWATER MONITORING WELL INSTALLED TO 3.9m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 3.9m TO 0.9m. CASING 0.9m TO SURFACE. 2mm SAND FILTER PACK 3.9m TO 3.0m. BENTONITE SEAL 0.9m TO 0.5m. BACKFILLED WITH SPOIL TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. **2**

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: 34948RF **Method:** SPIRAL AUGER **R.L. Surface:** ≈ 1057.9m

Date: 5/4/22 **Datum:** AHD

Plant Type: RGS UTE **Logged/Checked by:** R.G.S./O.F.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	REFER TO DCP TEST RESULTS	0		-	FILL: Silty clayey sand, fine to medium grained, dark brown.	W			TOPSOIL
					CL-CI	Sandy CLAY: low to medium plasticity, dark brown, fine to medium grained sand	w>PL	F-St		RESIDUAL
	U50, DB, DS		1		CI	Sandy CLAY: medium plasticity, grey and brown, fine to coarse grained sand, with fine to coarse grained angular gravel, and iron staining.		VSt		
								H		
			2		-	BASALT: brown and dark grey.	XW	VL-L		TERTIARY VOLCANICS
						END OF BOREHOLE AT 2.6m				RECOVERED AS CLAYEY GRAVEL
			3							'TC' BIT REFUSAL
			4							GROUNDWATER MONITORING WELL INSTALLED TO 2.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.0m TO 1.0m. CASING 1.0m TO SURFACE. 2mm SAND FILTER PACK 2.0m TO 1.0m. BENTONITE SEAL 1.0m TO 0.5m. BACKFILLED WITH SPOIL TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
			5							
			6							
			7							

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BOREHOLE LOG

Borehole No. 3

1/1

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: 34948RF **Method:** SPRIAL AUGER **R.L. Surface:** ≈ 1063.0m

Date: 5/4/22 **Datum:** AHD

Plant Type: RGS UTE **Logged/Checked by:** R.G.S./O.F.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	REFER TO DCP TEST RESULTS	0		-	FILL: Silty clay, low to medium plasticity, dark brown, root affected.	w>PL			APPEARS POORLY COMPACTED
						FILL: Gravelly clay, low plasticity, brown and dark brown, fine to coarse grained gravel and fine to coarse grained sand.				
	ES, DS				CI	Silty CLAY: medium plasticity, orange brown, trace of fine to coarse grained angular gravel	w>PL	VSt	320	RESIDUAL
			1							
					CL	Gravelly CLAY: low plasticity, dark grey and brown, fine to coarse grained angular gravel.	w<PL	Hd		
	DS		2		-	Extremely Weathered basalt: gravelly CLAY, low plasticity, grey and red brown, fine to coarse grained gravel with fine to coarse grained sand, iron staining, vesicular gravel.	XW	Hd		TERTIARY VOLCANICS
			3							
▼ ON COMPLET-ION	DS		4							
			5							GROUNDWATER MONITORING WELL INSTALLED TO 5.7m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 5.7m TO 4.0m. CASING 4.0m TO SURFACE. 2mm SAND FILTER PACK 5.7m TO 3.7m. BENTONITE SEAL 3.7m TO 3.0m. BACKFILLED WITH SPOIL TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
▶			6			BASALT: grey.	XW-DW	VL-L		
						END OF BOREHOLE AT 6.9m				
			7							

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BOREHOLE LOG

Borehole No. **4**

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: 34948RF **Method:** SPIRAL AUGER **R.L. Surface:** ≈ 1059.8m

Date: 5/4/22 **Datum:** AHD

Plant Type: RGS UTE **Logged/Checked by:** R.G.S./O.F.

Groundwater Record	SAMPLES ES	U50	DB	DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■			■	REFER TO DCP TEST RESULTS	0		-	FILL: Sandy clay, medium plasticity, fine to medium grained sand, dark brown.	w>PL			APPEARS POORLY COMPACTED
	■			■				CI	Silty CLAY: medium plasticity, orange brown, trace of fine to medium grained sand.	w>PL	VSt	300	RESIDUAL
	■			■		1		CL-CI	Gravelly CLAY: low to medium plasticity, grey and brown, fine to coarse grained angular gravel.				
						2		-	Extremely Weathered basalt: gravelly CLAY, low plasticity, grey, fine to coarse grained, with fine to coarse grained sand and highly weathered, low strength bands and boulders.	XW	Hd		TERTIARY VOLCANICS
						3			BASALT: grey.	HW	VL-L		
									END OF BOREHOLE AT 3.6m				'TC' BIT REFUSAL
						4							
						5							
						6							
						7							

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Log No. **TP5** **1/1**

SDUP3 0-0.1m

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED MIXED USE DEVELOPMENT

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: E34948PT **Method:** TEST PIT **R.L. Surface:** -

Date: 6/4/22 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** M.M.E/

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0		-	FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, and root fibres.	w≈PL			GRASS COVER SCREEN: 10.15kg 0-0.2m NO FCF
	■		■				0.25		CL	Silty CLAY: low to medium plasticity, orange brown, trace of root fibres.	w<PL			RESIDUAL
	■		■				0.5			Silty CLAY: low to medium plasticity, red brown, trace of ironstone gravel and root fibres.	w<PL			RESIDUAL
										END OF TEST PIT AT 0.6m				
							0.75							
							1							
							1.25							
							1.5							
							1.75							

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Log No. **TP6**

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED MIXED USE DEVELOPMENT

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: E34948PT **Method:** TEST PIT **R.L. Surface:** -

Date: 6/4/22 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** M.M.E/T.H

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■		■		■		0		-	FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, ash and root fibres.	w≈PL			GRASS COVER SCREEN: 9.62kg 0-0.2m NO FCF
▼	■		■				0.25		CL	Silty CLAY: low to medium plasticity, brown, trace of root fibres.	w≈PL w>PL			RESIDUAL
							0.5			END OF TEST PIT AT 0.5m				
							0.75							
							1							
							1.25							
							1.5							
							1.75							

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Log No. **TP7**

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED MIXED USE DEVELOPMENT

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: E34948PT **Method:** TEST PIT **R.L. Surface:** -

Date: 6/4/22 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** M.M.E/T.H

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0		-	FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, root fibres.	w≈PL			GRASS COVER SCREEN: 11.32kg 0-0.2m NO FCF
							0.25			FILL: Silty clay, low to medium plasticity, brown and red brown, trace of brick fragments, ironstone gravel, and root fibres.	w<PL			SCREEN: 10.53kg 0.2-0.7m NO FCF
							0.5							
							0.75		CL	Silty CLAY: low to medium plasticity, red brown, trace of ironstone gravel.	w<PL			RESIDUAL
										END OF TEST PIT AT 0.8m				
							1							
							1.25							
							1.5							
							1.75							

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ENVIRONMENTAL LOG

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Log No. **TP8**

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED MIXED USE DEVELOPMENT

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: E34948PT **Method:** TEST PIT **R.L. Surface:** -

Date: 6/4/22 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** M.M.E/T.H

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
							0		-	FILL: Silty clay, low to medium plasticity, brown, trace of ironstone gravel, ash, brick fragments and root fibres.	w≈PL			GRASS COVER SCREEN: 10.02kg 0-0.2m NO FCF
							0.25		CL	Silty CLAY: low to medium plasticity, trace of ironstone bands, and root fibres.	w≈PL			RESIDUAL
							0.5			END OF TEST PIT AT 0.5m				
							0.75							
							1							
							1.25							
							1.5							
							1.75							

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ENVIRONMENTAL LOG

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Log No. **TP9** **1/1**

SDUP4 0-0.1m

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED MIXED USE DEVELOPMENT

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: E34948PT **Method:** TEST PIT **R.L. Surface:** -

Date: 6/4/22 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** M.M.E/T.H

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0		-	FILL: Silty clay, low to medium plasticity, brown, trace of ironstone gravel and root fibres.	w≈PL			GRASS COVER SCREEN: 10.68kg 0-0.2m NO FCF
	■		■				0.25		CL	Silty CLAY: low to medium plasticity, red brown, trace of ironstone gravel and root fibres.	w<PL			RESIDUAL
										END OF TEST PIT AT 0.4m				
							0.5							
							0.75							
							1							
							1.25							
							1.5							
							1.75							

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ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the environmental report in regard to classification methods, field procedures and certain matters relating to the logging of soil and rock. Not all notes are necessarily relevant to all reports.

Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies include gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geoenvironmental practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) are referred to as 'laminite'.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the

structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N > 30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as 'N_c' on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

The borehole or test pit logs presented herein are an interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than 'straight line' variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse environmental characteristics or behaviour. If the volume and nature of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classification and rock strengths indicated on the environmental logs unless noted in the report.

SYMBOL LEGENDS

SOIL

- FILL
- TOPSOIL
- CLAY (CL, CI, CH)
- SILT (ML, MH)
- SAND (SP, SW)
- GRAVEL (GP, GW)
- SANDY CLAY (CL, CI, CH)
- SILTY CLAY (CL, CI, CH)
- CLAYEY SAND (SC)
- SILTY SAND (SM)
- GRAVELLY CLAY (CL, CI, CH)
- CLAYEY GRAVEL (GC)
- SANDY SILT (ML, MH)
- PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK

- CONGLOMERATE
- SANDSTONE
- SHALE/MUDSTONE
- SILTSTONE
- CLAYSTONE
- COAL
- LAMINITE
- LIMESTONE
- PHYLLITE, SCHIST
- TUFF
- GRANITE, GABBRO
- DOLERITE, DIORITE
- BASALT, ANDESITE
- QUARTZITE

OTHER MATERIALS

- BRICKS OR PAVERS
- CONCRETE
- ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
ine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

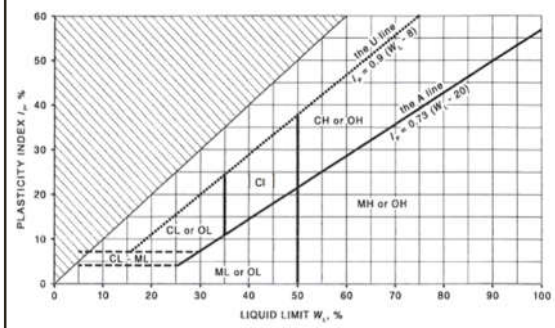
$$C_U = \frac{D_{60}}{D_{10}} \qquad and \qquad C_C = \frac{(D_{30})^2}{D_{10}\,D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

1. For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.
2. Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.
3. Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.
4. The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record	▼	Standing water level. Time delay following completion of drilling/excavation may be shown.
	C	Extent of borehole/test pit collapse shortly after drilling/excavation.
	▶	Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES	Sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos analysis.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
	PFAS	Soil sample taken over depth indicated, for analysis of Per- and Polyfluoroalkyl Substances.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL	Moisture content estimated to be greater than plastic limit.
	$w \approx$ PL	Moisture content estimated to be approximately equal to plastic limit.
	w < PL	Moisture content estimated to be less than plastic limit.
	$w \approx$ LL	Moisture content estimated to be near liquid limit.
	w > LL	Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D	DRY – runs freely through fingers.
	M	MOIST – does not run freely but no free water visible on soil surface.
	W	WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS	VERY SOFT – unconfined compressive strength ≤ 25kPa.
	S	SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa.
	F	FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa.
	St	STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa.
	VSt	VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa.
	Hd	HARD – unconfined compressive strength > 400kPa.
	Fr	FRIABLE – strength not attainable, soil crumbles.
	( )	Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)		**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)**
	VL	VERY LOOSE – ≤ 15 – 0 – 4
	L	LOOSE – > 15 and ≤ 35 – 4 – 10
	MD	MEDIUM DENSE – > 35 and ≤ 65 – 10 – 30
	D	DENSE – > 65 and ≤ 85 – 30 – 50
	VD	VERY DENSE – > 85 – > 50
	( )	Bracketed symbol indicates estimated density based on ease of drilling or other assessment.

Log Column	Symbol	Definition
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as: RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock. EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock. ALLUVIAL – soil deposited by creeks and rivers. ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents. MARINE – soil deposited in a marine environment. AEOLIAN – soil carried and deposited by wind. COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits. LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
Residual Soil		RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered		MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'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'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	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 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Appendix E: Laboratory Report(s) & COC Documents

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CERTIFICATE OF ANALYSIS 293078

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34948PT, Glenn Innes**
Number of Samples	28 Soil, 1 Water
Date samples received	08/04/2022
Date completed instructions received	08/04/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	19/04/2022
Date of Issue	19/04/2022

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Liam Timmins, Chemist
Lucy Zhu, Asbestos Supervisor
Steven Luong, Senior Chemist
Thomas Beenie, Lab Technician

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		293078-1	293078-3	293078-7	293078-8	293078-10
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0-0.1	0-0.2	0-0.1	0.3-0.5	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	13/04/2022	13/04/2022	13/04/2022	13/04/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	98	95	69	71	96

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		293078-13	293078-16	293078-18	293078-21	293078-23
Your Reference	UNITS	TP5	TP6	TP7	TP8	TP9
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	13/04/2022	13/04/2022	13/04/2022	13/04/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	93	77	91	74	74

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		293078-25	293078-26	293078-28
Your Reference	UNITS	SDup1	SDup3	TS-S1
Depth		-	-	-
Date Sampled		05/04/2022	06/04/2022	5/04/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	13/04/2022	13/04/2022
TRH C_6 - C_9	mg/kg	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	99%
Toluene	mg/kg	<0.5	<0.5	99%
Ethylbenzene	mg/kg	<1	<1	100%
m+p-xylene	mg/kg	<2	<2	100%
o-Xylene	mg/kg	<1	<1	99%
Naphthalene	mg/kg	<1	<1	[NT]
Total +ve Xylenes	mg/kg	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	80	100	95

svTRH (C10-C40) in Soil						
Our Reference		293078-1	293078-3	293078-7	293078-8	293078-10
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0-0.1	0-0.2	0-0.1	0.3-0.5	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	13/04/2022	13/04/2022	13/04/2022	13/04/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10}-C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16}-C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34}-C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	94	94	92	92	94

svTRH (C10-C40) in Soil						
Our Reference		293078-13	293078-16	293078-18	293078-21	293078-23
Your Reference	UNITS	TP5	TP6	TP7	TP8	TP9
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	12/04/2022	13/04/2022	13/04/2022	12/04/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10}-C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16}-C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34}-C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	93	93	97	86

svTRH (C10-C40) in Soil			
Our Reference		293078-25	293078-26
Your Reference	UNITS	SDup1	SDup3
Depth		-	-
Date Sampled		05/04/2022	06/04/2022
Type of sample		Soil	Soil
Date extracted	-	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	86	84

PAHs in Soil						
Our Reference		293078-1	293078-3	293078-7	293078-8	293078-10
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0-0.1	0-0.2	0-0.1	0.3-0.5	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	13/04/2022	12/04/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	92	91	89	102	90

PAHs in Soil						
Our Reference		293078-13	293078-16	293078-18	293078-21	293078-23
Your Reference	UNITS	TP5	TP6	TP7	TP8	TP9
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	87	83	88	93	91

PAHs in Soil			
Our Reference		293078-25	293078-26
Your Reference	UNITS	SDup1	SDup3
Depth		-	-
Date Sampled		05/04/2022	06/04/2022
Type of sample		Soil	Soil
Date extracted	-	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	83	86

Organochlorine Pesticides in soil						
Our Reference		293078-1	293078-3	293078-7	293078-10	293078-13
Your Reference	UNITS	BH1	BH2	BH3	BH4	TP5
Depth		0-0.1	0-0.2	0-0.1	0-0.1	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	85	82	84	82

Organochlorine Pesticides in soil						
Our Reference		293078-16	293078-18	293078-21	293078-23	293078-25
Your Reference	UNITS	TP6	TP7	TP8	TP9	SDup1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	-
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022	05/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	81	86	82	78

Organochlorine Pesticides in soil		
Our Reference		293078-26
Your Reference	UNITS	SDup3
Depth		-
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	12/04/2022
Date analysed	-	12/04/2022
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	81

Organophosphorus Pesticides in Soil						
Our Reference		293078-1	293078-3	293078-7	293078-10	293078-13
Your Reference	UNITS	BH1	BH2	BH3	BH4	TP5
Depth		0-0.1	0-0.2	0-0.1	0-0.1	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	85	82	84	82

Organophosphorus Pesticides in Soil						
Our Reference		293078-16	293078-18	293078-21	293078-23	293078-25
Your Reference	UNITS	TP6	TP7	TP8	TP9	SDup1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	-
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022	05/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	81	86	82	78

Organophosphorus Pesticides in Soil		
Our Reference		293078-26
Your Reference	UNITS	SDup3
Depth		-
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	12/04/2022
Date analysed	-	12/04/2022
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	81

PCBs in Soil						
Our Reference		293078-1	293078-3	293078-7	293078-10	293078-13
Your Reference	UNITS	BH1	BH2	BH3	BH4	TP5
Depth		0-0.1	0-0.2	0-0.1	0-0.1	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	85	82	84	82

PCBs in Soil						
Our Reference		293078-16	293078-18	293078-21	293078-23	293078-25
Your Reference	UNITS	TP6	TP7	TP8	TP9	SDup1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	-
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022	05/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	81	86	82	78

PCBs in Soil		
Our Reference		293078-26
Your Reference	UNITS	SDup3
Depth		-
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	12/04/2022
Date analysed	-	12/04/2022
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	81

Acid Extractable metals in soil						
Our Reference		293078-1	293078-3	293078-7	293078-8	293078-10
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0-0.1	0-0.2	0-0.1	0.3-0.5	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Arsenic	mg/kg	13	8	8	4	9
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	64	36	29	50	27
Copper	mg/kg	16	11	13	25	8
Lead	mg/kg	19	16	19	22	13
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Nickel	mg/kg	18	13	15	29	12
Zinc	mg/kg	30	30	30	34	17

Acid Extractable metals in soil						
Our Reference		293078-13	293078-16	293078-18	293078-21	293078-23
Your Reference	UNITS	TP5	TP6	TP7	TP8	TP9
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Arsenic	mg/kg	14	13	11	5	11
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	26	51	35	34	63
Copper	mg/kg	6	10	13	10	11
Lead	mg/kg	14	18	18	11	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	13	15	13	15
Zinc	mg/kg	15	20	31	32	17

Acid Extractable metals in soil			
Our Reference		293078-25	293078-26
Your Reference	UNITS	SDup1	SDup3
Depth		-	-
Date Sampled		05/04/2022	06/04/2022
Type of sample		Soil	Soil
Date prepared	-	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022
Arsenic	mg/kg	9	7
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	57	17
Copper	mg/kg	13	6
Lead	mg/kg	16	10
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	12	7
Zinc	mg/kg	23	15

Moisture						
Our Reference		293078-1	293078-3	293078-7	293078-8	293078-10
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0-0.1	0-0.2	0-0.1	0.3-0.5	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	13/04/2022	13/04/2022	13/04/2022	13/04/2022
Moisture	%	19	35	22	16	18

Moisture						
Our Reference		293078-13	293078-16	293078-18	293078-21	293078-23
Your Reference	UNITS	TP5	TP6	TP7	TP8	TP9
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	13/04/2022	13/04/2022	13/04/2022	13/04/2022
Moisture	%	16	21	21	30	18

Moisture			
Our Reference		293078-25	293078-26
Your Reference	UNITS	SDup1	SDup3
Depth		-	-
Date Sampled		05/04/2022	06/04/2022
Type of sample		Soil	Soil
Date prepared	-	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	13/04/2022
Moisture	%	18	19

Asbestos ID - soils NEPM - ASB-001						
Our Reference		293078-1	293078-3	293078-7	293078-10	293078-13
Your Reference	UNITS	BH1	BH2	BH3	BH4	TP5
Depth		0-0.1	0-0.2	0-0.1	0-0.1	0-0.1
Date Sampled		05/04/2022	05/04/2022	05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	19/04/2022	19/04/2022	19/04/2022	19/04/2022	19/04/2022
Sample mass tested	g	532.81	599.38	578.02	487.45	707.8
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001					
Our Reference		293078-16	293078-18	293078-21	293078-23
Your Reference	UNITS	TP6	TP7	TP8	TP9
Depth		0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		06/04/2022	06/04/2022	06/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	19/04/2022	19/04/2022	19/04/2022	19/04/2022
Sample mass tested	g	666.89	629.3	518.23	652.03
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–
FA and AF Estimation*	g	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001

vTRH(C6-C10)/BTEXN in Water		
Our Reference		293078-29
Your Reference	UNITS	FR-S1
Depth		-
Date Sampled		06/04/2022
Type of sample		Water
Date extracted	-	11/04/2022
Date analysed	-	11/04/2022
TRH C_6 - C_9	µg/L	240
TRH C_6 - C_{10}	µg/L	240
TRH C_6 - C_{10} less BTEX (F1)	µg/L	240
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	98
Surrogate toluene-d8	%	113
Surrogate 4-BFB	%	100

svTRH (C10-C40) in Water		
Our Reference		293078-29
Your Reference	UNITS	FR-S1
Depth		-
Date Sampled		06/04/2022
Type of sample		Water
Date extracted	-	12/04/2022
Date analysed	-	12/04/2022
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	79

PAHs in Water		
Our Reference		293078-29
Your Reference	UNITS	FR-S1
Depth		-
Date Sampled		06/04/2022
Type of sample		Water
Date extracted	-	12/04/2022
Date analysed	-	13/04/2022
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	103

Metals in Water - Dissolved		
Our Reference		293078-29
Your Reference	UNITS	FR-S1
Depth		-
Date Sampled		06/04/2022
Type of sample		Water
Date digested	-	12/04/2022
Date analysed	-	12/04/2022
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	0.1
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	293078-3
Date extracted	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Date analysed	-			13/04/2022	1	13/04/2022	13/04/2022		13/04/2022	13/04/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	92	99
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	92	99
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	93	102
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	92	99
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	91	98
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	93	99
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	93	100
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	92	1	98	93	5	86	89

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	13/04/2022	13/04/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	21	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	21	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	21	74	95	25	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	293078-3
Date extracted	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Date analysed	-			12/04/2022	1	13/04/2022	13/04/2022		12/04/2022	13/04/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	101	101
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	93	106
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	121	121
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	101	101
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	93	106
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	121	121
Surrogate o-Terphenyl	%		Org-020	91	1	94	93	1	95	91

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	13/04/2022	13/04/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	21	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	21	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	21	97	98	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	293078-3
Date extracted	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Date analysed	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	88
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	89
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	92
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	94
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	94
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	101
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	89
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	72	80
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	92	1	92	91	1	93	97

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	21	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	21	93	92	1	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	293078-3
Date extracted	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Date analysed	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	84
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	85
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	61	69
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	93
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	82
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	98
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	98
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	74
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	94
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	66	70
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	85	1	86	84	2	85	90

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	21	86	86	0	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	293078-3
Date extracted	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Date analysed	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	104
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	81
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	63	71
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	105
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	100
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	68	78
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	98
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	85	1	86	84	2	85	90

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	21	86	86	0	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	293078-3
Date extracted	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Date analysed	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	96	67
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	85	1	86	84	2	85	90

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	21	86	86	0	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	293078-3
Date prepared	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Date analysed	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Arsenic	mg/kg	4	Metals-020	<4	1	13	11	17	96	84
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	100	85
Chromium	mg/kg	1	Metals-020	<1	1	64	65	2	94	82
Copper	mg/kg	1	Metals-020	<1	1	16	18	12	95	97
Lead	mg/kg	1	Metals-020	<1	1	19	20	5	99	88
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	121	118
Nickel	mg/kg	1	Metals-020	<1	1	18	20	11	95	84
Zinc	mg/kg	1	Metals-020	<1	1	30	29	3	98	83

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	12/04/2022	12/04/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	21	5	5	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	21	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	21	34	29	16	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	10	10	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	11	11	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	13	12	8	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	32	32	0	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	11/04/2022	[NT]
Date analysed	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	11/04/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	113	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	121	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	120	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	90	[NT]	[NT]	[NT]	[NT]	82	[NT]
Surrogate toluene-d8	%		Org-023	91	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	95	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Date analysed	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	109	[NT]
Surrogate o-Terphenyl	%		Org-020	84	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Date analysed	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Naphthalene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Acenaphthylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	117	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: Metals in Water - Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date digested	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Date analysed	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	89	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	90	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	88	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	87	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	89	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	109	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	88	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	80	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E34948PT, Glenn Innes
Envirolab Reference	293078
Date Sample Received	08/04/2022
Date Instructions Received	08/04/2022
Date Results Expected to be Reported	19/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	28 Soil, 1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	Metals in Water - Dissolved	On Hold
BH1-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH1-0.3-0.5													✓
BH2-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH2-0.2-0.5													✓
BH2-0.8-1.0													✓
BH2-1.2-1.5													✓
BH3-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH3-0.3-0.5	✓	✓	✓				✓						
BH3-0.6-0.8													✓
BH4-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH4-0.3-0.5													✓
BH4-0.8-1.0													✓
TP5-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
TP5-0.2-0.4													✓
TP5-0.4-0.6													✓
TP6-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
TP6-0.3-0.5													✓
TP7-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
TP7-0.3-0.5													✓
TP7-0.7-0.8													✓
TP8-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
TP8-0.3-0.5													✓
TP9-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
TP9-0.3-0.4													✓
SDup1	✓	✓	✓	✓	✓	✓	✓						
SDup3	✓	✓	✓	✓	✓	✓	✓						
SDup4													✓
TS-S1	✓												
FR-S1									✓	✓	✓	✓	

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

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Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E34948PT Date Results Required: STANDARD Page: 1 of 2	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor

Location: Glen Innes

Sampler: MME

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6	Combo 3	Asbestos (WA 500mL method)	Asbestos (Detection)	BTEX
5/04/2022	1	BH1	0-0.1	G, A	0	F: sandy clay	X		X		
5/04/2022	2	BH1	0.3-0.5	G, A	0	silty clay					
5/04/2022	3	BH2	0-0.2	G, A	0	F: silty clay	X		X		
5/04/2022	4	BH2	0.2-0.5	G, A	0	sandy clay					
5/04/2022	5	BH2	0.8-1.0	G, A	0	sandy clay					
5/04/2022	6	BH2	1.2-1.5	G, A	0	sandy clay					
5/04/2022	7	BH3	0-0.1	G, A	0	F: silty clay	X		X		
5/04/2022	8	BH3	0.3-0.5	G, A	0	F: gravelly clay		X			
5/04/2022	9	BH3	0.6-0.8	G, A	0	silty clay					
5/04/2022	10	BH4	0-0.1	G, A	0	F: sandy clay	X		X		
5/04/2022	11	BH4	0.3-0.5	G, A	0	silty clay					
5/04/2022	12	BH4	0.8-1.0	G, A	1	gravelly clay					
6/04/2022	13	TP5	0-0.1	G, A	0	F: silty clay	X		X		
6/04/2022	14	TP5	0.2-0.4	G, A	0	silty clay					
6/04/2022	15	TP5	0.4-0.6	G, A	0	silty clay					
6/04/2022	16	TP6	0-0.1	G, A	0	F: silty clay	X		X		
6/04/2022	17	TP6	0.3-0.5	G, A	0	silty clay					
6/04/2022	18	TP7	0-0.1	G, A	0	F: silty clay	X		X		
6/04/2022	19	TP7	0.3-0.5	G, A	0	F: silty clay					
6/04/2022	20	TP7	0.7-0.8	G, A	0	silty clay					
6/04/2022	21	TP8	0-0.1	G, A	0	F: silty clay	X		X		
6/04/2022	22	TP8	0.3-0.5	G, A	0	silty clay					
6/04/2022	23	TP9	0-0.1	G, A	0	F: silty clay	X		X		
6/04/2022	24	TP9	0.3-0.4	G, A	0	silty clay					
5/04/2022	25	SDup1	-	G, A	-	Duplicate	X				

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 293078

Date Received: 8/4/22

Time Received: 1745

Received by: MM

Temp: Cool/Ambient

Cooling: Ice/icepack

Security: Intact/Broken/None

*Please note the following samples have been re-numbered:

Jar/bag	CoC (correct ref)
TP1	TP6
TP2	TP7
TP3	TP8
TP4	TP9

Please call Katrina if any questions.

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
	8.4.22	1715	Omuemze	8/4/22

SAMPLE AND CHAIN OF CUSTODY FORM

TO:
ENVIROLAB SERVICES PTY LTD
12 ASHLEY STREET
CHATSWOOD NSW 2067
P: (02) 99106200
F: (02) 99106201

Attention: Aileen

JKE Job Number: E34948PT

Date Results Required: STANDARD

Page: 2 of 2

FROM: JKEnvironments
REAR OF 115 WICKS ROAD
MACQUARIE PARK, NSW 2113
P: 02-9888 5000 F: 02-9888 5001
Attention: Katrina Taylor

Location: Glen Innes
Sampler: MME

Sample Preserved in Esky on Ice
Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6	Combo 3	Asbestos (WA 500mL method)	Asbestos (Detection)	BTEX							
6/04/2022	–	SDup2	-	G, A	-	Duplicate	X											
6/04/2022	26	SDup3	-	G, A	-	Duplicate	X											
6/04/2022	27	SDup4	-	G, A	-	Duplicate												
5/04/2022	28	TS-S1	-	G	-	Trip Spike					X							
6/04/2022	MR	FR-S1		V	-	Field Rinsate		X										

*Please note the following samples have been re-numbered:

Jar/bag	CoC (correct ref)
TP1	TP6
TP2	TP7
TP3	TP8
TP4	TP9

Please call Katrina if any questions.

Remarks (comments/detection limits required):
Please send SDUP2 to Melb

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag V - glass amber, BTEX vials, HNO3

293078

Relinquished By:	Date:	Time:	Received By:	Date:
[signature]	8.4.22	1715	[signature]	8/4/22

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CERTIFICATE OF ANALYSIS 293078-A

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34948PT, Glenn Innes**
Number of Samples	additional analysis
Date samples received	08/04/2022
Date completed instructions received	26/04/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	02/05/2022
Date of Issue	02/05/2022

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Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Liam Timmins, Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		293078-A-2	293078-A-8	293078-A-19
Your Reference	UNITS	BH1	BH3	TP7
Depth		0.3-0.5	0.3-0.5	0.3-0.5
Date Sampled		05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	28/04/2022	28/04/2022	28/04/2022
Date analysed	-	29/04/2022	29/04/2022	29/04/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	109	117	114

svTRH (C10-C40) in Soil				
Our Reference		293078-A-2	293078-A-8	293078-A-19
Your Reference	UNITS	BH1	BH3	TP7
Depth		0.3-0.5	0.3-0.5	0.3-0.5
Date Sampled		05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	28/04/2022	28/04/2022	28/04/2022
Date analysed	-	29/04/2022	29/04/2022	29/04/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	75	70	71

PAHs in Soil				
Our Reference		293078-A-2	293078-A-8	293078-A-19
Your Reference	UNITS	BH1	BH3	TP7
Depth		0.3-0.5	0.3-0.5	0.3-0.5
Date Sampled		05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	28/04/2022	28/04/2022	28/04/2022
Date analysed	-	29/04/2022	29/04/2022	29/04/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.07
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	0.07
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	84	84	79

Acid Extractable metals in soil				
Our Reference		293078-A-2	293078-A-8	293078-A-19
Your Reference	UNITS	BH1	BH3	TP7
Depth		0.3-0.5	0.3-0.5	0.3-0.5
Date Sampled		05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	28/04/2022	28/04/2022	28/04/2022
Date analysed	-	02/05/2022	02/05/2022	02/05/2022
Arsenic	mg/kg	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	220	49	140
Copper	mg/kg	42	26	48
Lead	mg/kg	11	21	16
Mercury	mg/kg	<0.1	<0.1	1.3
Nickel	mg/kg	52	24	59
Zinc	mg/kg	26	32	64

Moisture				
Our Reference		293078-A-2	293078-A-8	293078-A-19
Your Reference	UNITS	BH1	BH3	TP7
Depth		0.3-0.5	0.3-0.5	0.3-0.5
Date Sampled		05/04/2022	05/04/2022	06/04/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	28/04/2022	28/04/2022	28/04/2022
Date analysed	-	29/04/2022	29/04/2022	29/04/2022
Moisture	%	12	13	21

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/04/2022	[NT]	[NT]	[NT]	[NT]	28/04/2022	[NT]
Date analysed	-			29/04/2022	[NT]	[NT]	[NT]	[NT]	29/04/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	103	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	119	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	111	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	95	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	111	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/04/2022	[NT]	[NT]	[NT]	[NT]	28/04/2022	[NT]
Date analysed	-			29/04/2022	[NT]	[NT]	[NT]	[NT]	29/04/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	120	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	120	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	117	[NT]
Surrogate o-Terphenyl	%		Org-020	74	[NT]	[NT]	[NT]	[NT]	126	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/04/2022	[NT]	[NT]	[NT]	[NT]	28/04/2022	[NT]
Date analysed	-			29/04/2022	[NT]	[NT]	[NT]	[NT]	29/04/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	112	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	80	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			28/04/2022	[NT]	[NT]	[NT]	[NT]	28/04/2022	[NT]
Date analysed	-			02/05/2022	[NT]	[NT]	[NT]	[NT]	02/05/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	110	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	108	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	121	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	122	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E34948PT, Glenn Innes
Envirolab Reference	293078-A
Date Sample Received	08/04/2022
Date Instructions Received	26/04/2022
Date Results Expected to be Reported	02/05/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	On Hold
BH1-0-0.1					✓
BH1-0.3-0.5	✓	✓	✓	✓	
BH2-0-0.2					✓
BH2-0.2-0.5					✓
BH2-0.8-1.0					✓
BH2-1.2-1.5					✓
BH3-0-0.1					✓
BH3-0.3-0.5	✓	✓	✓	✓	
BH3-0.6-0.8					✓
BH4-0-0.1					✓
BH4-0.3-0.5					✓
BH4-0.8-1.0					✓
TP5-0-0.1					✓
TP5-0.2-0.4					✓
TP5-0.4-0.6					✓
TP6-0-0.1					✓
TP6-0.3-0.5					✓
TP7-0-0.1					✓
TP7-0.3-0.5	✓	✓	✓	✓	
TP7-0.7-0.8					✓
TP8-0-0.1					✓
TP8-0.3-0.5					✓
TP9-0-0.1					✓
TP9-0.3-0.4					✓
SDup1					✓
SDup3					✓
SDup4					✓
TS-S1					✓
FR-S1					✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

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Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Ming To

Subject: FW: Results for Registration 293078 E34948PT, Glenn Innes
Attachments: 293078-[R00].pdf; 293078-COC.pdf; JK Environment Soil for Envirolab 293078.xlsx; 293078.Excel.xlsx

Ref: 293078-A
TAT: 3 days.
Due: 02/05/2022

293078-A

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Tuesday, 26 April 2022 7:48 PM
To: Samplereceipt <Samplereceipt@envirolab.com.au>
Subject: FW: Results for Registration 293078 E34948PT, Glenn Innes

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Evening,

Please analyse the following samples on 3 day TA for combo #3:
2 BH1 (0.3-0.5)
8 BH3 (0.3-0.5)
19 TP7 (0.3-0.5)

Thank you.

Regards
Katrina Taylor
Associate | Environmental Scientist
NSW Licensed Asbestos Assessor

T: +612 9888 5000
D: 0418 481 628
E: KTaylor@jkenvironments.com.au
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115 Wicks Road
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JKEnvironments

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From: Jeremy Faircloth <JFaircloth@envirolab.com.au>
Sent: Tuesday, 19 April 2022 12:39 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 293078 E34948PT, Glenn Innes

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
an Excel or .csv file containing the results

Envirolab Services Pty Ltd
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25 Research Drive Croydon South VIC 3136
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melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 30890

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34948PT Glen Innes**
Number of Samples	1 Soil
Date samples received	12/04/2022
Date completed instructions received	12/04/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	20/04/2022
Date of Issue	20/04/2022

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Results Approved By
Chris De Luca, Operations Manager

Authorised By

P. Adams.

Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		30890-1
Your Reference	UNITS	SDup2
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	13/04/2022
Date analysed	-	14/04/2022
vTRH C_6 - C_9	mg/kg	<25
vTRH C_6 - C_{10}	mg/kg	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total BTEX	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	94

TRH Soil C10-C40 NEPM		
Our Reference		30890-1
Your Reference	UNITS	SDup2
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	13/04/2022
Date analysed	-	13/04/2022
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	85

PAHs in Soil		
Our Reference		30890-1
Your Reference	UNITS	SDup2
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	13/04/2022
Date analysed	-	13/04/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d_{14}	%	122

OCP in Soil		
Our Reference		30890-1
Your Reference	UNITS	SDup2
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	13/04/2022
Date analysed	-	13/04/2022
alpha-BHC	mg/kg	<0.1
Hexachlorobenzene	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve reported Aldrin + Dieldrin	mg/kg	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	92

OP in Soil		
Our Reference		30890-1
Your Reference	UNITS	SDup2
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	13/04/2022
Date analysed	-	13/04/2022
Azinphos-methyl	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyrifos	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorovos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	92

PCBs in Soil		
Our Reference		30890-1
Your Reference	UNITS	SDup2
Date Sampled		06/04/2022
Type of sample		Soil
Date extracted	-	13/04/2022
Date analysed	-	13/04/2022
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-fluorobiphenyl	%	104

Acid Extractable metals in soil		
Our Reference		30890-1
Your Reference	UNITS	SDup2
Date Sampled		06/04/2022
Type of sample		Soil
Date digested	-	14/04/2022
Date analysed	-	14/04/2022
Arsenic	mg/kg	23
Cadmium	mg/kg	<0.4
Chromium	mg/kg	82
Copper	mg/kg	13
Lead	mg/kg	29
Mercury	mg/kg	<0.1
Nickel	mg/kg	19
Zinc	mg/kg	26

Moisture		
Our Reference		30890-1
Your Reference	UNITS	SDup2
Date Sampled		06/04/2022
Type of sample		Soil
Date prepared	-	13/04/2022
Date analysed	-	14/04/2022
Moisture	%	22

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105°C for a minimum of 12 hours.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021/022	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Note, For OCs the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Date analysed	-			14/04/2022	[NT]	[NT]	[NT]	[NT]	14/04/2022	[NT]
vTRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	84	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	79	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	79	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	87	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	95	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: TRH Soil C10-C40 NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Date analysed	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	120	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	120	[NT]
Surrogate o-Terphenyl	%		Org-020	86	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Date analysed	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Acenaphthylene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Fluorene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Phenanthrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Pyrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022	<0.05	[NT]	[NT]	[NT]	[NT]	104	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022	114	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: OCP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Date analysed	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
gamma-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
delta-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
alpha-chlordane	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Dieldrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Endrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Methoxychlor	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	98	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: OP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/04/2022	1	13/04/2022	13/04/2022		13/04/2022	[NT]
Date analysed	-			13/04/2022	1	13/04/2022	13/04/2022		13/04/2022	[NT]
Azinphos-methyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	94	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	88	[NT]
Diazinon	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	102	[NT]
Dichlorovos	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	102	[NT]
Fenitrothion	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	92	[NT]
Malathion	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	98	1	92	94	2	98	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Date analysed	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Aroclor 1260	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022	110	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date digested	-			14/04/2022	[NT]	[NT]	[NT]	[NT]	14/04/2022	[NT]
Date analysed	-			14/04/2022	[NT]	[NT]	[NT]	[NT]	14/04/2022	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	98	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E34948PT Glen Innes
Envirolab Reference	30890
Date Sample Received	12/04/2022
Date Instructions Received	12/04/2022
Date Results Expected to be Reported	20/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10.4
Cooling Method	Icepack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	OCP in Soil	OP in Soil	PCBsin Soil	Acid Extractable metalsin soil
SDup2	✓	✓	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E34948PT Date Results Required: STANDARD Page: 2 of 2	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor

Location: Glen Innes

Sampler: MME

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6	Combo 3	Asbestos (WA 500mL method)	Asbestos (Detection)	BTEX
6/04/2022	–	SDup2		G, A		Duplicate	X				
6/04/2022	26	SDup3		G, A		Duplicate	X				
6/04/2022	27	SDup4	-	G, A	-	Duplicate					
5/04/2022	28	TS-S1	-	G	-	Trip Spike					X
6/04/2022	MR	FR-S1		V		Field Rinsate		X			

*Please note the following samples have been re-numbered:

Jar/bag	CoC (correct ref)
TP1	TP6
TP2	TP7
TP3	TP8
TP4	TP9

Please call Katrina if any questions.

Relinquished by
Els Sudney
CMuenne
11/4/22 1100
CM

ENVIROLAB
Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500
Job No: 30890
Date Received: 12/4/22
Time Received: 12:50pm
Received By: SS
Temp: Cool/Ambient 10.4°C
Cooling: cell/pack
Security: intact/Broken/None

Remarks (comments/detection limits required):
Please send SDUP2 to Melb

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag V - glass amber, BTEX vials, HNO3

293078

Relinquished By:	Date:	Time:	Received By:	Date:
[signature]	8.4.22	1715	CMuenne	8/4/22

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 293064

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34948PT, Glen Innes**
Number of Samples	5 Water
Date samples received	11/04/2022
Date completed instructions received	11/04/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	19/04/2022
Date of Issue	14/04/2022

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Josh Williams, Organics and LC Supervisor
Steven Luong, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in water				
Our Reference		293064-1	293064-2	293064-3
Your Reference	UNITS	MW1	MW2	MW3
Date Sampled		07/04/2022	07/04/2022	07/04/2022
Type of sample		Water	Water	Water
Date extracted	-	11/04/2022	11/04/2022	11/04/2022
Date analysed	-	11/04/2022	11/04/2022	11/04/2022
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference		293064-1	293064-2	293064-3
Your Reference	UNITS	MW1	MW2	MW3
Date Sampled		07/04/2022	07/04/2022	07/04/2022
Type of sample		Water	Water	Water
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	2
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	88	88	91
Surrogate toluene-d8	%	100	100	102
Surrogate 4-BFB	%	98	96	100

vTRH(C6-C10)/BTEXN in Water						
Our Reference		293064-1	293064-2	293064-3	293064-4	293064-5
Your Reference	UNITS	MW1	MW2	MW3	WDup1	TS
Date Sampled		07/04/2022	07/04/2022	07/04/2022	07/04/2022	05/04/2022
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	11/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022
Date analysed	-	11/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	<1	86%
Toluene	µg/L	<1	<1	<1	<1	97%
Ethylbenzene	µg/L	<1	<1	<1	<1	109%
m+p-xylene	µg/L	<2	<2	<2	<2	98%
o-xylene	µg/L	<1	<1	<1	<1	107%
Naphthalene	µg/L	<1	<1	<1	<1	[NT]
Surrogate Dibromofluoromethane	%	88	88	91	87	94
Surrogate toluene-d8	%	100	100	102	100	111
Surrogate 4-BFB	%	98	96	100	97	89

svTRH (C10-C40) in Water					
Our Reference		293064-1	293064-2	293064-3	293064-4
Your Reference	UNITS	MW1	MW2	MW3	WDup1
Date Sampled		07/04/2022	07/04/2022	07/04/2022	07/04/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50
Surrogate o-Terphenyl	%	93	75	84	77

PAHs in Water - Low Level					
Our Reference		293064-1	293064-2	293064-3	293064-4
Your Reference	UNITS	MW1	MW2	MW3	WDup1
Date Sampled		07/04/2022	07/04/2022	07/04/2022	07/04/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	13/04/2022	13/04/2022	13/04/2022	13/04/2022
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	94	82	89	79

HM in water - dissolved					
Our Reference		293064-1	293064-2	293064-3	293064-4
Your Reference	UNITS	MW1	MW2	MW3	WDup1
Date Sampled		07/04/2022	07/04/2022	07/04/2022	07/04/2022
Type of sample		Water	Water	Water	Water
Date prepared	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022	12/04/2022
Arsenic-Dissolved	µg/L	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	<1	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	<1	<1	10	<1
Zinc-Dissolved	µg/L	12	<1	4	9

Miscellaneous Inorganics				
Our Reference		293064-1	293064-2	293064-3
Your Reference	UNITS	MW1	MW2	MW3
Date Sampled		07/04/2022	07/04/2022	07/04/2022
Type of sample		Water	Water	Water
Date prepared	-	12/04/2022	12/04/2022	12/04/2022
Date analysed	-	12/04/2022	12/04/2022	12/04/2022
pH	pH Units	6.9	7.3	6.7
Electrical Conductivity	µS/cm	200	380	3,700

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			11/04/2022	3	11/04/2022	12/04/2022		11/04/2022	[NT]
Date analysed	-			11/04/2022	3	11/04/2022	12/04/2022		11/04/2022	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	3	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	3	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	3	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	3	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	3	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	3	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	3	<1	<1	0	88	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	3	<1	<1	0	106	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	3	<1	<1	0	93	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	3	<1	<1	0	93	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	3	<1	<1	0	97	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	3	<1	<1	0	102	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	3	<1	<1	0	99	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	3	<1	<1	0	115	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	3	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	3	2	2	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	90	3	91	117	25	82	[NT]
Surrogate toluene-d8	%		Org-023	91	3	102	99	3	101	[NT]
Surrogate 4-BFB	%		Org-023	105	3	100	107	7	95	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			11/04/2022	3	11/04/2022	12/04/2022		11/04/2022	[NT]
Date analysed	-			11/04/2022	3	11/04/2022	12/04/2022		11/04/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	3	<10	<10	0	113	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	3	<10	<10	0	113	[NT]
Benzene	µg/L	1	Org-023	<1	3	<1	<1	0	96	[NT]
Toluene	µg/L	1	Org-023	<1	3	<1	<1	0	110	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	3	<1	<1	0	121	[NT]
m+p-xylene	µg/L	2	Org-023	<2	3	<2	<2	0	120	[NT]
o-xylene	µg/L	1	Org-023	<1	3	<1	<1	0	115	[NT]
Naphthalene	µg/L	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	90	3	91	117	25	82	[NT]
Surrogate toluene-d8	%		Org-023	91	3	102	99	3	101	[NT]
Surrogate 4-BFB	%		Org-023	105	3	100	107	7	95	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	293064-2
Date extracted	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
Date analysed	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	12/04/2022
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	99	85
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	96	85
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	109	113
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	99	85
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	96	85
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	109	113
Surrogate o-Terphenyl	%		Org-020	84	1	93	74	23	98	115

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			12/04/2022	1	12/04/2022	12/04/2022		12/04/2022	[NT]
Date analysed	-			13/04/2022	1	13/04/2022	13/04/2022		13/04/2022	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	76	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	69	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	93	1	94	82	14	83	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Date analysed	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	109	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Date analysed	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

pH Samples were out of the recommended holding time for this analysis.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E34948PT, Glen Innes
Envirolab Reference	293064
Date Sample Received	11/04/2022
Date Instructions Received	11/04/2022
Date Results Expected to be Reported	19/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Holding time exceedance
No. of Samples Provided	5 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

#1 and 3- 1X vial received broken.

Holding time exceedance-pH.

Please contact the laboratory within 24 hours if you wish to cancel the aformentioned testing. Otherwise testing will proceed as per the COC and hence invoiced accordingly.

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	HM in water - dissolved	pH	Electrical Conductivity
MW1	✓	✓	✓	✓	✓	✓	✓
MW2	✓	✓	✓	✓	✓	✓	✓
MW3	✓	✓	✓	✓	✓	✓	✓
WDup1		✓	✓	✓	✓		
TS		✓					

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:
ENVIROLAB SERVICES PTY LTD
12 ASHLEY STREET
CHATSWOOD NSW 2067
P: (02) 99106200
F: (02) 99106201

Attention: Aileen

JKE Job Number: E34948PT

Date Results Required: STANDARD

Page: 1 of 1

FROM:
JKEnvironments
REAR OF 115 WICKS ROAD
MACQUARIE PARK, NSW 2113
P: 02-9888 5000 F: 02-9888 5001
Attention: Katrina Taylor

Location: Glen Innes
Sampler: MME

Sample Preserved in Esky on Ice
Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	#3L - TRH/BTEXN/LL	VOCs (includes BTEX)	EC/pH	BTEX								
7/04/2022	1	MW1	G1, Vx4, H	0	Water	X	X	X									
7/04/2022	2	MW2	G1, Vx4, H	0	Water	X	X	X									
7/04/2022	3	MW3	G1, Vx4, H	0	Water	X	X	X									
7/04/2022	4	WDup1	G1, Vx4, H	0	Duplicate	X											
5/04/2022	5	TS	V	-	Trip Spike				X								
~~6/4/22~~	~~6~~	~~FR~~	~~11/04 TD~~														

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 213064
Date Received: 8.4.2022
Time Received: 17 15
Received by: TSHAN
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):
All analysis PQLs to ANZECC (2000) Detection Limits Please

Sample Containers:
G1 - 500mL Amber Glass Bottle G2 - 1L Amber Glass Bottle
V - BTEX Vial H - HNO3 Wash PVC
PVC - HDPE Plastic Bottles

Relinquished By:	Date:	Time:	Received By:	Date:
	8.4.22.	1715	TSHAN	8.4.2022

17 15

Appendix F: Report Explanatory Notes

QA/QC Definitions

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)[18] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[19]. The NEPM (2013) is consistent with these documents.

A. Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection Limit for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations: *"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit*" (Keith, 1991).

B. Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD).

C. Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured (i.e. the proximity of an averaged result to the true value, where all random errors have been statistically removed). The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes. Accuracy is typically reported as percent recovery.

D. Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

E. Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;
- All blank data reported;

[18] US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)

[19] Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. Blanks

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling, transport and analysis.

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{(\text{Spike Sample Result} - \text{Sample Result}) \times 100}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$

Appendix G: Data (QA/QC) Evaluation

Data (QA/QC) Evaluation

A. INTRODUCTION

This Data (QA/QC) Evaluation forms part of the validation process for the DQOs documented in Section 6.1 of this report. Checks were made to assess the data in terms of precision, accuracy, representativeness, comparability and completeness. These 'PARCC' parameters are referred to collectively as DQIs and are defined in the Report Explanatory Notes attached in the report appendices.

1. Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

2. Field QA/QC Samples and Analysis

A summary of the field QA/QC samples collected and analysed for this investigation is provided in the following table:

Sample Type	Sample Identification	Frequency (of Sample Type)	Analysis Performed
Intra-laboratory duplicate (soil)	SDUP1 (primary sample BH1 0-0.1m)	Approximately 8% of primary samples	Heavy metals, TRH/BTEX, PAHs
Intra-laboratory duplicate (soil)	SDUP3 (primary sample TP6 0-0.1m)	As above	As above
Inter-laboratory duplicate (soil)	SDUP2 (primary sample TP9 0-0.1m)	Approximately 8% of primary samples	Heavy metals, TRH/BTEX, PAHs
Intra-laboratory duplicate (groundwater)	WDUP1 (primary sample MW1)	Approximately 33% of primary samples	Heavy metals, TRH/BTEX, PAHs
Trip spike (soil)	TS-S1 (5 April 2022)	One for the investigation to demonstrate adequacy of preservation, storage and transport methods	BTEX
Trip spike (water)	TS (5 April 2022)	One for the investigation to demonstrate adequacy of preservation, storage and transport methods	BTEX
Rinsate (excavator bucket)	FR-S1 (6 April 2022)	One for the investigation to demonstrate adequacy of decontamination methods	TRH/BTEX

The results for the field QA/QC samples are detailed in the laboratory summary tables (Table Q1 and Q2) attached to the investigation report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report.

3. Data Assessment Criteria

JKE adopted the following criteria for assessing the field and laboratory QA/QC analytical results:

Field Duplicates

Acceptable targets for precision of field duplicates in this report will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field Rinsates

Acceptable targets for field rinsate samples in this report will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to typical background concentrations in soils and published drinking water guidelines for waters.

Trip Spikes

Acceptable targets for trip spike samples in this report will be 70% to 130%.

Laboratory QA/QC

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the laboratory reports. These criteria were developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the acceptable limits adopted by the primary laboratory (Envirolab) is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics;
- 60-140% recovery acceptable for organics; and
- 10-140% recovery acceptable for VOCs.

Surrogate Spikes

- 60-140% recovery acceptable for general organics; and
- 10-140% recovery acceptable for VOCs.

Method Blanks

- All results less than PQL.

B. DATA EVALUATION

1. Sample Collection, Storage, Transport and Analysis

Samples were collected by trained field staff in accordance. Field sampling procedures were designed to be consistent with relevant guidelines, including NEPM (2013) and other guidelines made under the CLM Act 1997.

Appropriate sample preservation, handling and storage procedures were adopted. Laboratory analysis was undertaken within specified holding times generally in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies. Envirolab noted that the asbestos results were reported to be consistent with the recommendations in NEPM (2013), however this level of reporting is outside the scope of their NATA accreditation. In the absence of other available analytical methods for asbestos, this was found to be acceptable for the purpose of this investigation.

JKE note that the temperature on receipt of soil samples was reported to be up to 15°C. JKE understand that the temperature is measured at the laboratory using an infrared temperature probe by scanning the outside of the sample container (i.e. one sample jar/container at the time of registering the samples). This procedure is not considered to be robust as there is a potential for the outside of the jar to warm to ambient temperature, or at least to increase from that of the internal contents, relatively quickly. On this basis, JKE is of the opinion that the temperatures reported on the Sample Receipts are unlikely to be reliable or representative of the overall batch. This is further supported by the trip spike recovery results (discussed further below) which reported adequate recovery in the range of 99% to 100%.

A trip blank soil was placed in the esky during sampling. However, this sample container smashed during transportation to the JKE office. Given all BTEX results and volatile TRHs (F1 and F2) were below the PQLs this is not considered to adversely impact the dataset.

Review of the project data also indicated that:

- COC documentation was adequately maintained;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

2. Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC, with the exception of the anthracene PQL for groundwater analysis which was 10 times greater than the ecological SAC, and vinyl chloride in groundwater which was just over three times the recreational SAC. In light of the PAH/VOC concentrations reported for soil and groundwater, JKE are of the opinion that these are not significant, and do not affect the quality of the dataset as a whole or the outcome of the investigation.

3. Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for some analytes as discussed below:

- Elevated RPDs were reported for arsenic and nickel in SDUP1/BH1 (0-0.1m);
- Elevated RPDs were reported for arsenic, chromium, lead and nickel in SDUP2/TP6 (0-0.1m); and
- Elevated RPDs were reported for arsenic, chromium, copper, lead and nickel in SDUP3/TP9 (0-0.1m).

Values outside the acceptable limits have been attributed to sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogeneous matrices. As both the primary and duplicate sample results were less than the SAC, the exceedances are not considered to have had an adverse impact on the data set as a whole.

Rinsates

Trace concentrations of TRHs and copper were detected in the rinsate sample. There is a potential for light fraction TRHs and copper to have impacted the rinsate through plastics in a hose and the use of potable water. Considering the soil analysis results obtained during the investigation, there is considered to be a low potential for cross contamination to have occurred to an extent that may have significance for data validity.

Trip Spikes

The soil trip results ranged from 99% to 100% and indicated that field preservation methods were appropriate.

The water trip results ranged from 86% to 109% and indicated that field preservation methods were appropriate.

4. Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this investigation. A review of the laboratory QA/QC data identified the following minor non-conformances:

Envirolab report 293064

pH Samples were out of the recommended holding time for this analysis.

It is noted that the water pH analysis was marginally outside of the recommended holding time. This is not considered to have altered the outcome of the investigation.

C. DATA QUALITY SUMMARY

JKE is of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

Non-conformances were reported for some field QA/QC samples and laboratory QA/QC analysis. These non-conformances were considered to be sporadic and minor, and were not considered to be indicative of systematic sampling or analytical errors. On this basis, these non-conformances are not considered to materially impact the report findings.

There was only one groundwater monitoring event undertaken for the investigation. On this basis there is some uncertainty around the representativeness of the groundwater data, particularly during different climatic conditions and after wet/dry periods. However, given the low contaminant concentrations reported, the site history and the surrounding land uses, this is not considered to alter the conclusions of the investigation.

Appendix H: Field Work Documents

JKEnvironments

Client:	NSW Health Infrastructure	**Job No.:**	E34948PT
Project:	Proposed Mixed Use Development	**Well No.:**	MW1
Location:	94 Taylor Street, GLEN INNES, NSW	**Depth (m):**	3.87

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Pump	**SWL – Before (m):**	0.78
Date:	5/4/22	**Time – Before:**	3:45
Undertaken By:	MME	**SWL – After (m):**	—
Total Vol. Removed:	5L	**Time – After:**	—
PID Reading (ppm):	0		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
1	21.7	7.1	68.5	6.61	80.5
2	19.4	7.5	239.5	6.65	73.6
3	19.4	7.2	225.6	6.60	70.6
4	20.0	7.0	211.6	6.56	68.6
5	19.5	7.5	98.5	6.48	65.2

Comments: Odours (YES / NO) NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 5

Tested By:	MME	**Remarks:**
Date Tested:	5/4/22	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
Checked By:	KT	- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date:	12/4/22	

JKEnvironments

Client:	NSW Health Infrastructure	**Job No.:**	E34948PT
Project:	Proposed Mixed Use Development	**Well No.:**	MW2
Location:	94 Taylor Street, GLEN INNES, NSW	**Depth (m):**	2.03

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Pump	**SWL – Before (m):**	0.4
Date:	5/4/22	**Time – Before:**	3:24
Undertaken By:	MME	**SWL – After (m):**	Dry
Total Vol. Removed:	2 L	**Time – After:**	3:25
PID Reading (ppm):	1		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
1	22.5	8.8	231.3	7.32	169.5
2	19.9	8.1	96.9	6.87	25.2

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 5

Tested By:	MME	**Remarks:**
Date Tested:	5/4/22	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
Checked By:	KT	- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date:	12/4/22	

JKEnvironments

Client:	NSW Health Infrastructure	**Job No.:**	E34948PT
Project:	Proposed Mixed Use Development	**Well No.:**	MW3
Location:	94 Taylor Street, GLEN INNES, NSW	**Depth (m):**	6.13

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Pump	**SWL – Before (m):**	2.55
Date:	5/4/22	**Time – Before:**	4:14
Undertaken By:	MME	**SWL – After (m):**	Dry
Total Vol. Removed:	6 L	**Time – After:**	4:16
PID Reading (ppm):	1		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
1	18.8	6.8	1200	5.96	46.2
2	17.7	4.6	2010	5.97	43.2
3	17.7	4.3	2120	5.97	41.2
4	18.1	3.9	2201	5.95	40.3
5	18.4	3.7	2238	5.94	39.9
6	18.6	4.5	2242	5.92	39.5

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO) Steady State Achieved (YES / NO)

YSI Used: 5

Tested By:	MME	**Remarks:**
Date Tested:	5/4/22	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
Checked By:	KT	- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date:	12/4/22	

JKEnvironments

Client:	NSW Health Infrastructure	Job No.:	E34948PT
Project:	Proposed Mixed Use Development	Well No.:	MW1
Location:	94 Taylor Street, GLEN INNES, NSW	Depth (m):	3.87

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peri pump	SWL – Before:	0.87
Date:	7/4/22	Time – Before:	11:13
Undertaken By:	MME	Total Vol Removed:	0.9L
Pump Program No:	—	PID (ppm):	0

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
11:15	1.03	0.2		18.5	12.2	94.4	7.25	-5.7
11:17	1.04	0.4		18.4	7.0	168.4	7.17	3.0
11:19	1.04	0.5		18.4	6.3	177.9	7.09	3.0
11:21	1.04	0.6		18.4	6.7	176.5	6.91	3.0
11:23	1.05	0.7		18.3	5.6	174.7	6.82	1.5
11:25	1.05	0.8		18.2	5.6	174.2	6.80	1.3
11:27	1.05	0.9		18.3	5.5	173.0	6.80	1.0
			start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

WDupl

Sampling Containers Used: 1x glass amber, 4x BTEX vials, 1 x HNO3 plastic, ~~x H2SO4 plastic~~, ~~x unpreserved plastic~~

YSI used: 5

Tested By: ~~Katrina Taylor~~ MME	**Remarks:**
Date Tested: 7/4/22	- Steady state conditions - difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown
Checked By: KS	
Date: 12/4/22	

JKEnvironments

Client:	NSW Health Infrastructure	Job No.:	E34948PT
Project:	Proposed Mixed Use Development	Well No.:	MW2
Location:	94 Taylor Street, GLEN INNES, NSW	Depth (m):	2.03

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peri Pump.	SWL – Before:	0.94
Date:	7/4/22	Time – Before:	10:06
Undertaken By:	MME	Total Vol Removed:	1.1 L
Pump Program No:	–	PID (ppm):	0

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
10:08	0.95	0.2		16.6	9.7	11.0	7.22	11.4
10:10	0.98	0.3		17.9	6.8	58.1	7.87	13.7
10:12	1.0	0.4		17.8	3.7	266.1	7.50	0.7
10:14	1.02	0.5		17.9	3.1	330.2	7.35	-1.3
10:16	1.04	0.6		17.8	3.2	342.5	7.24	-2.0
10:18	1.05	0.7		17.8	3.1	344.9	7.18	-2.0
10:20	1.07	0.8		17.8	2.9	348.2	7.11	-1.7
10:22	1.09	0.9		17.9	2.9	351.0	7.04	-1.1
10:24	1.10	1.0		17.7	3.3	345.7	7.02	-1.5
10:26	1.12	1.1		17.7	3.4	343.6	7.00	-1.3
			start sampling					

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))

Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, 1 x HNO3 plastic, ~~x H2SO4 plastic~~, ~~x unpreserved plastic~~

YSI used: 5

Tested By: ~~Katrina Taylor~~ MME	**Remarks:**
Date Tested: 7/4/22	- Steady state conditions
Checked By: KT	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: 12/4/22	10% and SWL stable/not in drawdown

JKEnvironments

Client:	NSW Health Infrastructure	**Job No.:**	E34948PT
Project:	Proposed Mixed Use Development	**Well No.:**	MW3
Location:	94 Taylor Street, GLEN INNES, NSW	**Depth (m):**	6.13

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peri pump	**SWL – Before:**	2.57
Date:	7/4/22	**Time – Before:**	12:38
Undertaken By:	MME	**Total Vol Removed:**	0.9
Pump Program No:	–	**PID (ppm):**	0

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
12:40.	2.66	0.2		20.1	9.2	1.3	6.84	-71.2
12:42	2.68	0.3		19.8	9.4	437.1	6.35	-27.3
12:44	2.68	0.4		19.9	7.3	1900	6.30	-6.1
12:46	2.68	0.5		19.5	4.7	3159	6.31	-5.2
12:50	2.68	0.7		19.1	4.4	3185	6.31	-5.7
12:54	2.68	0.9		19.1	4.3	3208	6.31	-5.8
			start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 1 x glass amber, 4x BTEX vials, 1 x HNO3 plastic, ~~x H2SO4 plastic~~, x ~~unpreserved plastic~~

YSI used: 5

Tested By: ~~Katrina Taylor~~ MME	**Remarks:**
Date Tested: 7/4/22	- Steady state conditions
Checked By: KT	- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown
Date: 12/4/22	

JKEnvironments

PID FIELD CALIBRATION FORM

Client:	NSW Health Infrastructure		
Project:	Proposed Mixed Use Development		
Location:	94 Taylor Street, GLEN INNES, NSW		
Job Number:	E34948PT		
PID			
Make: LFL	Model:	Unit:	Date of last factory calibration:
Date of calibration: 1/4/22		Name of Calibrator: MME	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100.3 ppm		Error in measured reading: ±0.3	ppm
Measured reading Acceptable (Yes/No):			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	NSW Health Infrastructure		
Project:	Proposed Mixed Use Development		
Location:	94 Taylor Street, GLEN INNES, NSW		
Job Number:	E34948PT		
DISSOLVED OXYGEN			
Make: YSI 5	Model: Professional Plus		
Date of calibration: 5/4/22	Name of Calibrator: MME		
Span value: 70% to 130%			
Measured value: 87%			
Measured reading Acceptable (Yes/No):			
pH			
Make: YSI 5	Model: Professional Plus.		
Date of calibration: 5/4/22	Name of Calibrator: MME.		
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date: Dec 22	Lot No: 373135.	
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date: Apr 23	Lot No: 380832	
Measured reading of Buffer 1: 7.00.			
Measured reading of Buffer 2: 4.01			
Slope: ——	Measured reading Acceptable (Yes/No):		
EC			
Make: YSI 5	Model: Professional Plus		
Date: 5/4/22.	Name of Calibrator: MME.	Temperature: 23 °C	
Calibration solution: Conductivity standard	Expiry date: Dec 22	Lot No: 373623.	
Theoretical conductivity at temperature (see solution container): 1359 µS/cm			
Measured conductivity: 1360 µS/cm	Measured reading Acceptable (Yes/No):		
REDOX			
Make: YSI 5	Model: Professional Plus.		
Date of calibration: 5/4/22	Name of Calibrator: MME		
Calibration solution: ORP Test Solution.	Expiry date: July 26	Lot No: 6658.	
Theoretical redox value: 240mV			
Measured redox reading: 240 mV	Measured reading Acceptable (Yes/No):		

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	NSW Health Infrastructure		
Project:	Proposed Mixed Use Development		
Location:	94 Taylor Street, GLEN INNES, NSW		
Job Number:	E34948PT		
DISSOLVED OXYGEN			
Make: YSI 5	Model: Professional Plus		
Date of calibration: 7/4/22	Name of Calibrator: MME		
Span value: 70% to 130%			
Measured value: 94%			
Measured reading Acceptable (Yes/No):			
pH			
Make: YSI 5	Model: Professional Plus		
Date of calibration: 7/4/22	Name of Calibrator: MME		
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date: Dec 22	Lot No: 373135	
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date: Apr 23	Lot No: 380832	
Measured reading of Buffer 1: 7.02			
Measured reading of Buffer 2: 4.00			
Slope: —	Measured reading Acceptable (Yes/No):		
EC			
Make: YSI 5	Model: Professional Plus		
Date: 7/4/22	Name of Calibrator: MME	Temperature: 23.2 °C	
Calibration solution: Conductivity Standard	Expiry date: Dec 22	Lot No: 373623	
Theoretical conductivity at temperature (see solution container): 1359 µS/cm			
Measured conductivity: 1362 µS/cm	Measured reading Acceptable (Yes/No):		
REDOX			
Make: YSI 5	Model: Professional Plus.		
Date of calibration: 7/4/22	Name of Calibrator: MME		
Calibration solution: ORP Test Solution	Expiry date: July 26	Lot No: 6658	
Theoretical redox value: 240mV			
Measured redox reading: 240 mV	Measured reading Acceptable (Yes/No):		

Appendix I: Guidelines and Reference Documents

Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). Acid Sulfate Soils Manual

Australian and New Zealand Environment Conservation Council (ANZECC), (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality

Canadian Council of Ministers of the Environment, (1999). Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)

CRC Care, (2011). Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document

Contaminated Land Management Act 1997 (NSW)

Department of Land and Water Conservation, (1997). 1:25,000 Acid Sulfate Soil Risk Map Series

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

National Health and Medical Research Council (NHMRC), (2021). National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011

NSW Department of Environment and Conservation, (2007). Guidelines for the Assessment and Management of Groundwater Contamination

NSW EPA, (1995). Contaminated Sites Sampling Design Guidelines

NSW EPA, (2014). Waste Classification Guidelines - Part 1: Classifying Waste

NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997

NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition

NSW EPA, (2020). Consultants Reporting on Contaminated Land, Contaminated Land Guidelines

National Environment Protection Council (NEPC), (2013). National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)

Olszowy, H., Torr, P., and Imray, P., (1995). Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy (Resilience and Hazards) 2021 (NSW)

World Health Organisation (WHO), (2008). Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality

Western Australia Department of Health, (2021). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia

HERITAGE IMPACT STATEMENT

Ambulance Station -Glen Innes District Hospital

85 Taylor Street, Glen Innes

May 2022 | J5599

Weir Phillips Heritage and Planning

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Revision	Date	Person	Reviewed by
First Issue Draft	24.05.22	CL	AM, JP

Cover Image: View of the site where the proposed works are to be located looking west from West Avenue.

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1 INTRODUCTION

1.1 Preamble

This Heritage Impact Statement (HIS) has been prepared for the construction of a new Rural Ambulance Station at No. 85 Taylor Street, Glen Innes, New South Wales.

The site is located within the Glen Innes Severn Council Local Government Area. The principal planning control for the site is the *Glen Innes Severn Local Environmental Plan 2012*, hereafter referred to as the *Glen Innes Severn LEP 2012.* The site is listed as a heritage item by Schedule 5 Part 1 of the *Glen Innes Severn LEP 2012* and lies in the vicinity of a number of items listed by this Schedule.

Under Part 5.10 of the *Glen Innes Severn LEP 2012*, a heritage management document is required to assess the impact of a proposal on heritage significance. Although in this case the approval pathway for the proposal is development without consent pursuant to State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) (consent from Council is not required), Clause 14 of ISEPP requires that an assessment of heritage impact be prepared and consultation with Council be undertaken if a local heritage item is likely to be affected. The most appropriate heritage management document in this instance is a Heritage Impact Statement (HIS).

This HIS has been prepared at the request of Health Infrastructure NSW and accompanies plans prepared by DJRD Architects.

1.2 Authorship

This report has been prepared by Celine Louizos B.Arch.Env, M.Herit.Cons. (cand.) and James Phillips, B.Sc.(Arch), B.Arch., M.Herit.Cons.(Hons), of Weir Phillips Heritage and Planning.

1.3 Limitations

No provision was made for a search of Council records. An Aboriginal and historical archaeological assessment was not provided for.

1.4 Methodology

This assessment has been prepared with reference to the NSW Heritage Division publication *Statements of Heritage Impact* (2002 update) and with reference to the Council planning documents listed under Section 1.6 below.

1.5 Physical Evidence

Site information was gathered from the client and a desktop review using Google Maps and SIX Maps.

1.6 Documentary Evidence

1.6.1 General References

1.6.2 Heritage Listing Sheets

Land of the Beardies Museum (former hospital complex) 85 Taylor Street, Glen Innes.
State Heritage Inventory Database No.: 1600051

1.6.3 Planning Documents

Glen Innes Severn Council Development Control Plan 2014.

Glen Innes Severn Local Environmental Plan 2012.

1.7 Site Location

No.85 Taylor Street, Glen Innes is bounded by Taylor Street, Ferguson Street, West Avenue and Macquarie Street. The site is identified as Lot 1 of D.P 1126060.
For the purposes of this assessment the whole block is included as part of the site.

Figure 1: The location of the subject site, outlined in red.

SIX Maps.

2 HISTORICAL DEVELOPMENT

2.1 Aboriginal History

It is acknowledged that present day Glen Innes lies within the traditional lands of the Ngarabal people.

2.2 Brief History of Land of the Beardies Museum (former hospital complex)

The State Heritage Inventory provides the following historical notes for the Land of the Beardies Museum, No. 85 Taylor Street:

> *Foundation stone laid 4 August 1875; Hospital building completed on 2 September 1876 for male patients; an are of 10 acres dedicated 15 June 1877; 1880 female ward completed, trees planted and layout of the garden announced on 6 July; Dr F.H. Wrigley appointed in 1883 and held that position for 33 years; 1901 November Operation Room completed; 1904 Four new private wards are major additions to the hospital building (plans prepared by J.F. O'Connor), verandah at the rear of the male ward to be extended; 1909 hospital recognised as a training hospital; 1910 tenders called for construction of nurses' quarters (additions in 1921; 1919 matron's quarters and kitchen built; 1920 Beggs and Son completed a two storey building under the supervision of E.W. Anderson;*

July 1922 first Wood Day held for the hospital'; 1925-1926 Plans for the memorial wing (children's ward) developed and May 1926 memorial tablet set by J. Wetherspoon MLA; 1936 new operating theatres opened, northern wing opened by the Hon. H.P. Fitzsimmons M.L.A., Minister for Health on 4 November 1936; 1970 Land of the Beardies History House Museum opened on 24 January by Lieutenant Colonel Sir Michael Bruxner.[1]

This statement has been adopted for the purposes of this assessment.

3 SITE ASSESSMENT

3.1 The Site

For the following, refer to Figure 2, a recent aerial photograph over the site.

Figure 2 Aerial photograph over the site, outlined in red. The location of the ambulance station is outlined in yellow (diagrammatic).

SIX Maps 2022

[1] State Heritage inventory, Land of the Beardies Museum (former hospital complex)

Taylor Street, Ferguson Street, West Avenue, and Macquarie Street enclose the square shaped block. Each boundary is approximately 200m long. The property has a combined site area of approximately 828sqm. There is a fall across the site to the north.

The historic Glen Innes hospital building faces West Avenue. The front façade of the historic building faces east.

Apart from the north-eastern corner of the site, the entire site has been predominantly built up with hospital related buildings and the original hospital which has been more recently converted to a museum.

Figures 3 to 6 illustrate the subject site.

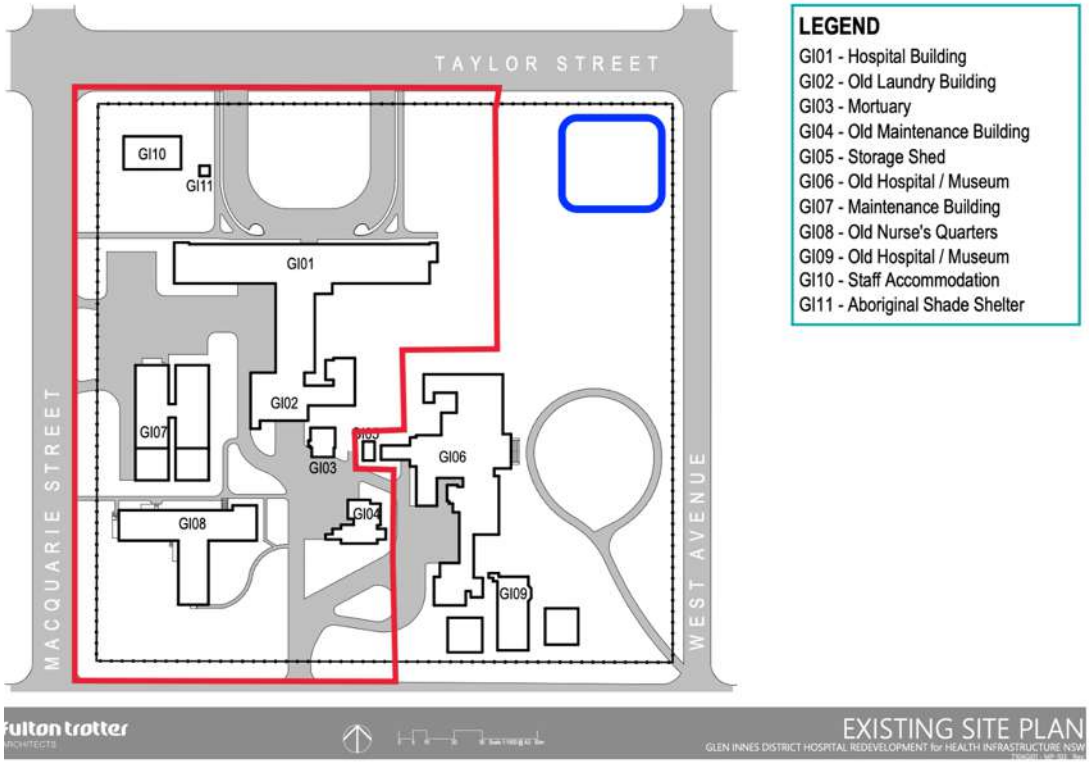

Figure 3: Site plan indicating location of proposed ambulance station in blue (diagrammatic).

Figure 4: Aerial view illustrating Museum and Hospital.

Figure 5: Aerial view outlining Old Nurses Quarters. Location of the site outlined in red (diagrammatic).
Beardies History House

Figure 6: Aerial view of the site to the southwest.

3.2 Glenn Innes District Hospital Building

The building on the site is a c.1956 freestanding, two story Post-WWII Period hospital building. The walls are constructed of face brickwork with a hipped roof clad in corrugated steel concealed behind a high, stepped brick parapet. The eaves are wide and lined with painted fiber cement sheets.

The front elevation is the northern elevation, addressing Taylor Street. This elevation is asymmetrical and is constructed of blonde face brickwork with contrasting balconies which are rendered and painted white. The first-floor balcony balustrade is clear glass whilst the first floor is painted metal. There is a driveway accessible via Taylor Street and connecting carpark located directly in front of the hospital.

See Figure 7 to Figure 8.

Figure 7: Front elevation of the hospital facing Taylor Street.

Figure 8: Carpark accessible via Taylor Street at the front of the hospital.

3.3 Former Glen Innes Hospital Building (Heritage listed Building)

The following physical description from the State Heritage Inventory has been adopted for the purposes of this assessment.'

> *' The early single storey building (1877) is constructed of decorative, concrete work with a gabled entrance way decorated in a way to complement the sets of three windows with Norman arches. The earlier buildings of Victorian Italianate style remain significantly intact. These buildings of the former Glen Innes Hospital comprise wards and staff accommodation were designed by the Colonial Architect's*

Office and Public Works Department. The later buildings are of Edwardian and Queen Anne style. It has fine entry gates and some early garden plantings. The complex also includes the separate building located to the west of the main complex; that is, the isolation ward. It is a large stand-alone building built of the distinctive blue brick with a galvanized iron roof with dragon heads typical of the period.'[2]

Figure 9 illustrates the front elevation of the heritage item.

Figure 9: Land of the Beardies Museum

3.4 The Surrounding Area

For the following, refer to **Figure 10**, an aerial photograph over the site and the surrounding area.

Figure 10: Aerial photograph over the site, outlined in red. The proposed subject site is outlined in black (diagrammatic).

SIX Maps 2022

[2] State Heritage inventory

3.4.1 The General Area

The site is located within a predominantly residential area of Glen Innes. Lots vary in size and width. Buildings in the immediate vicinity of the subject site range in date from the Federation period to the Mid-Twentieth Century. They are predominantly one storey in height and constructed of timber weatherboard.

3.4.2 Taylor Street

Taylor Street is a long street that runs in an east-west direction. The street is wide and carries traffic in both directions. There is street parking and nature strips to both sides of the street and a pedestrian footpath to the northern side only in the vicinity of the site.

There are regularly spaced mature street trees in the vicinity of the site. There is a gradual fall down to the west along the length of the street.

Taylor Street is characterised by freestanding, single storey dwellings set on rectangular allotments. Low brick or timber fences run across the front of property boundaries, providing relatively unobstructed views towards the buildings. Dwellings in this section of the street typically date from the Federation period to the Mid-Twentieth Century.

Figure 11 and Figure 12 illustrate the general character of Taylor Street in the vicinity of the site.

Figure 11: Nos 92 and 96 Taylor Street, directly opposite the subject site.
Google Maps 2022

Figure 12: Glen Innes district Hospital along Taylor Street.
Google Maps 2022

3.4.3 West Avenue

West Avenue begins where it intersects Grafton Street and runs in a north-south direction to Oliver Street. The street is wide and carries traffic in both directions. West avenue is characterised by a mix of residential, religious and commercial properties.

The Glen Innes district hospital is located on the western side of West Avenue and the Glen Innes District Tennis Association is located on the Eastern Side. See Figure 13.

Figure 13: Looking South along West Avenue.
Google Maps 2022

4 ASSESSMENT OF SIGNIFICANCE

4.1 Summary of Existing Citations and Listings for the Site

No. 85 Taylor Street, Glen Innes:

- Is not listed as a heritage item on the State Heritage Register under the auspices of the NSW Heritage Act 1977.
- Is listed as a heritage item by Schedule 5 Part 1 of the *Glen Innes Severn LEP 2012*.
- Is located within the vicinity of a number of heritage items as listed by the *Glen Innes Severn LEP 2012*.
- Is not located within a Heritage Conservation Area as defined by Schedule 5 Part 2 of the *Glen Innes Severn LEP 2012*.

4.2 Heritage Items in the Vicinity of the Site

For the following, 'in the vicinity' has been determined with reference to physical proximity, existing and potential view corridors and the nature of the proposed works.

Figure 14 shows the location of heritage items, listed by Schedule 5 Part 1 of the *Glen Innes Severn LEP 2012*. Heritage items are coloured brown and numbered. The subject site is outlined in red.

There are no heritage items listed on the State Heritage Register under the auspices of the *NSW Heritage Act 1977* within the vicinity of the site.

Figure 14: Detail of the Glen Innes Heritage Map. The site of proposed works is outlined in black.

Glen Innes Severn LEP 2012. (MAP 003AA)

The following heritage items, identified by Schedule 5 Part 1 of the *Glen Innes Severn LEP 2012*, lie within the immediate vicinity of the site:

- *House*, 129 Macquarie Street, Glen Innes (I144).

The State Heritage Inventory provides the following description of this item:

> *'This residence is an asymmetrically Edwardian 'Queen Anne' style house, weatherboarded with hipped and gabled galvanized iron roof. It has shingle trim to the gabled ends; bull-nosed galvanized iron verandah roofs; timber double hung and casement windows with lattice screens to the verandah. It is complemented by good garden planting featuring boundary hedges.*[3]

The State Heritage Inventory provides the following statement of significance for this item:

> *'The residence has historical, architectural, social and group value. Aesthetic significance arises from the architectural detail of the building dating from the Edwardian period. The architectural features that this residence was built as a fine home. It has group value arising from its position within an area of similar earlier cottages. Social significances arises from the use of the home as a domestic residence. This residence is representative of the fine homes that were built during the Edwardian period reflecting the wealth of Glen Innes at the time.*
>
> *This item has a lot boundary curtilage. The principal view corridors towards this item are obtained from the south towards its street front elevation. The building is generally visible from directly outside of it or on approach along Macquarie Street and Taylor Street. Secondary view corridors, partially obscured by adjacent dwellings and vegetation, are obtained of the side elevation of this item when travelling outside of it on*

[3] State Heritage Inventory Database No.: 1600005.

Taylor Street. Views between the subject site and this item are partially blocked due to the street trees and vegetation in the front yard of this item.

Figure 15: No.129 Macquarie Street.

- *House,* 130 Macquarie Street, Glen Innes (I145).

The State Heritage Inventory provides the following description of this item:

> *A fine Edwardian 'Queen Anne' style house asymmetrically massed and well detailed. It has a multi-gabled galvanised iron roof enlivened by fret screens to the gable ends, including the entry porch. The residence has weather-board walls, small verandahs with bracketed pots and an original roughcast chimney. It is a good example of its period and style as its is located in an area of similar residence.*[4]

The State Heritage Inventory provides the following statement of significance for this item:

> *The residence has social, architectural, research, representative and group value. Aesthetic significance arises from the architectural detail of the building dating from the Edwardian period. The architectural features indicate that this residence was built as a fine home. It has group value arising from its position within an area of similar earlier cottages. Social significance arises from its use as a domestic home. Construction of the residence provides the opportunity to research the diversity of architecture found in Glen Innes. This residence is representative of the fine homes that were built during the Edwardian period reflecting the wealth of Glen Innes at the time.*[5]

This item has a lot boundary curtilage. The principal view corridors towards this item are from directly outside of it on Taylor Street (Figure 15) and on approach in either direction along this street. Secondary view corridors are obtained of the eastern side, elevation of this item when standing outside of it on and along Macquarie Street and when on approach along this street from both directions. The subject site is partially visible from this item due to intervening vegetation.

[4] State heritage inventory.

[5] Ibid.

Figure 16: 130 Macquarie Street.

- *Veness Park,* East Avenue, Glen Innes (I073).

The State Heritage Inventory provides the following description of this item:

> *"Veness Park" is a suburban park with mature trees and an avenue of Quercus Robur (English Oaks). The vegetation of mature age includes Pines along East Avenue, Plums, Photina, Palms, Elms, Cotoneasters, Crab Apple and Cherry Trees along West Avenue. Other elements include pathways, tables, seats and a pedestrian bridge originally constructed in September 1911.* [6]

The State Heritage Inventory provides the following statement of significance of this item:

> *'Veness Park' has landmark, historical association, aesthetic, social, rarity and representative significance. Landmark significance arises from the design of the park and the planting of English vegetation to develop the park as an English park. Historical association arises from the relationship with Sir Henry Parkes, Alderman James Healey, James Rudd and the Town Clerk A.A. Veness. Aesthetic significance arises from the visual impact of the parkland in relationship to the other parks in the area. Along with the other parks, Veness Park has the research potential to investigate the establishment and development of the park. Social significance arises from the use of the park for leisure and varied social occasions for individuals, families and community organization. The park demonstrates how early colonial governments at the state and local level set out establish reserves and parks for the use of the local community for private and social occasions and other celebratory occasions. Development of the park is representative of the role Glen Innes community groups including the Citizen's Improvement Committee and the Horticultural Society played to develop the parkland over time..*

The principal view corridors towards the site are obtained from directly outside of it along West Avenue and East Avenue. Secondary view corridors are obtained of the northern, and southern side along Ferguson and Meade Street, (Figure 16).

4.3 View Corridors

The principal view corridors towards Glen Innes district hospital are obtained from directly outside of it on Taylor Street. Views are obscured until relatively close by on

[6] State Heritage inventory

approach from both directions along the street due to intervening street trees. Principal view corridors out of the site are to the North towards the streetscape of Taylor Street.

View from the principal driveway of the "Land of the Beardies" museum within the former hospital complex site looking north towards the location of the proposed ambulance station. Extant vegetation obscures almost all views towards the site.

Figure 17 illustrates the principal view corridor towards the site from the public domain.

Figure 17: Looking towards the Glen Innes district hospital from the northern side of Taylor Street.
Google Maps 2022

Figure 18: View from the principal driveway of the "Land of the Beardies" museum looking north towards the location of the proposed ambulance station. Extant vegetation obscures almost all views towards the site. The red arrow indicates the approximate location of the subject site.
Google Maps 2022

4.4 Integrity

Integrity, in terms of heritage significance, can exist on a number of levels. A heritage item or place may be an intact example of a particular architectural style or period and thus have a high degree of significance for its ability to illustrate that style or period. Equally, heritage significance may arise from a lack of architectural integrity, where significance lies in an ability to provide information of a significant evolution or change in use.

The following table outlines the construction dates of various buildings located within the site area:

Year	Building constructed
1880	The female ward and central courtyard
1901	Operation room completed
1904	Construction of the northern addition
1911	Fever wards completed;
1918	Extension of male wards
1919	Construction of Matron's quarters and hospital
1920	The first nurse's home and isolation wards built
1926	A children's ward opened
1936	New operating theatres opened
1956	The Glen Innes District Hospital was constructed

The Glen Innes District Hospital is not a historically significant building and it is not described on any statutory heritage register. The heritage listed buildings significant buildings are in the subject site's southern portion. The proposed works are to be located the site's northwestern corner, some distance from the heritage listed buildings. From research to date, the location of the proposed ambulance station has always been a landscaped area.

4.4.1 The Site

The Land of the Beardies Museum is located to the south of the Glen Innes Historic/District Hospital complex. The hospital currently in use is located to the northern portion of the site. The current district hospital is located to the north of the Land of the Beardies Museum (former hospital complex).

4.5 Statements of Significance

The State Heritage Inventory provides the following statement of significance for the Land of the Beardies Museum (former hospital complex):

> *'The former hospital complex has historic, social, cultural, archaeological, architectural, aesthetic, rarity, group and landmark values. Historical significance arises from its direct association with the provision of health care in Glen Innes and district. Historical and social significance also arises from the relationship between the health committee, the architects and the noted Sydney Doctor Dr. Alfred Roberts. It is rare that the planning work in hospital design of Dr Roberts has survived. The original building is an interesting example of a rural hospital in the late 19th century within a central courtyard. The site has significant archaeological potential arising from the architectural skills of the work of Sydney and Glen Innes architects. The complex provides the opportunity to research how the buildings have been modified to meet the demand for increased accommodation and the need to adapt design for a harsh climate as well as the architectural skills revealed in the building. The hospital is representative of the lobbying power of community groups to ensure that a hospital is constructed to meet the needs of Glen Innes and district residents and the role of the colonial government to ensure that hospitals are provided.*[7]

This statement has been adopted for the purposes of this assessment.

[7] State Heritage inventory

5 SCOPE OF WORKS

The following should be read in conjunction with the plans prepared by DJRD Architecture that accompany the proposal.

It is proposed to construct a new ambulance station in the northeastern corner of the Glen Innes Hospital site. The new ambulance station to meet current building codes and the requirements of modern ambulance services.

The following works are proposed:

- A freestanding single storey ambulance station building with a skillion roof to facilitate the present-day requirements of the hospital.
- Sawcut existing kerb and gutter for new driveway
- Sawcut existing brick wall for new driveway and path and provide brick pillars to match existing low brick wall to either side of driveway.
- 11 trees are to be removed and 13 new tuckeroo trees and various shrubs are to be planted around the proposed building form.
- Palisade fencing is proposed around the new building
- Two driveways, one off Taylor Street and one-off West Street
- Provide additional parking within the ambulance station area.
- The exterior is to be cladded in a dark grey and light grey Lysaght custom ORB Metal cladding.
- The roof is to be cladded in a light beige Lysaght custom ORB Metal cladding.
- There is to be a black metal palisade fence which will surround the ambulance station.

5.1 Method of Assessment

The following considers heritage related issues only. It does not consider compliance or otherwise with Council's numerical controls unless non-compliance will result in an adverse heritage impact.

The impact of the proposal is assessed with an understanding of the relevant provisions of the *Glen Innes Severn LEP 2012* and the *Glen Innes Severn Council Development Control Plan 2014* (*Glen Innes Severn DCP 2014*). This HIS is also written with an understanding of the requirements for Heritage Impact Statements provided by the Heritage NSW publication Statements of Heritage Impact (2002 update).

5.2 Effect of Work on the Heritage Significance of the Site

The proposed freestanding ambulance station will have a minimal and acceptable impact on the significance of the subject site for the following reasons:

- The site's topography ensures that the proposed structure will be mostly below ground level, with the roof being the only component visible from the former Glen Innes Hospital site. It should be noted that from the main circular driveway on the western side of the former hospital the proposed ambulance station is site is largely obscured by extant vegetation.

- The proposed vegetation will further screen views towards the proposed Ambulance station from the former Glen Innes Hospital. The proposed ambulance station will also be screened from from Taylor Street and West Avenue through the proposed boundary plantings around the site perimeter.

- Due to the low profile of the proposed Ambulance Station no views towards the former Hospital Complex will be impacted. Views towards the northeastern part of

the site from West Avenue are oriented away from the main cluster of buildings and are separated from the buildings by approx. 100m to the northwest.

- The proposed Ambulance station is simple in form, finishes and detailing and, where visible, will clearly read as secondary, contemporary buildings in response to the former rural hospital constructed in the late 19th Century. This is an appropriate response given the character of the former Hospital Complex.

- The proposed driveway off Taylor Street will require the removal of a small portion of the existing low boundary wall. To minimise the impact on the fence the proposed entry will be flanked by two new brick piers to match the existing piers.

- The design is consistent with other rural ambulance station designs across New South Wales.

5.3 Effect of Work on Heritage Items in the Vicinity of the Site

The proposed works will have a minimal and acceptable impact on the heritage items in the vicinity of the site for the following reasons:

- View from heritage items to the northwest of the site will largely be obscured from the site. The proposed cutting into the existing sloped site will obscure much of the built form by the landscape, the remainder of the station will largely be obscured by the proposed boundary plantings. Their setting will not be affected.

- The heritage items in the vicinity will continue to be read and understood as good examples of their respective type.

- The proposed ambulance station will largely not be visible from, or in conjunction with, any of the heritage items in the vicinity due to intervening topography, vegetation and structures.

- The simple material palette and neutral tones of the addition will help to ensure it does not dominate or detract from heritage items in the vicinity.

6 CONCLUSIONS

This Heritage Impact Statement has considered the proposal for construction of a new ambulance station building at No. 85 Taylor Street, Glen Innes. The site is listed as a heritage item as identified by the *Glen Innes Severn LEP 2012*. It is also located within the vicinity of several heritage items as identified by this plan.

The proposed works are to be located away from the historically significant buildings within the wider Glen Innes District Hospital site. The site's topography ensures that the proposed structure will be mostly below ground level, with the roof being the only component visible from the former Glen Innes Hospital site. From the main circular driveway on the western side of the former hospital the proposed ambulance station site is largely obscured by extant vegetation.

The heritage listed former hospital will continue to make a positive contribution to the setting of heritage items in the vicinity of the site.

The proposal fulfils the objectives for works to a heritage item, within the vicinity of heritage items as set out by the *Glen Innes Severn LEP 2012* and the *Glen Innes Severn DCP 2014*.

Clinical and Related Waste Management for Health Services

Summary This Policy Directive provides a minimum standard for waste management that must be met by health services to reduce uncertainty when staff move between NSW Health entities. The policy ensures handling and containment of specific clinical waste streams is in line with NSW legislation, licensing and waste minimisation.

Document type Policy Directive

Document number PD2020_049

Publication date 14 December 2020

Author branch Environmental Health

Branch contact (02) 9424 5918

Replaces PD2017_026

Review date 14 December 2025

Policy manual Not applicable

File number H20/51896

Status Active

Functional group Personnel/Workforce - Occupational Health and Safety
Population Health - Environmental, Waste Management

Applies to Ministry of Health, Public Health Units, Local Health Districts, Board Governed Statutory Health Corporations, Chief Executive Governed Statutory Health Corporations, Specialty Network Governed Statutory Health Corporations, Affiliated Health Organisations, NSW Health Pathology, Public Health System Support Division, Community Health Centres, NSW Ambulance Service, Dental Schools and Clinics, Public Hospitals

Distributed to Ministry of Health, Public Health System, Divisions of General Practice, NSW Ambulance Service, Health Associations Unions

Audience All Staff of NSW Health

Secretary, NSW Health

This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is mandatory for NSW Health and is a condition of subsidy for public health organisations.

CLINICAL AND RELATED WASTE MANAGEMENT FOR HEALTH SERVICES

POLICY STATEMENT

This Policy Directive requires health services to meet a minimum standard for waste management. Specific waste streams must be managed in line with NSW legislation, licensing, waste management contract and waste minimisation practices. Uniform application of this Policy Directive will help to reduce uncertainty when staff move between NSW Health entities.

SUMMARY OF POLICY REQUIREMENTS

Each NSW health service must establish a Waste Management Committee (WMC) and develop a Waste Management Plan (WMP) in consultation with other co-located services.

Local Health Districts (Districts) must determine the most appropriate geographical or functional jurisdictions for each WMP to cover, ensuring that all facilities/services are covered by a WMP.

The WMP must address:

- Governance, including oversight by a WMC and clear responsibilities
- Strategies for complying with this Policy Directive, waste minimisation, training, work health and safety, auditing, incident management, procedures for specific waste stream management and contract management.

All NSW Health agencies have waste management responsibilities and need to operate in line with the minimum standards set out in this Policy Directive:

- Districts, Speciality Health Networks and Statewide Health Services are responsible for ensuring that waste streams are managed in a safe, lawful, effective and efficient way
- At the District level, a specific position (or coordinating committee) responsible for implementation of waste management strategies and procedures must be identified and is to liaise across the different facilities
- Each health service must establish a WMC which implements a WMP in accordance with this Policy Directive
- NSW Ambulance is responsible for its own waste management policies consistent with the principles in this document.

REVISION HISTORY

Version	Approved by	Amendment notes
December-2020 (PD2020_049)	Deputy Secretary, Population and Public Health	Revised and updated the bin colour coding system for pharmaceutical waste so that it is consistent with AS/NZS 3816:2018 (Management of clinical and related waste).
August 2017 (PD2017_026)	Deputy Secretary, Population and Public Health	Mandated Policy Directive. Revised waste stream definitions and inclusion of anatomical waste as a waste stream. Standardised labelling and colour coding for specific waste streams. Introduces disposal requirements for radioactive sharps. Determination of health service boundaries at the local level. Updated online HETI training for waste management. Alignment with current standards and documents. Introduces negotiation of waste auditing with the contractor.
January 2005 (PD2005_132)	Director-General	Re-issued unchanged.
August 1998 Circular 98/89	Director-General	Definition of “contaminated waste” replaced with the term “clinical waste”. Emphasis on waste minimisation. Forms part of a package that includes the Guidelines, Generic Hospital Waste Plan and a training package.

ATTACHMENTS

1. Clinical and Related Waste management for Health Services: Policy Directive

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1 BACKGROUND

1.1 About this document

This Policy Directive provides a minimum standard for waste management that must be met by health services. Local Health Districts (Districts), Specialty Health Networks and Statewide Health Services are responsible for ensuring that waste streams are managed in a safe, lawful, effective and efficient way. Uniform application of this Policy Directive will help to reduce uncertainty when staff move between NSW Health entities.

NSW Ambulance is responsible for its own waste management policies consistent with the principles in this document.

When specific waste streams are appropriately handled and contained through safe work practices and the use of appropriate personal protective equipment (PPE), the risk of exposure to infection, chemical contamination, radiation exposure or other health and safety issues is minimised. The adoption of waste minimisation practices can reduce costs and environmental degradation.

The mandated NSW Government waste management contract outlines the responsibilities of the waste contractor for waste transport and disposal.

This Policy Directive will come into effect six (6) months from the date of publication. This timeframe will allow all facilities to implement the changes in a consistent manner.

1.2 Waste management responsibilities

All NSW Health agencies have waste management responsibilities and need to operate in line with the minimum standards set out in this Policy Directive. At the District level, a specific position (or coordinating committee) responsible for implementation of waste management strategies and procedures must be identified and is to liaise across the different facilities within the Districts.

1.3 Waste Management Committees (WMCs)

Each health service must establish a Waste Management Committee (WMC) responsible for implementing the Waste Management Plan. The WMC is to have a clear terms of reference, and include representation from key areas/departments of the health service, other entities covered by the Waste Management Plan (WMP), Work Health and Safety and include expertise in waste management. WMCs is to regularly review contractors' reports regarding waste streams management and collection data.

1.4 Waste Management Plan (WMP)

Districts must determine the most appropriate geographical or functional jurisdictions for each Waste Management Plan (WMP) to cover, ensuring that all facilities/services are covered by a WMP. Each service must have a WMP developed in consultation with other co-

located services such as pathology, laboratories and research facilities. The WMP must address:

- Governance, including oversight by a WMC and clarity of responsibilities where there is more than one Person Conducting a Business or Undertaking (PCBU) included in a WMP
- Strategies for
    - complying with this Policy Directive
    - minimising waste
    - training and waste management promotion
    - work health and safety
    - auditing
    - measuring waste management performance
    - incident management
- Procedures for segregating, collecting, transporting, storing and disposing of waste from various areas of the service and spills management
- Contract management, including contractor details, contact arrangements, auditing, safe operating and spill management procedures and relevant insurances and Environmental Protection Agency (EPA) licences.

1.5 Waste minimisation

Health services must consider how to minimise waste from the waste streams, without compromising work standards, environmental outcomes or patient/worker safety. Strategies may include:

- reduction, through product substitution, product modifications and procedural changes
- re-use, where clinically appropriate, environmentally sound, practical and cost effective to do so. Items that were packaged as single-use must never be re-used
- recycling, through increased volumes of current recycling and assessment of additional resource recovery programs for implementation.

1.6 Segregation

Segregation of various streams of waste is an important part of efficient waste management. Effective segregation can be best achieved through:

- education and training to all personnel who generate waste
- reviewing of material composition (Safety Data Sheet) for waste classified as hazardous (e.g. hazardous chemicals and dangerous goods) to ensure that waste components are handled safely, including storage and disposal

- ensuring identifiable colour coding and labelling for waste streams in line with Tables 1 and 2
- providing suitable containers and bags in appropriate locations
- incorporating quick and efficient waste disposal methods into patient care procedures
- ensuring all waste can be easily, safely and correctly segregated at the point of generation.

1.7 Legal and legislative framework

Legislation relevant to clinical and related waste includes the following:

State:

- Work Health and Safety (WHS) Act 2011
- WHS Regulation 2017
- Protection of the Environment Operations (POEO) Act 1997
- POEO Waste Regulation 2014
- POEO Amendment (Scheduled Activities and Waste) Regulation 2008
- Notice of exemption under clause 16C Number 2001 E01, POEO Waste Regulation 2005
- Radiation Control Act 1990
- Radiation Control Regulation 2013
- Gene Technology Act 2003
- Dangerous Goods (Road and Rail Transport) Act 2008
- Dangerous Goods (Road and Rail Transport) Regulation 2014
- Poisons and Therapeutic Goods Act 1966
- Poisons and Therapeutic Goods Regulation 2008

Federal:

- Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code) 2020 (given force in NSW via the NSW Dangerous Goods legislation)
- Gene Technology Act 2000
- Gene Technology Regulations 2001

2 WASTE STREAMS AND THEIR SPECIFIC MANAGEMENT: HANDLING, LABELLING, CONTAINMENT, STORAGE, TRANSPORT AND DISPOSAL

2.1 Labelling of waste

All waste containers and bin liners are to be colour coded and identified in accordance with Tables 1 and 2 ('Waste streams'). The labelling, packing and transport of Division 6.2 Infectious Substances must comply with the ADG Code for dangerous goods. These requirements typically apply for waste classified as UN 2814 (Category A Infectious Substances) and UN 3291 (Category B Infectious Substances). Portable and mobile bins must be marked, labelled and placarded as required by Chapters 5.2 and 5.3 of the ADG Code. Refer to the SafeWork NSW fact sheet on Packing and Transporting Clinical Waste. Health service staff will need to liaise with the transporter to ensure they have a transport document describing what is being transported.

2.2 Handling of waste bags/bin liners

It is best practice to minimise the handling of waste bags and to avoid decanting from one bin to another. When clinical waste bags must be handled, all bags are to be held away from the body by the closed top of the bag, and placed directly into a bin appropriate to the waste (see Table 1).

Gloves, apron and protective eyewear must be worn when closing the bags and placing them into the container. Gloves worn are to be appropriate for the type of waste being handled. Workplace hazard identification and risk assessment are to be undertaken before purchase to select a range of gloves of suitable material, size, style and fit and consider maintenance and disposal methods.

Waste bags must not be filled to more than two-thirds of their capacity and contents are to be secured within the bag when closing. Excess air is to be excluded without compaction, prior to closure at the point of waste generation. The bag is not to be secured with sharp protuberances, e.g. staples.

All clinical waste stream bags and receptacles stored, pending collection, are to be in a secured area that permits restricted access.

Pathology specimens and associated materials must be double packaged.

Anatomical waste must be packaged to minimise the risk of the contents spilling or puncturing the bin liner before being placed into the anatomical waste bin. This includes triple bagging of body parts or amputated limbs that may have sharp bone edges and/or the use of wet bags.

Sharps must never be placed in waste bags.

2.3 Management of waste

The following tables identify the management, handling, labelling, containment, and where relevant, storage and transport for various waste streams generated by health services.

Table 1: Management of clinical waste streams: anatomical, sharps and other clinical waste

Waste stream	Anatomical waste	Clinical sharps waste	Clinical waste (Incl. Pathological Waste)
Definition	Identifiable human body parts such as limbs, organs, placenta and recognisable or large pathological specimens resulting from investigation or treatment of a patient It does not include deceased bodies	Any clinical object capable of inflicting a penetrating injury which may or may not be contaminated with blood and or body substance. This includes needles, ampoules and any other sharp objects or instruments designed to perform penetrating procedures[1] May contain clinical material or Genetically Modified Organism (GMO)[2] waste	Clinical waste with the potential to cause injury, infection or offence: • Unrecognisable human tissue (excluding hair, teeth, nails and anatomical waste) • Bulk blood or other body fluids (or body substances) • Material and equipment visibly stained by blood or body fluids (includes incontinence pads and disposable nappies that come from an infectious patient)[3] • Lab specimens, cultures or other waste from lab investigations • Waste from medical or veterinary research • Genetically Modified Organisms (GMOs)
Bin colour	Yellow	Yellow	Yellow
Lid colour of bin	Orange	Yellow	Yellow
Plastic bin liners	Orange	N/A	Yellow
Labelling of bins and if applicable liners	Anatomical waste	Clinical sharps	Clinical waste
Symbol			
Symbol (description)	Black biological hazard	Black biological hazard	Black biological hazard
Label (if containing viable PC1 or PC2 GMOs)		Contains GMOs	Contains GMOs
Specific requirements	For incineration only	For incineration *or* autoclaving and shredding Sharps containers must be rigid-walled and meet the requirements specified in AS/NZS 4031 and AS/NZS 4261[4,5] Autoclave tape and bag indicators must be used to show autoclaving has been completed	For incineration *or* autoclaving [6] and shredding. Autoclave tape and bag indicators must be used to show autoclaving has been completed. Fluid may be able to be discharged into sewer depending on Liquid Trade Agreement between the health service and water utility All clinical waste once treated by a process acceptable to NSW Health[7] may be reclassified in accordance with the Waste Classification Guidelines[8] before recycling or disposal. There are special precautions regarding disposal of waste related to cases of viral haemorrhagic fever[9]
Relevant Act/ Regulation /Australian Standard	AS/NZS 3816:1998 Management of clinical and related waste AS/NZS 4123:2008 Mobile Waste Containers	AS/NZS 3816:1998 Management of clinical and related waste AS/NZS 4123:2008 Mobile Waste Containers *Protection of the Environment Operations Act 1997* *Protection of the Environment Operations (Waste) Regulation 2014*	AS/NZS 3816:1998 Management of clinical and related waste AS/NZS 4123:2008 Mobile Waste Containers *Protection of the Environment Operations Act 1997* *Protection of the Environment Operations (Waste) Regulation 2014*
EPA licence requirements	No	No	No

Table 2: Management of clinical waste streams: cytotoxic, pharmaceutical and radioactive

Waste stream	Cytotoxic waste	Pharmaceutical waste	Radioactive waste
Definition	Material contaminated with residues or preparations containing materials toxic or otherwise harmful to cells. This includes any residual cytotoxic drug or laboratory chemical and any discarded material or clinical waste associated with the preparation or administration or excretion of cytotoxic drugs May include Genetically Modified Organisms (GMOs) or tissues containing GMOs	Pharmaceuticals or other chemical substances specified as regulated goods in the Poisons and Therapeutic Goods Act 2008. Includes any substance specified in a Schedule of the Poisons List under the Act, as well as any therapeutic good which is unscheduled Includes expired or discarded pharmaceuticals, filters or other material contaminated by pharmaceutical products	Waste material, including sharps and clinical waste contaminated with a radioisotope which arises from the medical or research use of radionuclides, e.g. during nuclear medicine, radioimmunoassay and bacteriological procedures, and may be in solid, liquid or gaseous form, and which emits a level of radiation above the level set by regulatory authorities
Bin colour	Purple	Yellow	Red[1]
Lid colour of bin	Purple	Orange	Red
Plastic bin liners	Purple	N/A	Red
Labelling of bins and if applicable liners	Cytotoxic waste	Pharmaceutical waste	Radioactive waste plus specific requirements below
Symbol		Nil	
Symbol (description)	White telophase	Nil	Yellow background with distinctive 'trefoil' symbol in black and the lettering 'CAUTION RADIATION' in black
Label (if containing viable PC1 or PC2 GMOs)	Contains GMOs		
Specific requirements	For incineration only Collection, transport and handling only by licensed and registered waste management companies	Storage, destruction and disposal methods must comply with PD2013_043 Medication Handling in NSW Public Health Facilities[2] Pharmaceutical waste must be incinerated at a licensed controlled waste facility. Certain pharmaceuticals may only be destroyed by authorised persons under the *Poisons and Therapeutic Goods Act 1966* [3] Pharmaceutical waste bins must be lockable	Radioactive material to be stored on-site in appropriate storage area until it decays to below the thresholds of a "radioactive substance" as defined under the Radiation Control Act and Regulation Waste is to be classified with reference to the Safety Guide for the Classification of Radioactive Waste[4] and in accordance with the EPA Waste Classification Guidelines[5] Radioactive waste must be labelled with the substance, activity level and the date at which it is measured Handling and storage to comply with a Radiation Management Plan in accordance with the Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (ARPANSA 2008)[6] Radioactive sharps – see page 9 [7] When radioactive waste is to be transported, health services must comply with the Code of Practice for the Safe Transport of Radioactive Material (ARPANSA 2014)[8]
Relevant Act and Regulation	AS/NZS 4123:2008 Mobile Waste Containers *Protection of the Environment Operations Act 1997* *Protection of the Environment Operations (Waste) Regulation 2014*	*Poisons and Therapeutic Goods Act 1966* *Poisons and Therapeutic Goods Regulation 2008*	AS/NZS 4123:2008 Mobile Waste Containers *Radiation Control Act 1990* *Radiation Control Regulation 2013*
EPA licence requirements	No	No	Yes - Waste Classification Guidelines Part 3: Waste containing radioactive material (EPA, 2014)

Notes on Table 1: Management of clinical waste streams: anatomical, sharps and other clinical waste

1. Community sharps accepted or collected at a public hospital or authorised outlet of the Needle and Syringe Program are classified as clinical sharps waste and must be managed in accordance with this Policy.
2. Genetically modified organisms (GMO) must be disposed of in clinical waste, except if the GMOs also contain cytotoxic waste in which case they must be disposed of as cytotoxic waste for incineration.
3. Incontinence pads and disposable nappies can be treated as general waste unless the material is locally judged to come from an infectious patient (and consistent with the CEC Infection Prevention and Control Practice Handbook), is visibly blood stained, or is disposed of in a manner likely to cause offence such as in unusually large quantities, in which case it must be treated as clinical waste.
4. Sharps containers that are resistant to impact, penetration and leakage, are stable, have integrity of the handles/other carrying features and closure device, and have a capacity indicator (fill line) marked on the outside wall of the container must be used.
5. Reusable sharps containers must be readily emptied and cleaned before reuse.
6. Microbiological and pathological wastes must be decontaminated in accordance with Australian and New Zealand Standard 2243.3: Safety in Laboratories and shredded by the waste contractor prior to disposal.
7. Waste service providers require the application form for approval of a method to treat clinical waste if they collect, transport and treat clinical waste. Refer to the Guideline for Approval of Method to Treat Clinical Waste.
8. Reclassify waste in accordance with the EPA step-by-step waste classification process after treatment and before recycling or disposal.
9. For further clarification on requirements for disposal of infectious substances, refer to the most current Australian and New Zealand Standard 2243.3: Safety in Laboratories.

Notes on Table 2: Management of clinical waste streams: cytotoxic, pharmaceutical and radioactive

1. Radioactive sharps must be placed in a clinical sharps bin and the bin must be labelled with a radioactive sticker while the waste is radioactive, the name of the substance, activity level and the date at which it is measured. When radioactivity decays to background, the sticker must be removed and waste disposed of as clinical waste.
2. For requirements on medication handling and recommended destruction of Schedule 8 Medications, refer to NSW Health Policy Directive *Medication Handling in NSW Public Health Facilities* (PD2013_043).
3. Ibid. - See Note 2.

4. Refer to the RPS No.20 Safety Guide for Classification of Radioactive Waste for the classification of radioactive waste in consideration of long term safety and disposal of the waste.
5. Refer to the EPA classification guidelines for the step-by-step procedure to classify and manage radioactive waste.
6. For guidance on safe waste handling, segregation and storage of radioactive waste, refer to Part A2 'Requirements for Radioactive Waste' of the Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (RPS14). The Radiation Management Plan document needs to address dose limit requirements for the public and occupationally exposed persons as provided in Schedule 5 of the Radiation Control Act 1990.
7. The policy and procedure for radioactive sharps waste management is to be determined locally in the WMP, e.g. storage in a dedicated room.
8. Specific obligations are placed on the responsible person (including obtaining consent) and transporter by the Code for the Safe Transport of Radioactive Material (RPS2) which is mandated by the Radiation Control Regulation 2013.

Management of chemical waste

Chemical waste is generated by the use of chemicals in medical, veterinary and laboratory procedures. Chemical waste is to be classified in accordance with the step-by-step waste classification process in Waste Classification Guidelines Part 1: Classifying waste and the ADG Code.

These wastes must be managed and disposed of as per the Safety Data Sheet (SDS) for the hazardous chemical and recommended handling precautions, PPE and disposal.

All containers containing chemical waste must have labelling as per the requirements in Part 3 of Schedule 9 Classification, packaging and labelling requirements of the WHS Regulation 2017 and the Labelling of Workplace Hazardous Chemicals Code of Practice. This applies for a waste product that is reasonably likely to be a hazardous chemical. The waste is to be packed in a container with a label in English including the following for the hazardous chemical:

- product identifier,
- name, and the Australian address and business telephone number of:
  - the manufacturer, or
  - the importer,
- hazard pictogram and hazard statement consistent with the correct classification of the chemical.

A licence may be required for the disposal of high activity level radioactive substances classified as hazardous waste in accordance with the Waste Classification Guidelines Part 3:

Waste containing radioactive material, i.e. waste with a specific activity greater than 100 becquerels per gram and consisting of, or containing more than, the prescribed activity of a radioactive element in Schedule 1 of the Radiation Control Regulation 2013 – refer to the Note section of these guidelines.

Management of general waste

General waste is to be contained in white or opaque bags which are labelled according to the WMP. General waste is any waste that:

- is not included in Tables 1 and 2, and
- is not chemical waste, and
- has not been in contact with infectious agents, hazardous chemicals or radioactive substances, and
- does not pose a sharps hazard.

General waste may be further separated into recyclable or compostable streams as described in local waste/environmental management plans. Recycling strategies and labelling of general waste are to be outlined in the WMP.

2.4 Mobile Garbage Bins (MGBs) and trolleys

MGBs are re-usable rigid-walled containers used to contain and move clinical and related wastes (see Tables 1 and 2). Trolleys are used to move clinical wastes contained in plastic bags or non-mobile rigid-walled containers.

MGBs and trolleys must be dedicated solely for collecting and transporting waste to decrease spills, minimise collector contact with waste and minimise manual handling. MGBs and trolleys must be washable, with a lid that is lockable. MGBs must be securely closed during movement but not necessarily locked, unless the MGB is a pharmaceutical waste bin.

MGBs and trolleys must never be overfilled and the load is to not be more than three- quarters full (i.e. less than 55 kg). Waste collection rounds are to be performed as often as necessary to minimise housekeeping hazards.

If MGBs and trolleys are not removed and cleaned by the waste contractor then the following procedures are recommended to be regularly completed by the health service:

- rinse with cold water then wash with warm water and a neutral detergent, or equivalent (e.g. chemical formulated for cold water use)
- trolleys and MGBs are to be drained to sewer and left to dry
- clean trolleys and bins are to be stored separately to soiled containers
- appropriate personal protective equipment must be worn when cleaning MGBs
- waste water may only be diverted to the sewer.

2.4.1 Management of MBGs and bags

MGBs are to be readily inspected and cleaned after each use by the waste contractor. Defective containers must be repaired before use or taken out of service. Plastic bags/liners must have sufficient strength to safely contain waste and be suitable for the purpose if used for moist heat sterilization.

Chemical waste containers must be suitable for the chemical contained within and labelled.

2.5 Internal transport and tracking

All health services must optimise the waste collection process, reduce handling and transportation, and promote safe work practices. Waste transport routes need to avoid food preparation and heavily used areas where possible. Chutes must not be installed or used for the transport of wastes. Waste collection times must be routine to facilitate effective housekeeping and waste disposal practices.

Health services are to comply with the record keeping requirements specified in the EPA clinical waste tracking exemption for clinical waste, cytotoxic waste, sharps waste, pharmaceuticals and poisons, and radioactive waste.

2.6 Storage areas

Storage areas are to be cleaned regularly and to be kept free from odour and vermin. Health services must provide an enclosed structure such as a shed, garage, cage, fenced area or separate loading bay to store waste.

The storage area for anatomical and/or clinical waste may require refrigeration to prevent decomposition of the waste, if the waste is not removed on a frequent basis.

The holding area must be located away from food and clean storage areas, be inaccessible to the public, have a lockable door and rigid impervious flooring. If it is not practicable to lock the area, all bins in that area are to be locked. Where practicable, loading and unloading are to occur within the storage area. Clean up facilities, spills kits, appropriate drainage and bunding (i.e. retaining walls within the storage area to contain any material that has escaped) are to be provided.

2.7 Waste transport and disposal

While external transporters obligations are covered by the NSW Government waste contract, the requirements of the ADG Code may apply to the contractor for the transport of Division 6.2 Infectious Substances. When triggered, there may be requirements to supply the transporter with appropriate transport documents. Transport documents must describe the dangerous goods being transported, and appropriate emergency information for those goods. The ADG Code requirements commonly apply for the packing and transport of the following waste categories:

- UN 2814 (Category A Infectious Substances): Infectious substances affecting humans

- UN 3291 (Category B Infectious Substances): Infectious substances which do not meet the criteria for inclusion in Category A, which includes clinical wastes which are reasonably believed to have a low probability of containing infectious substances. (Refer to Chapter 2.6.3 of the ADG Code for further information on classification).

Refer to the SafeWork NSW factsheet - Packing and transporting clinical waste, which assists health services with the handling and transport of UN3291 clinical waste in accordance with Packing Instruction P62A of the ADG Code. UN 2814 waste may involve higher hazards and will need to comply with full packing and transport requirements of the ADG Code.

2.8 Spill management

Health services must manage waste spills as they occur in the facility, ensuring that:

- the WMP specifies procedures for waste spills
- personnel involved in spill management are trained in emergency procedures and handling requirements, including use of spill kits. Spill kits are to be readily accessible throughout the health service and clearly labelled and mapped
- health services have personal protective equipment and emergency spill kits that are appropriate to the waste streams handled, so staff can safely and effectively clean spills and dispose of the waste
- spill kits are to be disposed of with the relevant waste stream
- spill kits are restocked with the necessary components immediately after use, returned to their locations and regularly inspected for malfunctioning or missing components.

The WMC or equivalent is responsible for identifying other types of spill kits that might be needed to address spills from other waste streams.

2.9 Auditing

Auditing is important to establish benchmarks and whether waste is appropriately managed. The WMP is to include working with the supplier and reviewing contractor information and include an auditing process, including frequency and selection of samples. Audits may include:

- checking waste streams are appropriately used and managed
- checking that bags and MGBs/trolleys are not filled with loads more than two-thirds or three-quarters of their capacity, respectively
- review of WMP
- interview with key staff
- review of records.

Auditing is to be conducted by the waste management contractor at a frequency determined by the contract upon negotiation with the contractor and WMC. The frequency of auditing is to be included in the WMP.

Refer to NSW Government C1002676 Waste Audit Services which Districts can access if they require an independent waste audit.

3 WORK HEALTH AND SAFETY

3.1 Notifying incidents

Reporting serious injuries and illnesses is a requirement under the WHS legislation (see Part 3 Incident Notification, s35-39 of the WHS Act 2011). If a serious injury or illness, a death or a dangerous incident occurs, processes must be in place to ensure it is reported to SafeWork NSW immediately and the workers compensation insurer is notified within 48 hours. Staff must be made aware of and trained in processes for notifying incidents.

Depending on the nature of materials involved in incidents, there may be other legislative requirements regarding who must be informed if there is an incident.

3.2 Hygiene and cleaning

The health service must provide hand hygiene facilities for workers and promote regular hygiene procedures that comply with the NSW Health Policy Directive *Infection Prevention and Control Policy* (PD2017_013).

In addition, the health service must:

- designate specific areas for equipment cleaning (e.g. bunding or enclosed areas), maintenance and hygiene that are properly equipped with emergency showers and drainage to sewer. Locations of emergency showers and spills equipment are to be understood by relevant workers and identified throughout the health service (e.g. on the evacuation diagram),
- regularly clean and maintain equipment used to contain and transport waste
- clean all contaminated items as soon as possible, using approved detergents and hospital grade disinfectants.
- when cleaning contaminated items ensure staff wear appropriate Personal Protective Equipment (PPE), including face protection, use a scrubbing brush, and avoid splashing the water. If any item of PPE becomes contaminated or damaged, the item must be changed before continuing with the task.

3.3 Personal Protective Equipment (PPE)

Staff must use appropriate PPE when necessary and the health service must have a range of PPE that is suitable for the nature and degree of the identified hazard.

For tasks involving hazardous chemicals, ensure that the PPE recommended in the Safety Data Sheet (SDS) is provided and used. Staff must be trained in the proper selection, fitting (donning/doffing, or putting on/removing), storage and maintenance of PPE.

Health services must ensure all contractors, such as waste collectors, comply with all WHS and other legislative requirements, e.g. wearing appropriate PPE.

3.4 Sharps, blood and body fluids (or body substances) exposures

Needlestick injuries or exposures to blood and/or body fluids (or body substances) must be reported internally in accordance with the health organisation policy and are to be managed as outlined in NSW Health Policy Directive *HIV, Hepatitis B and Hepatitis C - Management of Health Care Workers Potentially Exposed* (PD2017_010).

Not all needlestick injuries or exposures to blood and/or body fluids need to be notified to SafeWork NSW – refer to their factsheet When to notify blood, body substance and needlestick exposure incidents for guidance on what incidents must be notified.

4 TRAINING AND INFORMATION

Management, including Districts and health services management, are responsible under the WHS legislation for providing appropriate information, training, instruction and supervision to ensure that safe systems of work are developed and maintained to minimise the risk of injury associated with waste handling and facilitate efficient waste management.

All workers need to know how to handle waste safely and notify incidents, including casual staff, contractors and volunteers. It is the responsibility of each health service to identify all workers that require training and ensure that the training is undertaken to the standards required by this Policy. This includes providing a waste management education module as part of the orientation for all new relevant staff.

The Health Education and Training Institute NSW (HETI) offers online learning and training modules on waste processes through My Health Learning. Specific training in all procedures associated with the implementation of the WMP is to be provided to:

- waste generators
- handlers, collectors
- transporters
- key management staff.

Training programs by the health service are to aim to prevent injury and disease by ensuring the health services include:

- infection control and hand hygiene procedures
- approved work practices, including specific waste handling and disposal, spill management, spill kit locations, etc.
- regulatory requirements and methods of compliance
- the provision and use of required PPE
- WHS and public health information relating to the equipment and chemicals/drugs used in the health service, e.g. SDSs for hazardous chemicals, handling of hazardous goods, hazardous manual tasks, operating manuals for clinical devices, sharps injury prevention, etc.
- first aid and treatment for needle stick and blood and body fluid (or body substance) exposure
- emergency response procedures and facilities (e.g. emergency showers, etc.)
- details of workplace vaccination program, post-incident counselling services with rights to privacy, etc.

Training programs must be revised as new equipment and work processes are introduced, or as technological change occurs, to ensure they do not introduce any new hazards.

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6 APPENDIX LIST

1. Abbreviations
2. Implementation / Compliance Checklist
3. Policies and guidelines

6.1 Abbreviations

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
AS/NZS	Australian/New Zealand Standard
EPA	Environment Protection Authority
GMO	Genetically Modified Organism
HETI	Health Education and Training Institute NSW
HIV	Human Immunodeficiency Virus
LHD	Local Health District
MGB	Mobile Garbage Bin
PC1 GMO	Physical Containment Level 1 facility Genetically Modified Organism
PC2 GMO	Physical Containment Level 2 laboratory Genetically Modified Organism
PCBU	Person Conducting a Business or Undertaking
POEO Act	*Protection of the Environment Operations Act 1997*
PPE	Personal Protective Equipment
SDS	Safety Data Sheet
Waste Regulation	*Protection of the Environment Operations (Waste) Regulation 2014*
WHS	Work Health and Safety
WHS Act	*Work Health and Safety Act 2011*
WHS Regulation	*Work Health and Safety Regulation 2017*
WMC	Waste Management Committee
WMP	Waste Management Plan

6.2 Implementation checklist

LHD/Facility:			
Assessed by:	**Date of Assessment:**		
IMPLEMENTATION REQUIREMENTS	**Not commenced**	**Partial compliance**	**Full compliance**
1. A specific position (or coordinating committee) has been identified as responsible for implementing waste management strategies and procedures. Position/committee is to liaise across the different facilities within the LHD.	❑	❑	❑
	Notes:		
2. Each health service has established a Waste Management Committee (WMC).	❑	❑	❑
	Notes:		
3. All facilities/health services in the LHD's jurisdiction are covered by a Waste Management Plan (WMP) developed in consultation with other co-located services.	❑	❑	❑
	Notes:		
4. All staff have completed the updated HETI (My Health Learning) training module for Waste Management.	❑	❑	❑
	Notes:		
5.	❑	❑	❑
	Notes:		
6.	❑	❑	❑
	Notes:		

6.3 Policies and guidelines

Policies and guidelines relevant to clinical and related waste include the following:

National guidelines and policies:

- AS/NZS 4031:1992 (Non-reusable containers for the collection of sharp medical items used in health care areas)
- AS/NZS 4261:1994 (Reusable containers for the collection of sharp items used in human and animal medical applications)
- AS/NZS 3816:2018 (Management of clinical and related waste)
- AS/NZS 2161.10 Parts 1-3:2005 (Occupational protective gloves)
- AS/NZS 4123 Parts 1-7:2008 (Mobile waste containers)
- AS/NZS 2243 Part 3:2010 (Safety in Laboratories)
- RPS No.20 Safety Guide for Classification of Radioactive Waste (ARPANSA, 2010)
- Code for the Safe Transport of Radioactive Material (ARPANSA, 2019)
- Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (RPS14) (ARPANSA, 2008)
- Industry Code of Practice for the Management of Biohazardous Waste (including Clinical & Related Wastes) (WMAA, 2014)
- The Australian Council on Healthcare Standards (ACHS) EQuIPNational Guidelines Standard 15 (ACHS, 2012)

NSW whole of government guidelines and policies:

- Waste Classification Guidelines. Part 1: Classifying waste (EPA, 2014)
- Waste Classification Guidelines. Part 3: Waste containing radioactive material (EPA, 2014)
- Labelling of workplace hazardous chemicals Code of Practice (SafeWork NSW, 2019)
- Code of Practice: Hazardous manual tasks (SafeWork NSW, 2019)

NSW Health guidelines and policies:

- PD2008_004 Community Sharps Disposal by Area Health Services
- PD2013_043 Medication Handling in NSW Public Health Facilities
- Guideline for Approval of Method to Treat Clinical Waste
- PD2017_013 Infection Prevention and Control Policy
- PD2017_010 HIV, Hepatitis B and Hepatitis C - Management of Health Care Workers Potentially Exposed
- GL2018_013 Work Health and Safety – Blood and Body Substances Occupational Exposure Prevention
- PD2020_022 Cleaning of the Healthcare Environment
- Infection prevention and control practice handbook (CEC, 2020)
- Environmental Cleaning Standard Operating Procedures. Module 3.4 Environment (CEC-HAI, 2012)
- Environmental Cleaning Standard Operating Procedures. Module 6 Cleaning Agents (CEC-HAI, 2012)

REPORT TO

NSW HEALTH INFRASTRUCTRE

ON

GEOTECHNICAL INVESTIGATION

FOR

PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

AT

94 TAYLOR STREET, GLEN INNES, NSW

Date: 25 May 2022
Ref: 34948SFrpt

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ATTACHMENTS

AC Testing Services Material Test Reports, Ref: RGS-429-1

Environmental Analysis Laboratory Results of Soil Analysis, Ref: M7649

Borehole Logs 1 to 4 Inclusive

Dynamic Cone Penetration Test Results Sheet

Figure 1: Site Location Plan

Figure 2: Borehole Location Plan

Report Explanation Notes

1 INTRODUCTION

This report presents the results of a geotechnical investigation for the proposed rural ambulance infrastructure reconfiguration (RAIR2) at 94 Taylor Street, Glen Innes, Kingscliff. NSW. The location of the site is shown in Figure 1. The investigation was commissioned by NSW Health Infrastructure and was carried out in accordance with our fee proposal, Ref: P56062RF, dated 1 March 2022.

We understand from correspondence with Mace Group and preliminary annotated architectural drawings provided by Bonacci that it is proposed to:

- Construct a one to two storey steel framed and clad building within the north-eastern corner of the Glen Innes Hospital site. We expect relatively light structural loads for a building of this type. The proposed Finished Floor Level (FFL) is RL1058.5m which will require cut and fill earthworks.
- Over the remainder of the site construct external on-grade pavements and car parking areas. Given the slope of the site, we expect that cut and fill earthworks will be required, although the extent of these are unknown at the time of writing this report.

The purpose of the investigation was to obtain geotechnical information on the subsurface conditions, and to use this as a basis for providing comments and recommendations on site classification, excavation conditions, footings, earthquake design classification, subgrade preparation and engineered fill.

2 INVESTIGATION PROCEDURE

The fieldwork for the investigation was carried out on 5 April 2022 by Regional Geotechnical Solutions (RGS) (who were engaged by JK Geotechnics) and comprised four boreholes drilled with a ute mounted drilling rig. The boreholes were drilled to termination depths between 3.0m and 8.0m below existing surface levels using spiral auger techniques and a Tungsten Carbide ('TC') bit. The boreholes were augmented by four Dynamic Cone Penetration (DCP) tests that extended to refusal depths of 1.5m to 1.6m below existing surface levels.

The borehole locations are shown on the attached Figure 2, and were set out by a registered surveyor at the locations nominated by the client. The surface reduced levels (RLs) shown on the attached logs were interpolated from spot heights shown on the survey plan and therefore should be considered approximate only. The height datum used is the Australian Height Datum (AHD).

The strength of the residual clay soils were assessed from Dynamic Cone Penetration (DCP) test blow counts augmented by hand penetrometer tests on remoulded samples of clayey soils. Groundwater observations were made in the boreholes during and on completion of drilling. In BH1, BH2 and BH3, Class 18 machine slotted PVC standpipes were installed for environmental purposes and finished with a cast iron gatic cover to allow longer term groundwater monitoring to be completed. No further geotechnical groundwater monitoring was carried out.

The fieldwork was completed in the full-time presence of a RGS geotechnical engineer who set out the borehole locations, nominated the testing and sampling, logged the encountered subsurface profile and nominated in-situ testing and sampling. For more details of the investigation procedures and their limitations, reference should be made to the attached Report Explanation Notes.

Selected samples were returned to AC Testing Services, a NATA accredited laboratory, for Standard compaction and four day soaked CBR, Atterberg limits, and linear shrinkage testing. The results are summarised in the attached AC Testing Services Material Test Report, Ref: RGS-429-1. Selected samples were also sent to another NATA accredited analytical laboratory (Southern Cross University) for soil pH, sulphate, chloride and resistivity testing. The results are summarised in the attached Results of Soil Analysis, Ref:M7649.

3 RESULTS OF INVESTIGATION

3.1 Site Description

The site is located in gently undulating topography with a general slope down towards the north-east towards level terrain associated with the flood banks of a north flowing creek. The site itself appears to be on the lower slopes of the hill and slopes at about 5°. The subject site is the north-eastern corner of the Glen Innes Hospital site.

The site is bounded by Taylor Street and West Avenue to the north and east, respectively. The roads comprise of asphaltic concrete pavement generally appear in moderate to good condition with the occasional minor depression observed in the pavement.

The site itself consisted of a grassed area with a few small to medium sized trees, although one large tree greater than 25m high was present. A low height brick boundary wall is present along the northern side of the site and the wall appears in good condition based upon a cursory inspection.

3.2 Subsurface Conditions

The 1:250,000 Geological Map of Grafton indicates the site to be underlain by Tertiary age volcanics comprising basalt and dolerite.

The boreholes disclosed a subsurface profile generally comprising fill and topsoil overlying residual clays with occasional sand and gravel inclusions. Weathered basalt was encountered at relatively shallow depths. Groundwater was only encountered in one borehole within the rock profile. Reference should be made to the attached borehole logs for detailed subsurface descriptions at specific locations. A summary of the subsoil conditions, as encountered, is presented below:

Fill

Fill was encountered at the surface in all boreholes extending depths between 0.2m and 0.6m below existing surface level. The fill predominantly comprised silty clay assessed to be of low to medium plasticity with varying amounts of sand, root fibres and some gravel in part.

Residual Clays

Residual clay was encountered below the fill in all boreholes, extending to depths between 1.6m and 2.4m below existing surface levels. The residual clay then transitioned into sandy clay and gravelly clay. The clays were assessed to be of stiff to very stiff strength and of low to medium plasticity. The moisture content was typically greater than the plastic limit.

Weathered Bedrock

Weathered basalt bedrock was encountered in all boreholes at depths between 1.6m and 2.4m depth below existing surface levels, or between about RL1055.5m and RL1061.2m, indicating the bedrock surface slopes down north. The bedrock was assessed to typically be extremely weathered and of hard soil strength improving to very low to low strength at depths between 2.6m and 6.5m.

Groundwater

Groundwater was encountered on completion in BH3 at 3.8m depth. No groundwater was encountered in BH1 and BH4. No longer term groundwater monitoring has been undertaken.

3.3 Laboratory Test Results

Based on the Atterberg Limits and Linear Shrinkage determination, the residual silty clays were confirmed to be of medium plasticity and have a moderate to high potential for shrink/swell movements with changes in moisture content.

The four day soaked CBR tests on samples of the medium plasticity clay from BH3 and BH4 returned values of 6% and 4.5%, respectively, when compacted to 98% of their Standard Maximum Dry Density (SMDD) and surcharged with 9kg. During soaking, the samples swelled by 3% and 4%, further confirming the moderate to high reactive potential, and potential for softening upon wetting.

The following table summarises the results from Southern Cross University. Reference should be made to the attached Results of Soil Analysis, Ref: M7649 for further details.

Sample	Soil Type	pH	Chloride mg/kg	Sulphate mg/kg	Resistivity ohm.cm
BH1 2.3-2.5m	BASALT	7.2	38	56	22,681
BH2 1.3-1.5m	Sandy CLAY	7.9	13	60	30,377
BH4 0.8-1.0m	Silty CLAY	6.9	9	21	50,736

4 COMMENTS AND RECOMMENDATIONS

4.1 Site Preparation

Prior to any excavation commencing we recommend that reference be made to the NSW Government "Code of Practice Excavation Work" dated January 2020 or the latest version at the time of the earthworks.

Site preparation is expected to comprise removal of trees and stripping of topsoil and/or root affected soils. In areas where no excavation is required, any obvious deleterious or contaminated existing fill not disclosed by this investigation should be removed. These stripped materials should be taken offsite as they are not suitable for re-use as engineered fill. The topsoil and/or root affected soils may be separately stockpiled and used for subsequent landscaping purpose, or appropriately disposed of.

Tree root systems dry out the surrounding clayey soils and their removal will result in localised moisture recovery leading to swelling which may have a detrimental impact on the performance of proposed nearby buildings and paved surfaces founded/supported in the clayey soil profile within the site. Therefore, trees should only be removed where necessary and as soon as practicable, in order for the moisture content of the clayey subsoils to recover; ideally this would be years in advance of construction though we understand this is usually not feasible.

Due to the existing site slope, cut and fill earthworks will be required to achieve design surface levels. The soil materials and extremely weathered bedrock should be readily excavated using the buckets of conventional earthmoving equipment, such as hydraulic excavators, although localised areas of higher strength bedrock ay be encountered that could require the use of a hydraulic impact hammer.

Temporary batter slopes of 1 Vertical (V) in 1 Horizontal (H) through the clay soils are generally considered to be appropriate. If permanent batters are proposed, then we recommend the batters are no steeper than 1V:3H and appropriately vegetated to prevent erosion.

4.2 Footing Design

Due to the presence of fill greater than 0.4m thickness in BH3 and the possibility of abnormal moisture conditions due to existing trees, we consider that the site classifies as Class 'P' in accordance with AS2870-2011 'Residential Slabs and Footings'.

If the footings are designed to be founded on the natural clay soils, consideration must still be given to the potential for reactive movements of the residual clays with changes in moisture content. In our opinion, any new footings must be designed on the assumption that shrink-swell movements of the clays similar to Class 'H2' type movements will occur assuming that trees will be removed and filling up to 1m will occur. We note that in the strictest sense AS2870 does not apply to development such as this, however it provides a useful guide for footing design on reactive clay sites. Reference may also be made to AS2870 for design, construction, performance criteria and maintenance precautions on reactive clay sites. Once further details of the proposed development are known, including the footings, extent of earthworks and tree removal, then

the reactivity of the clay soils must be checked to confirm whether movements similar to Class 'H2' conditions are applicable, or revise as necessary.

Based on the expected cut and fill earthworks, there will be variable ground conditions exposed at bulk excavation level. We expect extremely weathered basalt to be exposed over the south-western portion of the site, natural clays within the central portion of the site and the engineered fill over the north-eastern portion of the site. We assume the material excavated from the cut earthworks will be utilised for the fill earthworks, i.e. clayey soils used for filling.

Given that bedrock will be exposed over portions of the building footprint, ideally the footings should be uniformly founded on bedrock to avoid any potential differential settlements. However, the proposed building comprises of an admin building and an adjoining plant room which would require suspended slabs over a relatively large area and therefore, considering the structure comprise relatively flexible steel framed buildings with Colorbond cladding, consideration can be given to adopting alternative footing systems provided some differential settlements are acceptable. Given the assumed light loads, the differential settlements are likely to be relatively minor provided the slabs are sufficiently stiff.

For the admin building, the subgrade will predominantly consist of engineered fill, with some natural clays in the south-eastern corner. Weathered basalt may also be encountered over a small area, however is expected to be relatively limited. Based on this, given the usage and presence of internal plasterboard walls, a stiffened raft slab seems to be the most appropriate supported by engineered fill and natural clay. Minor differential movements are expected due to shrink-swell but should be manageable provided the slab is designed to the appropriate site classification. Extremely weathered basalt may be encountered at footing level in the south-western corner of the admin however it is expected to have the properties of gravelly clay and be of a very limited area and so should be able to be managed with appropriate stiffening of the slab.

The proposed plant room consists of columns around the perimeter with the roof spanning over the whole area. We expect bedrock to be exposed over the south-western portion of the plant room area, natural clay within the central portion and then engineered fill over the north-eastern portion. Given the differing subgrade conditions, we consider two footings options are the most practical; either a stiffened raft slab over the entire plant room, or, footings below load bearing elements and then a slab-on-ground (essentially a concrete pavement). A stiffened raft slab will have varying founding conditions which will cause differential movements, although we would expect these to be relatively minor given the assumed low structural loads. The main differential movements will arise from shrink-swell movements given the slab will be founded on a mixture of engineered fill, natural clay and weathered bedrock.

The presumably cheaper option will be to adopt footings supporting the load bearing elements (columns and load bearing walls) and then a slab-on-ground, although differential movements will occur between the footings and slabs, resulting in either damage or steps in the slab. This can be mitigated to a degree by dowelled/keyed joints. We also acknowledge there may be an issue where 'hard points' will be present below the slab where it extends over footings, such as where pad footings are present given they could be quite large to resist uplift. Smaller piled footings located around the perimeter of the building would minimise this effect. The only way to fully overcome these issues is to adopt a fully suspended slab.

In our opinion, we consider the footings and slab-on-ground to be the preferred option. If the differential movements are considered unacceptable, then a suspended slab will need to be adopted.

Stiffened rafts, strip or pad footings may be designed for an Allowable Bearing Pressure (ABP) of 150kPa when bearing on natural clays of at least stiff strength or 100kPa when bearing on engineered fill, provided it is placed under Level 1 supervision as defined in AS3798. Subgrade preparation and engineered fill recommendations below stiffened raft slabs are provided in Section 4.5 below.

If higher bearing pressures are required, then consideration can be given to piles uniformly founded within weathered basalt. For piles socketed a minimum 0.3m into the weathered basalt may be designed based on an ABP of 600kPa. An allowable shaft adhesion in compression and tension of 50kPa and 25kPa may be adopted, respectively. Where piles are adopted, the effect of the shrink-swell potential of the soils must still be considered and we therefore recommend the use of void formers of at least 80mm thickness below the slab and beams to accommodate the potential shrink-swell reactivity of the clayey subgrade. Further advice in this regard can be provided once details of the footing system and site earthworks (cut and fill) are known.

In accordance with Table 6.4.2(C) of AS2159-2009 '*Piling – Design and Installation'*, the site is underlain by soils above groundwater and therefore 'Soil Conditions B' are warranted. Based on the aggressivity testing, the site has a 'Non-aggressive' exposure classification for concrete piles. For steel piles and in accordance with Table 6.5.2 (c), the exposure classification for the soils tested is 'Non-aggressive'.

At least the initial stages of footing excavation should be inspected by a geotechnical engineer to ascertain that the recommended founding material has been reached and to check initial assumptions about foundation conditions and possible variations that may occur between borehole locations. The need for further inspections can be assessed following the initial visit. Footings must be dry and free of any loose or water softened materials prior to pouring concrete. As the clayey soils are reactive and will deteriorate if exposed to moisture, if there is any delay in pouring footing then following geotechnical inspection, consideration should be given to protecting the base of the footing excavation with a blinding layer of concrete. If no blinding later is provided any water and/or water softened material must be removed prior to pouring the concrete.

4.3 Retaining Walls

For any cantilevered gravity type retaining walls supporting soil materials (if required and assuming they are set-back sufficient distance from the site boundaries), we recommend that walls can be designed on the basis of an 'active' earth pressure co-efficient (K_a) of 0.35 where some wall movements are tolerable and assuming a horizontal backfill surface. If retaining walls are temporarily propped, backfilled and permanently supported by the structure then an 'at rest' earth pressure co-efficient (K_o) of 0.55 should be adopted. A bulk unit weight of 20kN/m^3 should be adopted for the soil profile. Surcharge loads (e.g. nearby footings, compaction stresses, sloping retained surfaces, construction loads etc) should be allowed for in the design using the appropriate above earth pressure coefficient. The retaining walls should be designed as drained, otherwise hydrostatic pressures would be in addition to the above earth pressures.

Any backfill behind retaining walls should comprise engineered fill in order to reduce post construction settlements. We note that compaction of engineered fill behind retaining walls is very difficult and time consuming to carry out effectively, and it is inevitable that even with good quality control and compaction that some post construction settlements will occur. Post construction settlements can cause adverse impacts on paving, landscaped retaining walls or other structures and services founded on or within the backfill. If potential post construction settlements are deemed problematic by the designers, then we recommend that further geotechnical advice be obtained . However, due to the limited space that may be available behind the walls, our preference for backfill behind retaining walls is to backfill using a single sized durable gravel, such as 'blue metal' or crushed concrete gravel (free of fines). These granular materials do not require significant compactive effort and provide better long term performance in regard to settlement than soil materials. A non-woven geotextile filter fabric should be placed over the cut faces prior to backfilling and then over the top surface of the gravel in order to reduce subsoil erosion. A clay capping layer should be provided above the free draining backfill material to reduce the likelihood of surface water entering the backfill and surcharging the retaining walls.

4.4 Earthquake Design Classification

Based upon AS1170.4-2007 "Structural Design Actions, Part 4: Earthquake Actions in Australia", the following design parameters may be adopted:

- Hazard Factor (Z) = 0.08;
- Class C_e – Shallow soil site.

4.5 Subgrade Preparation and Engineered Fill

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

4.5.1 Subgrade Preparation

If the floor slabs are proposed to be fully suspended on the piled footings, then no particular subgrade preparation would be necessary other than stripping all root-affected or deleterious topsoil/fill. However, based on the reactivity of the clay soils, as discussed above, we recommend the use of void formers under the building floor slabs to separate the slab from the subgrade and suitable to accommodate at least 80mm of movement.

Recommendations for subgrade preparation below stiffened raft slabs and slabs on ground are outlined below. Slab-on-ground (other than stiffened raft slabs) should also be constructed separate from the footings of the building (i.e. designed as 'floating').

1. All root affected or deleterious fill or topsoil must be removed; there may be an extensive zone of root affected soil where trees have been removed. These stripped materials should be taken off site as they are not suitable for reuse as engineered fill. Where depressions result from stripping, they may

be infilled with inert well-graded granular fill such as crushed sandstone, placed and compacted in layers as engineered fill.

2. Where existing uncontrolled fill is present and the proposed building will be formed over areas of existing fill, then the existing fill must be excavated to the natural subgrade. We recommend the excavation of the fill extend at least 1m beyond the building footprint.

3. Following the above, the entire subgrade should be proof rolled with at least 6 passes of an at least 8 tonne smooth drum roller used in static or non-vibratory mode of operation. The purpose of the proof rolling is to detect any soft or heaving areas.

4. The final pass of proof rolling 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. Care should be taken not to over-compact clayey subgrade areas.

5. If dry conditions prevail at the time of construction the clay subgrade may become desiccated or have shrinkage cracks prior to pouring any concrete slabs. If this occurs then the subgrade must be watered and rolled until the cracks disappear. This should be completed immediately prior to pouring concrete.

6. Unstable subgrade detected during proof rolling should be locally excavated down to a stiff or 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. From the borehole results we expect few, if any, unstable subgrade areas to occur provided good site drainage is maintained and the earthworks are carried out during good weather.

4.5.2 Engineered Fill

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 crushed sandstone, free of deleterious substances and having a maximum particle size not exceeding 75mm. Such fill should be compacted in horizontal layers not greater than 200mm loose thickness, to a minimum density of 98% of Standard Maximum Dry Density (SMDD). 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 and with a reduced maximum particle size of 40mm for the engineered fill.

From a geotechnical perspective, the existing fill and residual clays at the site may be acceptable for re-use as engineered fill on condition that the soils used are clean (i.e. free of organics and inclusions greater than 75mm size (or 40mm size, as necessary), and free of contaminants. These clayey soils should be compacted in maximum 200mm loose layers to a density strictly between 98% and 102% of SMDD and at moisture content within 2% of their Standard Optimum Moisture Content (SOMC). All clay fill should preferably be used in the lower fill layers. Consideration must also be made by the building designer of the greater reactive potential of new fills comprising reactive clays as opposed to existing clayey soils, as discussed in Section 4.2 above Thus, the use of clay materials for engineered fill will entail more rigorous earthwork supervision and

compaction control, time for possible moisture conditioning and hence, possibly a greater eventual cost for earthworks.

Density tests should be regularly carried out on engineered fill to confirm the above specifications are achieved. Density tests should be carried out at the frequencies outlined in AS3798 (Table 8.1) for the volume of fill involved. Within the proposed building footprint and particularly if the engineered fill will be supporting structural loads, then the fill must be placed under Level 1 supervision, as defined in AS3798-2007. Areas where engineered fill will not be supporting structural loads, then a reduced Level 2 control of fill compaction may be adopted. Any areas of insufficient compaction will require reworking and retesting to confirm the required specification has been achieved. Preferably, the geotechnical testing authority (GTA) should be engaged directly on behalf of the client and not by the earthworks subcontractor.

4.5.3 Drainage During Construction

The subgrade will comprise clay soils. The clays may be found to be unstable if proper site drainage is not implemented during construction. It is therefore important to provide good drainage in order to promote run-off and reduce ponding. Earthworks platforms should be graded to maintain cross-falls during construction. If the clays are exposed to periods of rainfall, softening may result and site trafficability will be poor. If softening occurs, the subgrade should be over-excavated to below the depth of moisture softening. The material removed should be replaced with engineered fill. Such work would likely cause delays to the earthworks program. Trafficability may be improved by the use of a sacrificial surface layer of crushed demolition rubble.

4.6 Pavement Design Parameters

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. Flexible pavements may have a lower initial cost but maintenance will be higher. These factors should be considered when making the final choice. We recommend that reference also be made to AS2870 for drainage and vegetation precautions on reactive clay sites. We acknowledge that the CBR tests returned values of 4.5% and 6%, however we consider these values are likely elevated due to the gravel content in the samples artificially increasing the CBR value. However, based on the amount of swelling of the CBR samples during testing, as well as the Atterberg Limit tests, we recommend the pavements are designed based on a reduced CBR value of 3% or an estimated subgrade reaction modulus (for concrete slabs or pavements) of 25kPa/mm (750mm diameter plate).

Alternatively, if higher CBR values are required, then consideration could be given to providing an appropriate select fill layer as part of the overall pavement thickness. The select fill should be well graded crushed sandstone or other good quality rock with a minimum soaked CBR value of 10%. The pavement sections where imported fill is used to raise site levels may be designed taking into account the thickness and soaked CBR value of the imported fill material.

Concrete pavements should have a sub-base layer of at least 100mm thickness of crushed rock to the latest revision of Transport for NSW QA specification 3051 (2010 unbound base material (or equivalent good quality and durable fine crushed rock) which is compacted using a heavy roller to at least 98% of Modified Maximum Dry Density (MMDD). Adequate moisture conditioning to within 2% of Modified Optimum Moisture Content (MOMC) should be provided during placement so as to reduce the potential for material breakdown during compaction. Concrete pavements should be designed with an effective shear transmission of all joints by way of either doweled or keyed joints. If flexible pavements are proposed then the base and sub-base materials must also comply with the above Transport for NSW QA specification 3051.

Careful attention to subsurface and surface drainage is required in view of the effect of moisture on the clay subgrade. The surface of the pavement and the subgrade should be sloped to shed water, and adequate subsurface drainage should be installed around the pavement to intercept and dispose of water flows. The drainage trenches should be excavated with a longitudinal fall to appropriate discharge points so as to reduce the risk of water ponding. The subsoil drainage should extend at least 0.3m below the subgrade levels.

The pavement sections where imported fill is used to raise site levels, by at least 0.5m may be designed on the basis of a four-day soaked CBR value of the imported fill material, as noted above.

4.7 Further Geotechnical Input

The following is a summary of the further geotechnical input which is required and which has been detailed in the preceding sections of this report:

- Confirmation of site classification once structural design, earthworks and tree removal are known.
- Footing inspections.
- Proof rolling of subgrade
- Density tests of engineered fill and/or pavement construction materials.

5 GENERAL COMMENTS

The recommendations presented in this report include specific issues to be addressed during the construction phase of the project. In the event that any of the construction phase recommendations presented in this report are not implemented, the general recommendations may become inapplicable and JK Geotechnics accept no responsibility whatsoever for the performance of the structure where recommendations are not implemented in full and properly tested, inspected and documented.

The long term successful performance of floor slabs and pavements is dependent on the satisfactory completion of the earthworks. In order to achieve this, the quality assurance program should not be limited to routine compaction density testing only. Other critical factors associated with the earthworks may include subgrade preparation, selection of fill materials, control of moisture content and drainage, etc. The satisfactory control and assessment of these items may require judgment from an experienced engineer. Such judgment often cannot be made by a technician who may not have formal engineering qualifications

and experience. In order to identify potential problems, we recommend that a pre-construction meeting be held so that all parties involved understand the earthworks requirements and potential difficulties. This meeting should clearly define the lines of communication and responsibility.

Occasionally, the subsurface conditions between and below the completed boreholes may be found to be different (or may be interpreted to be different) from those expected. Variation can also occur with groundwater conditions, especially after climatic changes. If such differences appear to exist, we recommend that you immediately contact this office.

This report provides advice on geotechnical aspects for the proposed civil and structural design. As part of the documentation stage of this project, Contract Documents and Specifications may be prepared based on our report. However, there may be design features we are not aware of or have not commented on for a variety of reasons. The designers should satisfy themselves that all the necessary advice has been obtained. If required, we could be commissioned to review the geotechnical aspects of contract documents to confirm the intent of our recommendations has been correctly implemented.

A waste classification is required for any soil and/or bedrock excavated from the site prior to offsite disposal. Subject to the appropriate testing, material can be classified as Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM), General Solid, Restricted Solid or Hazardous Waste. Analysis can take up to seven to ten working days to complete, therefore, an adequate allowance should be included in the construction program unless testing is completed prior to construction. If contamination is encountered, then substantial further testing (and associated delays) could be expected. We strongly recommend that this requirement is addressed prior to the commencement of excavation on site.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in this report then all recommendations should be reviewed. Copyright in this report is the property of JK Geotechnics. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report. The report shall not be reproduced except in full.

Material Test Report

AC TESTING SERVICES
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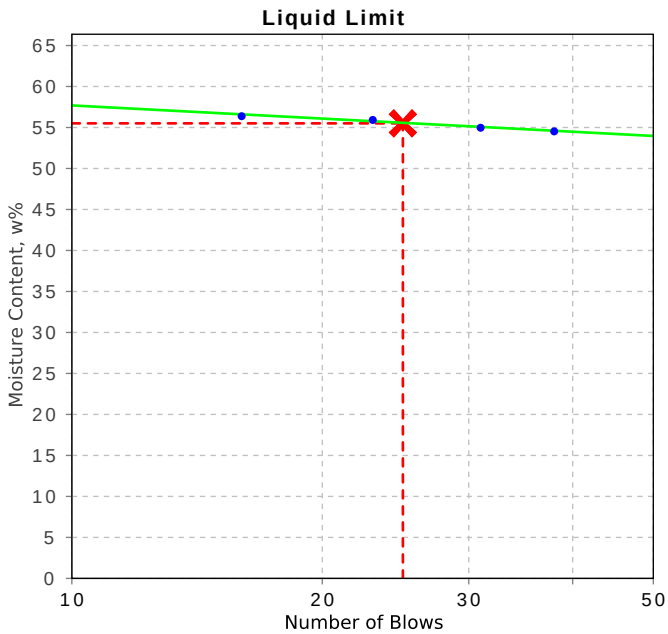
NATA
WORLD RECOGNISED ACCREDITATION

Approved Signatory: Adam Crawford
Lab Manager
NATA Accredited Laboratory Number: 19604

Report Number: **RGS-429-1**
Issue Number: 1
Date Issued: 25/05/2022
Client: Regional Geotechnical Solutions
14/25-27 Hurley Drive, Coffs Harbour NSW 2450
Contact: Joel Babbage
Project Number: RGS-429
Project Name: JK Geotechnics - Glen Innes Hospital Redevelopment
Project Location: Glen Innes
Client Reference: RGS33140.1
Work Request: 4088
Sample Number: ACTS22-4088A
Date Sampled: 08/04/2022
Dates Tested: 12/04/2022 - 21/05/2022
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: RGS33140.1
Site Selection: Selected by Client
Sample Location: **BH1 , Depth: 0.3-0.8**

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	56		
Plastic Limit (%)	31		
Plasticity Index (%)	**25**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	15.0		
Cracking Crumbling Curling	Curling		



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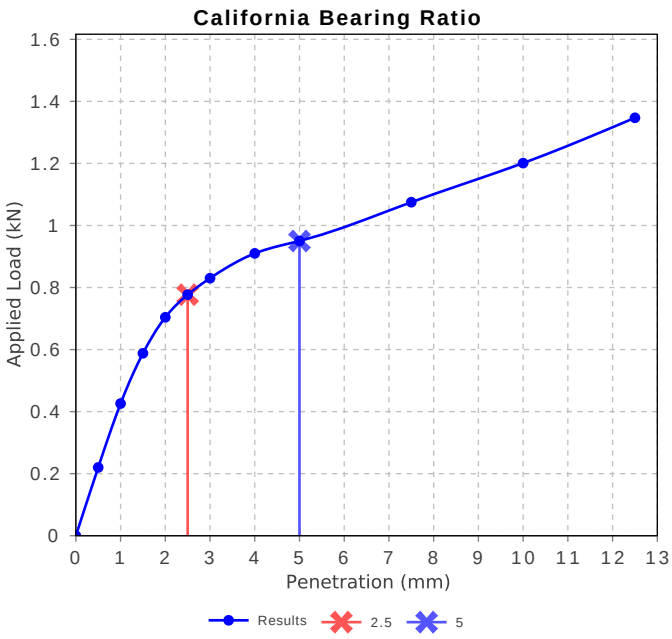
Approved Signatory: Adam Crawford
Lab Manager
NATA Accredited Laboratory Number: 19604

Report Number: **RGS-429-1**
Issue Number: 1
Date Issued: 25/05/2022
Client: Regional Geotechnical Solutions
14/25-27 Hurley Drive, Coffs Harbour NSW 2450
Contact: Joel Babbage
Project Number: RGS-429
Project Name: JK Geotechnics - Glen Innes Hospital Redevelopment
Project Location: Glen Innes
Client Reference: RGS33140.1
Work Request: 4088
Sample Number: ACTS22-4088B
Date Sampled: 08/04/2022
Dates Tested: 12/04/2022 - 21/05/2022
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: RGS33140.1
Site Selection: Selected by Client
Sample Location: **BH3 , Depth: 0.6-1.2**

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual/Tactile		
Maximum Dry Density (t/m^3)	1.35		
Optimum Moisture Content (%)	34.5		
Laboratory Density Ratio (%)	98.5		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m^3)	1.30		
Field Moisture Content (%)	35.9		
Moisture Content at Placement (%)	34.6		
Moisture Content Top 30mm (%)	40.4		
Moisture Content Rest of Sample (%)	34.9		
Mass Surcharge (kg)	9.0		
Soaking Period (days)	4		
Curing Hours	31.5		
Swell (%)	3.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	57		
Plastic Limit (%)	30		
Plasticity Index (%)	**27**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	16.0		
Cracking Crumbling Curling	Curling		

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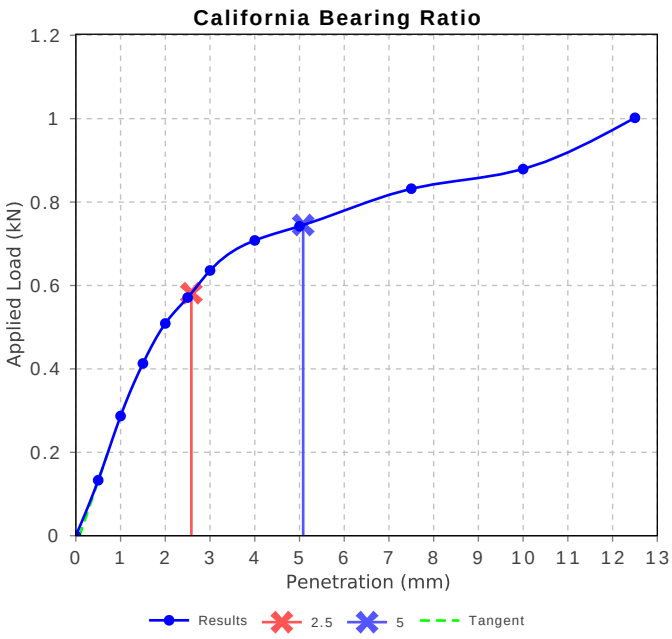
Approved Signatory: Adam Crawford
Lab Manager
NATA Accredited Laboratory Number: 19604

Report Number: **RGS-429-1**
Issue Number: 1
Date Issued: 25/05/2022
Client: Regional Geotechnical Solutions
14/25-27 Hurley Drive, Coffs Harbour NSW 2450
Contact: Joel Babbage
Project Number: RGS-429
Project Name: JK Geotechnics - Glen Innes Hospital Redevelopment
Project Location: Glen Innes
Client Reference: RGS33140.1
Work Request: 4088
Sample Number: ACTS22-4088C
Date Sampled: 08/04/2022
Dates Tested: 19/02/2022 - 19/02/2022
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: RGS33140.1
Site Selection: Selected by Client
Sample Location: **BH4, Depth: 0.3-0.7**

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**4.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual/Tactile		
Maximum Dry Density (t/m^3)	1.36		
Optimum Moisture Content (%)	34.5		
Laboratory Density Ratio (%)	98.0		
Laboratory Moisture Ratio (%)	102.0		
Dry Density after Soaking (t/m^3)	1.31		
Field Moisture Content (%)	35.3		
Moisture Content at Placement (%)	35.2		
Moisture Content Top 30mm (%)	36.8		
Moisture Content Rest of Sample (%)	35.6		
Mass Surcharge (kg)	9.0		
Soaking Period (days)	4		
Curing Hours	31.2		
Swell (%)	2.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



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Report Number:	**RGS-429-1**
Issue Number:	1
Date Issued:	25/05/2022
Client:	Regional Geotechnical Solutions 14/25-27 Hurley Drive, Coffs Harbour NSW 2450
Contact:	Joel Babbage
Project Number:	RGS-429
Project Name:	JK Geotechnics - Glen Innes Hospital Redevelopment
Project Location:	Glen Innes
Client Reference:	RGS33140.1
Work Request:	4088
Dates Tested:	12/04/2022 - 16/05/2022
Remarks:	RGS33140.1
Location:	Glen Innes Hospital

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Approved Signatory: Adam Crawford
Lab Manager
NATA Accredited Laboratory Number: 19604

Moisture Content AS 1289 2.1.1

Sample Number	Sample Location	Moisture Content (%)	Material
ACTS22-4088A	BH1 , Depth: 0.3-0.8	36.6 %	**
ACTS22-4088B	BH3 , Depth: 0.6-1.2	35.0 %	**

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RESULTS OF SOIL ANALYSIS

3 samples supplied by Regional Geotechnical Solutions Pty Ltd on 11/04/2022 - Lab Job No. M7649
Analysis requested by Joel Babbage. - **Your Project: RGS33140.1**
44 Bent Street WINGHAM NSW 2429

	Method	Sample 1 BH1 2.3-2.5	Sample 2 BH2 1.3-1.5	Sample 3 BH4 0.8-1.0
	EAL job No.	***M7649/1***	***M7649/2***	***M7649/3***
Moisture (%)	*inhouse*	30	21	29
Texture	*See note 2 below.*	Fine	Fine	Fine
pH	Rayment & Lyons 2011 - 4A1 (1:5 Water)	7.23	7.87	6.87
Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.044	0.033	0.020
Resistivity (ohm.mm)	** Calculation	226,809	303,767	507,357
Resistivity (ohm.cm)	** Calculation (ohm.mm / 10)	22,681	30,377	50,736
Chloride (mg/kg)	** Water Extract - ISE (1:5 Water)	37.6	13.2	8.8
Chloride **(as %)**	** Calculation	0.004	0.001	0.001
Sulfate (mg/kg)	** Water Extract-APHA 3120 ICPOES	56	60	21
Sulfate **(as % SO_4)**	** Calculation	0.006	0.006	0.002
Chloride / Sulfate Ratio	** Calculation	0.7	0.2	0.4

Notes:

1. ppm = mg/kg dried soil
2. For Texture: coarse = sands to loamy sands; medium = sandy loams to light clays; fine = medium to heavy clays and silty clays
3. All results as dry weight DW - soils were dried at 60°C for 48hrs prior to crushing and analysis.
4. For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm
5. Methods from Rayment and Lyons, 2011. Soil Chemical Methods - Australasia.CSIRO Publishing: Collingwood.
6. Based on Australian Standard AS: 2159-2009
7. Methods from Ahern, CR, McElnea AE , Sullivan LA (2004). *Acid Sulfate Soils Laboratory Methods Guidelines* . QLD DNRME.
8. Analysis conducted between sample arrival date and reporting date.
9. ** NATA accreditation does not cover the performance of this service.
10. .. Denotes not requested.
11. This report is not to be reproduced except in full.
12. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
13. Results relate only to the samples tested.
14. This report was issued on 28/04/2022.

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Environmental Analysis Laboratory, Southern Cross University,
Tel. 02 6620 3678, website: scu.edu.au/eal

checked: .....
Graham Lancaster
Laboratory Manager

JKGeotechnics

BOREHOLE LOG

Borehole No. **1**

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: 34948RF **Method:** SPIRAL AUGER **R.L. Surface:** ≈ 1059.5m

Date: 5/4/22 **Datum:** AHD

Plant Type: RGS UTE **Logged/Checked by:** R.G.S./O.F.

Groundwater Record	SAMPLES ES	U50	DB	DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■				REFER TO DCP TEST RESULTS	0		-	FILL: Sandy clay, low plasticity, dark brown, root affected, fine to medium grained sand.	w>PL			TOPSOIL
	■			■				CI	Silty CLAY: medium plasticity, orange brown, trace of fine to medium grained sand and gravel.	w>PL	St - VSt	200	APPEARS POORLY COMPACTED RESIDUAL
						1		CL-CI	Gravelly CLAY: low to medium plasticity, dark brown and orange brown, fine to coarse grained angular gravel, iron staining.			320	
				■		2		-	Extremely Weathered basalt: gravelly CLAY, low to medium plasticity, fine to coarse grained angular gravel.	XW	Hd		TERTIARY VOLCANICS
						3			BASALT: grey and brown.	HW	L		
						4			END OF BOREHOLE AT 3.9m				'TC' BIT REFUSAL GROUNDWATER MONITORING WELL INSTALLED TO 3.9m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 3.9m TO 0.9m. CASING 0.9m TO SURFACE. 2mm SAND FILTER PACK 3.9m TO 3.0m. BENTONITE SEAL 0.9m TO 0.5m. BACKFILLED WITH SPOIL TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. **2**

1/1

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: 34948RF **Method:** SPIRAL AUGER **R.L. Surface:** ≈ 1057.9m

Date: 5/4/22 **Datum:** AHD

Plant Type: RGS UTE **Logged/Checked by:** R.G.S./O.F.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	REFER TO DCP TEST RESULTS	0		-	FILL: Silty clayey sand, fine to medium grained, dark brown.	W			TOPSOIL
					CL-CI	Sandy CLAY: low to medium plasticity, dark brown, fine to medium grained sand	w>PL	F-St		RESIDUAL
	U50, DB, DS		1		CI	Sandy CLAY: medium plasticity, grey and brown, fine to coarse grained sand, with fine to coarse grained angular gravel, and iron staining.		VSt		
								H		
			2		-	BASALT: brown and dark grey.	XW	VL-L		TERTIARY VOLCANICS
						END OF BOREHOLE AT 2.6m				RECOVERED AS CLAYEY GRAVEL
			3							'TC' BIT REFUSAL
			4							GROUNDWATER MONITORING WELL INSTALLED TO 2.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.0m TO 1.0m. CASING 1.0m TO SURFACE. 2mm SAND FILTER PACK 2.0m TO 1.0m. BENTONITE SEAL 1.0m TO 0.5m. BACKFILLED WITH SPOIL TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
			5							
			6							
			7							

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BOREHOLE LOG

Borehole No. **3**

1/1

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: 34948RF **Method:** SPRIAL AUGER **R.L. Surface:** ≈ 1063.0m

Date: 5/4/22 **Datum:** AHD

Plant Type: RGS UTE **Logged/Checked by:** R.G.S./O.F.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	REFER TO DCP TEST RESULTS	0		-	FILL: Silty clay, low to medium plasticity, dark brown, root affected.	w>PL			APPEARS POORLY COMPACTED
						FILL: Gravelly clay, low plasticity, brown and dark brown, fine to coarse grained gravel and fine to coarse grained sand.				
	ES, DS				CI	Silty CLAY: medium plasticity, orange brown, trace of fine to coarse grained angular gravel	w>PL	VSt	320	RESIDUAL
			1							
					CL	Gravelly CLAY: low plasticity, dark grey and brown, fine to coarse grained angular gravel.	w<PL	Hd		
	DS		2		-	Extremely Weathered basalt: gravelly CLAY, low plasticity, grey and red brown, fine to coarse grained gravel with fine to coarse grained sand, iron staining, vesicular gravel.	XW	Hd		TERTIARY VOLCANICS
			3							
▼ ON COMPLET-ION	DS		4							
			5							GROUNDWATER MONITORING WELL INSTALLED TO 5.7m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 5.7m TO 4.0m. CASING 4.0m TO SURFACE. 2mm SAND FILTER PACK 5.7m TO 3.7m. BENTONITE SEAL 3.7m TO 3.0m. BACKFILLED WITH SPOIL TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
▶			6			BASALT: grey.	XW-DW	VL-L		
						END OF BOREHOLE AT 6.9m				
			7							

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BOREHOLE LOG

Borehole No.
4
1/1

Client: NSW HEALTH INFRASTRUCTURE

Project: PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Job No.: 34948RF **Method:** SPIRAL AUGER **R.L. Surface:** ≈ 1059.8m

Date: 5/4/22 **Datum:** AHD

Plant Type: RGS UTE **Logged/Checked by:** R.G.S./O.F.

Groundwater Record	SAMPLES ES	U50	DB	DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■			■	REFER TO DCP TEST RESULTS	0		-	FILL: Sandy clay, medium plasticity, fine to medium grained sand, dark brown.	w>PL			APPEARS POORLY COMPACTED
	■			■				CI	Silty CLAY: medium plasticity, orange brown, trace of fine to medium grained sand.	w>PL	VSt	300	RESIDUAL
	■			■		1		CL-CI	Gravelly CLAY: low to medium plasticity, grey and brown, fine to coarse grained angular gravel.				
						2		-	Extremely Weathered basalt: gravelly CLAY, low plasticity, grey, fine to coarse grained, with fine to coarse grained sand and highly weathered, low strength bands and boulders.	XW	Hd		TERTIARY VOLCANICS
						3			BASALT: grey.	HW	VL-L		
									END OF BOREHOLE AT 3.6m				'TC' BIT REFUSAL
						4							
						5							
						6							
						7							

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DYNAMIC CONE PENETRATION TEST RESULTS

Client:	NSW HEALTH INFRASTRUCTURE						
Project:	PROPOSED RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION (RAIR2)						
Location:	94 TAYLOR STREET, GLEN DAVIS, NSW						
Job No.	34948RF			Hammer Weight & Drop: 9kg/510mm			
Date:	5-4-22			Rod Diameter: 16mm			
Tested By:	RGS			Point Diameter: 20mm			
Test Location	**1**	**2**	**3**	**4**			
Surface RL	~1059.5m	~1057.9m	~1063.0m	~1059.8m			
Depth (mm)	Number of Blows per 100mm Penetration						
0 - 100	SUNK	SUNK	SUNK	1			
100 - 200	1	1	1	2			
200 - 300	3	1	1	2			
300 - 400	3	1	2	4			
400 - 500	3	2	5	5			
500 - 600	3	2	11	7			
600 - 700	3	4	4	6			
700 - 800	3	5	5	7			
800 - 900	4	8	4	8			
900 - 1000	4	8	5	10			
1000 - 1100	6	9	5	9			
1100 - 1200	10	9	6	13			
1200 - 1300	10	9	8	10			
1300 - 1400	16	9	11	9			
1400 - 1500	17	16	14	11			
1500 - 1600	REFUSAL	23	25	22			
1600 - 1700		REFUSAL	REFUSAL	REFUSAL			
1700 - 1800							
1800 - 1900							
1900 - 2000							
2000 - 2100							
2100 - 2200							
2200 - 2300							
2300 - 2400							
2400 - 2500							
2500 - 2600							
2600 - 2700							
2700 - 2800							
2800 - 2900							
2900 - 3000							

Remarks:
1. The procedure used for this test is described in AS1289.6.3.2-1997 (R2013)
2. Usually 8 blows per 20mm is taken as refusal
3. Datum of levels is AHD

Ref: JK Geotechnics DCP 0-3m Rev5 Feb19

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

This plan should be read in conjunction with the JK Geotechnics report.

Title:	**SITE LOCATION PLAN**
Location:	94 TAYLOR STREET, GLEN INNES, NSW
Report No:	34948RF
Figure No:	1

JKGeotechnics

PLOT DATE: 11/05/2022 9:44:57 AM DWG FILE: S:\6 GEOTECHNICAL\6F GEOTECHNICAL JOBS 34000\S 34948RF GLEN INNES CAD 34948RF.DWG

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AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 4 8 12 16 20

SCALE 1:400 @A3 METRES

This plan should be read in conjunction with the JK Geotechnics report.

Title: **BOREHOLE LOCATION PLAN**

Location: 94 TAYLOR STREET, GLEN INNES, NSW

Report No: 34948RF

Figure No: 2

JKGeotechnics

PLOT DATE: 11/05/2022 9:45:05 AM DWG FILE: S:\6 GEOTECHNICAL 6F GEOTECHNICAL JOBS 34000 S 34948RF GLEN INNES CAD 34948RF.DWG

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REPORT EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the geotechnical report in regard to classification methods, field procedures and certain matters relating to the Comments and Recommendations section. Not all notes are necessarily relevant to all reports.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Geotechnical engineering involves gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) is referred to as 'laminite'.

SAMPLING

Sampling is carried out during drilling or from other excavations to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon the degree of disturbance, some information on strength and structure. Bulk samples are similar but of greater volume required for some test procedures.

Undisturbed samples are taken by pushing a thin-walled sample tube, usually 50mm diameter (known as a U50), into the soil and withdrawing it with a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shrink-swell behaviour, strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N > 30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as 'N_c' on the borehole logs, together with the number of blows per 150mm penetration.

Cone Penetrometer Testing (CPT) and Interpretation: The cone penetrometer is sometimes referred to as a Dutch Cone. The test is described in Australian Standard 1289.6.5.1–1999 (R2013) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Static Cone Penetration Resistance of a Soil – Field Test using a Mechanical and Electrical Cone or Friction-Cone Penetrometer'*.

In the tests, a 35mm or 44mm diameter rod with a conical tip is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with a hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the frictional resistance on a separate 134mm or 165mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are electrically connected by wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck. The CPT does not provide soil sample recovery.

As penetration occurs (at a rate of approximately 20mm per second), the information is output as incremental digital records every 10mm. The results given in this report have been plotted from the digital data.

The information provided on the charts comprise:

- Cone resistance – the actual end bearing force divided by the cross sectional area of the cone – expressed in MPa. There are two scales presented for the cone resistance. The lower scale has a range of 0 to 5MPa and the main scale has a range of 0 to 50MPa. For cone resistance values less than 5MPa, the plot will appear on both scales.
- Sleeve friction – the frictional force on the sleeve divided by the surface area – expressed in kPa.
- Friction ratio – the ratio of sleeve friction to cone resistance, expressed as a percentage.

  The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and occasionally very soft clays, rising to 4% to 10% in stiff clays and peats. Soil descriptions based on cone resistance and friction ratios are only inferred and must not be considered as exact.

Correlations between CPT and SPT values can be developed for both sands and clays but may be site specific.

Interpretation of CPT values can be made to empirically derive modulus or compressibility values to allow calculation of foundation settlements.

Stratification can be inferred from the cone and friction traces and from experience and information from nearby boreholes etc. Where shown, this information is presented for general guidance, but must be regarded as interpretive. The test method provides a continuous profile of engineering properties but, where precise information on soil classification is required, direct drilling and sampling may be preferable.

There are limitations when using the CPT in that it may not penetrate obstructions within any fill, thick layers of hard clay and very dense sand, gravel and weathered bedrock. Normally a 'dummy' cone is pushed through fill to protect the equipment. No information is recorded by the 'dummy' probe.

Flat Dilatometer Test: The flat dilatometer (DMT), also known as the Marchetti Dilometer comprises a stainless steel blade having a flat, circular steel membrane mounted flush on one side.

The blade is connected to a control unit at ground surface by a pneumatic-electrical tube running through the insertion rods. A gas tank, connected to the control unit by a pneumatic cable, supplies the gas pressure required to expand the membrane. The control unit is equipped with a pressure regulator, pressure gauges, an audio-visual signal and vent valves.

The blade is advanced into the ground using our CPT rig or one of our drilling rigs, and can be driven into the ground using an SPT hammer. As soon as the blade is in place, the membrane is inflated, and the pressure required to lift the membrane (approximately 0.1mm) is recorded. The pressure then required to lift the centre of the membrane by an additional 1mm is recorded. The membrane is then deflated before pushing to the next depth increment, usually 200mm down. The pressure readings are corrected for membrane stiffness.

The DMT is used to measure material index (I_D), horizontal stress index (K_D), and dilatometer modulus (E_D). Using established correlations, the DMT results can also be used to assess the 'at rest' earth pressure coefficient (K_o), over-consolidation ratio (OCR), undrained shear strength (C_u), friction angle (ϕ), coefficient of consolidation (C_h), coefficient of permeability (K_h), unit weight (γ), and vertical drained constrained modulus (M).

The seismic dilatometer (SDMT) is the combination of the DMT with an add-on seismic module for the measurement of shear wave velocity (V_s). Using established correlations, the SDMT results can also be used to assess the small strain modulus (G_o).

Portable Dynamic Cone Penetrometers: Portable Dynamic Cone Penetrometer (DCP) tests are carried out by driving a 16mm diameter rod with a 20mm diameter cone end with a 9kg hammer dropping 510mm. The test is described in Australian Standard 1289.6.3.2–1997 (R2013) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – 9kg Dynamic Cone Penetrometer Test'*.

The results are used to assess the relative compaction of fill, the relative density of granular soils, and the strength of cohesive soils. Using established correlations, the DCP test results can also be used to assess California Bearing Ratio (CBR).

Refusal of the DCP can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Vane Shear Test: The vane shear test is used to measure the undrained shear strength (C_u) of typically very soft to firm fine grained cohesive soils. The vane shear is normally performed in the bottom of a borehole, but can be completed from surface level, the bottom and sides of test pits, and on recovered undisturbed tube samples (when using a hand vane).

The vane comprises four rectangular blades arranged in the form of a cross on the end of a thin rod, which is coupled to the bottom of a drill rod string when used in a borehole. The size of the vane is dependent on the strength of the fine grained cohesive soils; that is, larger vanes are normally used for very low strength soils. For borehole testing, the size of the vane can be limited by the size of the casing that is used.

For testing inside a borehole, a device is used at the top of the casing, which suspends the vane and rods so that they do not sink under self-weight into the 'soft' soils beyond the depth at which the test is to be carried out. A calibrated torque head is used to rotate the rods and vane and to measure the resistance of the vane to rotation.

With the vane in position, torque is applied to cause rotation of the vane at a constant rate. A rate of 6° per minute is the common rotation rate. Rotation is continued until the soil is sheared and the maximum torque has been recorded. This value is then used to calculate the undrained shear strength. The vane is then rotated rapidly a number of times and the operation repeated until a constant torque reading is obtained. This torque value is used to calculate the remoulded shear strength. Where appropriate, friction on the vane rods is measured and taken into account in the shear strength calculation.

LOGS

The borehole or test pit logs presented herein are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than 'straight line' variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse engineering characteristics or behaviour. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 *'Methods of Testing Soils for Engineering Purposes'* or appropriate NSW Government Roads & Maritime Services (RMS) test methods. Details of the test procedure used are given on the individual report forms.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building) the information and interpretation may not be relevant if the design proposal is changed (eg. to a twenty storey building). If this happens, the Company will be pleased to review the report and the sufficiency of the investigation work.

Reasonable care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions – the potential for this will be partially dependent on borehole spacing and sampling frequency as well as investigation technique.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of persons or contractors responding to commercial pressures.
- Details of the development that the Company could not reasonably be expected to anticipate.

If these occur, the Company will be pleased to assist with investigation or advice to resolve any problems occurring.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

REPRODUCTION OF INFORMATION FOR CONTRACTUAL PURPOSES

Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The Company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Copyright in all documents (such as drawings, borehole or test pit logs, reports and specifications) provided by the Company shall remain the property of Jeffery and Katauskas Pty Ltd. Subject to the payment of all fees due, the Client alone shall have a licence to use the documents provided for the sole purpose of completing the project to which they relate. Licence to use the documents may be revoked without notice if the Client is in breach of any obligation to make a payment to us.

REVIEW OF DESIGN

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/constraints are quite complex, it is prudent to have a joint design review which involves an experienced geotechnical engineer/engineering geologist.

SITE INSPECTION

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

Requirements could range from:

i) a site visit to confirm that conditions exposed are no worse than those interpreted, to

ii) a visit to assist the contractor or other site personnel in identifying various soil/rock types and appropriate footing or pile founding depths, or

iii) full time engineering presence on site.

SYMBOL LEGENDS

SOIL

- FILL
- TOPSOIL
- CLAY (CL, CI, CH)
- SILT (ML, MH)
- SAND (SP, SW)
- GRAVEL (GP, GW)
- SANDY CLAY (CL, CI, CH)
- SILTY CLAY (CL, CI, CH)
- CLAYEY SAND (SC)
- SILTY SAND (SM)
- GRAVELLY CLAY (CL, CI, CH)
- CLAYEY GRAVEL (GC)
- SANDY SILT (ML, MH)
- PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK

- CONGLOMERATE
- SANDSTONE
- SHALE/MUDSTONE
- SILTSTONE
- CLAYSTONE
- COAL
- LAMINITE
- LIMESTONE
- PHYLLITE, SCHIST
- TUFF
- GRANITE, GABBRO
- DOLERITE, DIORITE
- BASALT, ANDESITE
- QUARTZITE

OTHER MATERIALS

- BRICKS OR PAVERS
- CONCRETE
- ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
ine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

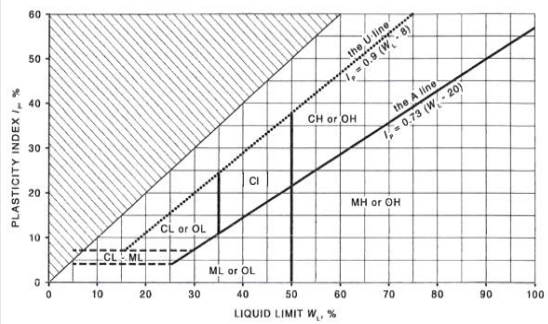
$$C_U = \frac{D_{60}}{D_{10}} \qquad and \qquad C_C = \frac{(D_{30})^2}{D_{10}\, D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

1. For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.
2. Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.
3. Clay soils with liquid limits > 35% and 50% may be classified as being of medium plasticity.
4. The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record	▼	Standing water level. Time delay following completion of drilling/excavation may be shown.
	C	Extent of borehole/test pit collapse shortly after drilling/excavation.
	▶	Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES	Sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos analysis.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL	Moisture content estimated to be greater than plastic limit.
	$w \approx$ PL	Moisture content estimated to be approximately equal to plastic limit.
	w < PL	Moisture content estimated to be less than plastic limit.
	$w \approx$ LL	Moisture content estimated to be near liquid limit.
	w > LL	Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D	DRY – runs freely through fingers.
	M	MOIST – does not run freely but no free water visible on soil surface.
	W	WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS	VERY SOFT – unconfined compressive strength ≤ 25kPa.
	S	SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa.
	F	FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa.
	St	STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa.
	VSt	VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa.
	Hd	HARD – unconfined compressive strength > 400kPa.
	Fr	FRIABLE – strength not attainable, soil crumbles.
	( )	Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)		**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)**
	VL	VERY LOOSE – ≤ 15 – 0 – 4
	L	LOOSE – > 15 and ≤ 35 – 4 – 10
	MD	MEDIUM DENSE – > 35 and ≤ 65 – 10 – 30
	D	DENSE – > 65 and ≤ 85 – 30 – 50
	VD	VERY DENSE – > 85 – > 50
	( )	Bracketed symbol indicates estimated density based on ease of drilling or other assessment.
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.

Log Column	Symbol	Definition
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as:
		RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock.
		EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock.
		ALLUVIAL – soil deposited by creeks and rivers.
		ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents.
		MARINE – soil deposited in a marine environment.
		AEOLIAN – soil carried and deposited by wind.
		COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits.
		LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
Residual Soil		RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered		MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'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'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	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 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Abbreviations Used in Defect Description

Cored Borehole Log Column		Symbol Abbreviation	Description
Point Load Strength Index		• 0.6	Axial point load strength index test result (MPa)
		x 0.6	Diametral point load strength index test result (MPa)
Defect Details	– Type	Be	Parting – bedding or cleavage
		CS	Clay seam
		Cr	Crushed/sheared seam or zone
		J	Joint
		Jh	Healed joint
		Ji	Incipient joint
		XWS	Extremely weathered seam
	– Orientation	Degrees	Defect orientation is measured relative to normal to the core axis (ie. relative to the horizontal for a vertical borehole)
	– Shape	P	Planar
		C	Curved
		Un	Undulating
		St	Stepped
		Ir	Irregular
	– Roughness	Vr	Very rough
		R	Rough
		S	Smooth
		Po	Polished
		Sl	Slickensided
	– Infill Material	Ca	Calcite
		Cb	Carbonaceous
		Clay	Clay
		Fe	Iron
		Qz	Quartz
		Py	Pyrite
	– Coatings	Cn	Clean
		Sn	Stained – no visible coating, surface is discoloured
		Vn	Veneer – visible, too thin to measure, may be patchy
		Ct	Coating ≤ 1mm thick
		Filled	Coating > 1mm thick
	– Thickness	mm.t	Defect thickness measured in millimetres

Civil Engineering Design Report

R31 Glen Innes Site
94 Taylor Street, Glen Innes, NSW

Revision A

NSW RAIR PROGRAM

Project Reference #12537-01

May 2022

Prepared For:

Health-Infrastructure
1 Reserve Road
St Leonards
NSW 2065

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REV	ISSUE/AMENDMENT	WRITTEN BY	REVIEWED BY	DATE
A	Tender Submission	LD	GK	27.05.22

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1 Introduction

This report is intended to provide civil engineering design information to Rural Ambulance Infrastructure Program (RAIR II) R31 Glen Innes Site stakeholders.

Civil works will include the construction of proposed carpark zone and ambulance access driveways to allow access from Taylor Street and West Avenue into the proposed carpark and building.

The strategic plan for the management of stormwater drainage is to generally maintain the existing catchment stormwater flow rates and stormwater quality by providing stormwater detention and treatment control devices. Bioretention basin with surcharge pits is proposed to achieve the required run off and pollutant reductions.

It is the design intent that all existing overland flow rates and discharge points are preserved.

2 Site Description

2.1 Location

The site is at the intersection of Taylor Street and West Avenue. Site development covers approximately 3,383sqm in area.

The existing site is fully covered by grass and is sloping down approximately 8.2% towards the intersection of Taylor Street and West Avenue.

Figure 2-1: Glen Innes Site Location

2.2 Existing Services

Meinhardt Bonacci have been provided a site survey conducted by Monteath & Powys, dated 15th of March 2022, that indicates existing utilities including stormwater, electrical, water, and telecommunication lines located within and around the site boundary at the time of that survey. An existing stormwater pipe is located adjacent and within the proposed site location. A sewer line is also being observed adjacent to the proposed development.

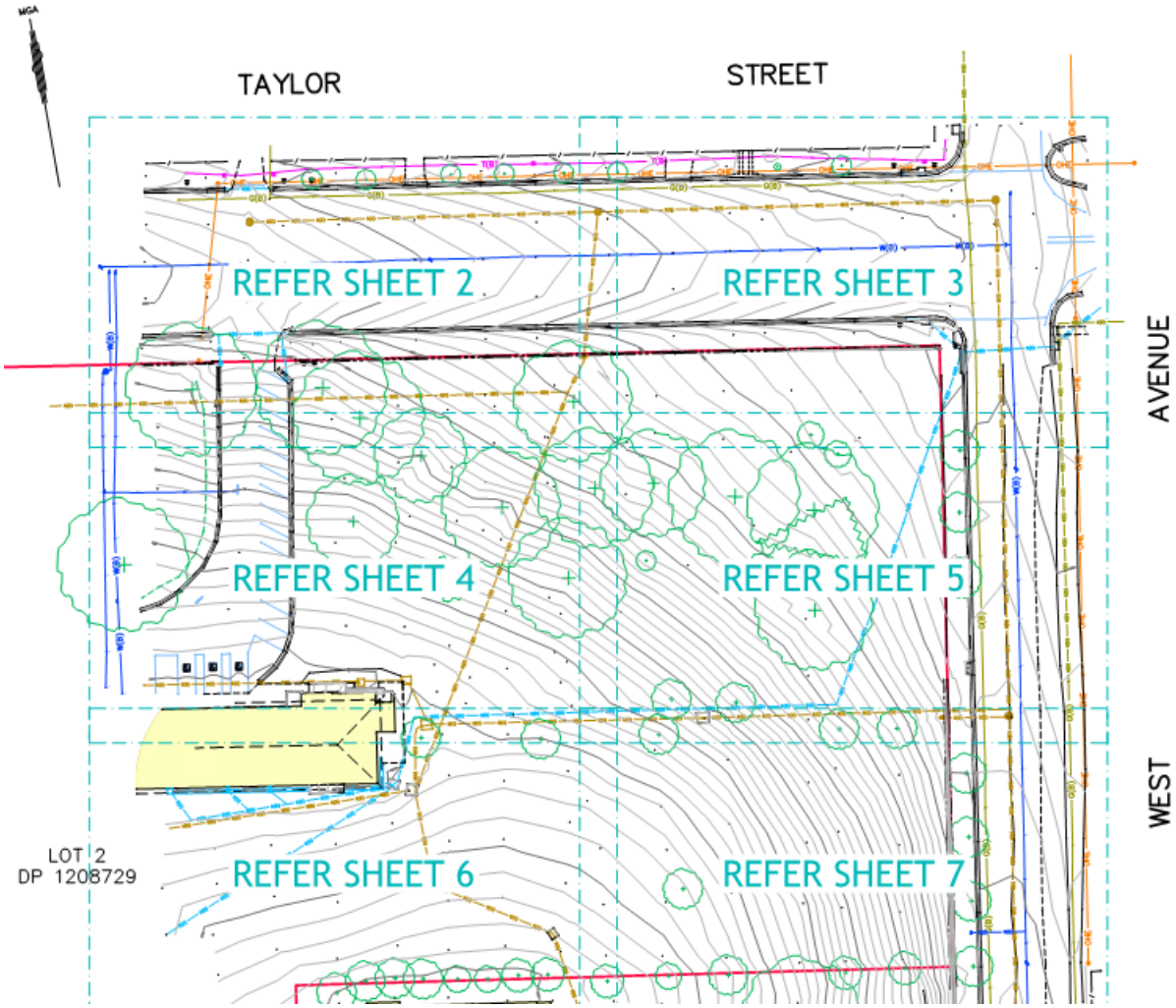


Figure 2-2: Existing Site Survey

3 Proposed Development

The proposed development consists of the construction of new building, carparks, driveways and associated site infrastructure. The development is shown in Figure 3-1 below.

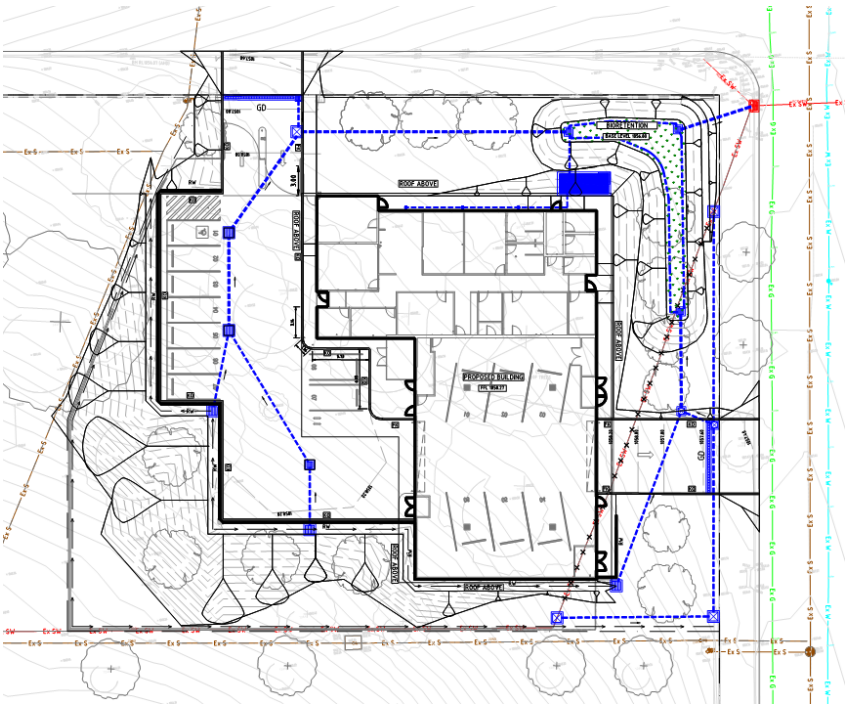


Figure 3-1: Proposed Development

3.1 Earthworks

The earthwork quantities associated with the proposed development are provided in the figures below:

- Cut – 2770m3
- Fill – 134m3

Majority of the earthworks involve cut and will require export of approximately 2636m3 of excess material.

3.2 Stormwater Drainage Strategy

In accordance with Glen Innes Severn Council (GISC), the design of stormwater drainage systems shall be carried out in accordance with Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia 2019, and the requirements of GISC for Stormwater Drainage.

Stormwater storage system is required for any developments with additional impervious surface area to ensure there is no adverse impact from increased stormwater runoff on downstream properties as a result of new developments or redevelopments during all storm events up to and including the 100-year Annual Recurrence Interval (ARI) event. The Bioretention basin are to be designed to ensure that stormwater targets, as indicated in NSW Ambulance, Rural Ambulance Station Facilities ESD Design (RASFED) Guideline, Credit 26: Stormwater – Peak Discharge, are achieved.

The existing site is 0% impervious. This will increase to approximately 52% impervious based on the proposed concept design details. A bioretention basin with Surcharge pits is proposed to limit the post-development flows to the pre-development conditions as outlined in NSW Ambulance, RASFED Guideline.

The preliminary analysis undertaken using DRAINS computer software indicates a volume of approximately 30m3 of detention storage is required. Please refer Figure 3-3 for the preliminary DRAINS layout and estimated stormwater flows for the site.

Proposed development's bioretention is designed to outlet on a pipe tapping on an existing drainage pit located along West Avenue. See Figure 3-2 for reference.

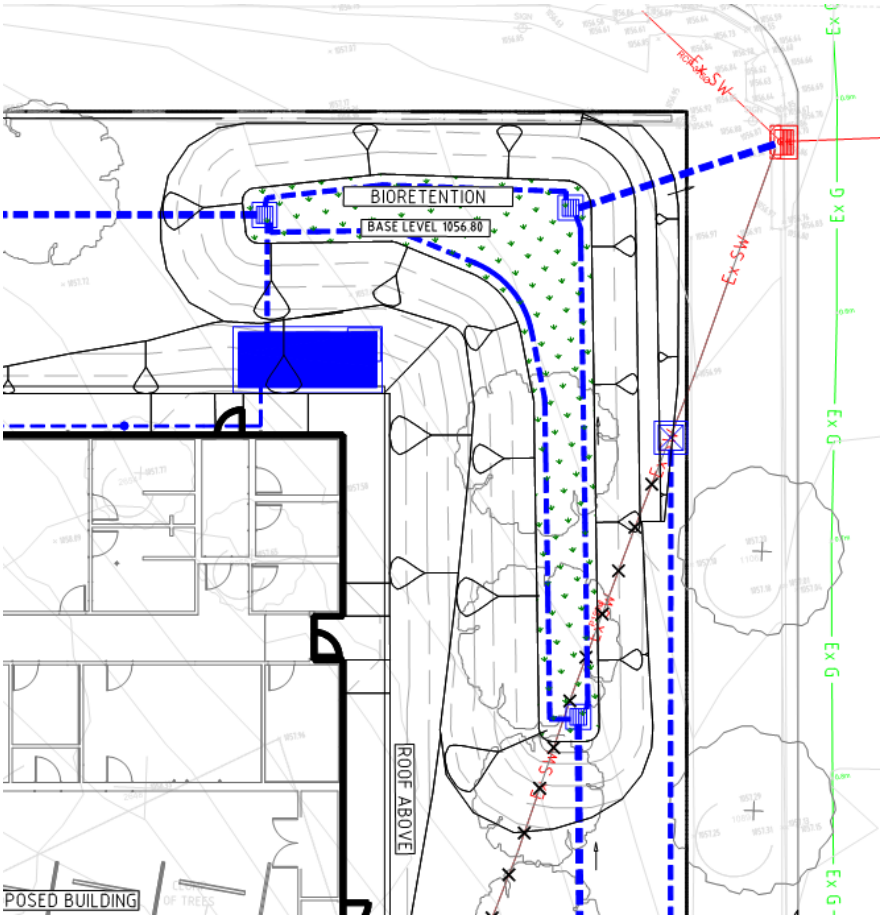


Figure 3-2: Proposed Drainage Connecting to Existing

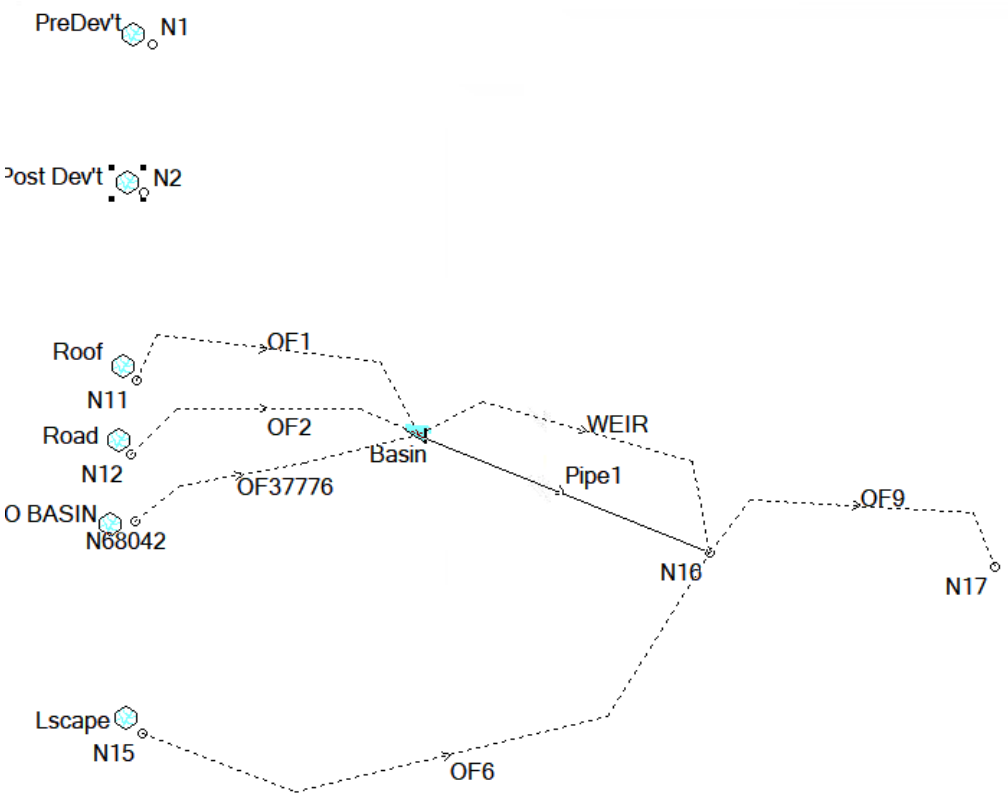


Figure 3-3: Preliminary DRAINS Layout

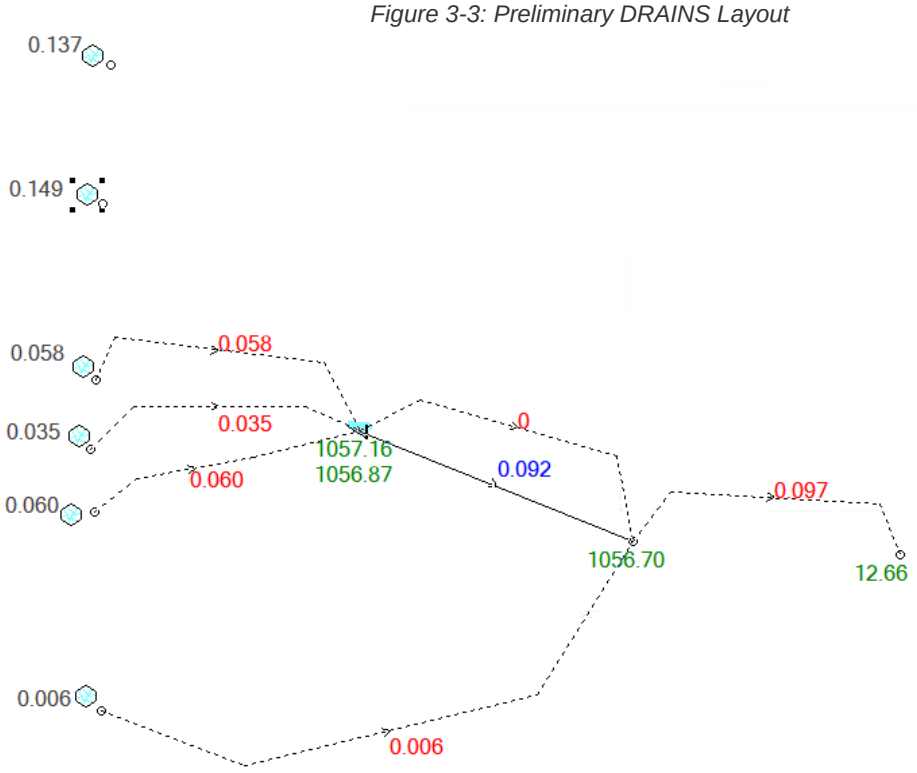


Figure 3-4: DRAINS Results for Q100

The estimated pre-development stormwater flow rate is 0.137m3/s = 137L/s, and the unmitigated post-development is 149L/s for the 1 in 100 years ARI rainfall event (Q100), as shown above. With on-site detention, the post-development stormwater flow rates are smaller than the pre-development flow rates, also, for other rainfall events.

A major system is also required for the proposed development in the form of overland flow paths. The major system should be designed to convey flows surcharged from the underground drainage system for storm events up to 100-year ARI. The overland flow is to be directed away from the buildings and carparks and towards the public road kerb and gutter provided.

3.3 Stormwater Quality Management Strategy

To protect the existing ecology, the development will be required to satisfy the water quality requirements to maintain the long-term protection of the pre-determined Environmental Values. The WSUD Guideline, outlines that any development must undertake a stormwater quality assessment to demonstrate that the development will retain existing pollutant loads for the proposed site.

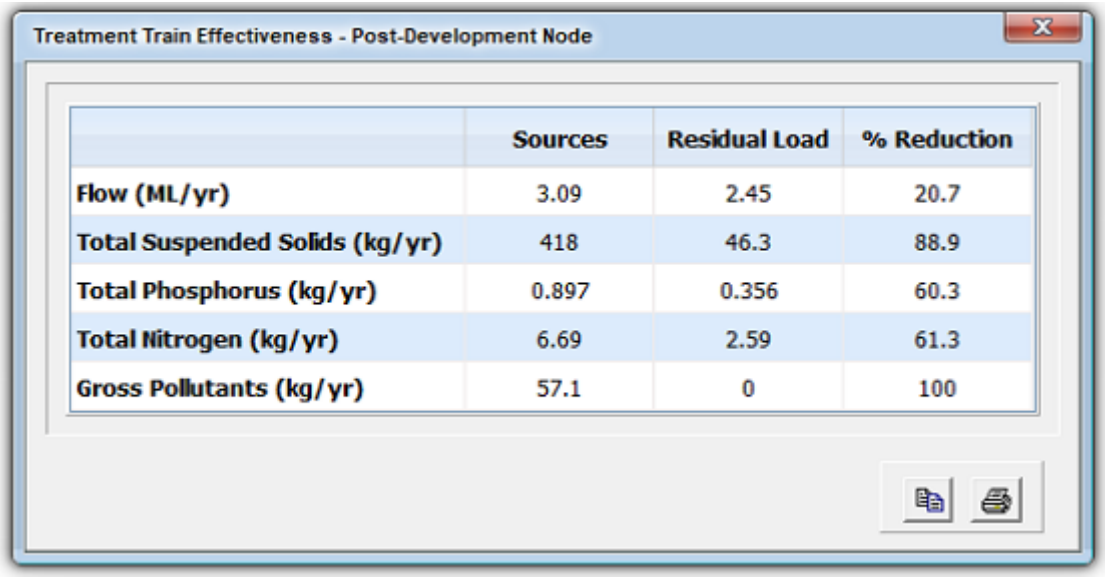
Treatments were determined in accordance with NSW Ambulance Water Quality Set B Targets (*Figure 3-5*).

Table 11 Pollution Reduction Targets from Green Star Design & As Built v1.3 Submission Guidelines

POLLUTANT	REDUCTION TARGET (% OF THE TYPICAL URBAN ANNUAL LOAD)		
	A	B	C
Total Suspended Solids (TSS)[1]	80%	80%	90%
Gross Pollutants	85%	90%	95%
Total Nitrogen (TN)[2]	30%	45%	60%
Total Phosphorus (TP)[2]	30%	60%	70%
Total Petroleum Hydrocarbons[3]	60%	90%	90%
Free Oils[3]	90%	90%	98%

Figure 3-5: NSW Ambulance Water Quality Targets (Sept 2021)

Bioretention is proposed for the site as water quality treatment. For the benefit of reducing the demand on water supply, a rainwater harvesting system can be proposed onsite via the provision of a rainwater tank, subject to confirmation by the Project Manager. Music Analysis results on *Figure 3-6* below.



Treatment Train Effectiveness - Post-Development Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	3.09	2.45	20.7
Total Suspended Solids (kg/yr)	418	46.3	88.9
Total Phosphorus (kg/yr)	0.897	0.356	60.3
Total Nitrogen (kg/yr)	6.69	2.59	61.3
Gross Pollutants (kg/yr)	57.1	0	100

Figure 3-6: Music Analysis Result

4 Erosion & Sediment Control (During Construction)

The erosion and sediment control measures for the site will be implemented during construction. The design of these measures is to be in accordance with the Landcom “Blue Book”. These will include:

- A sediment fence
- Temporary access to site with shaker pad
- An indicative stockpile area with sediment fence around it during construction.
- Geotextile inlet pit filters or sandbags to be placed around existing stormwater pits.

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Glen Innes

Client Service ID : 694906

Emma Anderson

1310 Bowraville Road
Bellingen New South Wales 2454

Attention: Emma Anderson

Email: eanderson@geolink.net.au

Date: 23 June 2022

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 2, DP:DP1208729, Section : - with a Buffer of 200 meters, conducted by Emma Anderson on 23 June 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Home Public registers Contaminated land record of notices

Search results

Your search for:Suburb: GLEN INNES

Matched 2 notices relating to 1 site.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
GLEN INNES	Lot 2 Lang STREET	Council-owned Laneway	2 former

Page 1 of 1

8 July 2022

For business and industry

For local government

Contact us

131 555 (tel:131555)

Online (https://yoursay.epa.nsw.gov.au/epa-website-feedback)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

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Find us on

Heritage NSW

GeoLINK Glen Innes Ambulance Station

Legend

- World Heritage Areas NSW
- SEPP
- State Heritage Register
- Aboriginal Place
- Local Environmental Plan
  - Cluster (label denotes number)
- Aboriginal Place
  - Cluster (label denotes number)
- State Heritage Register
  - Cluster (label denotes number)
- Interim Heritage Order
  - Cluster (label denotes number)

Notes

Notes

229.3 0 114.66 229.3 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

© Latitude Geographics Group Ltd.

This map is a user generated static output from the Heritage Management System and is for reference only. Information that appears on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 28-Jun-2022

- Summary
- Details
  - Matters of NES
  - Other Matters Protected by the EPBC Act
  - Extra Information
- Caveat
- Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	30
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	1
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	1100 - 1200km upstream from Ramsar site	In feature area
Riverland	1100 - 1200km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	1300 - 1400km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities			[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps. Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.			
Community Name	Threatened Category	Presence Text	Buffer Status
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community may occur within area	In feature area
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	Critically Endangered	Community may occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Nyctophilus corbeni			
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans			
Greater Glider [254]	Vulnerable	Species or species habitat may occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area	In feature area
Petrogale penicillata			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Arthraxon hispidus			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Boronia granitica			
Granite Boronia [18598]	Endangered	Species or species habitat may occur within area	In buffer area only
Callistemon pungens			
[55581]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diuris pedunculata Small Snake Orchid, Two-leaved Golden Moths, Golden Moths, Cowslip Orchid, Snake Orchid [18325]	Endangered	Species or species habitat likely to occur within area	In feature area
Eucalyptus mckieana McKie's Stringybark [20199]	Vulnerable	Species or species habitat may occur within area	In feature area
Eucalyptus nicholii Narrow-leaved Peppermint, Narrow-leaved Black Peppermint [20992]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area	In feature area
REPTILE			
Uvidicolus sphyrurus Border Thick-tailed Gecko, Granite Belt Thick-tailed Gecko [84578]	Vulnerable	Species or species habitat may occur within area	In feature area
Wollumbinia belli Bell's Turtle, Western Sawshell Turtle, Namoi River Turtle, Bell's Saw-shelled Turtle [86071]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat likely to occur within area	In feature area
Rhipidura rufifrons			
Rufous Fantail [592]		Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11408]	NSW	In feature area
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Telstra Corporation Limited [11409]	NSW	In feature area

Commonwealth Heritage Places			[Resource Information]
Name	State	Status	Buffer Status
Historic			
Glen Innes Post Office	NSW	Listed place	In feature area

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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CIVICA

GeoLINK

Rural Ambulance Infrastructure Reconfiguration Project

RAIR Glen Innes, Taylor Street, Glen Innes NSW Arboricultural Impact Assessment

2 May 2022

Assessment and Report prepared by:

Andy Clark
AQF Level 5

JNC02976v2

CIVICA

JNC02976v2

2 May 2022

Mr Simon Waterworth
Director/Town Planner
GeoLINK Consulting Pty Ltd
PO Box 1446
Coffs Harbour NSW 2450

Arboricultural Impact Assessment Report – Rural Ambulance Infrastructure Reconfiguration (RAIR) development project, Glen Innes

Dear Simon,

We are pleased to provide you with the following Arboricultural Impact Assessment Report for twenty-three (23) trees within the grounds of Glen Innes Hospital, the site of a proposed new ambulance station.

Complete use of this report is authorised under the conditions limiting its use as stated in Appendix A Item 7 of "*Arboricultural Reporting Assumptions and Limiting Conditions*".

Should you have any queries relating to this report, its recommendations, or the options considered please do not hesitate to contact us on 1300 272 671.

Regards,

Andy Clark
Consulting Arborist
Dip. Hort. (Arb.), AQF Level 5

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1 Executive Summary

1.1.1 The following Arboricultural Impact Assessment (Report) regards twenty-three (23) trees located within the grounds of the Glen Innes Hospital. The subject site was identified by GeoLINK Consulting Pty Ltd (the Client) as possessing trees that may be impacted upon by the proposed development of a new ambulance station, completed under the auspices of the NSW Government Rural Ambulance Infrastructure Reconfiguration (RAIR) project.

1.1.2 In part, the project scope was to nominate subject trees that can be retained, or require removal to facilitate the proposed development, as well as identify and reduce potential conflicts between subject trees and site development. Accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction have been provided.

1.1.3 Tree retention values have been determined based upon a modified version of the British Standard and which have been prescribed into one of the following four (4) categories, A, B, C and U. Refer to Appendix C for further detail. Generally, relevant consent authorities will consider:

- **A** retention value trees as a site constraint and may require alterations to the proposed development design and/or specific protection measures to allow retention, unless the proposed development outweighs the retention value of the tree
- **B** retention value trees as a site constraint consideration, lesser changes should be considered to retain such trees
- **C** retention value trees are not considered a site constraint
- **U** retention value trees are considered a site opportunity, as such trees are recommended for removal regardless of the proposed development.

1.1.4 Trees impacted by the proposed development:

Category	Description	Total	Removal		Retain	
			located within development footprint	irrespective of future development	with specific protection	with generic protection
A	High retention value trees	2	7			15
B	Moderate retention value trees	5	1, 8, 11			2, 3
C	Low retention value trees	10	5, 6, 9, 13, 20			17, 18, 19, 22, 23
U	Trees to be removed irrespective of proposed development	6		4, 10, 12, 14, 16, 21		

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2 Introduction

2.1.1 ArborSafe Australia Pty Ltd was engaged by Mr Simon Waterworth on behalf of the Client to complete an Arboricultural Impact Assessment Report on twenty-three (23) trees located within or adjacent to the proposed site of the new ambulance station at the Glen Innes Hospital.

2.1.2 The proposed development has been reviewed and in summary consists of the construction of a new building and carparking area across a currently undeveloped section of the surrounding managed grounds. Two previous plans were initially put forward for review, with the current updated Plan received in early April.

2.1.3 The report was intended to provide information on site trees and how they may be impacted upon by the proposed development. Report findings and recommendations provided are based upon guidance provided within Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*.

2.1.4 Observations and recommendations provided within this report are based upon information provided by the Client and an arborist site visit.

3 Scope

3.1.1 Carry out a visual examination of the nominated trees located within the vicinity of the proposed development, including trees located within the adjacent Council street verge.

3.1.2 Provide an objective appraisal of the subject trees in relation to their species, estimated age, health, structural condition, useful life expectancy (ULE) and viability within the landscape.

3.1.3 Based on the findings of this investigation, provide independent recommendations on the retention value of the trees.

3.1.4 Nominate subject trees that can be retained or require removal to facilitate the development.

3.1.5 Identify and reduce potential conflicts between subject trees and site development by providing accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction.

3.1.6 Provide information on restricted activities within the area nominated for tree protection, as well as suitable construction methods to be adopted during demolition and/or construction.

4 Methodology

4.1 Data Collection

4.1.1 Andy Clark of ArborSafe Australia Pty Ltd carried out a site inspection of the subject trees on 18 March 2022.

4.1.2 Trees that are the subject of this report (Figure 2) were identified during discussions with the Client and reviewing relevant supplied development documentation. All trees within the site have been included within this Report.

4.1.3 The subject trees were inspected from the ground using the initial component of Visual Tree Assessment (VTA) (Matthek, 1994). No foliage or soil samples were taken and no aerial, underground or internal investigations were undertaken.

4.1.4 Tree height and canopy width were estimated and have been provided to the nearest whole metre. Trunk diameter at breast height (DBH) and trunk diameter at the root crown (DRB) were measured with a diameter tape and provided to the nearest centimetre.

4.1.5 TPZ encroachment calculations are based upon measurements obtained from using PDF measuring tools and/or onsite measurements calculated within a dedicated TPZ calculator.

4.1.6 Environmental and Heritage information may be sourced from SEED NSW. The source of all information has been referenced accordingly.

4.1.7 Data collected on site was analysed by Andrew Clark, where-upon relevant recommendations were formulated and collated into report format.

4.1.8 Tree protection zones (TPZ) and structural root zones (SRZ) were calculated in accordance with the Australian Standard AS 4970–2009: Protection of Trees on Development Sites (refer to Section 7.6).

4.1.9 Retention values have been determined based upon a modified version of the British Standard BS 5837–2012: Trees in Relation to Design, Demolition and Construction (refer to Appendix C).

4.1.10 All photographs were taken at the time of the site inspections by the author and have not been altered for brightness or contrast, nor have they been cropped.

4.1.11 Plans of the existing site and of the proposed development were provided to ArborSafe in early March 2022.

4.1.12 No proposed underground service locations have been reviewed in the preparation of this report.

5 Observations

5.1 Location

5.1.1 The proposed development site was located within the north-eastern corner of the Glen Innes Hospital grounds, Taylor Street, Glen Innes (Figure 2).

5.1.2 The area was an undeveloped area consisting of managed grass and scattered trees.

5.1.3 The site possessed a slightly sloping aspect characterised by a high point in the south-western corner, near the existing hospital building, sloping down to the low point along West Street.

5.1.4 The site was located within the Glen Innes Severn Council Local Government Area (LGA).

5.1.5 Usage surrounding the site was a mixture of Hospital grounds to the west and south, residential properties to the north, across Taylor Street, and Tennis courts to the east across West Street.

5.1.6 No site soil sampling or tests were taken as part of the assessment.

Figure 1. Whole site image (location). Red lines delineate the site and area containing the subject trees that are to be impacted by the proposed development. (Nearmap, March 2022).

5.2 Site Trees

5.2.1 Trees can be identified on site using white tree tags which are typically located at approximately 2.0m from ground level on the trunk.

5.2.2 The majority of trees are of exotic species, considered to have been planted for amenity value, with the only exception being the large *Eucalyptus deanei* (Mountain Blue Gum) identified as Tree 7. The age of the existing surveyed trees is rated as 13% Senescent (3 trees), 61% mature (14 trees), with the remaining 26% being semi-mature/juvenile (6 trees).

5.2.3 Six (6) trees (numbered 4, 10, 12, 14, 16 and 21) are recommended for removal, irrespective of development, as they are either dead or have poor health and/or structure with a Useful Life Expectancy (ULE) of under five years.

5.2.4 Three (3) semi-mature Council Street trees, *Fraxinus* sp.(European Ash), were included within the subject trees. These were untagged but identified as Trees 1, 2 and 3.

5.2.5 The dominant species are *Ulmus parvifolia* (Chinese Elm) and various *Prunus* sp. (Cherry), none of which are performing remarkably well on the site.

5.2.6 The large *Eucalyptus deanei* (Mountain Blue Gum), Tree 7, is the dominant tree on the site, is indigenous to the area, has no significant health or structural issues and has a ULE of >50 years.

Figure 2. Site map showing subject trees. Tree attributes are to be obtained from Appendix E – Tree Assessment Data. (ArborSafe, March 2022).

Figure 3. An image of Tree 7 *Eucalyptus deanei* (Mountain Blue Gum) and the Council Street Trees 1 (centre of image), 2 and 3 from West Street. (ArborSafe, March 2022).

Figure 4. An image of Tree 7 *Eucalyptus deanei* (Mountain Blue Gum) from West Street. Trees 22 and 23 can be seen to the left and Tree 6 to the right. (ArborSafe, March 2022).

Figure 5. An image from the southwest of Tree 7 *Eucalyptus deanei* (Mountain Blue Gum) in the centre with Trees 8 and 6 to the left. (ArborSafe, March 2022).

Figure 6. An image of Tree 11 *Liquidambar styraciflua* (Liquidambar) from the west. (ArborSafe, March 2022).

5.3 Proposed Construction

5.3.1 The proposed development has been reviewed and in summary consists of the construction of a new building, with associated carparking and hard landscaping (access paths) within the undeveloped north-eastern corner of the Hospital grounds.

5.3.2 A retaining wall would be required around the southern aspect of the proposed site due to the existing site topography.

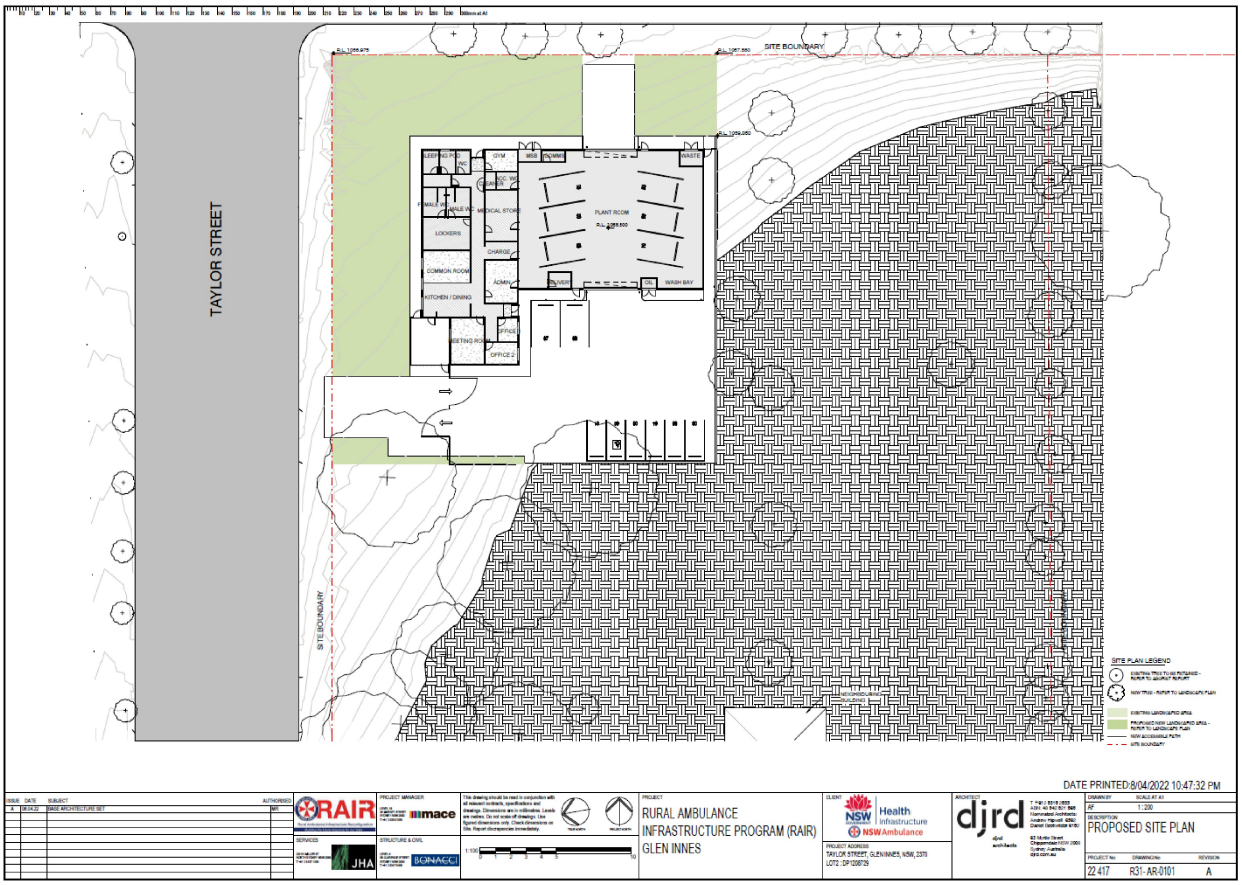


Figure 7. Excerpt from RAIR Glen Innes Proposed Site Plan (Drawing No. R31-AR-0101, Rev. A). (DJRD Architects, 8 April 2022).

5.4 Tree Retention Values

5.4.1 Retention values were determined based upon a modified version of the British Standard BS 5837–2012: Trees in Relation to Design, Demolition and Construction. This standard categorises tree retention value based upon assessment of the tree's quality (health and structure), and life expectancy. Other criteria such as its physical dimensions, age class, location and its Amenity, Heritage and Environmental significance are also considered. A breakdown of attributes required for each category can be obtained from Appendix C – Tree Retention Values.

Category	Tree numbers
A	7, 15
B	1, 2, 3, 8, 11
C	5, 6, 9, 13, 17, 18, 19, 20, 22, 23
U	4, 10, 12, 14, 16, 21

5.5 Heritage Status

5.5.1 The proposed development site has no trees identified as being of national, state or local heritage significance. (SEED, n.d.).

5.6 Botanical and Environmental Status

5.6.1 The site trees were considered common species in the local area and as such hold limited botanical significance.

6 Discussion

6.1 Determining TPZ Encroachment

6.1.1 **Major encroachment.** As per the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*, a major encroachment into the TPZ of any tree is considered to occur when it is beyond 10% of the total TPZ area. Trees with major encroachment may require removal or, in certain instances, be retained with specific protection requirements throughout the construction stage.

6.1.2 **Minor encroachment**. Under the aforementioned standard, a minor encroachment is determined as being less than 10% of the total TPZ area. Trees with minor encroachment may be retained with specific, generic or no protection requirements throughout the construction stage.

6.1.3 **No encroachment**. Trees with no encroachment may be retained with generic or no protection requirements throughout the construction stage.

6.1.4 For the purposes of this report, trees to be removed or retained have been identified as those:

- Requiring removal due to a level of encroachment into their TPZ that would likely result in a detrimental impact upon their future health and/or stability
- Retainable and requiring specific protection requirements throughout construction (i.e. generic requirements plus arborist supervision and careful construction methods within their TPZ)
- Retainable and requiring generic tree protection measures only (i.e. protective fencing and restriction of activities within the TPZ).

6.2 Impact of Proposed Development

6.2.1 Review of the proposed design has been undertaken in the context of tree retention and removal across the site.

6.2.2 The development will impact six (6) site trees through direct conflict with the proposed construction footprint (Trees 1, 5, 6, 7, 8 and 9) and three (3) trees through major TPZ encroachment (Tree 11, 13 and 20). These trees would require removal under the current design. To retain any of these trees a redesign or relocation of the development would be required. Refer to Appendix E for full detail.

6.2.3 It should be noted the tree identified as Tree 1 is a Council Street tree.

6.2.4 The other main development impact which affects trees, but not necessarily to the point of requiring immediate removal, is through significant root damage due to TPZ encroachment. These can largely be placed into three (3) categories – soil compaction, level changes or direct root severance.

6.2.5 Negative tree impacts can manifest as either a reduction in health and/or vigour due to root loss (absorption and/or transport roots) resulting in a reduction in water and nutrient absorption capability or on tree stability if larger roots are impacted. Ultimately, the outcome for the trees depends on a number of variable factors including species, age, current health, TPZ encroachment percentage, soil type, topography, previous site use and the proposed design and construction methodology.

6.2.6 Compacted soils, especially artificially compacted soils such as those found under driveways or building platforms, have a higher bulk density down to a deeper level of subsoil. Bulk density is the term used for describing the weight of soil per unit volume. The broad engineering thinking is that the higher the density the more stable the road surface due to less soil movement in expansion, contraction, or compression. A higher bulk density is produced by compacting the soil to reduce available pore space between the soil particles.

6.2.7 The effect of compacted soils on plants is somewhat influenced by the soil type but generally a reduction in available pore space reduces the available area for oxygen and water within the soil. A reduction in available soil water and oxygen inhibits root activity within the soil, as they are essential for root elongation and growth, and the lack of these properties is considered a major limiting factor.

6.2.8 A similar reduction in root activity, due to a reduction in pore space, can occur following significant soil level changes across the TPZ, although this generally occurs over a longer time frame than if the roots were directly severed. Root severance has the same effect, reduction in root function and capability, but on an instantaneous time scale where there is no time for the tree to adjust.

6.2.9 The majority of the trees recommended for retention have nil to minor (under 10%) TPZ encroachment.

6.2.10 It is considered the remaining trees can be retained with minimal long-term health or structural impacts with the main protection factor being to exclude them from the worksite, outside of any installed site perimeter fence.

6.2.11 Other generic protection measures which may be required if the trees can't be excluded from the worksite, or minor design changes are made, include a combination of the following – root sensitive construction methods being adhered to within the TPZ, minimal excavation within the TPZ to limit root severance (i.e. construction placed outside the TPZ where possible), fill rather than excavation utilised to affect level changes where possible (i.e. to minimise root severance and allow the trees root system time to adjust), no construction occurring within the SRZ of retained trees, compensatory area being available around the unimpacted aspects of the trees and the enhancement of the existing TPZ area (i.e. mulched, soil conditioning and irrigation when required).

7 Tree Protection and Management Recommendations

7.1 Tree Removal

7.1.1 Fifteen (15) trees would require removal as follows, based on the supplied design proposal. These trees would require removal to allow the proposed development.

7.1.2 Nine (9) of these are affected by direct footprint conflict and/or major TPZ encroachment to the point they would be non-viable following the completion of development works.

7.1.3 Six (6) trees should be removed in the context of development (Category U) due to poor health and/or structure and very limited ULE.

Recommendation	Category A High retention value		Category B Moderate retention value		Category C Low Retention value		Category U No retention value	
	Qty	Tree numbers	Qty	Tree numbers	Qty	Tree numbers	Qty	Tree numbers
Remove for development	1	7	3	1, 8, 11	5	5, 6, 9, 13, 20	0	
Remove irrespective of development	0		0		0		6	4, 10, 12, 14, 16, 21

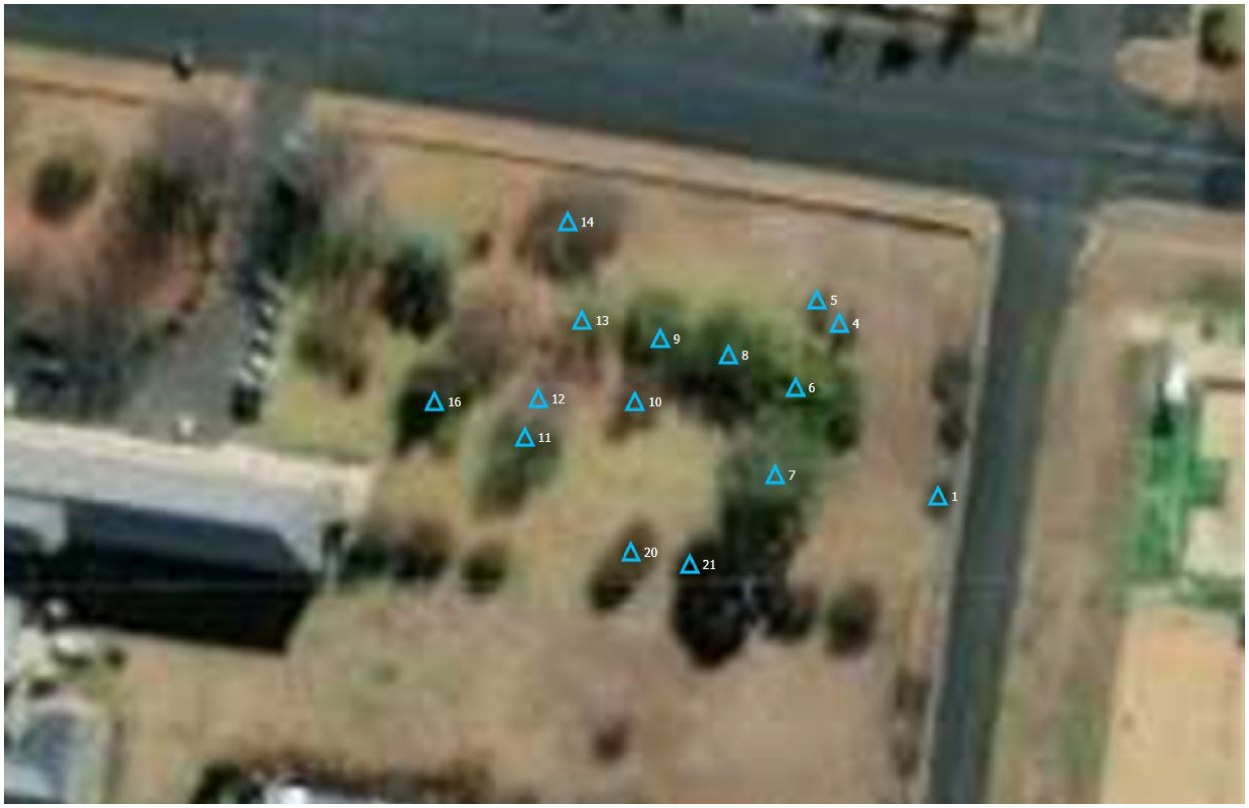


Figure 8. Site map showing trees to be removed to facilitate the proposed development (ArborPlan, March 2022).

7.2 Tree Retention

7.2.1 Eight (8) trees were recommended for retention and require generic protection measures during construction to ensure they remain viable following the completion of works.

Recommendation (Refer Section 7.3–7.6)	Category A High retention value		Category B Moderate retention value		Category C Low Retention value	
	Qty	Tree numbers	Qty	Tree numbers	Qty	Tree numbers
Retain with generic protection requirements	1	15	2	2, 3	5	17, 18, 19, 22, 23

Figure 9. Site map showing tree requiring generic protection measures. (ArborSite, March 2022).

7.3 Generic Protection and Reporting Measures

7.3.1 All retained trees require generic protection measure (**Error! Reference source not found.**). Refer to Section 7.3–7.6 for further detail.

7.3.2 All trees to be retained require protection during the construction stage. Tree protection measures include a range of:

- Activities restricted within the TPZ
- Protective fencing
- Trunk and ground protection
- Tree protection signage
- Involvement from the project arborist
- Project milestones
- Compliance reporting

7.3.3 Activities Prohibited within the TPZ

- Machine excavation including trenching
- Storage
- Preparation of chemicals, including cement products
- Parking of vehicles and plant
- Refuelling
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill
- Lighting of fires
- Soil level changes
- Temporary or permanent installation of utilities and signs
- Physical damage to the tree

7.4 Protective Fencing Specification

7.4.1 Protective fencing (Figure 10) is to be installed as far as practicable from the trunk of any retained trees. Fencing should be erected as per the image below before any machinery or materials are brought to site and before commencement of works (including demolition).

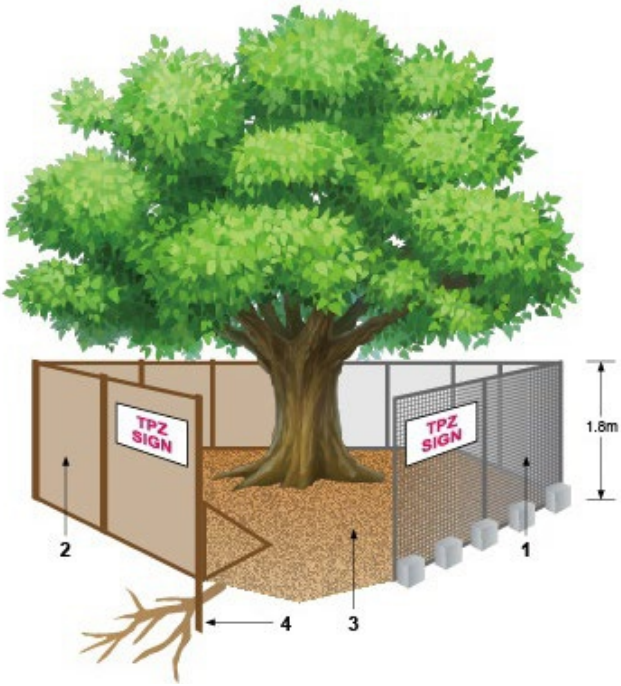
7.4.2 In some areas of the site (i.e. protection of trees on neighbouring properties) existing boundary fencing may be used as an alternative to protective fencing.

7.4.3 Once erected, protective fencing must not be removed or altered without approval from the project arborist. The TPZ fencing should be secured to restrict access.

7.4.4 TPZ fencing is to be a minimum of 1.8m high and mesh or wire between posts must be highly visible. Fence posts and supports should have a diameter greater than 20mm and should ideally be freestanding, otherwise be located clear of the roots. See image below.

7.4.5 Tree protection fencing must remain intact throughout all proposed construction works and must only be dismantled after their conclusion. The temporary dismantling of tree protection fencing must only be done with the authorisation of a consulting arborist and/or the responsible authority.

7.4.6 The subject trees themselves must also not to be used as a billboard to support advertising material. Affixing nails or screws into the trunks of trees to display signs of any type is not a recommended practice in the successful retention of trees.



Legend:

1. Chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet
2. Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ
3. Mulch installation across surface of TPZ (at discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage materials of any kind are permitted within the TPZ
4. Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

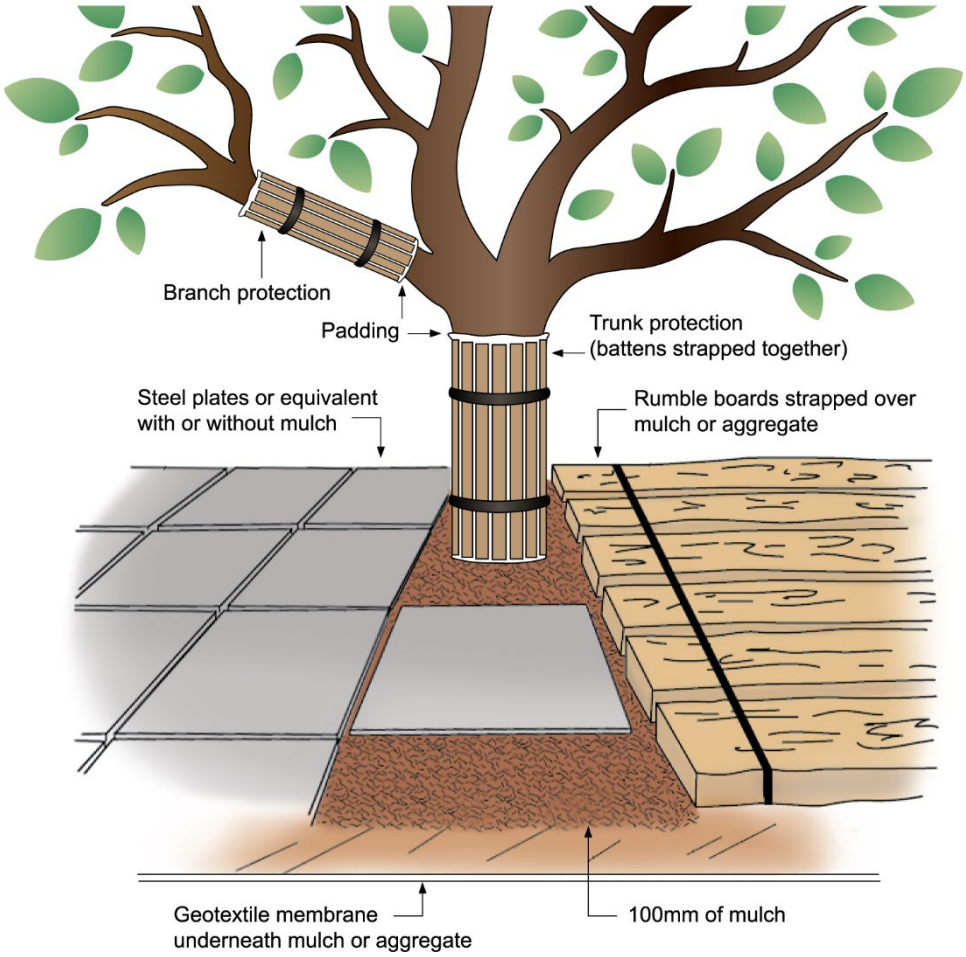
Figure 10. Depicts standard fencing techniques. (AS 4970–2009).

7.5 Trunk and Ground Protection

7.5.1 Given that proposed works are often within the TPZs of retained trees, standard protective fencing may not always be a viable method of protection. In these areas trunk protection and ground protection should be installed prior to the commencement of works and remain in place until after construction works have been completed.

7.5.2 Where construction access into the TPZ of retained trees cannot be avoided, the root zone of each tree must be protected using either steel plates or rumble board strapped over mulch/aggregate until such a time as permanent above ground surfacing (cellular confinement system or similar) is to be installed.

7.5.3 Trunk and ground protection (Figure 11) should be undertaken in line with the Australian Standard AS 4790–2009: *Protection of Trees on Development Sites* as per the image below:



Notes:

1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
2. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

Figure 11. Depicts trunk and ground protection techniques. (AS 4970–2009).

7.6 Tree Protection Signs

7.6.1 Signs identifying the TPZ (Figure 12) should be placed at 10m intervals around the edge of the TPZ and should be visible from within the development site.

Figure 12. Depicts standard fencing techniques. (AS 4970–2009).

7.7 Project Arborist

7.7.1 An official "Project Arborist" must be commissioned to oversee the tree protection, any works within the TPZ's and complete regular monitoring compliance certification.

7.7.2 The project arborist must have minimum five (5) years industry experience in the field of arboriculture, horticulture with relevant demonstrated experience in tree management on construction sites, and Diploma level qualifications in arboriculture – AQF Level 5.

7.7.3 Inspections are to be conducted by the project arborist at several key points during the construction in order to ensure that protection measures are being adhered to during construction stages and decline in tree health or additional remediation measures can be identified.

7.8 Project Milestones

7.8.1 The following visits and milestones were recommended as to when on-site tree inspection by the project arborist is required:

Item	Purpose of Visit	Timing of Visit(s)	Prerequisites
1	Pre-start induction	Following sign off from Item 1. Contractor to provide a minimum of five days advance notice for this visit.	Prior to commencement of works. All parties involved in the project to attend.
2	Supervision of works in TPZ's including all regrading and excavations	Whenever there is work planned to be performed within the TPZ's. Contractor to provide a minimum of five days advance notice for such visits.	
3	Regular site inspections	Minimum frequency monthly for the duration of the project.	The checklist must be completed by the Project Arborist at each site inspection and signed by both parties.
4	Final sign off	Following completion of works.	Practical completion of works and prior to tree protection removal.

7.9 Compliance Reporting

7.9.1 Following each inspection, the project arborist shall prepare a report detailing the condition of the trees. These reports should certify whether or not the works have been completed in compliance with the consent relating to tree protection.

7.9.2 These reports should contain photographic evidence where required to demonstrate that the work has been carried out as specified.

7.9.3 Matters to be monitored and included in these reports should include tree condition, tree protection measures and impact of site works which may arise from changes to the approved plans.

7.9.4 The reports and Compliance Statements shall be submitted to the Project Manager (as well as the Clients' nominated representative) following each inspection.

7.9.5 The reports and any Non-Compliance Statements shall be submitted to the Project Manager (as well as the Clients' nominated representative) if tree protection conditions have been breached. Reports should contain clear remedial action specifications to minimise any adverse impact on any subject tree.

7.10 Pruning

7.10.1 It is anticipated that minor pruning only may be required, largely centred on reduction or crown lifting to facilitate site access during construction, of no greater than 10% of any one trees total crown area. Such pruning is considered to have minimal long term health impact on the trees.

7.10.2 All pruning is recommended to be completed in accordance with the Australian Standard AS 4373–2007: *Pruning of Amenity Trees* (Standards Australia, 2007) and undertaken by a suitably qualified arborist (minimum AQF 3 arborist).

7.10.3 Reduction pruning should focus on the removal of smaller diameter branches where feasible and remove no greater than 10% of the total crown. Branches no greater than 50mm diameter are to be removed unless specifically approved by the project arborist.

7.11 Offset Tree Planting

7.11.1 Offset planting should reflect the number of trees removed and the initial loss of amenity and biomass. New trees should be of long-term potential and sourced from a reputable supplier.

7.11.2 Replacement tree species must suit their location on the site in terms of their potential physical size and their tolerance(s) to the surrounding environmental conditions. To avoid unethical or unprofessional tree selection and/or their placement within the landscape, replacement tree species must be selected in consultation with a consulting arborist, who can also assist in implementing successful tree establishment techniques.

7.11.3 Replacement tree species must have the genetic potential to reach a mature size potential of those trees removed to facilitate the development. As a guide, potential height will be a minimum of 10m (or more) and produce a spreading canopy so as they may provide amenity value to the property and contribute to the tree canopy of the surrounding area in the future.

7.12 Additional Excavation/Trenching within TPZs

7.12.1 In the event additional excavation is required within the TPZs of retained trees identified within this report, or any other site trees, arborist involvement will be required to ensure works are undertaken in accordance with the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites.*

7.12.2 Where excavation or trenching is required to facilitate installation of underground services within the TPZs of any site trees arborist supervision is required. Works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage. Such techniques include:

1. Excavation by hand
2. Excavation using a high-pressure water jet and vacuum truck
3. Excavation using an Air Spade with vacuum truck.

7.12.3 Machine excavation should be prohibited within the TPZs of retained trees unless undertaken at the direct consent from the project arborist and/or the responsible authority.

8 References

- Matthek, C. a. B. H., 1994. *The Body Language of Trees: A Handbook for Failure Analysis.* H. M. Stationery Office: University of Michigan.
- SEED, N. G. -., n.d. *SEED - Sharing and Enabling Environmental Data.* [Online] Available at: https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU
- Standards Australia, 2007. *AS 4373–2007 Pruning of Amenity Trees,* GPO Box 476 Sydney NSW 2001: Standards Australia.
- Standards Australia, 2009. *AS4970–2009: Protection of Trees on Development Sites,* Sydney: Standards Australia.
- The British Standards Institution, 2012. *BS5837–2012: Trees in relation to design, demolition and construction,* London: BSI Standards Limited.
- Urban, J., 2008. *Up By Roots - Healthy Soils and Trees in the Built Environment.* Champaign (Illinois): International Society of Arboriculture.

Plans of the existing site and of the proposed development were provided to ArborSafe in March 2022 and include:

- Proposed Site Plan, Project No. 22 417, Drawing No. R31-AR-101, Rev. A, DJRD Architects, 8 April 2022

Appendix A. Arboricultural Reporting Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. Any titles and ownership of any property are assumed to be good. No responsibility is assumed for matters legal in character.
2. It is assumed that any property/project is not in violation of any applicable codes, ordinances, statutes or other government regulations.
3. Care has been taken to obtain all information from reliable sources. All data has been verified in so far as possible, however, the consultant can neither guarantee nor be responsible for the accuracy of the information provided by others.
4. The consultant shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services.
5. Loss or alteration of any part of this report invalidates the entire report.
6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by anyone but the person to whom it is addressed, without the prior written consent of the consultant.
7. Neither all nor any part of the contents of this report, nor any copy thereof, shall be used for any purpose by anyone but the person to whom it is addressed, without the written consent of the consultant. Nor shall it be conveyed by anyone, including the Client, to the public through advertising, public relations, news, sales or other media, without the written consent of the consultant.
8. This report and any values expressed herein represent the opinion of the consultant and the consultant's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys unless expressed otherwise.
10. Information contained in this report covers only those items that were examined and reflect the condition of those items at the time of inspection.
11. Inspection is limited to visual examination of accessible components without dissection, excavation or probing. There is no warranty or guarantee expressed or implied that the problems or deficiencies of the plants or property in question may not arise in the future.

Appendix B. Explanation of Tree Assessment Terms

Tree number: Refers to the individual identification number assigned within the ArborSafe software to each assessed tree on the site and the number which appears of the tree's tag.

Tree location: Refers to the easting and northing coordinates assigned to the location of the tree as obtained from the geo-referenced aerial image within the ArborSafe software.

Tree species: Provides the botanic name (genus, species, sub-species, variety and cultivar where applicable) in accordance with the International Code of Botanical Nomenclature (ICBN), and the accepted common name.

Trees in group: The number of trees encompassing a collective assessment of more than one tree. Typically grouped trees have similar attributes that can be encompassed within one data record.

Height: The estimated range in metres attributed to the tree from its base to the highest point of the canopy. Where required height will be estimated to the nearest metre.

Diameter at Breast Height (DBH): Refers to the tree's estimated trunk diameter measured 1.4m from ground level for a single trunked tree. These estimates increase in 50mm increments. Where required DBH will be measured to give an accurate measurement for single trunked trees, trees with multiple trunks, significant root buttressing, bifurcating close to ground level or trunk defects and will be measured as per the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*.

Tree Protection Zone (TPZ): A specified area above and below ground and at a given distance measured radially away from the centre of the tree's trunk and which is set aside for the protection of its roots and crown. It is the area required to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development. The radius of the TPZ is calculated by multiplying its DBH by 12. TPZ radius = DBH × 12. (Note "Breast Height" is nominally measured as 1.4m from ground level).TPZ is a theoretical calculation and can be influenced by existing physical constraints such as buildings, drainage channels, retaining walls, etc. (Standards Australia, 2009).

Structural Root Zone (SRZ): The area close to the base of a tree required for the tree's anchorage and stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. SRZ radius = $(D \times 50)^{0.42 \times 0.64}$ (Standards Australia, 2009).

Canopy spread: The estimated range in metres attributed to the spread of the tree's canopy on its widest axis. Where required crown spread will be estimated to the nearest metre.

Origin: Refers to the origin of the species and its type.

Category	Description
Indigenous	Occurs naturally in the local area and is native to a given region or ecosystem.
State Native	Occurs naturally within State but is not indigenous.
Australian Native	Occurs naturally within Australia and its territories but is not a State native or indigenous.
Exotic Evergreen	Occurs naturally outside of Australia and its territories and typically retains its leaves throughout the year.
Exotic Deciduous	Occurs naturally outside of Australia and its territories and typically loses its leaves at least once a year.

Health: Refers to the health and vigour of the tree.

Category	Description
Excellent	Canopy full with even foliage density throughout, leaves are entire and are of an excellent size and colour for the species with no visible pathogen damage. Excellent growth indicators, e.g. seasonal extension growth. Exceptional specimen.
Good	Canopy full with minor variations in foliage density throughout, leaves are entire and are of good size and colour for the species with minimal or no visible pathogen damage. Good growth indicators, none or minimal deadwood.
Fair	Canopy with moderate variations in foliage density throughout, leaves not entire with reduced size and/or atypical in colour, moderate pathogen damage. Reduced growth indicators, visible amounts of deadwood, may contain epicormic growth.
Poor	Canopy density significantly reduced throughout, leaves are not entire, are significantly reduced in size and/or are discoloured, significant pathogen damage. Significant amounts of deadwood and/or epicormic growth, noticeable dieback of branch tips, possibly extensive.
Dead	No live plant material observed throughout the canopy, bark may be visibly delaminating from the trunk and/or branches.

Age: Refers to the life cycle of the tree.

Category	Description
Young	Newly planted small tree not fully established may be capable of being transplanted or easily replaced.
Juvenile	Tree is small in terms of its potential physical size and has not reached its full reproductive ability.
Semi-mature	Tree in active growth phase of life cycle and has not yet attained an expected maximum physical size for its species and/or its location.
Mature	Tree has reached an expected maximum physical size for the species and/or location and is showing a reduction in the rate of seasonal extension growth.
Senescent	Tree is approaching the end of its life cycle and is exhibiting a reduction in vigour often evidenced by natural deterioration in health and structure.

Structure: Refers to the structure of the tree from roots to crown.

Category	Description
Good	Sound branch attachments with no visible structural defects, e.g. included bark or acute angled unions. No visible wounds to the trunk and/or root plate. No fungal pathogens present.
Fair	Minor structural defects present, e.g. apical leaders sharing common union(s). Minor damage to structural roots. Small wounds present where decay could begin. No fungal pathogens present.
Poor	Moderate structural defects present, including bifurcations with included bark with union failure likely within 0–5 years. Wounding evident with cavities and/or decay present. Damage to structural roots.
Hazardous	Significant structural defects with failure imminent (3–6 months). Defects may include active splits and/or partial branch or root plate failures. Tree requires immediate arboricultural works to alleviate the associated risk.

Useful Life Expectancy (ULE): Useful life expectancy refers to an expected period of time the tree can be retained within the landscape before its amenity value declines to a point where it may detract from the appearance of the landscape and/or presents a greater risk and/or more hazards to people and/or property. ULE values consider tree species, current age, health, structure and location. ULE values are based on the tree at the time of assessment and do not consider future changes within the tree's location and environment which may influence the ULE value.

Category
0 Years
<5 Years
5–10 Years
10–15 Years
15–25 Years
25–50 Years
>50 Years

Defects: Visual observations made of the presenting defects of the tree and its growing environment that are, or have the capacity to impact upon, the health, structural condition and/or the useful life expectancy of the tree. Defects may include adverse physical traits or conditions, signs of structural weaknesses, plant disease and/or pest damage, tree impacts to assets or soil related issues.

Tree Significance: Includes environmental, social or historical reasons why the tree is significant to the site. The tree may also be rare under cultivation or have a rare or localised natural distribution.

Arborist Actions: A list of arboricultural and/or plant health care works that are aimed at maintaining or improving the tree's health, structural condition or form. Actions may also directly or indirectly reduce the risk potential of the tree such as via the removal of a particular branch or the moving of infrastructure from under its canopy.

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Appendix C. Tree Retention Values

Based upon a modified version of the British Standard BS 5837–2012: *Trees in relation to design, demolition and construction* – recommendations.

Category and definition	Criteria (including sub-categories where appropriate)		
Category U			
Trees in such a condition that they cannot realistically be retained as viable trees in the context of the current land use for longer than 5 years.	• Trees that have a severe structural defect that are not remediable such that their failure is expected within 12 months. • Trees that will become unviable after removal of other Category U trees (e.g. where for whatever reason the loss of companion shelter cannot be mitigated by pruning). • Trees that are dead or are showing signs of significant, immediate and irreversible overall decline. • Trees infected with pathogens of significance to the health and or safety of other trees nearby • Low quality trees suppressing adjacent trees of better quality. • Noxious weeds or species categorised as weeds within the local area. **Note:** Category U trees can have existing or potential conservation value* which might make it desirable to preserve.		
	1. Arboricultural Qualities	**2. Landscape qualities**	**3. Cultural and environmental values**
Category A			
Trees of High Quality with an estimated remaining life expectancy of at least 25 years and of dimensions and prominence that it cannot be readily replaced in <20 years.	Trees that are particularly good examples of their species, especially if rare or unusual (in the wild or under cultivation); or those that are important components of groups or avenues.	Trees or groups of significant visual importance as arboricultural and/or landscape features. (e.g. feature and landmark trees).	Trees, groups or plant communities of significant conservation, historical, commemorative or other value (e.g. remnant trees, aboriginal scar trees, critically endangered plant communities, trees listed specifically within a Heritage statement of significance).
Category B			
Trees of Moderate Quality with an estimated remaining life expectancy of 15–25 years and of dimensions and prominence that cannot be readily replaced within 10 years.	Trees that might be included within Category A but are downgraded because of diminished condition such that they are unlikely to be suitable for retention beyond 25 years.	Trees that are visible from surrounding properties and/or the street but make little visual contribution to the wider locality.	Trees with conservation or other cultural value (trees within conservation areas or landscapes described within a statement of significance, locally indigenous species).
Category C			
Trees of Low Quality with an estimated remaining life expectancy of 5–15 years, or young trees that are easily replaceable.	Trees of very limited value or such impaired condition that they do not qualify in higher categories.	Trees offering low or only temporary/transient landscape benefits.	Trees with no material conservation or other cultural value.

* Where trees would otherwise be categorised as U, B or C but have significant identifiable conservation, heritage or landscape value even though only for the short term, they may be upgraded, although they might be suitable for retention only.

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Tree Quality

		Health**			
		Excellent/ Good	Fair	Poor	Dead
Structure	Good	A	B	C	U
	Fair	B	B	C	U
	Poor	C	C	U	U
	Hazard *	U	U	U	U

* Structural hazard that cannot be remediated through mitigation works to enable safe retention.

** Trees of short term reduced health that can be remediated via basic, low cost plant health care works (e.g. mulching, irrigation etc.) may be designated in a higher health rating to ensure correct retention value nomination.

Category A	Typically trees in this category are of high quality with an estimated remaining life expectancy of at least 25 years and of dimensions and prominence that it cannot be readily replaced in <20 years. The tree may make significant amenity contributions to the landscape and may make high environmental contributions. In some cases, trees within this category may not meet the above criteria, however possess significant heritage or ecological value. Trees of this retention value warrant design consideration and amendment to ensure their viable retention.
Category B	Typically trees in this category are of moderate quality with an estimated remaining life expectancy of 15–25 years and prominence of size dimensions that cannot be readily replaced within 10 years. They may make moderate amenity contributions to the landscape and make low/moderate environmental contributions. Trees with this retention value warrant lesser design consideration in an attempt to allow for their retention.
Category C	Trees in this category are of low quality with an estimated remaining life expectancy of 5–15 years, or young trees that are easily replaceable, may have poor health and/or structure, are easily replaceable, or are of undesirable species and do not warrant design consideration.
Category U	Trees in this category are found to be in such a condition that they cannot realistically be retained as viable trees in the context of the current land use for longer than five years. These trees may be dead and/or of a species recognised as a weed that resulted in them being unretainable.

Appendix D. Plant Health Care and Mulching

Guide to plant health tonics and root growth stimulants

Considering the varying sizes of trees in common urban landscapes, it is suggested that an application volume of combined water and product solution of 80–150L for small to medium sized trees (5-10m height), 150–250L for medium to large sized trees (10-20m height) and 250–400L for large to very large sized trees (+20m height). Note: a lesser volume of total mixed product could be used if a more concentrated mix is drenched and water irrigation used to further drench the area and therefore dilute the stronger mix application.

The following product recommendations have been based on previous successful works undertaken by ArborSafe. The information provided is to be used as a general guide only, depending on your tree species, health or location. We recommend you always refer to the manufacturers label before applying any product. You may need to further consult with ArborSafe or your Project Arborist to develop a more specific program for your tree needs.

- **Soil Conditioner** concentrate such as Kelpro, Seasol or similar 600–800mL/100L of water. A concentration of beneficial nutrients stimulating plant growth and root establishment, ideal for trees under stress.
- **Nitrogen Boost** concentrate such as Nitrosol liquid plant food or similar 300mL/100L of water. A general-purpose fertilizer that contains a nitrogen boost (the most abundantly used element for tree growth). NB: Care must be taken when applying general fertilizer, particularly where plants can be affected Phosphorus toxicity.
- **Root Biostimulant** concentrate such as Auxinone or similar 400mL/100L of water. A scientific blend of hormone root growth stimulants and vitamins assisting in the regeneration of roots.
- **Microbial Formulation** concentrate such as Noculate Liquid or similar 500mL/100L of water. Generally containing strains of beneficial soil microorganisms, humic acid, kelp, essential amino acids, vitamins, biotin, folic acid and natural sugars designed to enhance the establishment of beneficial microbial populations.
- **Carbohydrate Energy Source** such as Molasses 500-800mL/100L of water. Molasses is the by-product of sugar refining. It contains all the nutrients from the raw sugarcane plant and is a carbohydrate energy source that feeds soil microorganisms and increases microbial activity.
- **Surfactant/Wetting Agent** (optional) such as Dispatch (Liquid) 200–300ml/100L of water. Improves the infiltration and penetration of applied water and irrigation.

We recommend you always refer to the manufacturers label before applying any product using the above as a guide only.

Guide to mulching and maintenance for established trees

Whether a tree is a newly planted young tree, or a well-established mature tree, the area around its base is a key factor in its long-term retention and viability. Maintaining a soil environment that is conducive to tree root development is vital for trees of all ages. This guide provides information on appropriate maintenance practices around the base of trees including mulching and the restriction of activities that may cause harm to tree roots or trunks.

1. Why mulch?

Mulching is a plant health care action which can be undertaken to improve plant and soil health (Figure 13), as well as overall landscape aesthetics. Placing an organic (or sometimes inorganic) material on the soil surface reduces the level of direct sunlight contact. Mulching should not be confused with composting which involves incorporating organic matter such as composts or manures into the soil profile. All plants in their natural ecologies (except for some arid and coastal ecologies) are naturally mulched by the falling of leaves, bark, flowers and other organic material.

This action is of great importance in successful cultivation of plants as it:

- assists in the regulation of soil moisture and temperature levels
- helps to suppress weeds
- minimises soil compaction
- reduces run-off during periods of heavy rain
- adds organic matter to the soil, and
- improves overall structure, nutrition and water holding composition.

Mulch is best comprised of organic materials such as wood chips, leaf litter, straw or hay as these will degrade over time. Long-term mulching improves soil health and structure as it encourages the activities of earthworms, microflora and beneficial fungi. Inorganic materials such as stones and gravel can be moderately effective as mulch but will not provide the ongoing improvements to soil health.

Figure 13. An excellent example of how to mulch a young tree. (Lachlan Andrews, September 2015).

2. How to mulch

- Apply mulch to damp soil, as placing over dry soil makes it difficult to rehydrate. Applying during the cooler months of the year is an ideal time.
- If mulching on top of a pre-existing grass area, grass or weeds must first be hand weeded and/or sprayed with a non-selective herbicide and left to wilt and die before applying mulch.
- Mulch should be applied at a uniform thickness of 75–100mm and re-applied approximately every 12 months. Do not place mulch up against the trunk of a tree as the damp mulch can cause bark to decay.
- Apply over a wide area, at least as large as a tree's crown projection (preferably larger), within and outside the current root mass to encourage lateral root development and expansion.
- Wood chip mulch (such as that generated from wood chippers) is considered an ideal mulch for landscape use as it contains a wide variety of materials that are of different sizes (such as bark, foliage and timber), is relatively cheap to purchase, and can be obtained in large quantities. Stockpiling of mulch after tree contractors have conducted works at a site is a way of generating 'free' mulch and ensuring that plant material from tree pruning and/or removals is recycled on site, not imported from external suppliers, saving costs and making the site more self-sustaining.
- The use of mulch made from pine bark or red gum chips are discouraged as they seldom degrade and therefore do not add nutrition to the soil profile. The uniform particle size and resin content can provide an impervious layer to water as well as retarding gaseous exchange.
- Mulching within the canopy areas of larger trees (Figure 14) can not only improve long-term tree health but can also act to reduce tree risk by decreasing the number of targets that pass and/or congregate under their canopies. This in turn will minimise the likelihood of injury in the event of a branch failure.
- When using wood chip mulch, ensure that if it has been made from live plant material that is stored and allowed to compost for between 3 and 6 months prior to use. Never apply fresh, 'green' mulch around trees as this can induce what is called the nitrogen drawdown, which can result in the removal of nitrogen from the soil resulting in plants with nutrient deficiencies.

For further information refer to the Australian Standard AS 4454–2012: *Composts, Soil Conditioners and Mulches*.

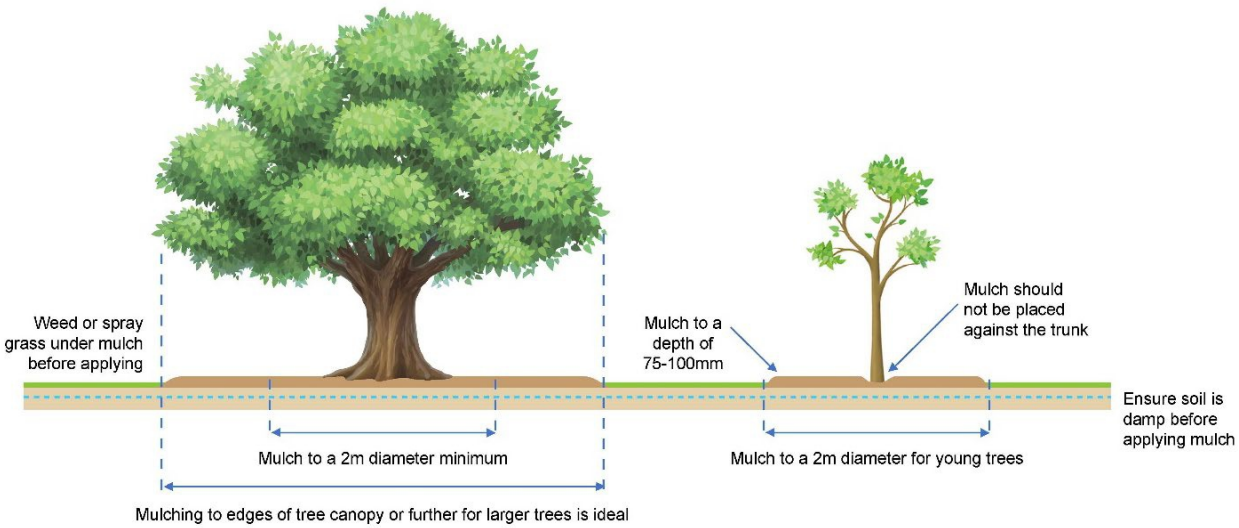

Figure 14. Mulching established and young trees (ArborSafe Australia, 2020).

3. Root and trunk damage

The function of tree roots is primarily to provide water and nutrient uptake for the tree, provide stability through structural roots that anchor it to the ground and as a means of food and nutrient storage. Damage to tree roots can lead to a reduction to any or all of these functions.

Damage to tree roots (Figure 15 and Figure 16) and the lower portion of a tree's trunk is a common and often unnecessary occurrence that can lead to the entry of decay fungi into a tree's structural framework. Once present, decay may develop in larger structural roots and/or the base of the trunk, which can result in a reduction in tree health and in severe cases even compromise stability.

Works such as trenching and excavation are often the cause of root damage to trees. Refer to ArborSafe's Guide – Tree protection during construction or the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites* for things to consider when performing construction activities near trees.

Everyday activities such as grass cutting via mowing or brush cutters can result in serious root damage or wounding to the lower trunk. Young trees with their trunks damaged by machinery often need replacing, while damage to the trunks and/or surface roots of established trees is not only detrimental to tree health but can also result in costly repairs to machinery.

Another advantage to mulching around the trunk and root crown is that it limits damage to both parts from mowing equipment. This in turn reduces mechanical damage and compaction.

Figure 15. An example of damage to tree roots caused via mowing. (Luke Dawson, June 2017).

Figure 16. Image showing wound caused to upper portion of surface root by mower. (Luke Dawson, June 2017).

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4. How to avoid root and trunk damage

The following points serve to highlight ways to avoid damage to tree roots and trunks caused via grass cutting activities:

- Mulching around young and established trees negates the need for brush cutter and/or lawn mower use around the base of a tree. Mulching therefore not only creates a barrier between tree roots and trunk that are susceptible to damage, it improves soil condition, minimises soil compaction and decreases the total area required for mowing.
- Where mulching is not feasible, raising the cutting height of mowers and maintaining grass at a greater height can avoid unnecessary 'scalping' of roots and damage to mowers/blades.
- Where surface roots are located away from the trunk and in a location where neither the application of mulch nor the raising of mower height is inappropriate, it may be possible to raise the soil grade directly around the root/s to minimise damage. It is important that the application of new material does not result in significant changes to the soil profile that may inadvertently damage roots. Material applied should be permeable and allow the development of turf which will protect the roots. Coarse sand or a planting mix with a high sand to organic matter ratio (e.g. 80/20 mix) spread at a depth of 75–100mm could suitably protect the surface root from damage, while allowing turf to redevelop within the area.
- ArborSafe is able to answer any questions regarding the material, depth and method of application to be used to ensure the tree/s remain viable for the long-term.

Appendix E. Tree Assessment Data

Tree no.	*Botanical Name*	Common Name	Origin	Trees in group	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	TPZ area (m2)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Health	Structure	Age	TLE (Yrs.)	Defects	Significance	Arborist comments	Tree Quality Score	Tree Retention value subcategory	Recommendation
1	*Fraxinus excelsior*	European Ash	Exotic	1	22	28	2.6	21.90	1.9	6	6	Good	Fair	Semi-Mature	15-25	Crossing/rubbing branches;	Amenity value/shade; Attractive landscape feature; Avenue tree;	17-03-2022 : Andy Clark : Untagged Council Street tree.	B	2	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
2	*Fraxinus angustifolia ssp. angustifolia*	Desert Ash	Exotic	1	26	38	3.1	30.58	2.2	6	6	Good	Good	Semi-Mature	15-25		Amenity value/shade; Attractive landscape feature; Avenue tree;	17-03-2022 : Andy Clark : Untagged Council Street tree.	B	2	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
3	*Fraxinus excelsior*	European Ash	Exotic	1	29	36	3.5	38.05	2.2	8	8	Good	Good	Semi-Mature	15-25	Epicormic growth; Wound(s);	Amenity value/shade; Attractive landscape feature; Avenue tree;	17-03-2022 : Andy Clark : Untagged Council Street tree.	B	2	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
4	*Cercis siliquastrum*	Judas Tree	Exotic	1	38	48	4.6	65.33	2.4	<5	<5	Fair	Poor	Senescent	<5	Co-dominant stems; Crack(s)/split(s); Deadwood/stubs > 30mm; Decay; Dieback; Epicormic growth; Included bark; Poor pruning; Weak union(s); Wound(s);	Amenity value/shade;	17-03-2022 : Andy Clark : The tree is in a reduced state of health with minimal canopy density, terminal branch dieback and the remaining foliage consisting of 100% epicormic growth. Included basal union has separated.	U		Remove tree irrespective of future development.
5	*Cercis siliquastrum*	Judas Tree	Exotic	1	28	33	3.4	35.47	2.1	3	4	Good	Good	Semi-Mature	15-25	Co-dominant stems; Epicormic growth; Weak union(s); Wound(s);	Amenity value/shade;		C	2	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
6	*Hesperocyparis macrocarpa 'Brunniana'*	Brunning's Golden Cypress	Exotic	1	53	65	6.4	127.08	2.8	5-10	15-20	Fair	Poor	Mature	5-10	Co-dominant stems; Crack(s)/split(s); Deadwood/stubs > 30mm; Decay; Dieback; Hanger(s); Included bark; Previous failure(s); Weak union(s); Wound(s);	Amenity value/shade; Significant due to age/size;	17-03-2022 : Andy Clark : Two of the three stems have failed, at the decayed included basal union, and are resting on the ground but still living. The remaining stem appears structurally stable at the current assessment but has dieback in the terminal branches, indicating a loss of vigour and reduced ULE.	C	2	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
7	*Eucalyptus deanei*	Mountain Blue Gum	Endemic	1	105	132	12.6	498.76	3.7	20-30	20-30	Good	Good	Mature	25-50	Deadwood/stubs > 60mm;	Amenity value/shade; Attractive landscape feature; Significant due to age/size;	17-03-2022 : Andy Clark : 23m from rod, 16m from T21. Direct conflict with carpark of both plans.	A	2	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
8	*Ulmus parvifolia*	Chinese Elm	Exotic	1	58	95	7.0	154.63	3.2	5-10	10-15	Good	Fair	Mature	15-25	Co-dominant stems; Crossing/rubbing branches; Deadwood/stubs > 30mm; Epicormic growth; Included bark; Previous failure(s); Wound(s);	Amenity value/shade; Attractive landscape feature;	17-03-2022 : Andy Clark : The multiple included unions appear inactive at this assessment (no cracking, canopy separation, sap exudation).	B	2	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
9	*Ulmus parvifolia*	Chinese Elm	Exotic	1	42	63	5.1	81.16	2.7	8	5-10	Poor	Fair	Mature	5-10	Co-dominant stems; Deadwood/stubs > 60mm; Dieback; Epicormic growth; Excessive end weight; Wound(s);		17-03-2022 : Andy Clark : The tree is in a reduced state of health with minimal canopy density, large terminal branch dieback and the remaining foliage consisting of 100% epicormic growth. Decline attributed to residual drought stress.	C	1	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
10	*Prunus serrulata*	Japanese Flowering Cherry	Exotic	1	31	38	3.7	42.93	2.2	3	3	Poor	Poor	Mature	5-10	Co-dominant stems; Decay; Epicormic growth; Included bark; Poor pruning;		17-03-2022 : Andy Clark : Lopped 3m trunk	U		Remove tree irrespective of future development.
11	*Liquidambar styraciflua*	Sweet Gum	Exotic	1	65	78	7.8	191.13	3.0	10-15	10-15	Good	Fair	Mature	15-25	Co-dominant stems; Included bark; Resin exudation/kino; Weak union(s);	Amenity value/shade; Attractive landscape feature;	17-03-2022 : Andy Clark : The multiple included unions appear inactive at this assessment (no cracking, canopy separation, sap exudation).	B	2	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
12	*Ulmus parvifolia*	Chinese Elm	Exotic	1	15	22	2.0	12.57	1.8	3	2	Poor	Poor	Juvenile	<5	Cavity(s); Co-dominant stems; Crossing/rubbing branches; Deadwood/stubs > 30mm; Decay; Epicormic growth; Mechanical damage; Previous failure(s); Suppressed; Weak union(s); Wound(s);		17-03-2022 : Andy Clark : Poor tree easily replaced.	U		Remove tree irrespective of future development.
13	*Ulmus parvifolia*	Chinese Elm	Exotic	1	50	65	6.0	111.56	2.8	5-10	5-10	Poor	Fair	Mature	5-10	Co-dominant stems; Deadwood/stubs > 60mm; Dieback; Epicormic growth; Excessive end weight; Wound(s);		17-03-2022 : Andy Clark : The tree is in a reduced state of health with minimal canopy density, terminal branch dieback and the remaining foliage consisting of 80% epicormic growth. Decline attributed to residual drought stress.	C	1	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
14	*Crataegus sp.*	Hawthorn	Exotic	1	41	56	4.9	75.32	2.6	5-10	5-10	Good	Poor	Mature	<5	Co-dominant stems; Crack(s)/split(s); Decay; Included bark; Undesirable species; Weak union(s); Wound(s);	Amenity value/shade;	17-03-2022 : Andy Clark : Separation within decayed, included basal union observed. Stability considered unpredictable.	U		Remove tree irrespective of future development.
15	*Aesculus indica*	Indian Horse Chestnut	Exotic	1	76	74	9.1	260.98	2.9	5-10	10-15	Good	Good	Mature	25-50	Co-dominant stems;	Amenity value/shade; Attractive landscape feature;		A	2	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
16	*Dead Tree*	Dead tree	Exotic	1	40	0	4.8	72.38		5-10	5-10	Dead	Poor	Semi-Mature	0	Deadwood/stubs > 100mm; Decay; Previous failure(s);		17-03-2022 : Andy Clark : A dead tree surrounded by sapling of various weed species.	U		Remove tree irrespective of future development.
17	*Cedrus atlantica*	Atlas Cedar	Exotic	1	68	120	8.2	210.27	3.6	5-10	10-15	Fair	Fair	Senescent	5-10	Co-dominant stems; Deadwood/stubs > 100mm; Decay; Dieback; Epicormic growth; Excessive thinning;	Amenity value/shade;	17-03-2022 : Andy Clark : Two of the four stems are dead.	C	1	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
18	*Prunus sp.*	Cherry	Exotic	3	45	65	5.4	91.61	2.8	<5	6	Fair	Poor	Mature	10-15	Co-dominant stems; Crossing/rubbing branches; Decay; Epicormic growth; Poor pruning; Weak union(s); Wound(s);		17-03-2022 : Andy Clark : Repeatedly lopped into a ball shape.	C	2	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
19	*Prunus sp.*	Cherry	Exotic	1	43	52	5.2	83.65	2.5	<5	<5	Fair	Poor	Mature	10-15	Co-dominant stems; Crossing/rubbing branches; Decay; Dieback; Epicormic growth; Poor pruning; Weak union(s); Wound(s);			C	2	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
20	*Prunus cerasifera 'Nigra'*	Purple-leaved Cherry Plum	Exotic	1	32	38	3.8	46.32	2.2	<5	<5	Fair	Poor	Mature	5-10	Co-dominant stems; Crossing/rubbing branches; Decay; Epicormic growth; Included bark; Poor pruning; Weak union(s); Wound(s);	Amenity value/shade;	Situtaed adjacent proposed retaining wall.	C	2	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
21	*Prunus cerasifera 'Nigra'*	Purple-leaved Cherry Plum	Exotic	1	35	0	4.2	55.42		<5	<5	Poor	Poor	Senescent	<5	Co-dominant stems; Crossing/rubbing branches; Deadwood/stubs > 60mm; Decay; Dieback; Epicormic growth; Included bark; Poor pruning; Weak union(s); Wound(s);			U		Remove tree irrespective of future development.
22	*Prunus sp.*	Cherry	Exotic	1	37	41	4.4	61.93	2.3	<5	6	Good	Fair	Mature	10-15	Co-dominant stems; Crossing/rubbing branches; Decay; Dieback; Epicormic growth; Poor pruning; Weak union(s); Wound(s);	Amenity value/shade;	17-03-2022 : Andy Clark : Repeatedly lopped to maintain shape.	C	2	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
23	*Prunus sp.*	Cherry	Exotic	1	45	55	5.4	91.61	2.6	<5	6	Good	Fair	Mature	10-15	Co-dominant stems; Crossing/rubbing branches; Decay; Dieback; Epicormic growth; Poor pruning; Weak union(s); Wound(s);	Amenity value/shade;	17-03-2022 : Andy Clark : Repeatedly lopped to maintain shape.	C	2	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).

Appendix F. Tree Protection Plan

Tree List

Tree #	Species	Risk
2	Desert Ash	No Rating
3	European Ash	No Rating
15	Indian Horse Chestnut	No Rating
17	Atlas Cedar	No Rating
18	Cherry	No Rating
19	Cherry	No Rating
22	Cherry	No Rating
23	Cherry	No Rating

Figure 17. Site map showing retained trees with suggested Tree Protection Fence location. (ArborSafe, March 2022).

For further information
Telephone 1300 272 671
www.arborsafe.com.au

CIVICA

RAIR Glen Innes R31

Taylor Street, Glen Innes, NSW 2370

Contract

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The contractor shall check and verify all work on site (including work by others) before commencing the landscape installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred to the Landscape Architect for confirmation.

Issue	Revision Description	Drawn	Check	Date
G	Tree Removal Amendment	LW	NM	19.09.2022
F	Contract	LW	NM	19.07.2022
E	Architectural Coordination	RG	NM	06.07.2022
D	Tender	LW	NM	01.06.2022
C	Architectural Coordination	LW	NM	19.05.2022
B	Architectural Coordination	LW	NM	27.04.2022
A	Development Application	LW	NM	26.04.2022

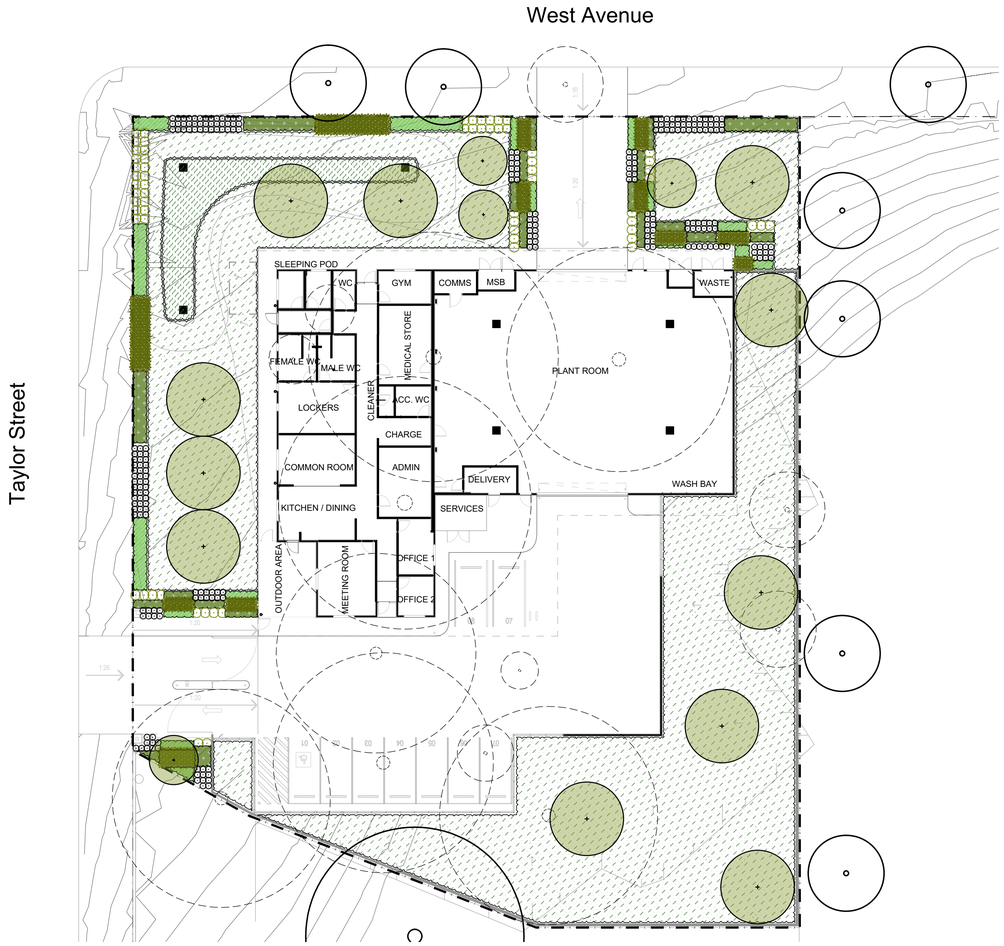
Legend

Drawing Schedule

Drawing Number	Drawing Title	Scale
000	Landscape Coversheet	N/A
101	Landscape Plan	1:150
501	Landscape Details	As Shown

Plant Schedule

	Botanic Name	Common Name	Mature Size (h x w) (m)	Spacing	Pot Size	Quantity
	TREES					
Ca	*Cupaniopsis anacardioides*	Turkeroo	15 x 5	As Shown	100L	4
Fp	*Fraxinus pennsylvanica* 'Wasky Skyward'	Green Ash	13 x 8	As Shown	100L	11
	SHRUBS					
Ad	*Austromyrtus dulcis*	Midgen Berry	1 x 0.8	As Shown	200mm	65
LPC	*Leptospermum hybrid 'Pink Cascade'*	Tea Tree	0.8 x 1.5	As Shown	300mm	176
LPP	*Loropetalum 'Purple Pixie'*	Purple Pixie	0.3 x 1.2	As Shown	300mm	105
WAB	*Westringia fruticosa 'Aussie Box'*	Native Rosemary	0.6 x 0.6	As Shown	300mm	137
	GRASSES AND GROUNDCOVERS					
Cg	*Carpobrotus glaucescens*	Pigface	.1 x 2	5/sqm	150mm	74
Dc	*Dianella caerulea*	Flax Lily	.4 x .4	5/sqm	150mm	89
Dr	*Dianella revoluta*	Blueberry Lily	1 x 2	5/sqm	150mm	85
GBR	*Grevillea* Bronze Rambler	Grevillea Bronze Rambler	.3 x 3	5/sqm	150mm	54
Hs	*Hibbertia scandens*	Snake Vine	.1 x 1	5/sqm	150mm	63
Hv	*Hardenbergia violacea*	False Sarsaparilla	3 x 2	5/sqm	150mm	46
Ll	*Lomandra longifolia*	Matt Rush	1 x 1	4/sqm	150mm	63
	Matrix Planting					
		Total Area				
					/25sqm	
Ad	*Austromyrtus dulcis*	Midgen Berry	1	8	5	257
CLJ	*Callistemon 'Little John'*	Bottlebrush	1	1	8	
WAB	*Westringia fruticosa 'Aussie Box'*	Native Rosemary	0.6	0.6	14	721
Hs	*Hibbertia scandens*	Trailing Guidea Flower	0.2	1	7	360
Ll	*Lomandra longifolia*	Matt Rush	1	1	8	412
Dc	*Dianella caerulea*	Flax Lily	0.4	0.4	23	1184
Hv	*Hardenbergia violacea*	False Sarsaparilla	3	2	12	618
	Bioretention Basin Mix Planting					
Ca	*Carex appressa*	Tall Sedge	1 x 1	10/m2	150mm	73
Fn		Club Rush	1 x 1	10/m2	150mm	73
Ju	*Juncus usitatus*	Common Rush	1.2 x 1.5	10/m2	150mm	73
Ll	*Lomandra longifolia*	Mat-rush	1 x 0.8	10/m2	150mm	73
Jp	*Juncus prismatocarpus*	Branching Rush	0.6 x 0.3	10/m2	150mm	73



Site Plan | Scale 1:250

Key Plan

Client

Health Infrastructure

NSW Ambulance

Project

RAIR Glen Innes
Taylor Street, Glen Innes,
NSW 2370

SITE IMAGE

Level 1, 3-5 Baptist Street
Redfern NSW 2016
Australia

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Landscape Architects

Contract

Drawing Name

Landscape Coversheet

Scale

Job Number	Drawing Number	Issue
SS22-4920	R31-LA-000	G

NOT FOR CONSTRUCTION

A1

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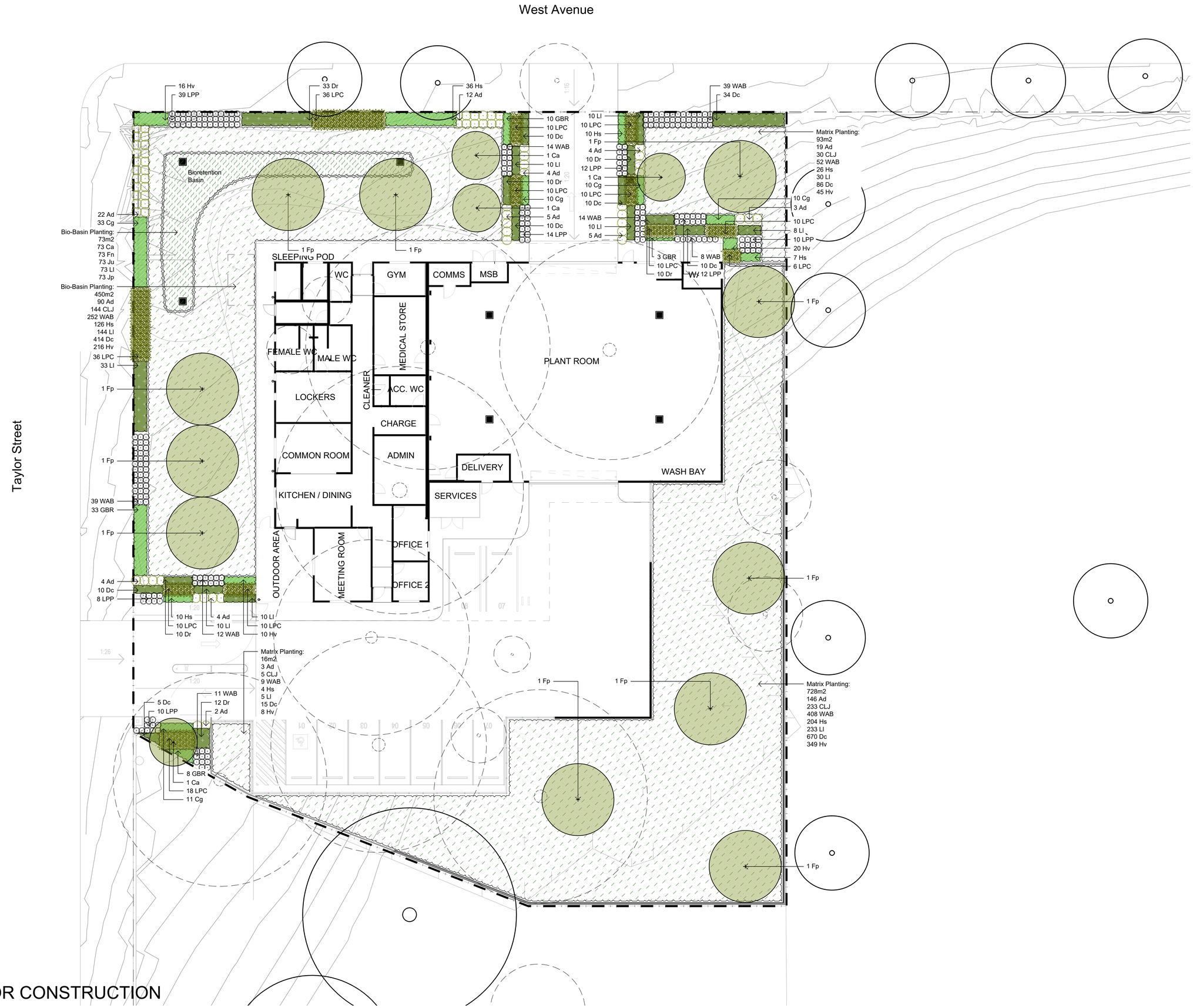

NOT FOR CONSTRUCTION

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Issue	Revision Description	Drawn	Check	Date
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C	Architectural Coordination	LW	NM	19.05.2022
B	Architectural Coordination	LW	NM	27.04.2022
A	Development Application	LW	NM	26.04.2022

Legend

- Boundary
- Tree to be Retained
- Tree to Removed
- Proposed Tree (Refer Schedule and Detail)
- Grasses and Groundcovers (Refer Schedule and Detail)
- Shrubs and Accents (Refer Schedule and Detail)
- Planting Matrix (Refer Schedule and Detail)
- Bioretention Planting (Refer Schedule and Detail)

Key Plan

Client

NSW GOVERNMENT Health Infrastructure

NSW Ambulance

Project

RAIR Glen Innes
Taylor Street, Glen Innes,
NSW 2370

SITE IMAGE

Level 1, 3-5 Baptist Street
Redfern NSW 2016
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Landscape Architects

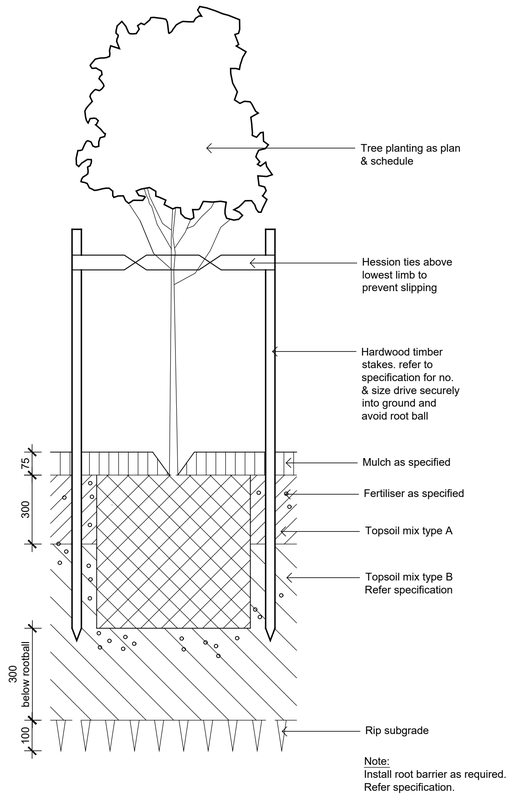
Contract

Drawing Name

Landscape Plan

Scale 1:150 @ A1 (0 1 2 3 4 5m)

Job Number	Drawing Number	Issue
SS22-4920	R31-LA-101	G



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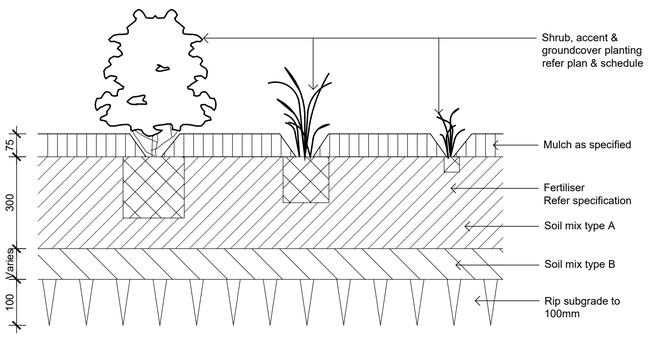

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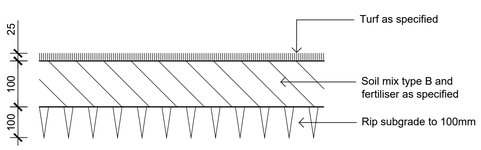

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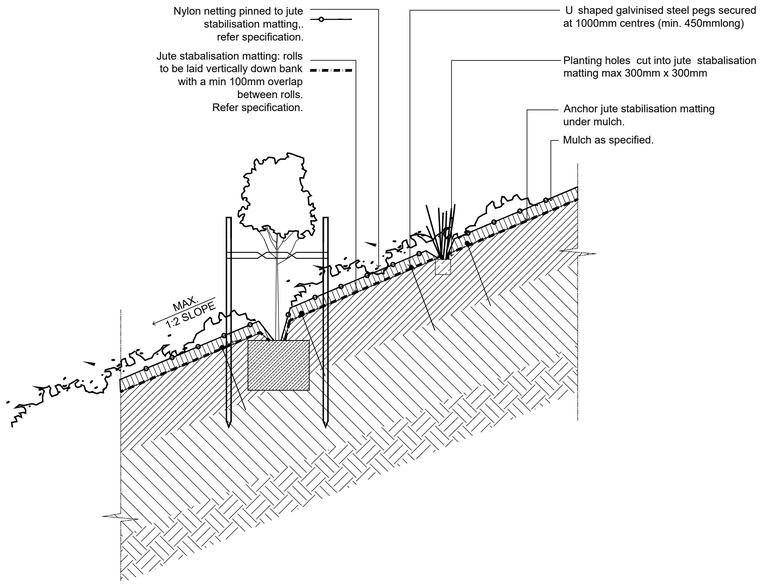

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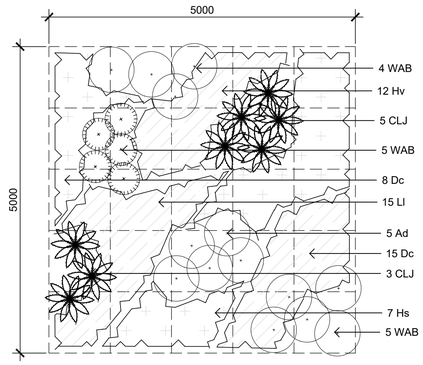

04 501 Planting Matrix
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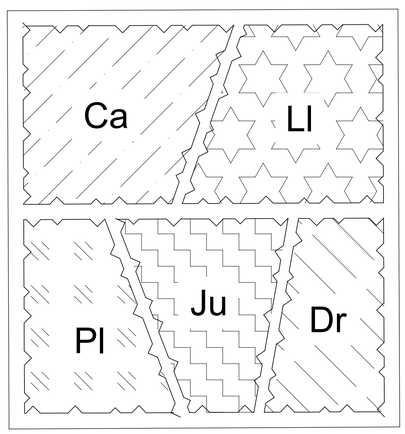

05 501 Bio-Retention Basin Mix Planting
1:30

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Issue	Revision Description	Drawn	Check	Date
C	Tender	LW	NM	01.06.2022
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Legend

Key Plan

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Tender

Drawing Name
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Scale As Shown

Job Number	Drawing Number	Issue
SS22-4920	R31-LA-501	C

ACOUSTIC REPORT FOR REF / DA

RAIR GLEN INNES

JHA

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DOCUMENT CONTROL SHEET

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APPENDIX A: NSW AMBULANCE – EMERGENCY DRIVING AND USE OF WARNING DEVICES POLICY DIRECTIVE (PD2016-033) 28

1 INTRODUCTION

NSW Ambulance is improving infrastructure across NSW rural areas to ensure they continue to enhance the high-quality emergency medical care delivered to the community now and into the future.

JHA Consulting Engineers has been engaged by Mace to provide acoustic services for a proposed ambulance station refurbishment for the Rural Ambulance Infrastructure Reconfiguration (RAIR) program in Glen Innes, NSW.

The proposed development involves the construction of a new ambulance station, with an ambulance plantroom and ancillary spaces. An acoustic assessment has been undertaken and it is detailed in this report along with the findings and recommendations.

The objectives of this acoustic assessment are:

- Identify the external noise and vibration sources that will potentially affect the proposed development.
- Carry out noise surveys to determine the existing ambient and background noise levels on site.
- Establish the appropriate noise level and vibration criteria in accordance with the relevant standards, guidelines and legislation for the following issues:
  - Noise emissions from mechanical plant from the development to the surrounding receivers.
  - Noise emissions from traffic generated by the proposed development.
  - Noise emissions from the use of the wash bay.
  - Noise intrusion.
- Carry out an acoustic assessment to determine whether the relevant criteria can be achieved and, where applicable, comment on noise control measures required to achieve compliance with the relevant noise level criteria.
- Provide recommendations for Construction Noise and Vibration Planning.

This report provides:

- A statement of compliance with the relevant statutory criteria for the proposed development within the vicinity of the nearest potentially affected receivers.
- Recommendations for noise mitigation measures for the proposed development in order to meet the relevant criteria when compliance is not achieved.
- Recommendations for noise and vibration criteria and best practices during construction phase.

The following documentation has been used for the preparation of this report:

- Architectural drawings of the proposed development prepared by DJRD Architects.

This document and related work have been prepared following JHA Consulting Engineers Quality Management System, which is based on AS/NZS ISO 9001:2015 and ISO 14001:2015 Environmental Management Systems.

2 DESCRIPTION OF THE PROPOSAL

Glen Innes is a town on the Northern Tablelands, in the New England region of NSW, located 610 kilometres from the Sydney. It belongs to the Local Government Area of the Glenn Innes Severn Shire Council.

The proposed development site is located in the north-eastern corner of 85 Taylor Street, Glen Innes– legally known as Lot 2/DP1208729 being located within a general residential area and adjacent to Glen Innes District Hospital.

The site is surrounded by healthcare, heritage and residential buildings as well as recreational areas in a suburban residential environment. The proposed development will operate 24 hours per day, 7 days per week.

The noise sensitive receivers surrounding the site are healthcare, heritage / retail, active recreational and residential. Figure 1 shows the proposed site location (red dotted line with yellow shadow), residential receivers (green shadow), active recreational receivers (blue shadow), healthcare receivers (orange shadow) and heritage / retail receiver (magenta shadow).

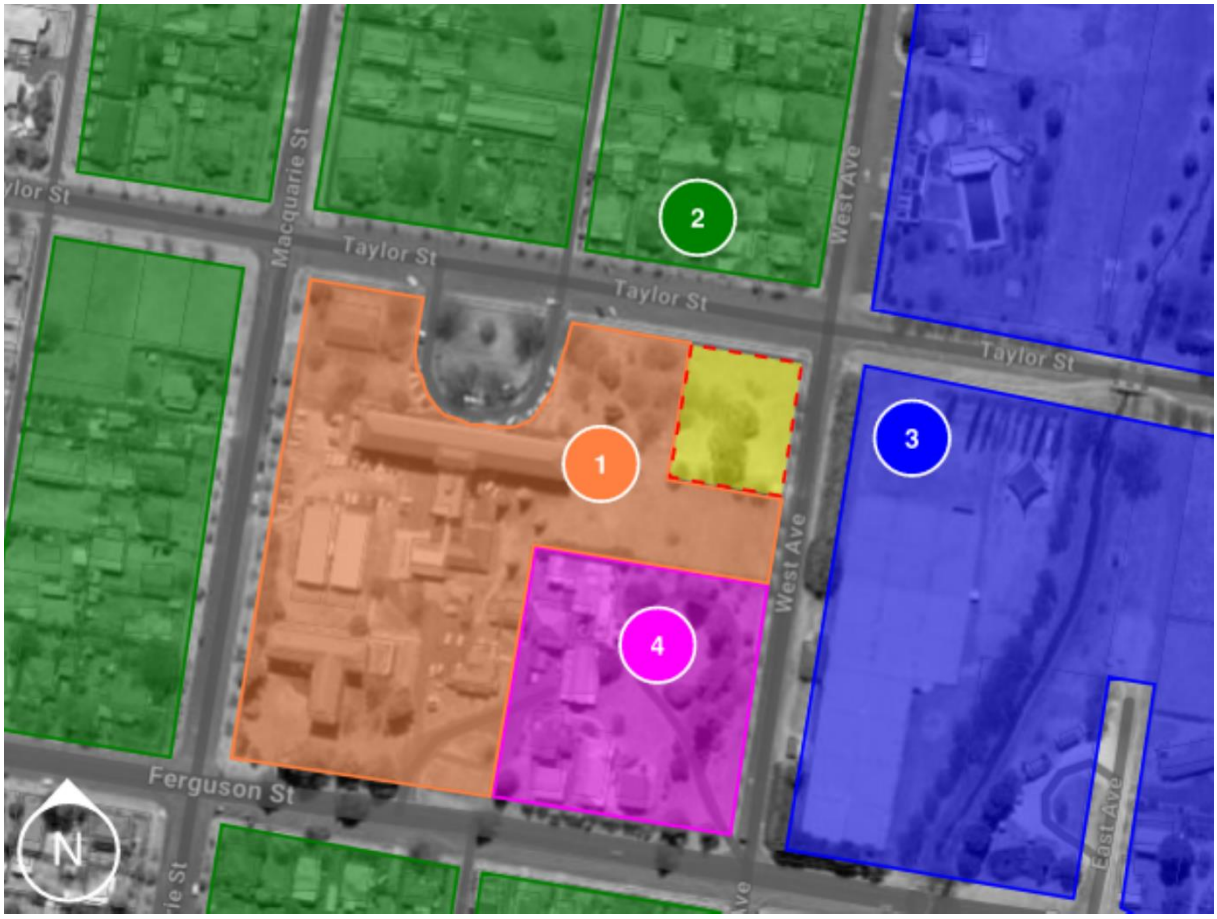

Figure 1: Aerial view of site (red dashed line with yellow shading) showing the location of surrinding noise sensitive receivers.

It is noted that if noise impacts associated with the proposed development are controlled at the nearest noise sensitive receivers, then compliance with the recommended criteria at all noise sensitive receivers will be achieved. For the residential catchments, the nearest residential receiver will be used for assessment purposes.

A summary of the nearest sensitive receivers surrounding the site location is shown in Table 1, including the approximate distances between closest lot boundaries.

ID	Sensitive Receiver	Receiver Type	Distance (m)
1	Glen Innes District Hospital	Healthcare	5
2	100 Taylor Street – 176 West Avenue	Residential	30
3	Glen Innes Tennis Association & skate park	Active Recreation	25
4	Glen Innes & District Historical Society	Retail / Heritage	30

Table 1: Nearest sensitive receivers surrounding the site location plus approximate distances.

The proposed development involves the construction of a new ambulance station with ancillary spaces which will comprise:

- 8 ambulance bays (2 of them outside the plantroom)
- Staff carpark
- Internal Vehicle wash bay
- Equipment preparation and storage spaces
- Office and administration spaces
- Sleeping pods
- Meeting room
- Amenities and common areas
- Gym

Figure 2 shows diagrams of the Ambulance Station layout (Source: DJRD Architects).

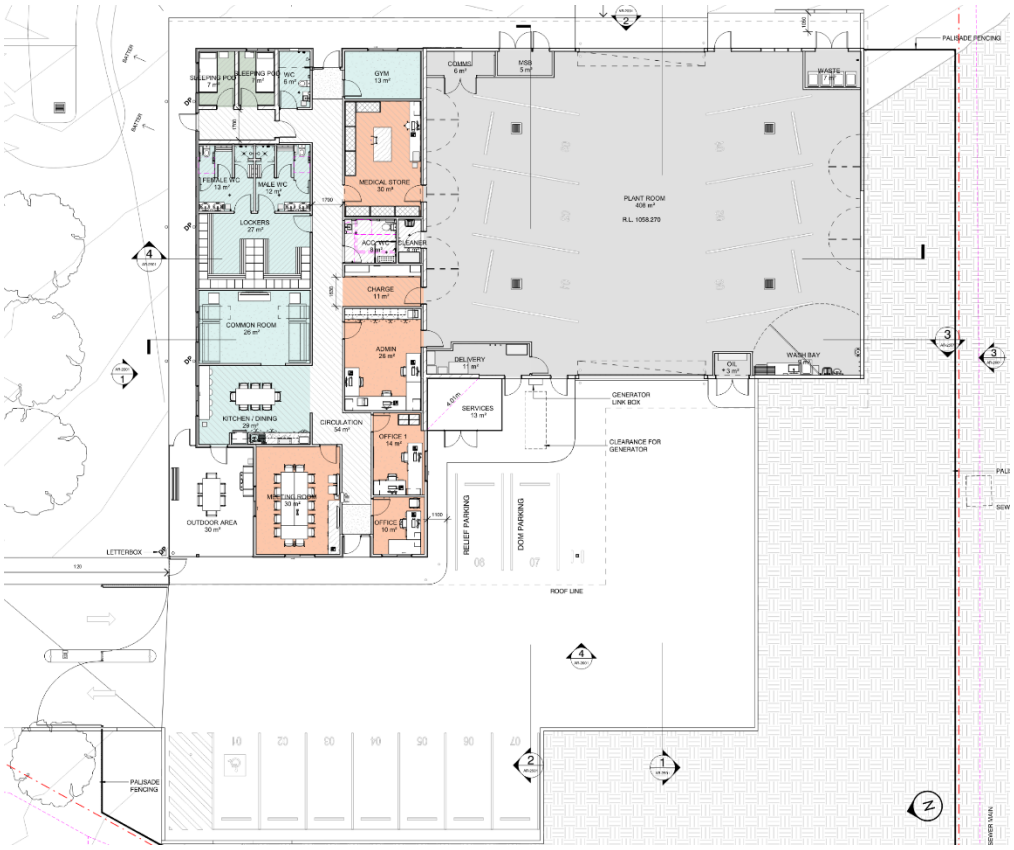

Figure 2: Ambulance Station layout.

3 RELEVANT NOISE STANDARDS AND GUIDELINES

3.1 STANDARDS AND GUIDELINES

The following standards and guidelines are considered relevant to the project and have been referenced in developing the project noise level criteria.

- Regulatory Framework:
  - Environmental Planning and Assessment (EP&A) Act 1979.
  - Protection of the Environmental Operations (POEO) Act 1997.
- Planning Framework:
  - Glen Innes Severn Council Local Environment Plan 2012.
  - Glen Innes Severn Council Development Control Plan 2014.
- Operational Noise
  - Protection of the Environmental Operations. Noise Regulation Controls (NRC) 2008.
  - NSW EPA Noise Policy for Industry (NPI) 2017.
  - NSW Department of Environment Climate Change and Water (DECCW) Noise Guide for Local Government (NGLG) 2013.
  - NSW DECCW Road Noise Policy (RNP) 2011.
- External Noise Intrusion
  - NSW Health Infrastructure 'Engineering Services Guideline' (ESG) Update July 2017.
- Construction Noise and Vibration
  - NSW DECCW Interim Construction Noise Guideline (ICNG) 2009.
  - NSW DECC Assessing Vibration: A Technical Guideline 2006.
  - NSW Road Maritime Service (RMS) Construction Noise and Vibration Guideline 2016.
  - Australian Standard AS 2436:2010 *'Acoustics – Guide to Noise Control on Construction, Maintenance & Demolition Sites'*.
  - NSW EPA, Draft Construction Noise Guideline 2020.

3.2 REGULATORY FRAMEWORK

The Environmental Planning and Assessment Act 1979 (EP&A Act) provides the regulatory framework for the protection of the environment in NSW. The EP&A Act is relevantly about planning matters and ensuring that "environmental impact" associated with the proposed development is properly considered and reasonable before granting development consent to develop.

The assessment of "environmental impact" relies upon the identification of acceptable noise criteria which may be defined in a Development Control Plan, or derived from principles using guidelines like NSW EPA Noise Policy for Industry (NPI 2017) or Noise Guide for Local Government (NGLG 2013).

The Protection of the Environment Operations (POEO) Act 1997 has the objective of protecting, restoring and enhancing the quality of NSW environment. Abatement of noise pollution is underpinned by the definition of "offensive noise" as follows:

"...

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

> *(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or*
>
> *(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or*

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.

..."

3.3 GLEN INNES SEVERN COUNCIL LEGISLATION

Relevant Planning Documents of Glen Innes Severn Council have been reviewed for any noise requirement or criteria.

The Glen Innes Severn Council Local Environmental Plan (GI-LEP 2012) sets the Land Zoning as shown in Figure *3* as per information extracted from the GI-LEP map 3010_COM_LZN_003A_020_20190312. The site and surroundings are categorized as General Residential (R1) and Public Recreation (RE1).

Figure 3: Land Zoning of the site (red outline) and surroundings.

Glen Innes Severn Council Development Control Plan (GI-DCP 2014) has been reviewed for any relevant noise requirements or criteria for the proposed development. There are no specific noise level criteria, but rather sections of the GI-DCP provide general planning strategies.

3.4 AMBIENT AND BACKGROUND NOISE LEVELS

JHA Engineers has not been engaged to undertake a noise survey for this project. The noise assessments for the ambulance station are based on a desktop assessment.

In absence of a noise survey, the recommended background noise levels from NSW Noise Policy for Industry have been used as the basis for the noise assessment as they will set stringent noise level criteria. Therefore, JHA Engineers note that the noise assessment is conservative. Table 2.3 of the NSW NPI provides typical background noise level based on the land zoning. Table 2 shows the estimated background noise levels for the site area.

Description of the area	*Average Background A-weighted noise level (L_{A90})*					
	Monday to Saturday			*Sundays and public holidays*		
	07.00 – 18.00	*18.00 – 22.00*	*22.00 – 07.00*	*08.00 – 18.00*	*18.00 – 22.00*	*22.00 – 08.00*
General Residential (R1)	50	45	40	50	45	40

Table 2: Average background noise levels as per NSW NPI.

3.5 NSW EPA NOISE POLICY FOR INDUSTRY

The NSW EPA Noise Policy for Industry 2017 assesses noise from industrial noise sources - scheduled under the POEO. Mechanical noise from the development shall be addressed following the recommendations in the NSW NPI.

The assessment is carried out based on the existing ambient and background noise levels addressing the following:

- Intrusiveness Criteria, to control intrusive noise into nearby sensitive receivers.
- Amenity Criteria, to maintain the noise level amenity for particular land uses.

These criteria are established for each assessment period (day, evening and night) and the more stringent sets the Project Noise Trigger Level (PNTL's).

3.5.1 INTRUSIVENESS CRITERIA

The NSW NPI defines the intrusiveness criteria as follows:

"The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the background noise level by more than 5dB when beyond a minimum threshold."

Based on the intrusiveness criteria definition and the NPI typical background noise levels on site, Table 3 shows the intrusiveness criteria for the noise sensitive receivers.

Indicative Noise Amenity Area	*Period*	*Measured Rating Background Level (L_{A90}), dB(A)*	*Intrusiveness Criteria, dB(A)*
Residential General (R1)	Day	50	55
	Evening	45	50
	Night	40	45

Table 3: Determination of the intrusiveness criterion for residential noise sensitive receivers.

3.5.2 AMENITY CRITERIA

The NSW NPI states the following to define the amenity criteria:

"To limit continuing increases in noise levels from application of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels specified in Table 2.2 where feasible and reasonable. The recommended amenity noise levels will protect against noise impacts such as speech interference, community annoyance and some sleep disturbance."

Based on the amenity criteria definition and the land zoning, Table 4 shows the amenity criteria for the noise sensitive receivers.

Indicative Noise Amenity Area	*Period*	*Recommended Amenity Noise Level (L_{Aeq}), dB(A)*	*Amenity Criterion, dB(A)*
Residential General (R1)	Day	60	58 $L_{Aeq,15min}$ (60-5+3)
	Evening	50	48 $L_{Aeq,15min}$ (50-5+3)
	Night	45	43 $L_{Aeq,15min}$ (45-5+3)
Healthcare	Noisiest 1-hour	50 (external)	48 $L_{Aeq,15min}$ (50-5+3)
Commercial premises	When in use	65	63 $L_{Aeq,15min}$ (65-5+3)
Active Recreation	When in use	55	53 $L_{Aeq,15min}$ (55-5+3)

Table 4: Determination of the amenity criterion for noise sensitive receivers.

3.5.3 PROJECT NOISE TRIGGER LEVELS

The PNTL's are shown in Table 5 and have been obtained in accordance with the requirements of the NSW NPI. These shall be assessed to the most affected point on or within the noise sensitive receiver boundary.

Indicative Noise Amenity Area	*Period*	*Intrusiveness Criterion*	*Amenity Criterion*
General Residential (R1)	Day	55	58
	Evening	50	48
	Night	45	43
Healthcare (external)	Nosiest 1-hour when in use	---	48
Commercial	When in use	---	63
Active Recreation	When in use	---	53

Table 5: Determination of PNTL's (light grey highlight) for noise sensitive receivers.

3.6 POEO NOISE REGULATION CONTROLS

The POEO Noise Regulation Controls streamlines the handling of common neighbourhood noise problems by providing more specific controls than the general powers provided under the POEO Act. The provisions of the regulation are aimed at residential activities and equipment, rather than those on commercial or industrial premises.

Part 4 deals with common neighbourhood noise problems such as the times of use of air conditioners, heat pump water heaters, pneumatic tools, swimming pool pumps, power tools, building intruder alarms and loud music. This part mainly applies to council enforcement / authorised officers and Police officers, but OEH enforcement / authorised officers also have powers in relation to some provisions.

The regulation applies different methods of control to different neighbourhood noise problems. These controls are:

- Preventing the use of certain articles where they can be heard during noise sensitive periods (e.g. night time).
- Placing limits on how long an article can emit noise (e.g. alarms).
- Prohibiting the use of certain articles where they emit 'offensive noise' (e.g. off-road trail bikes).

Although the clause below refers to residential premises, it is understood that it could be applied as a good practice plus establish a noise control. Power tools and equipment noise management is described as follows:

"…

Clause 51 – Use of power tools on residential premises

> *(a) the person causes or permit a power tool to be used on residential premises in such a manner that it emits noise that can be heard within any room in any other residential premises (that is not a garage, storage area, bathroom, laundry, toilet or pantry) whether or not any door or window to that room is open:*

(a) before 8 am or after 8 pm on any Saturday, Sunday or public holiday, or

(b) before 7 am or after 8 pm on any other day.

…"

Therefore, noise from power tools shall be inaudible during the above listed time periods and shall not be *'offensive noise'* (as per POEO Act definition) for other time periods.

3.7 TRAFFIC NOISE

Road traffic noise impact is assessed in accordance with the introduced NSW OEH Road Noise Policy (RNP) 2011. The NSW Road Noise Policy (RNP) establishes criteria for traffic noise from:

- Existing roads,
- New road projects,
- Road development projects,
- New traffic generated by developments.

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2dB above the existing noise levels. An increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.

3.8 NSW HEALTH INFRASTRUCTURE ESG

Section 13 of the NSW Health Infrastructure Engineering Services Guideline provides acoustic design for healthcare buildings considering internal noise levels, reverberation times plus sound insulation performances that should be achieved for the Ambulance Station.

Therefore, the criteria and guides outlined in the ESG shall be adopted for this project, particularly during the design stage.

3.9 CONSTRUCTION NOISE AND VIBRATION

3.9.1 NOISE CRITERIA

The ICNG suggest construction noise management levels that may minimise the likelihood of annoyance being caused to noise sensitive residential receivers depending on the duration of works. The management levels for long-term duration works are as follows:

- Within recommended standard hours.

  The $L_{Aeq,15min}$ level measured at the most exposed boundary of any affected residential receiver when the construction site is in operation must not exceed the background noise level by more than 10dB(A). This noise level represents the point above which there may be some community reaction to noise.

  However, in the case of a highly noise affected area, the construction noise level ($L_{Aeq,15min}$) at the most exposed boundary of any affected residential receiver when the construction site is in operation should not exceed 75dB(A). This level represents the point above which there may be strong community reaction to noise.

- Outside recommended standard hours.

  The $L_{Aeq,15min}$ level measured at the most exposed boundary of any affected residential receiver when the construction site is in operation must not exceed the background level by more than 5dB(A). It is noted that a strong justification is required for works outside the recommended standard hours.

In order to establish the airborne construction noise criteria, estimated noise levels shall be used for the noise sensitive receivers – refer to Section 3.4. Table 6 below, summarises the airborne construction noise criteria for most the affected noise sensitive receivers surrounding the development site.

Sensitive Receiver		*Airborne Construction Noise Criteria, L_{Aeq} dB(A)*	
		Within Standard Hours	*Outside Standard Hours*
Residential (R1)	Noise affected / External	RBL + 10	RBL + 5
	Highly noise affected / External	75	N/A

Table 6: ICNG construction airborne noise criteria for noise sensitive receivers surrounding the site.

Table 7 summaries the airborne construction noise criteria for healthcare facilities, recreation and commercial receivers surrounding the development site.

Land Use	*Management Level, L_{Aeq} dB(A)*
Hospital Wards and operating theatres	Internal Noise Level 35dB(A) External Noise Level 45dB(A)
Active Recreation areas	External Noise level 65dB(A)
Retail / Offices	External Noise level 70dB(A)

Table 7: ICNG construction airborne noise criteria for no-resindential receivers.

Where reference is made to an internal noise level, an external noise level 10dB above the internal noise levels are applied which should achieve the internal noise level where a window is adequately opened to provide natural ventilation.

The ICNG recommends internal ground-borne noise maximum levels at residences affected by nearby construction activities. Ground-borne noise is noise generated by vibration transmitted through the ground into a structure and can be more noticeable than airborne noise for some sensitive receivers. The ground-borne noise levels presented below from the ICNG are for residential receivers during evening and night-time periods only, as the objective is to protect the amenity and sleep of people when they are at home.

- Evening: $L_{Aeq,15min}$ 40dB(A) (internal)
- Night: $L_{Aeq,15min}$ 35dB(A) (internal)

The internal noise levels are assessed at the centre of the most affected habitable room.

3.9.2 VIBRATION CRITERIA

3.9.2.1 Human Comfort

The Department of Environment and Climate Change (DECC) developed the document '*Assessing Vibration: A Technical Guideline*' in February 2006 to assist in preventing people from exposure to excessive vibration levels within buildings. It is based on the guidelines contained in BS 6472.1:2008 '*Guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting*'.

The guideline does not address vibration induced damage to structures or structure-borne noise effects. Vibration and its associated effects are usually classified as continuous (with magnitudes varying or remaining constant with time), impulsive (such as shocks) or intermittent (with the magnitude of each event being either constant or varying with time). Vibration criteria for continuous and impulsive vibration are presented in Table 8 below, in terms of vibration velocity levels.

Place	*Time*	*r.m.s. velocity, mm/s [dB ref 10^{-6}mm/s]*			
		Continuous Vibration		*Impulsive Vibration*	
		Preferred	*Maximum*	*Preferred*	*Maximum*
Residences	Day-time	0.20 [106 dB]	0.40 [112 dB]	6.00 [136 dB]	12.00 [142 dB]
	Night-time	0.14 [103 dB]	0.28 [109 dB]	2.00 [126 dB]	4.00 [132 dB]
Offices, schools, educational and worship	When in use	0.40 [112 dB]	0.80 [118 dB]	13.00 [142 dB]	26.00 [148 dB]
Critical Areas	When in use	0.1 [100dB]	0.20 [106dB]	0.1 [100dB]	0.2 [106dB]

Table 8: Continuous and impulsive vibration criteria applicable to the site.

When assessing intermittent vibration comprising a number of events, the Vibration Dose Value (VDV) it is recommended to be used. Table 9 shows the acceptable VDV values for intermittent vibration.

Place	*Time*	*Vibration Dose Values, $m/s^{1.75}$*	
		Preferred	*Maximum*
Residences	Day-time	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational and worship	When in use	0.40	0.80
Critical Areas	When in use	0.10	0.20

Table 9: Intermittent vibration criteria applicable to the site.

3.9.2.2 Structural Building Damage

Ground vibration from construction activities can damage surrounding buildings or structures. For occupied buildings, the vibration criteria given in previous section for Human Comfort shall generally form the limiting vibration criteria for the Project.

For unoccupied buildings, or during periods where the buildings are unoccupied, the vibration criteria for building damage suggested by German Standard DIN 4150.3:2016 *'Vibration in Buildings – Effects on Structures'* are to be adopted. Guideline values from DIN 4150.3:2016 are presented in Table 10.

Structural type	*Vibration velocity, mm/s (Peak Particle Velocity - PPV)*				
	Foundation			*Plane of floor uppermost full storey in horizontal direction*	*Floor slabs, vertical direction*
	1Hz to 10Hz	*10Hz to 50Hz*	*50Hz to 100Hz*	*All frequencies*	*All frequencies*
Type 1: Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	20
Type 2: Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
Type 3: Structures that because of their particular sensitivity to vibration, cannot be classified under Type 1 and 2 and are of great intrinsic value (e.g. heritage buildings)	3	3 to 8	8 to 10	8	20

Table 10: DIN 4150.3:2016 Guideline values of vibration velocity (PPV) for evaluating the effects of short-term vibration.

4 NOISE EMISSIONS ASSESSMENT

Noise break-out from the proposed Ambulance Station has the potential to impact on existing noise sensitive receivers. For the purpose of this noise impact assessment, the noise sources are assumed as follows:

- Noise emissions from mechanical plant from the Ambulance Station to the surrounding receivers.
- Noise emissions from traffic generated by the proposed development.
- Noise emissions from wash bay.

Each of these noise sources has been considered in the noise impact assessment. The acoustic assessment has considered the following:

- Noise levels have been considered as continuous over assessment time period to provide the worst-case scenario.
- Distance attenuation, building reflections and directivity.
- Lowest estimated background noise levels at the nearest noise sensitive receiver have been used to provide a worst-case scenario.

4.1 EXTERNAL MECHANICAL PLANT

Noise from the proposed development mechanical plant should be controlled to ensure external noise emissions are not intrusive and do not impact on the amenity of the sensitive receivers.

The mechanical plant will operate continuously during all day periods. At this stage, a preliminary selection of the external mechanical plant has been provided and a noise assessment at the nearest noise sensitive receivers has been carried out based on the noise data from the manufacturers. The selected units and their noise levels are listed below:

- Condenser Unit Daikin REYQ18TAY1 – 62dB(A) @1m (as per manufacturer data sheet)

The following assumptions have been made in the noise assessment:

- The location of the external plant is as per Figure 4.
- The nearest noise sensitive receivers are Glen Innes District Hospital (to the south west), 104 Taylor Street (to the north), Glen Innes Skate Park (to the east) and Glen Innes & District Historical Society (to the south).
- Building reflections and directivity.

The noise assessment of the mechanical plant is summarised in Table 11.

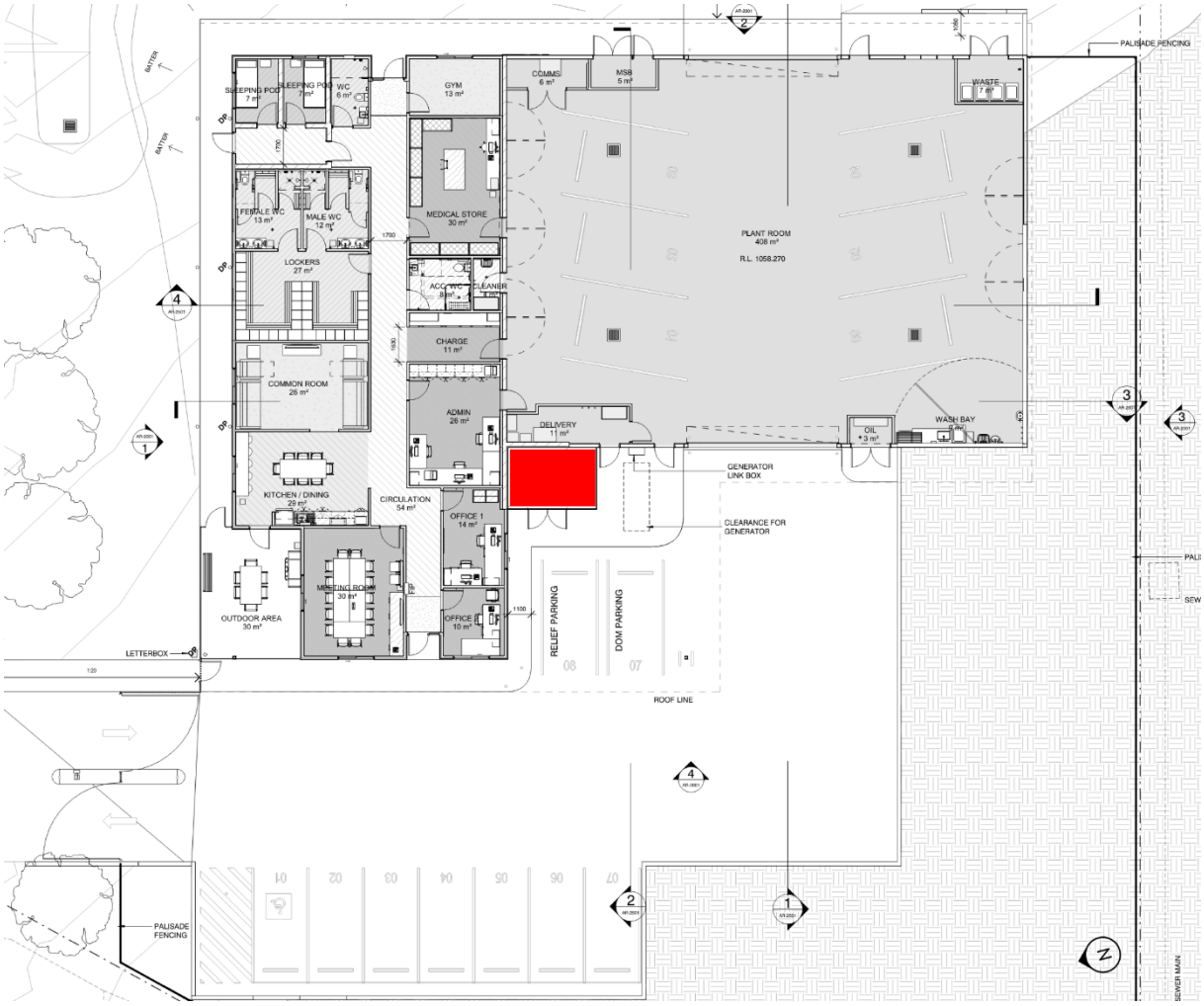

Figure 4. Proposed location of the external mechanical plant (red shadow).

Calculation	Overall A-weighted noise level, in dB(A)			
	District Hospital	104 Taylor Street	Skate Park	District Historical Society
L_{Aeq} CU @1m	71	71	71	71
Distance attenuation, dB	-26	-35	-33	-36
Building attenuation / reflections / directivity, dB	---	-10	-10	---
$L_{Aeq,15min}$ resulting at residential receiver	45	26	28	35
Day-time criteria NPI / Complies?	48 / Yes	55 / Yes	53 / Yes	63 / Yes
Night-time criteria NPI / Complies?	48 / Yes	43 / Yes	53 / Yes	---

Table 11: Noise assessment of external mechanical plant to the nearest noise sensitive receivers.

Based on this assessment and the NSW NPI noise level criteria in Table 5, the mechanical plant will meet the noise level criteria at the nearest noise sensitive receivers.

Usual design noise controls that may need to be implemented will typically include, but are not limited to:

- Strategic location and selection of plant to ensure the cumulative noise level at the receiver boundaries is met.
- Selection of appropriate quiet plant.
- Acoustic noise control measures to be put in place to minimise noise impacts such as:
  - In-duct attenuation
  - Noise enclosures as required
  - Sound absorptive panels
  - Acoustic louvres as required
  - Noise barriers as required

Acoustic assessment of all mechanical plant shall continue during the detailed design phase of the project in order to confirm any noise control measures. If new or replacing external mechanical plant is proposed, then an acoustic assessment of all mechanical plant shall continue during the detailed design phase of the project in order to confirm any noise control measures.

4.2 VEHICLE NOISE EMISSIONS

The potential noise sources associated with the proposed vehicles operations will be:

- Noise generated by vehicles movements, particularly ambulances dispatched for emergencies during night-time.
- Noise generated by ambulance sirens.
- Noise generated by staff vehicles movements.

It is expected that vehicle movements will be moving slowly and the number of vehicles movement will be low compared with the existing traffic flows.

4.2.1 AMBULANCE MOVEMENTS

There is provision for 8 ambulance vehicles within the proposed development. Based on this low number, it is understood that ambulance movements will only slightly increase the traffic flows. Therefore, it can be stated that there will be no significant increase in the existing ambient and background noise levels road traffic as a result of the development.

As noted in Section 4.6.2, when considering land use development and the impact on sensitive land uses the NSW Road Noise Policy (RNP) states that an increase up to 2dB in relation to existing noise levels is anticipated to be insignificant.

Therefore, traffic noise associated with the ambulance movements is expected to meet the NSW RNP recommendations.

4.2.2 AMBULANCE SIRENS

Regarding the use of ambulance sirens on site – when ambulances depart to attend incidents – it is not specifically addressed in relevant regulations. When in use, noise levels from ambulance sirens will be audible at the nearest residential receivers.

Events identified as Priority One events (Life Threating Emergencies), require that warning devices must be used, including warning lights and sirens. The NSW Ambulance *Emergency Driving and Use of Warning Policy Directive 2016-033* states that:

"NSW Ambulance personnel who drive a vehicle under emergency response conditions shall use safety equipment provided by NSW Ambulance for that purpose which includes warning devices: lights and sirens. Lights can be used in isolation without the use of a siren if the driver of the vehicle deems the circumstances are safe to do so and can justify reasonable cause to do so."

Based on the above, it is understood that ambulance drivers will make a judgement call on whether to use ambulance sirens on case-by-case basis. It is further understood that it is the practice of Paramedics to minimise the use of sirens when it will cause a noise disturbance and the sirens are deemed unnecessary.

For reference, Appendix A contains the NSW Ambulance *Emergency Driving and Use of Warning Policy Directive 2016-033*.

4.2.3 STAFF MOVEMENTS

There is provision for 7 staff carparks in the proposed development. Based on this low number, it is understood that staff movements will only slightly increase the traffic flows to the expected traffic levels in the area. Therefore, it can be stated that there will be no significant increase in road traffic as a result of the development due to the additional staff carparks.

As noted in Section 4.6.2, when considering land use development and the impact on sensitive land uses the NSW Road Noise Policy (RNP) states that an increase up to 2dB in relation to existing noise levels is anticipated to be insignificant.

Therefore, traffic noise associated with the development is expected to meet the NSW RNP recommendations.

4.3 AMBULANCE WASH BAY

Based on the architectural layout, the building façade will provide shielding to the nearest noise sensitive receivers. Distance attenuation will further reduce the noise levels. It is expected that the pressure washer will not be used continuously. Therefore, noise levels from the wash bay are anticipated to be in compliance with the noise level criteria and will not impact the nearest noise sensitive receivers.

The internal location of the ambulance wash bay is shown below in Figure 5.

Figure 5. Proposed location of the internal wash bay (red shadow).

It is recommended to restrict pressure washer operations to day-time period whenever possible. As required by the NSW POEO NCR 2008, noise from all power tools, including the pressure washer, shall not be audible within any habitable room in any residential premises outside the proposed hours. The allowed operation time period is between 7am and 8pm Monday to Friday, and between 8am and 8pm on Saturday, Sundays and Public Holidays. Therefore, whenever reasonable, the pressure washer shall only be used during these hours.

5 NOISE INTRUSION

The total noise level within the internal spaces of the proposed development will be a result of the combination of external noise and noise from the building services. Noise generated by building services, particularly the air-conditioning and ventilation systems, needs to be considered to ensure that the internal noise levels for each space of the Ambulance Station meet the ambient noise levels as per NSW Health Infrastructure ESG.

In order to achieve these internal noise levels for each space, noise control treatments will need to be incorporated into the mechanical systems as required. Table 12 outlines the NSW Health Infrastructure ESG Criteria for Continuous Internal Noise Levels.

Area Designation	*Continuous Internal Noise Levels L_{Aeq} dB*	
	Satisfactory	*Maximum*
Dining Room	45	50
Meeting Room	35	40
Private Offices	35	40
Multi Person Office	40	45
Sleep Pod	40	45
Toilets / Showers / Locker Rooms	50	55

Table 12: Continuous Internal Noise Levels (L_{Aeq}) as per NSW Health Infrastructure ESG.

6 CONSTRUCTION NOISE AND VIBRATION PLANNING

Currently a detailed construction program is not yet fully defined. This section of the Construction Noise and Vibration Planning provides general recommendations only and provides applicable criteria together with feasible and reasonable noise and vibration control practices to be observed during the construction of the proposed development.

This preliminary advice in relation to construction noise and vibration management shall form the basis for the Contractor's Construction Noise and Vibration Management Plan (CNVMP) which shall identify any noise criteria exceedance once construction methods and stages are known.

Any noise from demolition and construction activities to be carried out on site must not result in *'offensive noise'* to any noise sensitive receiver. To this end, the Contractor employed to undertake the demolition and/or construction works is responsible for ensuring that any site noise and, in particular, any complaints shall be monitored, investigated, managed and controlled.

6.1 RELEVANT STANDARDS FOR CONSTRUCTION NOISE AND VIBRATION CRITERIA

Section 3.9 of this report contains the relevant legislation, codes and standards in addition to construction noise and vibration criteria for this project.

6.2 CONTROL ELEMENTS

6.2.1 WORKING HOURS

The following construction hours are proposed as follows:

- Monday to Friday: 7am to 6pm.
- Saturday: 8am to 1pm.
- Sundays and Public Holidays: No excavation or construction works.

It is noted that the proposed construction hours are within the recommended NSW EPA hours. Noise control measures are to be implemented during these hours following consultation and engagement with the community.

It is recommended that high noise level works – i.e. piling, excavation, etc – shall be scheduled to not occur during shoulder periods of the recommended standard hours – i.e 7am to 8am and 5pm to 6pm.

A detailed Construction Noise & Vibration Management Plan (CNVMP) shall further assess the noise impact of construction works, and shall include a protocol to minimise any potential noise impacts to identified sensitive receivers, and ensure that appropriate noise control measures are defined and implemented to comply with all relevant noise guidelines.

6.2.2 MITIGATION MEASURES

In order to meet the noise and vibration requirements of the site, the Contractor will be required to engage a qualified acoustic consultant to assist in the compilation of a Construction Noise and Vibration Management Plan, and undertake noise and vibration monitoring for the duration of the project, if required by the CNVMP and / or Conditions of Consent.

6.2.2.1 General Control Elements

As a general rule, minimising noise and vibration should be applied as universal work practice at any time of day, but especially for any construction works to be undertaken at critical times outside normal daytime/weekday periods.

It is noted that the reduction of noise and vibration at the source and the control of the transmission path between the construction site and the receiver(s) are the preferred options for noise minimisation. Providing treatments at the affected receivers should only be considered as a last resort. Construction noise and vibration shall be managed by implementing the strategies listed below:

- *Plant and equipment*. In terms of both cost and results, controlling noise and vibration at the sources is one of the most effective methods of minimising the impacts from any work site activities. Work practices that will reduce noise and vibration at the source include:
  - Employing quieter techniques for all high noise activities such as rock breaking, concrete sawing, and using power and pneumatic tools.
  - Use quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks.
  - Selecting plant and equipment with low vibration generation characteristics.
  - Operate plant in a quietest and most effective manner.
  - Where appropriate, limit the operating noise of equipment.
  - Regularly inspecting and maintain plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively.
- *On site noise management*. Practices that will reduce noise from the site include:
  - Maximising the distance between noise activities and noise sensitive receivers. Strategically locate equipment and plant.
  - Undertaking noisy fabrication work off-site where possible.
  - Avoid the use of reversing beeping alarms or provide for alternative systems, such as broadband reversing alarms.
  - Maintaining any pre-existing barriers or walls on a demolition or excavation site as long as possible to provide optimum sound propagation control.
  - Constructing barriers that are part of the project design early in the project to afford mitigation against site noise.
  - Using temporary site building and material stockpiles as noise barriers. These can often be created using site earthworks and may be included as a part of final landscape design.
  - Installing purpose-built noise barriers, acoustic sheds and enclosures.
- *Work scheduling*. Scheduling work during periods when people are least affected is an important way of reducing adverse impacts. The following scheduling aspects may reduce impacts:
  - Provide respite periods, including restricting very noisy activities to daytime, restricting the number of nights that after-hours work is conducted near residences, or by determining any specific requirements, particularly those needed for noise sensitive receivers.
  - Scheduling activities to minimise impacts by undertaking all possible work during hours that will least adversely affect sensitive receivers and by avoiding conflicts with other scheduled events.
  - Scheduling work to coincide with non-sensitive periods.
  - Scheduling noisy activities to coincide with high levels of neighbourhood noise so that noise from the activities is partially masked and not as intrusive.

  - Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from sensitive receivers.
  - Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours.
  - Designating, designing and maintaining access routes to the site to minimise impacts.
- *Consultation, notification and complaints handling.*
  - Provide information to neighbours before and during construction.
  - Maintain good communication between the community and Project staff.
  - Have a documented complaints process and keep register of any complaints.
  - Give complaints a fair hearing and provide for a quick response.
  - Implement all feasible and reasonable measures to address the source of complaint. Implementation of all reasonable and feasible mitigation measures for all works will ensure that any adverse noise impacts to surrounding receivers are minimised when noise goals cannot be met due to safety or space constraints.

6.2.2.2 Additional Noise and Vibration Control Measures

If, during construction, an item of equipment exceeds either the noise criteria at any location or the equipment noise level limits, the following noise control measures, together with construction best practices, shall be considered to minimise the noise impacts on the neighbourhood.

- Schedule noisy activities to occur outside of the most sensitive times of the day for each nominated receiver.
- Consider implementing equipment-specific screening or other noise control measures recommended in Appendix C of AS 2436:2010.
- Limit the number of trucks on site at the commencement of site activities to the minimum required by the loading facilities on site.
- When loading trucks, adopt best practice noise management strategies to avoid materials being dropped from height into dump trucks.
- Avoid unnecessary idling of trucks and equipment.
- Ensure that any miscellaneous equipment (extraction fans, hand tools, etc.) not specifically identified in the CNVMP incorporates silencing/shielding equipment as required to meet the noise criteria.

Implementation of all reasonable and feasible mitigation measures for all internal works will ensure that any adverse noise impacts to surrounding noise sensitive receivers are minimised when noise goals cannot be met due to safety or space constraints.

7 MANAGEMENT AND COMPLIANCE

Limiting noise nuisance from a premise generally requires management on an ongoing basis. Strategies for the proposed development should consider the following:

- Whenever possible, the pressure washer and other power tools shall be operated between 7am to 8pm during Monday and Friday and between 8am to 8pm on Saturdays, Sundays and Public Holidays.
- Use of ambulance sirens within the Ambulance Station lot and surroundings shall be minimised whenever possible.
- To minimise impact on the surrounding amenity, Waste Collection movements are recommended to occur during the day-time.

8 SUMMARY AND CONCLUSIONS

A noise assessment has been carried out for the proposed development of a RAIR Ambulance Station at 85 Taylor Street Glen Innes, NSW. This report forms part of the documentation package to be submitted to NSW Health Infrastructure as part of the DA / REF application.

This report establishes relevant noise level criteria, details the acoustic assessment and provides comments and recommendations for the proposed development.

The noise assessment has adopted methodology from relevant guidelines, standards and legislation to assess noise impact. The noise impacts have been predicted at the nearest noise sensitive receiver boundaries, taking in account distance attenuation, building reflections and directivity.

At this stage, a preliminary selection of the external mechanical plant has been provided and a noise assessment at the nearest noise sensitive receivers has been carried out based on noise data from the manufacturers. Based on the assessment results, the mechanical plant will meet the noise level criteria at the nearest noise sensitive receivers. If new or replacing external mechanical plant is proposed, then an acoustic assessment of all mechanical plant shall continue during the detailed design phase of the project in order to confirm any noise control measures.

Existing ambient and background noise levels will not be significantly increased by vehicle movements from the Ambulance Station as there will only be any additional 8 Ambulance vehicles and 7 staff carpark spaces. For noise from ambulance sirens, it is recommended that their operation within the development and surroundings shall be addressed in the Management Plan and minimised whenever possible.

Wash bay operations are expected to comply with the relevant noise criteria as it is proposed within the ambulance plantroom and, therefore, the building façade will offer shielding to the nearest noise sensitive receivers. It is expected that the pressure washer will not impact the nearest noise sensitive receivers. However, it is recommended to restrict its use to 7am to 8pm during Monday to Friday and 8am and 8pm on Saturdays, Sundays and Public Holidays whenever reasonable.

Preliminary construction noise and vibration management planning has been presented in this report and recommendations based on the relevant guidelines are provided. If, during construction works, an item of equipment exceeds the stated airborne noise and / or vibration criteria at any sensitive location, the additional noise / vibration control measures presented in this report or in the CNVMP, together with construction best practices, shall be considered to minimise noise and vibration impacts on the sensitive receivers.

The information presented in this report shall be reviewed if any modifications to the features of the development specified in this report occur, including and not restricted to selection of mechanical plant, modifications to the building and introduction of any additional noise sources.

Based on the information presented in this report, relevant objectives will be satisfied and therefore approval is recommended to be granted.

APPENDIX A: NSW AMBULANCE – EMERGENCY DRIVING AND USE OF WARNING DEVICES POLICY DIRECTIVE (PD2016-033)

NSW Ambulance

POLICY DIRECTIVE

EMERGENCY DRIVING AND USE OF WARNING DEVICES POLICY DIRECTIVE

Document No.	PD2016-033
File No.	16/623 (D16/23847)
Date issued	13 January 2017
Contents	**Policy Directive** Policy Directive - Emergency Driving and Use of Warning Devices
	Attachments Nil
Directorate	Service Delivery
Author Branch	Service Delivery
Branch Contact	Executive Staff Officer 9320 7873
Summary	The purpose of this policy is to outline the correct use of warning devices for all operational staff.
Applies to	All NSW Ambulance operational staff
Review Date	February 2022
Previous Reference	SOP2014-001
Status	Active
Approved by	Chief Executive

Related Documents

- Australian Road Rules Part 19 Rule 306 – Exemptions for Drivers of Emergency Vehicles
- Roads & Traffic Authority Vehicle Standards Information 10.366 Cat No. 45070588 Rev. 4.1
- SOP2013-015 Self Responding to Incidents Policy
- NSW Work Health and Safety Act 2011
- SOP2013-014 Dispatch – Emergency Response Standards Policy
- Fleet Manual Policy Directive PD2016-034
- Fleet Manual Operating Procedure PRO2016-039

Compliance with this work instruction is **mandatory**

Emergency Driving & Use of Warning Devices Policy Directive

1. Background

This policy directive has been created to minimise risk to operational personnel and the Public and to ensure legal compliance under Road Traffic Act 1909 No. 5 and The Australian Road Rules 2008 whilst engaged in emergency response driving.

NSW Ambulance personnel driving a NSW Ambulance vehicle under emergency response conditions can claim exemptions in certain circumstances. Specifically the driver must be able to prove, in the circumstances:

- they were taking reasonable care; and
- it was reasonable that the rule should not apply; and
- If the vehicle is a motor vehicle that is moving - the vehicle is displaying a blue or red flashing light and sounding an alarm. Alternatively, displaying a blue or red flashing light only.

The Australian Road Rules refer to the driver of any emergency vehicle, where it is expedient and safe to do so, may:

- Drive in any direction on part of a public street or overtake or pass on either side of another vehicle, but only with due care
- Stop, leave standing or park the emergency vehicle at any time or place
- Exceed the speeds prescribed by the Traffic Act 1909 No. 5 only when safe to do so

2. Use Of Warning Devices

When driving a NSW Ambulance vehicle under emergency response conditions, the driver shall:

- Be solely responsible for the vehicle and afford maximum safety of its occupants and any other road users, at all times.
- Comply with requirements of the Traffic Act 1909 No. 5 and Australian Road Rules 2008.
- Drive at a speed and manner appropriate to traffic, road and prevailing weather conditions.
- Drive in a professional manner at all times.
- Not proceed through a railway or tram crossing when the warning signals are in operation unless directed to do so by an authorised person.

- Wear a seat belt at all times. Seat belts must be worn at all times in the rear patient compartment unless immediate lifesaving intervention is required.
- Not enter an intersection or junction that is controlled by a traffic sign, light or other road marking, at a speed where the driver cannot stop the vehicle in order to avoid a crash or causing a crash.
- On approach to a traffic light controlled intersection faced with a red light, the driver must slow down and stop if necessary until all other traffic has completely stopped. Once all other traffic has stopped, and it is safe to do so, enter and proceed through the intersection with caution.
- Particular care must be exercised when transiting through school zones as the unpredictability of children; especially at the sight of an emergency vehicle approaching is heightened.

2.1 Category One response

- NSW Ambulance personnel who drive a vehicle under emergency response conditions shall use safety equipment provided by NSW Ambulance for that purpose which includes warning devices: lights and sirens. Lights can be used in isolation without the use of a siren if the driver of the vehicle deems the circumstances are safe to do so and can justify reasonable cause to do so.
- Blue or red flashing lights shall be activated at the commencement of all emergency drives. Blue or red flashing lights shall remain active when parked at the emergency scene, unless parked in a position that affords maximum safety without the need to display the lights.
- Where the highest clinical level paramedic responsible for the patient decides that the patient's condition warrants the use of emergency driving procedures during transfer (this decision must be communicated to the control centre immediately).
- A crew decision to upgrade the response in order to expedite to a location as described in SOP2013-014 for priority two (2) incidents (this decision must be communicated to the control centre immediately).
- The siren should be considered on the approach to any hazard, in particular:
    - Physical hazards such as junctions, roundabouts, bends or hill crests
    - Those created by the presence, position or movement of other road users
- Deactivation of the siren during an emergency drive should only be considered if the driver can justify reasonable cause to do so, there is no benefit to be gained from the use of the siren and there is no compromise to the safety of other road users.
- The driver's decision to use all warning devices will always be supported by NSW Ambulance should a complaint be received due to noise made when responding to an emergency

- When exceeding the prescribed speed limit:
  - Drive so that you are able to stop safely in the distance you can see to be clear
  - Drive at a speed which is appropriate to the conditions
  - Remember if you double your speed, quadruple your stopping distance
  - No emergency is so great to justify an accident

3. COLLISION

Personnel involved in a collision must:

- Stop at the scene
- Notify control immediately
- Ensure safety of personnel
- Give all possible assistance to any person involved in the incident
- If extra resources are needed, notify control
- Give all "required particulars" to:
  - any other driver (or that driver's representative) involved in the collision; and
  - any other person involved who is injured (or that person's representative)
  - the owner of any property (including any vehicle) damaged in the collision (or the owner's representative), unless, in the case of damage to a vehicle, the particulars are given to the driver of the other vehicle
- The driver's responsibility
  - the driver must give the driver's required particulars, within the required time, to a police officer; that is not more than 90 minutes after the collision
  - present himself or herself to a police officer at the scene of the collision or at a police station for the purpose of providing particulars of the collision
  - submit to any requirement to undertake a test relating to the presence of alcohol or a drug in his or her blood or oral fluid

4. SELF RESPONDING

It is an organisational mandate that no self-responding to incidents is to occur, however, operational managers and on road supervisors may initiate a response within their geographic area of responsibility provided appropriate notification is given to the control centre so that a tasking record can be produced.

REVISION HISTORY

Version (Document #)	Amendment notes
12/2016 (PD2016-033)	Policy transferred to new template nil changes made
10 April 2014 (SOP2014-001	Endorsed by Chief Executive. Updating of SOP to make requirement of using warning devices (lights / sirens) as AND / OR + examples of when one or the other might be used as opposed to both. Change to recognise that an Operational Manager can instigate a response to an incident but must advise the Control Centre
5 September 2012 (SOP2012-018)	Endorsed by the Chief Executive

Summary of Mitigation Measures

Aspect	Mitigation measure	Timing
Soils and Geology	• Implement the recommendations contained in the Geotechnical Investigation Report prepared by JK Geotechnics; • Erosion and sediment controls would be implemented in accordance with the Landcom/ Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) and ensure any water diversion or control outlets associated with the site compound/ stockpile do not result in scouring; • The Stormwater Management Plan, including sediment and erosion notes and conditions would be implemented in accordance with The Civil Engineering Design Report by Meinhardt Bonacci; • Works would only commence once all erosion and sediment controls have been established. The controls would be maintained in place until the works are complete, and all exposed erodible materials are stable; • Erosion and sedimentation controls would be checked and maintained (including clearing of sediment from behind barriers) on a regular basis (including after any precipitation events) and records kept and provided on request; • All sediment control measures would be checked and repaired or re-installed (if required) if heavy rainfall was forecast; • Imported materials would be sourced as clean fill from an approved site; and • Disturbance of natural sediments and vegetation would be minimised.	Prior to Commencement of Works/During Construction
Hazardous Materials and Contamination	• Storage and handling of material shall be in accordance with AS1940 The Storage and Handling of Flammable and Combustible Liquids, SafeWork NSW Code of Practice - Managing Risks of Hazardous Chemicals at Workplaces, *Protection of the Environment Operations Act 1997* and *Work Health and Safety Act* and Regulations 2011. • A spill containment kit would be available at all times. All personnel would be made aware of the location of the kit and trained in its effective deployment. • Any hazardous materials would be handled, managed, transported, and disposed of according to applicable regulations, including WH&S and EPA waste protocols. • The Stormwater Management Plan, including sediment and erosion notes and conditions would be implemented in accordance with the Civil Engineering Design Report by Meinhardt Bonacci; • As part of the implementation of unexpected finds protocol, a suitably qualified contaminated land consultant should be engaged to inspect the site during development works in the event that there are unexpected finds. Unexpected finds may include stained or odorous soil, and/or fill that appears different to that recorded on the borehole or test pit logs and that has other indicators of contamination such as fibre cement, ash or slag etc. Where an inspection is	Prior to Commencement of Works/During Construction/ Undertaking of Work

Aspect	Mitigation measure	Timing
	triggered, a letter should be prepared by the consultant to document the findings of the inspection(s) and provide further commentary on assessing/managing potential contamination and the unexpected find. The following should be implemented in the event of an unexpected find: - All work in the immediate vicinity should cease, and the contaminated land consultant should be contacted immediately to inspect and document the find. The project manager/client must also be contacted and advised of the find; - Temporary barricades should be erected to isolate the area; - The consultant should develop and implement a strategy to assess the issue and provide guidance on the appropriate course of action; - Review and update the waste classification for the off-site disposal of the suspect material; and - Any actions should be implemented and validated to demonstrate that there are no unacceptable risks to the receptors.	
Hydrology, Flooding and Water Quality	• The erosion and sediment control measures for the site will be implemented during construction. The design of these measures is to be in accordance with the Landcom “Blue Book”. These will include: - A sediment fence. - Temporary access to site with shaker pad. - An indicative stockpile area with sediment fence around it during construction. - Geotextile inlet pit filters or sandbags to be placed around existing stormwater pits.	Prior to Commencement of Works
Ecology	• Trees identified for retention will be protected during construction in accordance with the Arboricultural Impact Assessment prepared by Civica (May 2022). • Landscaping of the site will be carried out in accordance with the plans prepared by Site Image Landscape Architects (Project No. SS22-4920 June 2022). • All trees to be removed shall be replaced on site on a 1:1 basis with appropriate native species of similar size to the tree being removed.	During Construction/Prior to Commencement of Operation
Traffic, Access and Parking	• A Traffic Control Plan (TCP) shall be prepared by a suitably qualified person and implemented for the works in accordance with the requirements of the Traffic Control at Worksites Manual (RTA 2010 V4) and AS1742.3. Licensed traffic controllers will assist with traffic control during the Project. • Where possible, current traffic movements will be maintained during the works. • Regard to public safety will be maintained at all times.	Prior to Commencement of Works/During Construction/ Undertaking of Work

Aspect	Mitigation measure	Timing
	• Appropriate signage will be erected and details will be confirmed by appropriate Project personnel responsible for site safety during the development. • Traffic delay notifications will be issued to Council at least two weeks prior to commencement of works requiring full or partial road closure. An Access Management Plan shall be prepared to manage internal site traffic and pedestrian movements to ensure the safety of workers and public within the site. • Neighbouring residents and property owners are to be informed in writing at least two weeks prior with respect to any changes to pedestrian movements and parking restrictions associated with the development.	
Noise and Vibration	• The following construction hours are proposed as follows: - Monday to Friday: 7am to 6pm. - Saturday: 8am to 1pm. - Sundays and Public Holidays: No excavation or construction works. Noise control measures are to be implemented during these hours in accordance with the approved construction noise and vibration management plan. High noise level works – i.e. piling, excavation, etc – should be scheduled to not occur during shoulder periods of the recommended standard hours – i.e. 7 am to 8 am and 5 pm to 6 pm. • A detailed Construction Noise and Vibration Management Plan (CNVMP) is to be prepared to further assess the noise impact of construction works, include a protocol to minimise any potential noise impacts to identified sensitive receivers, and to ensure that appropriate noise control measures are defined and implemented to comply with all relevant noise guidelines. In order to meet the noise and vibration requirements for the site, the Contractor will be required to engage a qualified acoustic consultant to assist in the compilation of a Construction Noise and Vibration Management Plan (CNVMP) and undertake noise and vibration monitoring for the duration of the project, if • Plant and equipment: - Employing quieter techniques for all high noise activities such as rock breaking, concrete sawing, and using power and pneumatic tools. - Use quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks. - Selecting plant and equipment with low vibration generation characteristics. - Operate plant in a quietest and most effective manner. - Where appropriate, limit the operating noise of equipment.	Prior to Commencement of Works/During Construction/ Undertaking of Work/During operation

Aspect	Mitigation measure	Timing
	- Regularly inspecting and maintain plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively. • On site noise management: - Maximising the distance between noise activities and noise sensitive receivers. Strategically locate equipment and plant. - Undertaking noisy fabrication work off-site where possible. - Avoid the use of reversing beeping alarms or provide for alternative systems, such as broadband reversing alarms. - Maintaining any pre-existing barriers or walls on a demolition or excavation site as long as possible to provide optimum sound propagation control. - Constructing barriers that are part of the project design early in the project to afford mitigation against site noise. - Using temporary site building and material stockpiles as noise barriers. These can often be created using site earthworks and may be included as a part of final landscape design. - Installing purpose-built noise barriers, acoustic sheds and enclosures. • Work scheduling: - Provide respite periods, including restricting very noisy activities to daytime, restricting the number of nights that after-hours work is conducted near residences, or by determining any specific requirements, particularly those needed for noise sensitive receivers. - Scheduling activities to minimise impacts by undertaking all possible work during hours that will least adversely affect sensitive receivers and by avoiding conflicts with other scheduled events. - Scheduling work to coincide with non-sensitive periods. - Scheduling noisy activities to coincide with high levels of neighbourhood noise so that noise from the activities is partially masked and not as intrusive. - Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from sensitive receivers. - Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours. - Designating, designing and maintaining access routes to the site to minimise impacts. • Consultation, notification and complaints handling:	

Aspect	Mitigation measure	Timing
	- Provide information to neighbours before and during construction. - Maintain good communication between the community and Project staff. - Have a documented complaints process and keep register of any complaints. - Give complaints a fair hearing and provide for a quick response. - Implement all feasible and reasonable measures to address the source of complaint. Implementation of all reasonable and feasible mitigation measures for all works will ensure that any adverse noise impacts to surrounding receivers are minimised when noise goals cannot be met due to safety or space constraints. • If, during construction, an item of equipment exceeds either the noise criteria at any location or the equipment noise level limits, the following noise control measures, together with construction best practices, shall be considered to minimise the noise impacts on the neighbourhood. - Schedule noisy activities to occur outside of the most sensitive times of the day for each nominated receiver. - Consider implementing equipment-specific screening or other noise control measures recommended in Appendix C of AS 2436:2010. - Limit the number of trucks on site at the commencement of site activities to the minimum required by the loading facilities on site. - When loading trucks, adopt best practice noise management strategies to avoid materials being dropped from height into dump trucks. - Avoid unnecessary idling of trucks and equipment. - Ensure that any miscellaneous equipment (extraction fans, hand tools, etc.) not specifically identified in the CNVMP incorporates silencing/shielding equipment as required to meet the noise criteria. • Whenever possible, the pressure washer and other power tools shall be operated between 7am to 8pm during Monday and Friday and between 8am to 8pm on Saturdays, Sundays and Public Holidays. • Use of ambulance sirens within the Ambulance Station lot and surroundings should be minimised whenever possible and their operation addressed in the Management Plan. • To minimise impact on the surrounding amenity, Waste Collection movements are recommended to occur during the day-time.	
Air Quality and Energy	• No materials will be burnt on site. • Vehicles transporting waste or other materials that may produce dust will be covered during transportation.	During Construction/ Undertaking of Work

Aspect	Mitigation measure	Timing
	• Vehicles, machinery and equipment will be maintained in accordance with manufacturer's specifications in order to meet the requirements of the *Protection of the Environment Operations Act 1997* and associated regulations. • Vehicles and equipment will be switched off when not operating. • Debris and waste will be immediately collected into appropriate storage facilities and removed from the site as soon as practical to ensure light-weight material is not dispersed by wind gusts. • Stockpiles and exposed soils will be covered or dampened to reduce incidence of air dispersal. • Appropriate practices are to be in place to minimise dust that could be dispersed during excavation. • New fixtures and fittings would meet relevant energy efficiency standards.	
Non-Aboriginal Heritage	• The stop work provision should be applied in line with the requirements of the *NSW Heritage Act* 1977 if any unexpected archaeological both historical and Aboriginal find be exposed during construction and earthworks. An appropriately qualified heritage professional and an archaeologist should be engaged to assess the finds and advise on their management.	During Construction
Aboriginal Heritage	• All personnel working on site would receive induction on their responsibilities under the *NPW Act*; and • If Aboriginal cultural material is identified on site, a Stop Work Procedure will be followed, which includes: - Works will cease immediately. - A temporary exclusion zone established. - CVC project manager and Local Aboriginal Land Council will be contacted immediately. • Heritage NSW contacted immediately.	Prior to Commencement of Works/During Construction
Visual Amenity	• Upon completion of construction, any works areas would be restored to an acceptable visual state. • The construction worksite would be maintained, kept free of rubbish and cleaned up at the end of each workday.	During Construction/Undertaking of Work
Land Uses and Services	• Any potential services interruptions shall be communicated to the relevant services authorities to enable flow on notifications to any affected services customers.	During Construction/Undertaking of Work
Waste Generation	• Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each construction day. • Waste material is not to be left on site once the works have been completed.	During Construction/Undertaking of Work/During operation

Aspect	Mitigation measure	Timing
	• The working areas will accommodate separate bins and other waste storage structures to cater for waste streams required to foster waste avoidance and resource recovery. • Operation of the ambulance station will be undertaken in accordance with the NSW Health Policy Clinical and Related Waste Management for Health Services.	
Community Impact/ Social Impact	• HI and project staff shall monitor DPIE's major projects register and Glen Innes Severn Council's Development Application tracker for any significant developments that may occur locally and with potential to coincide with the activity construction period. • Where required project staff will undertake pre-construction review and liaison with other development sites to co-ordinate works and minimise impacts (e.g. delivery times, parking).	During Construction/Undertaking of Work

GLEN INNES SEVERN COUNCIL

PO Box 61, Glen Innes, 2370
Ph: 02 6730 2350

PLANNING CERTIFICATE

Issued under Section 10.7(2) of the
Environmental Planning and Assessment Act 1979, as amended

APPLICANT DETAILS		***CERTIFICATE DETAILS***	
Geolink PO Box 1466 COFFS HARBOUR NSW 2450		***Certificate Number:***	409/21-22
		Certificate Date:	5 May 2022
PROPERTY DETAILS		***Your Reference:***	GEO3730
Property Details:	85 Taylor Street Glen Innes	***Fee:***	$53.00
Legal Description:	Lot 2 DP1208729	***Receipt Number:***	125964

1 Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

Glen Innes Severn Local Environmental Plan 2012 – Gazetted 14 September 2012.

For a list of all State Environmental Planning Policies applicable to this land refer to Annexure 1.

(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified the Council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

There are no current draft planning proposals for the Glen Innes Severn local government area.

(3) The name of each development control plan that applies to the carrying out of development on the land.

Glen Innes Severn Development Control Plan 2014.

***Please Note**: A full copy of the Glen Innes Severn Development Control Plan 2014 is available from Council, or alternatively is available from Council's website – www.gisc.nsw.gov.au.*

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

There are no current draft planning proposals for the Glen Innes Severn local government area.

2 Zoning and land use under relevant LEPs

For each local environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP).

(a) the identity of the zone, whether by reference to a name (such as "Residential Zone" or "Heritage Area") or by reference to a number (such as "Zone No 2 (a)"),

Current Zone under Glen Innes Severn Local Environmental Plan 2012:

Zone R1 General Residential

Objectives of zone

- To provide for the housing needs of the community.
- To provide for a variety of housing types and densities.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.

(b) the purposes for which the instrument provides that development may be carried out within the zone without the need for development consent,

Environmental protection works; Home-based child care; Home occupations

(c) the purposes for which the instrument provides that development may not be carried out within the zone except with development consent,

Attached dwellings; Boarding houses; Building identification signs; Business identification signs; Child care centres; Community facilities; Dwelling houses; Group homes; Home industries; Hostels; Multi dwelling housing; Neighbourhood shops; Places of public worship; Plant nurseries; Residential flat buildings; Respite day care centres; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Waste or resource transfer stations; Any other development not specified in item 2 or 4

(d) the purposes for which the instrument provides that development is prohibited within the zone,

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Backpackers' accommodation; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Car parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Extractive industries; Farm buildings; Farm stay accommodation; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Industrial retail outlets; Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Public administration buildings; Recreation facilities (major); Registered clubs; Research stations; Restricted premises; Rural industries; Rural workers' dwellings; Service stations; Sewage treatment systems; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water recycling facilities; Water treatment facilities; Wholesale supplies

(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed,

The development standards applying to minimum lot size are listed in the *Glen Innes Severn Local Environmental Plan 2012. Clause 4.1 – Minimum subdivision lot size* applies to any land shown on the Lot Size Map.

The land to which this certificate applies is shown on the Lot Size Map as having a minimum **lot size of 450m^2.**

(f) whether the land includes or comprises critical habitat,

No, however the property may be affected by other threatened species matters. Separate enquiries should be made to the Department of Environment, Climate Change and Water.

(g) whether the land is in a conservation area (however described),

No

(h) whether an item of environmental heritage (however described) is situated on the land.

Yes – This land shown is adjoining a parcel on the Heritage Map and is listed in Schedule 5 under the *Glen Innes Severn Local Environmental Plan 2012* as being in an item of environmental heritage being the Land of the Beardies Museum (formerly Hospital complex) being Lot 1 DP1208729

Please Note: *A full copy of the Glen Innes Severn Local Environmental Plan 2012 (as amended) is available from Council, or alternatively is available from the NSW Government's legislation website –*

http://www.legislation.nsw.gov.au/ or Council's web site – www.gisc.nsw.gov.au

Applicants should refer to the Glen Innes Severn Local Environmental Plan 2012 and the Glen Innes Severn Development Control Plan 2008 for further details of local development controls applicable to the property.

2A Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the SEPP), or

(b) A Precinct Plan (within the meaning of the 2006 SEPP), or

(c) A proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act,

The particulars referred to in clause 2(a)-(h) in relation to that land (with a reference to "the instrument" in any of those paragraphs being read as a reference to part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).

Not applicable to this property.

3 Complying development

(1) Whether or not the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (c) and (d) and 1.19 of that Policy of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) If complying development may not be carried out on that land because of the provisions of clauses 1.17A (c) and (d) and 1.19 of that Policy, the reasons why it may not be carried out under that clause.

The State Environmental Planning Policy (Exempt and Complying Development Codes) Clause 1.17A and Clause 1.19 Considerations

Complying development under the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*, **may not** be carried out on the land as the land is subject to one or more of the following categories as identified in either clause 1.17A or 1.19 of that Policy:

Clause 1.17A

3. Land that comprises, or on which there is, an item of environmental heritage that:

(ii) is an item of environmental heritage in an environmental planning instrument,

General Housing Code

Complying development under the General Housing Code **may not** be carried out on the land as the land is affected by specific land exemptions as identified in clause 1.17A and clause 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Rural Housing Code

Complying development under the Rural Housing Code **may not** be carried out on the land as the land is not in a specified zone RU1, RU3 and R5.

Housing Alterations Code

Complying development under the Housing Alterations Code **may not** be carried out on the land as the land is affected by specific land exemptions as identified in clause 1.17A and clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

General Development Code

Complying development under the General Development Code **may not** be carried out on the land as the land is affected by specific land exemptions as identified in clause 1.17A and clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Commercial and Industrial Code

Complying development under the General Commercial and Industrial Code **may not** be carried out on the land as the land is affected by specific land exemptions as identified in clause 1.17A and clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Commercial and Industrial (New Building and Additions) Code

Complying development under the Commercial and Industrial Alterations Code **may not** be carried out on the land as the land is affected by specific land exemptions as identified in Clause 5A.1 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code **may not** be carried out on the land as the land is not in a specified zone B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3.

Subdivisions Code

Complying development under the Subdivisions Code **may** be carried out on the land.

Demolition Code

Complying development under the Demolition Code **may** be carried out on the land.

Fire Safety Code

Complying development under the Fire Safety Code **may** be carried out on the land.

4 Coastal protection

Whether or not the land is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Public Works.

Not Applicable to this property.

4A Certain information relating to beaches and coasts

(1) Whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of the Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

(2) (a) whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of the Act) have been placed on the land (or on public land adjacent to that land), and

(b) if works have been so placed – whether council is satisfied that the works have been removed and the land restored in accordance with that Act.

(3) Such information (if any) as is required by the regulations under section 56B of the Coastal Protection Act 1979 to be included in the planning certificate and of which council has been notified pursuant to those regulations.

Not Applicable to this property.

4B Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 196B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Note: *"Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.*

Not Applicable to this property.

5 Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

No

6 Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under:

(a) Division 2 of Part 3 of the Roads Act 1993, or

For information please consult with the Roads and Maritime Services and / or your title deeds.

(b) any environmental planning instrument, or

No

(c) any resolution of the council.

No

7 Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(a) adopted by the council, or

No

(b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council.

No

7A Flood related development controls information

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.

No

(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls.

No

8 Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 make provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

No.

9 Contributions plans

The name of each contributions plan applying to the land.

Glen Innes Severn Section 94A Contributions Plan.

Please Note: *For further details please see Council's website – www.gisc.nsw.gov.au.*

9A Biodiversity certified land

If the land biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995 relates.

No.

10 Biobanking agreements

If the land is land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates, a statement to that effect (but only if the council has been notified of the existence of an agreement by the Director-General of Heritage NSW).

No

10A Native vegetation clearing set asides

If the land contains a set aside area under section 60ZC of the Local Land Services Act 2013, a statement to that effect (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section).

Council has not been notified that this land is affected by a set aside area under the *Local Land Services Act 2013.*

11 Bush fire prone land

If any of the land is bush fire prone land (as defined in the Act), a statement that all or, as the case may be, some of the land is bush fire prone land.

If none of the land is bush fire prone land, a statement to that effect.

The land is not identified in the certified Bush Fire Prone Land map for the Glen Innes Severn area.

12 Property vegetation plans

If the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies, a statement to that effect (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act).

Council has not been notified that this land is affected by a property vegetation plan under the *Native Vegetation Act 2003*.

13 Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land (but only if the council has been notified of the order).

No.

14 Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.

No such direction applies to the land.

15 Site compatibility certificates and conditions for seniors housing

If the land is land to which State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 applies:

(a) a statement of whether there is a current site compatibility certificate (of which the council is aware), issued under clause 25 of that Policy in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(i) the period for which the certificate is current, and

(ii) that a copy may be obtained from the head office of the Department of Planning & Infrastructure, and

(b) a statement setting out any terms of a kind referred to in clause 18 (2) of that Policy that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.

Not applicable to this property.

16 Site compatibility certificates for infrastructure

A statement of whether there is a valid site compatibility certificate (of which the council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(a) the period for which the certificate is valid, and

(b) that a copy may be obtained from the head office of the Department of Planning & Infrastructure.

Not applicable to this property.

17 Site compatibility certificates for conditions for affordable rental housing

(1) A statement of whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:

(a) the period for which the certificate is valid, and

(b) that a copy may be obtained from the head office of the Department of Planning & Infrastructure.

Council is not aware of a site compatibility certificate for affordable rental housing being applicable to this property.

(2) A statement setting out any terms of a kind referred to in clause 17(1) or 38(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

Not applicable to this property.

18 Paper Subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

Not applicable to this property.

(2) The date of any subdivision order that applies to the land.

Not applicable to this property.

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

Not applicable to this property.

19 Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:

(a) the matter certified by the certificate, and

Note. A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

(b) the date on which the certificate ceases to be current (if any), and

(c) that a copy may be obtained from the head office of the Department.

Council is not aware of a site verification certificate being applicable to this property.

20 Loose-fill asbestos insulation

If the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division, a statement to that effect.

Council is not aware of any residential premises *(within the meaning of Division 1A of Part 8 of the Home Building Act 1989) applicable to this property being listed on the register.*

21 Affected building notices and building product rectification orders

(1) A statement of whether there is any affected building notice of which the council is aware that is in force in respect of the land

Council is not aware of any affected building notice applicable to this property being listed on the register.

(2) A statement of:

(a) Whether there is any building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with, and

(b) Whether any notice of intention to make a building product rectification order of which the council is aware has been given in respect of the land and is outstanding

(3) **In this clause:**

Affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017

Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017

(a) Council is not aware of any building product rectification order that is in force in respect of the land and that has not been fully complied with.

(b) Council is not aware of any notice of intention to make a building rectification order in respect of the land and that is outstanding.

ADDITIONAL MATTERS TO BE SPECIFIED IN PLANNING CERTIFICATE

Additional matters are pursuant to Schedule 4 of the

Environmental Planning And Assessment Regulation 2000, as amended

Contaminated Land Management Act 1997

The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:

(a) ***that the land to which the certificate relates is significantly contaminated land within the meaning of that Act—if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,***

Not Applicable

(b) ***that the land to which the certificate relates is subject to a management order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,***

Not Applicable

(c) ***that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act—if it is the subject of such an approved proposal at the date when the certificate is issued,***

Not Applicable

(d) ***that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,***

Not Applicable

(e) ***that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act—if a copy of such a statement has been provided at any time to the local authority issuing the certificate.***

Not Applicable

Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009

Section 26 of this Act provides that advice about any exemption under section 23 or authorisation under section 24 of that Act is to be included in this certificate, if the council is provided with a copy of the exemption or authorisation by the Co-ordinator General under that Act.

Not Applicable to this Property

Kathleen Taminiau
Town Planner

Date: 5 May 2022

ANNEXURE 1

STATE ENVIRONMENTAL PLANNING POLICIES APPLICABLE AT DATE OF ISSUE OF THIS CERTIFICATE

(INFORMATION IS PROVIDED TO EXTENT THAT COUNCILHAS BEEN NOTIFIED BY THE NSW DEPARTMENT OF PLANNING & INFRASTRUCTURE)

SEPP (Affordable Rental Housing) 2009
The aims of this Policy are as follows—
(a) to provide a consistent planning regime for the provision of affordable rental housing,
(b) to facilitate the effective delivery of new affordable rental housing by providing incentives by way of expanded zoning permissibility, floor space ratio bonuses and non-discretionary development standards,
(c) to facilitate the retention and mitigate the loss of existing affordable rental housing,
(d) to employ a balanced approach between obligations for retaining and mitigating the loss of existing affordable rental housing, and incentives for the development of new affordable rental housing,
(e) to facilitate an expanded role for not-for-profit-providers of affordable rental housing,
(f) to support local business centres by providing affordable rental housing for workers close to places of work,
(g) to facilitate the development of housing for the homeless and other disadvantaged people who may require support services, including group homes and supportive accommodation.

SEPP Building Sustainability Index: BASIX 2004
This SEPP operates in conjunction with *Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004* to ensure the effective introduction of BASIX in NSW. The SEPP ensures consistency in the implementation of BASIX throughout the State by overriding competing provisions in other environmental planning instruments and development control plans, and specifying that SEPP 1 does not apply in relation to any development standard arising under BASIX. The draft SEPP was exhibited together with draft *Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004*.

SEPP (Exempt and Complying Development Codes) 2008
This policy commences from 27 February 2009. It aims to provide streamlined assessment processes for development that complies with specified development standards by:
(a) providing exempt and complying development codes that have State-wide application, and
(b) identifying, in the General Exempt Development Code, types of development that are of minimal environmental impact that may be carried out without the need for development consent, and
(c) identifying, in the General Housing Code, types of complying development that may be carried out in accordance with a complying development certificate as defined in the *Environmental Planning and Assessment Act 1979*, and
(d) enabling the progressive extension of the types of development in this Policy, and
(e) providing transitional arrangements for the introduction of the State-wide codes, including the amendment of other environmental planning instruments.

SEPP (Housing for Seniors or People with a Disability) 2004
Aims to increase the supply and choice of housing for older people or people with a disability. Such housing is permitted, with council consent, wherever houses, flats, hospitals or certain 'special uses' are permitted in or adjoining urban areas, except for some environmentally sensitive lands. The policy contains development standards and matters a council and the Department of Planning & Infrastructure must consider when determining development applications. For example, future residents must have reasonable access to services they require, taking into account convenience, affordability and the type and scale of housing. Relevant Government Circulars should be read in conjunction with this Policy.

SEPP (Infrastructure) 2007

Provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. The SEPP supports greater flexibility in the location of infrastructure and service facilities along with improved regulatory certainty and efficiency.

SEPP Koala Habitat Protection 2020
Encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range. The policy applies to 107 local government areas. Local councils cannot approve development in an area affected by the policy without an investigation of core koala habitat. The policy provides the state-wide approach needed to enable appropriate development to continue, while ensuring there is ongoing protection of koalas and their habitat.

SEPP (Mining, Petroleum Production and Extractive Industries) 2007
This Policy aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State. The Policy establish appropriate planning controls to encourage ecologically sustainable development.

SEPP No. 21 – Caravan Parks
The aim of this Policy is to encourage—
(a) the orderly and economic use and development of land used or intended to be used as a caravan park catering exclusively or predominantly for short-term residents (such as tourists) or for long-term residents, or catering for both, and
(b) the proper management and development of land so used, for the purpose of promoting the social and economic welfare of the community, and
(c) the provision of community facilities for land so used, and
(d) the protection of the environment of, and in the vicinity of, land so used.

SEPP No. 33 - Hazardous and Offensive Development
Provides new definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The new definitions enable decisions to approve or refuse a development to be based on the merit of proposal. The consent authority must careful consider the specifics the case, the location and the way in which the proposed activity is to be carried out. The policy also requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy. For example, any application to carry out a potentially hazardous or potentially offensive development is to be advertised for public comment, and applications to carry out potentially hazardous development must be supported by a preliminary hazard analysis (PHA). The policy does not change the role of councils as consent authorities, land zoning, or the designated development provisions of the Environmental Planning and Assessment Act 1979.

SEPP No. 36 - Manufactured Home Estates
Helps establish well-designed and properly serviced manufactured home estates (MHEs) in suitable locations. Affordability and security of tenure for residents are important aspects. The policy applies to Gosford, Wyong and all local government areas outside the Sydney Region. To enable the immediate development of estates, the policy allows MHEs to be located on certain land where caravan parks are permitted. There are however, criteria that a proposal must satisfy before the local council can approved development. The policy also permits, with consent, the subdivision of estates either by community title or by leases of up to 20 years. A section 117 direction issued in conjunction with the policy guides councils in preparing local environmental plans for MHEs, enabling them to be excluded from the policy.

SEPP No. 55 - Remediation of Land
Introduces state-wide planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals. To assist councils and developers, the Department, in conjunction with the Environment Protection Authority, has prepared Managing Land Contamination: Planning Guidelines.

SEPP No. 64 - Advertising and Signage

Aims to improve the amenity of urban and natural settings by managing the impact of outdoor advertising. The policy responds to growing concerns from the community, the advertising industry and local government that existing controls and guidelines were not effective. SEPP No. 64 offers the comprehensive provisions and consistent approach needed. SEPP 64 – Advertising and Signage: Explanatory Information should be read in conjunction with the policy.

SEPP No. 65 – Design Quality of Residential Flat Development
This SEPP highlights 10 design quality principles to guide architects designing residential flats and to assist councils in assessing these developments. The principles relate to key design issues such as:

- the context for design – the locality and streetscape
- scale, form and density of the building
- measures to achieve resource, energy and water efficiency
- landscape design to create useful outdoor spaces for residents
- safety and security, including ensuring public areas are safe, visible and well lit at night.

Aims to improve the design quality of flats of three or more storeys with four or more dwellings. The policy sets out a series of design principles for local councils or other consent authorities to consider when assessing development proposals for flats. It also creates a role for special design review panels and registered architects in the design and approval

SEPP No. 70 Affordable Housing (Revised Schemes)
This Policy:
(a) identifies that there is a need for affordable housing across the whole of the State, and
(b) describes the kinds of households for which affordable housing may be provided, and
(c) makes a requirement with respect to the imposition of conditions relating to the provision of affordable housing.

SEPP (Primary Production and Rural Development) 2019
The aims of this Policy are as follows—
(a) to facilitate the orderly economic use and development of lands for primary production,
(b) to reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources,
(c) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,
(d) to simplify the regulatory process for smaller-scale low risk artificial waterbodies, and routine maintenance of artificial water supply or drainage, in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts,
(e) to encourage sustainable agriculture, including sustainable aquaculture,
(f) to require consideration of the effects of all proposed development in the State on oyster aquaculture,
(g) to identify aquaculture that is to be treated as designated development using a well-defined and concise development assessment regime based on environment risks associated with site and operational factors.

SEPP (State and Regional Development) 2011
The aims of this Policy are as follows—
(a) to identify development that is State significant development,
(b) to identify development that is State significant infrastructure and critical State significant infrastructure,
(c) to identify development that is regionally significant development.

SCHEDULE OF DRAFT STATE ENVIRONMENTAL PLANNING POLICIES OF WHICH COUNCIL HAS BEEN MADE AWARE AT DATE OF ISSUE OF CERTIFICATE

Please Note*: The NSW Department of Planning & Infrastructure has issued Circular PS 08-013 to Councils on 13 November 2008. From 1 March 2009, Councils are directed not to consider draft environmental planning instruments that were exhibited prior to 1 March 2006 and not yet gazetted for the purpose of assessing development applications under Section 79C(a)(ii) of the Environmental Planning and Assessment Act 1979.*

Nil Current

GLEN INNES SEVERN COUNCIL

PO Box 61, Glen Innes, 2370
Ph: 02 6730 2350

SECTION 10.7(5) CERTIFICATE

Information supplied pursuant to s149(5) of the

Environmental Planning And Assessment Act 1979 ,as amended

APPLICANT DETAILS		***CERTIFICATE DETAILS***	
Geolink PO Box 1466 COFFS HARBOUR NSW 2450		***Certificate Number:***	396/21-22
		Certificate Date:	28 April 2022
PROPERTY DETAILS		***Your Reference:***	GEO03730
Property Details:	85 Taylor Street Glen Innes	***Fee:***	$53.00
Legal Description:	Lot 2 DP 1208729 Parish Glen Innes	***Receipt Number:***	125886

(a) Has development consent under the Environmental Planning and Assessment Act 1979, as amended been issued for a use of the land within the past five years? If so, what conditions of consent apply?

No

(b) Is the land affected by a Tree Preservation Order?

No

The above information has been taken from Council's records but Council cannot accept responsibility for any omission or inaccuracy.

Please Note:

- *Prospective purchasers should consult their legal advisers concerning any easements or restrictions on the title of the property.*
- *Council does not incur any liability in respect of advice provided in good faith pursuant to s149(5) in accordance with s149(6) of the Environmental Planning and Assessment Act 1979, as amended.*
- *Information on any outstanding notices or orders pertaining to this property can be obtained through a Certificate available from Council pursuant to s121ZP of the Environmental Planning as Assessment Act 1979 and s735A of the Local Government Act 1993.*

Kathleen Taminiau
Town Planner

Date: 28 April 2022

RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION PROGRAM - GLEN INNES

DISCIPLINE: ELECTRICAL SERVICES

CLIENT: NSW GOVERNMENT HEALTH INFRASTRUCTURE

SITE PLAN

SCALE: N.T.S.

DRAWING LIST

R31-EL-DRG-0000	COVER SHEET AND DRAWING LIST
R31-EL-DRG-0001	ELECTRICAL LEGEND
R31-EL-DRG-0002	SITE PLAN
R31-EL-DRG-0100	GROUND FLOOR LIGHTING AND FIRE DETECTION LAYOUT
R31-EL-DRG-0200	GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
R31-EL-DRG-0201	ROOF PLAN POWER AND COMMUNICATIONS LAYOUT
R31-EL-DRG-0300	ELECTRICAL SCHEMATICS

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
P1	28.04.22	PRELIMINARY ISSUE	J.G.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

All dimensions to be verified on site/s prior to commencement of on-site work and/ or off-site prefabrication. Figured dimension to be taken in preference to scaled dimensions. This drawing is copyright and remains the property of JHA Consulting Engineers. Reproduction in whole or part of these drawings without written consent constitutes an infringement of copyright.

BUILDER: RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3385

CLIENT: NSW GOVERNMENT Health Infrastructure; NSW Ambulance

ARCHITECT: djrd architects — T +612 9319 2955, ABN: 48 942 521 969, Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 5192, 64 Rose Street, Chippendale NSW 2008, Sydney Australia, djrd.com.au

CONSULTANT: JHA — Level 23, 101 Miller Street, North Sydney NSW 2060, Australia, +61 (02) 9437 1000, general@jhaengineers.com.au, www.jhaservices.com

PROJECT: RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE: ELECTRICAL SERVICES COVER SHEET AND DRAWING LIST

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

DRAWN	S.H.	SCALE @ A1
CHECKED	E.L.	N.T.S.
APPROVED	J.G.	
CREATED	APR 2022	
JOB No.	210067	

DRAWING No. R31-EL-DRG-0000 — REV P1

\\jhasrv-fs001\jha\JOB No\Job No 20210000-20210099\210067 RAIR Building Services Consultants\Drawings\Electrical\Glen Innes\R31-EL-DRG-0000.dwg

LIGHTING

- D1 19W — LED RECESSED DOWNLIGHT, 4000K, CRI 85, WHITE FINISH, PIERLITE
  MODEL: 9758P4
  D - DENOTES DIMMABLE VERSION PIERLITE MODEL 9758P4D3
- D2 15W — LED RECESSED DOWNLIGHT, 4000K, WHITE, IP44, FROSTED DIFFUSER. VERSALUX
  MODEL: COMO WHITE S CWS2.WB.FO4K
- F1 28W — LED RECESSED LINEAR, 4000K, WHITE, PIERLITE D-LED.
  MODEL: DLED2B1234F4
  D - DENOTES DIMMABLE
- F2 50W — LED SURFACE MOUNTED BATTEN, OPAL DIFFUSER, IP20 PIERLITE
  MODEL: ECOBAT505E4
- F3 30W/34W — LED SURFACE MOUNTED IP66. EAGLE LIGHTING, DENSUS LED
  MODEL: EL-DENL-2101-000
  DENOTES EMERGENCY PACK TO BE INCLUDED. FITTING TO BE TESTED FROM A TEST SWITCH WITHIN THE MSB, 34W
- F4 36W — LED SURFACE MOUNTED IK10, CLEAR FROSTED DIFFUSER, VERSALUX.
  MODEL: ENDURALUXLEDF975-3280
- X1 160W — LED LOWBAY SURFACE MOUNTED 160W, 4K, IP65, IK8 LUMINAIRE. PIERLITE C350
  MODEL: C350S150SE84W
- P1 94W — LED POLE MOUNTED POST TOP WITH BACK LIGHT SHIELD, 4000K, MOUNTED ON 4.6m POLE DIE CAST ALUMINIUM BODY WITH BLACK POWDER COAT FINISH CREE DELTAGUARD, POLE TO MATCH COLOUR OF FITTING, COORDINATE WITH STRUCTURAL FOR RAGBOLT ASSEMBLY DETAILS. ADLT CREE XSP SERIES MODEL: XSP-E-02-4ME-E-40K-+-24-BK-Q9-S-00
  LIGHT POLE ADLT CROWN-WELD PS MODEL: PS4S15C1BK.
- P2 58W — LED POLE MOUNTED POST TOP WITH BACK LIGHT SHIELD, 4000K, MOUNTED ON 4.6m POLE DIE CAST ALUMINIUM BODY WITH BLACK POWDER COAT FINISH CREE DELTAGUARD, POLE TO MATCH COLOUR OF FITTING, COORDINATE WITH STRUCTURAL FOR RAGBOLT ASSEMBLY DETAILS. ADLT CREE XSP SERIES MODEL: XSP-E-02-3ME-E-40K-+-24-BK-Q2-S-00
  LIGHT POLE ADLT CROWN-WELD PS MODEL: PS4S15C1BK.
- W1 18W — LED EXTERIOR WALL MOUNTED LIGHT FITTING, MOUNTED AT 2.7m AFFL U.N.O., IP65, IK07, 4000K, 14W, T2 OPTICS. LIGMAN LEEDS 4.
  MODEL: LEE-30011-T2-W40-ND-01
- W2 31W — LED EXTERIOR WALL MOUNTED LIGHT FITTING, MOUNTED AT 4m AFFL, IP66, IK07, 4000K, OPTICS TYPE 4ME. ADLT CREE XSPW
  MODEL: XSPW-B-WM-4ME-4L-40K-UL-BK
- W3 10W — LED INTERIOR WALL MOUNTED LIGHT FITTING, MOUNTED AT 2.2m AFFL, WHITE FINISH, 4000K, DIMMABLE.
  ASTRO LIGHTING PETRA 180 SHADE MODEL: 5027001. INCLUDE OSRAM 10W E27 LED SUPERSTAR CLASSIC GLOBE DIMMABLE
- B 24W — LED BOLLARD LIGHT FITTING, 4000K, IP65, IK10, COMPLETE WITH ELECTRONIC CONTROL GEAR, BLACK FINISH. ADLT ARCLUCE KLOU-IK180. MODEL: 0870006A-840-16
- LED — RECESSED EMERGENCY LUMINAIRE, NON-MAINTAINED, SINGLE POINT TESTING SYSTEM FROM THE MSB AND COMPLETE WITH EMERGENCY BATTERY PACK. MODEL: CLEVERTRONICS ZLIFE PRO L10 PREMIUM
  V - DENOTES WITH VANDAL RESISTANT POLYCARBONATE DOME.
  S - DENOTES SURFACE MOUNTED. PROVIDE SQUARE MOUNTING KIT AS NECESSARY
- LED — LED EXIT SIGN, MAINTAINED. WITH INTEGRAL BATTERIES AND DUAL RATE CHARGER, SINGLE POINT TESTING SYSTEM FROM THE MSB. ARROW DENOTES DIRECTIONAL EXIT SIGN. MODEL: CLEVERTRONICS ULTRABLADE L10 PREMIUM, UNLESS NOTED OTHERWISE
  D - DENOTED DOUBLE SIDED
  V - DENOTES IP65 VANDAL RESISTANT (4W COLD CATHODE VERSION). MODEL: CLEVERTRONICS WEATHERPROOF RANGE.
  C - DENOTES CARPARK SUITABLE EXIT SIGN (4W COLD CATHODE VERSION) MODEL: CLEVERTRONICS CLEVERFIT EXIT RANGE.
- 360° DUAL TECHNOLOGY MOTION SENSOR, WITH TIMER. STEINEL 3000 SERIES RANGE. WHERE LOCATED IN THE AMBULANCE PLANT ROOM, DETECTOR MUST BE SUITABLE FOR THE INSTANT DETECTION OF ENTERING VEHICLES.
  DP - DENOTES DOUBLE POLE CONTACTORS.
  S - DENOTES SURFACE MOUNTED. PROVIDE SQUARE MOUNTING KIT AS NECESSARY
  HB - DENOTES MOTION SENSOR TO BE INSTALLED AT HIGH LEVEL TO BE MX HIGHBAY FROM STEINEL OR SIMILAR
  C - DENOTES MOTION SENSOR COVERAGE SHALL BE SUITABLE FOR CORRIDORS
  (USE CONTACTOR FOR SWITCHING IF LIGHTING LOAD EXCEEDS SENSOR CONTACT RATING. CONTACTOR MUST BE IN ACCESSIBLE LOCATION. ALL SENSORS IN A ROOM TO BE OPERATED BY A SINGLE OVER-RIDE SWITCH UNLESS NOTED OTHERWISE)
- LIGHT SWITCH MOUNTED AT 1000mm
  WP - DENOTES IP65 RATED
  OR - DENOTES SWITCH FOR PIR OVER-RIDE OFF WHERE A DETECTOR SHOWN IN ROOM
  2W - DENOTES 2 WAY SWITCHING
  D - DENOTES SWITCH WITH SEPARATE DIMMER ON SAME FACEPLATE
  xG - DENOTES "X" GANG LIGHT SWITCH, WHERE "X" IS THE NUMBER OF GANGS
- LCP — LIGHTING CONTROL PANEL SWITCH MOUNTED AT 1000mm
  WP - DENOTES IP65 RATED
  2W - DENOTES 2-WAY SWITCHING
  4G - DENOTES 4-GANG LIGHT SWITCH

FIRE DETECTION SYSTEM

- RFP — RESIDENTIAL FIRE ALARM PANEL (SIMILAR TO BROOKS RFP12V2 WITH ZONE OUTPUT CARD SUB365)
- SMOKE ALARM (SIMILAR TO BROOKS EIB650IWX WITH INTERFACE BASE BAX16)
- HEAT ALARM (SIMILAR TO BROOKS EIB603CX WITH INTERFACE BASE BAX16)
- SMOKE ALARM CONCEALED (SIMILAR TO BROOKS EIB650IWX WITH INTERFACE BASE BAX16)
- HORN TYPE EMERGENCY SPEAKER. WATERPROOF TYPE FOR EXTERNAL AREAS
- VISUAL ALARM INDICATOR
- SOUNDER ALARM INDICATOR. WP DENOTES IP-RATED TYPE
- MAGNETIC DOOR HOLDER DEVICE WITH LOCAL RELEASE BUTTON . LINKED TO RFP. MOUNT AT 2200MM AFFL

PHOTOVOLTAIC & BATTERY STORAGE SYSTEM

- PHOTOVOLTAIC SOLAR PANEL.DIMENSIONS: 1600(L)x1000(W)x50(H)mm. MINIMUM OF 335W POWER RATING
- P-INV — PHOTOVOLTAIC SOLAR INVERTER FOR THE PV SYSTEM IN THE ROOF
- B-INV — PHOTOVOLTAIC SOLAR INVERTER TO CHARGE THE BATTERY STORAGE UNIT
- BAT — WALL-MOUNTED BATTERY STORAGE UNIT

POWER

- DOUBLE 10A GENERAL PURPOSE OUTLET UNO. REFER TO GENERAL ABBR.
- SINGLE 10A GENERAL PURPOSE OUTLET UNO. REFER TO GENERAL ABBR.
  (OUTLETS INSTALLED 300mm AFFL UNLESS OTHERWISE NOTED OR AS SHOWN ON ARCHITECTURAL DETAILS.
- SP — FLOOR TO CEILING SERVICE POLE. TO MATCH WORKSTATION. INTERNAL SEGREGATION BETWEEN POWER & COMMS CABLING. PURCHASE SERVICE POLE FROM MANUFACTURER OF WORKSTATIONS.
- 3N 40A — DIRECT CONNECTION WITH ISOLATOR, UNLESS OTHERWISE STATED. REFER TO GENERAL ABBR. (IP56 TYPE WHERE SHOWN EXTERNAL TO A BUILDING)
  No. - DENOTES CURRENT RATING .
  1N - DENOTES NO. OF PHASES (I.E 3N DENOTES 3 PHASE)
  RSD - DENOTES FOR ROLLER SHUTTER
- SWITCHBOARD
- MP — AUTHORITY METER PANEL
- UPS — UNINTERRUPTED POWER SUPPLY
- MAIN SWITCHBOARD
- MCC BOARD (MECHANICAL TRADE)
- DB-P* ES — CIRCUIT DESIGNATION.
  ES - DENOTES CIRCUIT CONNECTED VIA EMERGENCY STOP CONTACTOR
  L - DENOTES LIGHTING CIRCUIT
  P - DENOTES POWER CIRCUIT
  No. - DENOTES DISTRIBUTION BOARD NUMBER
- TS/PE — DISTRIBUTION BOARD NUMBER.
  DENOTES CIRCUIT CONTROLLED BY COMBINED MULTICHANNEL TIME SWITCH/PHOTO CELL WITH OVERRIDE ON DISTRIBUTION BOARD. REFER SCHEMATIC.
- TSL — DENOTES CIRCUIT CONTROLLED BY 24hr TIME SWITCH LOCATED NEAR DEVICE.
- NUMBER OF PHASES.
  / - DENOTES SINGLE PHASE.
  /// - DENOTES THREE PHASE.
- TS T — DIGITAL PROGRAMMABLE TIME SWITCH. (24hr, 7 day MIN 6 CHANNEL).
- 20A — ON-LOAD ISOLATOR (No. DENOTES CURRENT RATING)
- 20A — CIRCUIT BREAKER
  No. - DENOTES CURRENT RATING.
- 20A/30mA — EARTH LEAKAGE CIRCUIT BREAKER
  30mA SENSITIVITY. 10mA SENSITIVITY WHERE NOTED.
- C — CONTACTOR COIL.
- — E — — ELECTRICAL UNDERGROUND CONDUIT ROUTE.
- DPM — DENOTES LAN-CONNECTED MULTIFUNCTION METER WITH RS 485 & RJ45 CONNECTIONS. PROVIDE WHOLE CURRENT OR CT METERING TO MANUFACTURER RECOMMENDATIONS.
- UNFUSED TEE. DO NOT BREAK CABLE GAUGE. PROVIDE ENCLOSURE ABOVE FIRST BOARD IN CHAIN WHEN TEE IS NOT WITHIN AN ELECTRICAL CUPBOARD.
- FB1 — 6-OFF MODULE FLOOR BOX CONTAINING 1-OFF DGPO, 1-OFF STARTER SOCKET TO SERVE TABLE BOX, 2-OFF DOUBLE DATA/ TELEPHONE OUTLETS MOUNTED ON 4-WAY FACEPLATES. PROVIDE A BLANK MODULE FOR THE UNUSED POSITION, 2- OFF BLANK FACEPLATES READY FOR AV CONNECTIONS/CABLING BY AV CONTRACTOR. CONTRACTOR TO SUPPLY AND INSTALL UMBILICAL CORD AND EXTEND DATA OUTLETS TO TABLE BOX.
- TB1 — TABLE BOX TO BE PART OF WORKSTATION MANUFACTURER'S SCOPE. TO CONTAINING 4-OFF GPO'S, 2-OFF USB-A CHARGING PORTS, 4-OFF DATA/ TELEPHONE OUTLETS MOUNTED ON 4-WAY FACEPLATES. PROVIDE A BLANK MODULE FOR THE UNUSED POSITION, 2- OFF BLANK FACEPLATES READY FOR AV CONNECTIONS/CABLING BY AV CONTRACTOR.
- SS — POLE MOUNTED 1PH 20A STARTER SOCKET OUTLET
- GL — GENERATOR LINK BOX
- E — HEAVY DUTY TYPE 'B' ELECTRICAL PIT WITH LOCKABLE STEEL LID. (LABELLED ' ELECTRICAL') UNLESS NOTED OTHERWISE. IF PIT IS LOCATED IN VEHICLE TRAFFIC AREA, A PIT CLASS 'D' MUST BE USED INSTEAD.
  EX - DENOTES EXISTING.
  E1 - DENOTES 600 x 600mm PIT WITH 1265mm DEPTH.
  E2 - DENOTES 450 x 450mm PIT WITH 1140mm DEPTH.
- ROD SUSPENDED CABLE TRAY DEDICATED FOR ELECTRICAL SERVICES. UNISTRUT SUPATRAY OR SIMILAR

PUBLIC ADDRESS

- RECESSED/SURFACE PUBLIC ADDRESS SPEAKER WIRED BACK TO PUBLIC ADDRESS HEAD END. S - DENOTES SURFACE MOUNTED. LOCAL - DENOTES LOCAL SEPERATE ZONE. REFER TO SPECIFICATION FOR DETAILS.
- PA-H — NEW PA EQUIPMENT HEAD END RACK.

MATV

- TV — DUAL GANG MATV OUTLET (75ohm)+ FOXTEL OUTLET (TYPE F). ON ONE FACE PLATE. MATV CABLING WIRED TO MATV SYSTEM. FOXTEL CABLING TO BE CONSOLIDATED INI CUPBOARD. REFER TO SPECIFICATION & SCHEMATICS.
- MATV — MATV ANTENNA. PROVIDE BRACKET TO MOUNT ON ROOF AS REQUIRED.

SECURITY

- CR — CARD READER. WHERE CARD READER IS SHOWN OUTSIDE OF BUILDING, IN A CUSTODIAL AREA OR WITHIN THE PUBLIC FOYER, PROVIDE AN IP65-RATED CARD READER.
- CTV — SINGLE RJ45 OUTLET CABLED WITH CAT6 BACK TO CCTV RACK. GREEN SHEATH.
- ES — ELECTRIC DOOR STRIKE. EQUIVALENT TO PADDE ES2000 C/W STRIKE MICRO-SWITCH
- G — WEATHERPROOF NEAUTROL AIRKEY RECIEVER. PROVIDE ALL OTHER ELECTRONICS, ADAPTER PANELS, AIRKEYS FOR A FULLY COMPATIBLE & WORKING SYSTEM WITH ACCESS CONTROL SYSTEM.
- I — AUDIO INTERCOM, VANDAL RESISTANT, STAINLESS STEEL FACEPLATE. WHERE INTERCOM IS SHOWN OUTSIDE OF BUILDING, PROVIDE AN IP65-RATED INTERCOM STATION. WHERE MOUNTED ON POST, PROVIDE MOUNTING HARDWARE AS NECESSARY.
- IH — AUDIO INTERCOM HANDSET WITH DOOR RELEASE PUSHBUTTONS. ONE LABELED PUSHBUTTON FOR EACH CONTROLLED DOOR. SEPARATE PUSH BUTTONS ARE ACCEPTABLE
- IHB — 2-WAY INTERCOM HANDSET LINKED AS SHOWN ON DRAWINGS.
- IHD — 2-WAY INTERCOM HANDSET LINKED TO VIDEO INTERCOM HANDSET 'IH'
- KP — PIN & PROXIMITY READER COMBO DEVICE. TO BE WEATHERPROOF WHEN LOCATED ON EXTERNAL OR WET AREAS. HID SIGNO 40K
- ML — ELECTRIC MORTICE LOCK COMPLETE WITH BUILT IN MICRO SWITCH.
- MI — MASTER VIDEO INTERCOM WITH DOOR RELEASE PUSH-BUTTON PANEL. ONE LABELLED PUSHBUTTON FOR EACH CONTROLLED DOOR. LABELS TO BE PAINT-FILLED ENGRAVED. SEPERATE PUSH BUTTONS ARE ACCEPTABLE
- D — DURESS CALL BACK TO COMMS ROOM.
- R — REED SWITCH AT TOP LEADING EDGE OF DOOR OR EDGE OF ROLLER SHUTTER - TO ACTIVATE WHEN DOOR IS OPEN TO 50mm OR LESS.
- SEC-H — SECURITY ACCESS CONTROL/ INTRUDER DETECTION SYSTEM HEAD ENDS
  MODEL: INTEGRITI FROM INNER RANGE
- BLUE WEATHERPROOF STROBE LIGHT TO FLASH WHEN SECURITY CALL FROM THE RED PHONE CALL POINT..
- STATIONARY WATERPROOF & VANDALPROOF CCTV CAMERA, WITH BRACKET TO ALLOW MOVEMENT TO FOCUS ON A FIXED AREA. PROVIDE RJ45 OUTLET AT LOCATION AS REQUIRED.
  P - DENOTES POLE MOUNTED.
  MP - DENOTES MEGAPIXEL CAMERA.
- PB — PUSH BUTTON FOR DOOR EXIT OVERRIDE

COMMUNICATIONS

- RJ45 CAT6A OUTLET CABLED WITH UTP BACK TO COMMS RACK UNLESS NOTED OTHERWISE. ON VERTICALLY ORIENTED FACEPLATE.
  # - DENOTES NUMBER OF DATA SOCKETS
  PA - DENOTES DIRECT UTP CABLE BETWEEN OUTLETS MARKED PA.
  PAL - DENOTES PAL PHONE OUTLET MOUNTED AT 1400MM WITH DIRECT DIAL TO NUMBER TBA.
  T - DENOTES WALL PHONE OUTLET MOUNTED AT 1400MM AFFL ON A RJ12 JACK.
  U - DENOTES DESK TOP PHONE FOR PUBLIC USE.
  WAP - DENOTES WIRELESS ACCESS POINT. CEILING MOUNT
- DIRECT EXTERNAL TELEPHONE CONNECTION (NOT VIA PABX) MOUNTED ON VERTICALLY ORIENTED FACEPLATE
  T - DENOTES WALL PHONE OUTLET MOUNTED AT 1400 AFFL.
  P - DENOTES PRISONER PHONE OUTLET MOUNTED. DUPLICATE IN CUSTODY MANAGER OFFICE
  L - DENOTES CONNECTION TO LIFT IN 2hr FIRE-RATED CABLE. CONNECT TO LOCATION ADVISED BY LIFT INSTALLER
  VM- DENOTES PHONE FOR VENDING MACHINE.
  FIP - DENOTES CONNECTION TO FIP IN 2HR FIRE RATED CABLE.
  FDT - DENOTES FRONT DOOR TELEPHONE. LEAVE 2M TAIL FOR TERMINATION BY OTHERS
  (SIMILAR TO KRONE HIGHWAY MEDIA WALL PHONE MOUNTING KIT 6467-1-114-10)
- CM, CAM — SINGLE RJ45 DATA OUTLET WIRED IN 4 PAIR CAT 6A CABLES,
  CAM - DENOTES OUTLET DEDICATED FOR CCTV CAMERA, ALLOW FOR ALL PATCH LEADS FROM OUTLET TO CAMERA.
- — C — — COMMUNICATIONS UNDERGROUND CONDUIT ROUTE.
- C — HEAVY DUTY TYPE 'B' COMMUNICATIONS PIT WITH LOCKABLE LID (LABELLED 'COMMUNICATIONS') UNLESS NOTES OTHERWISE. IF PIT IS LOCATED IN VEHICLE TRAFFIC AREA, A PIT CLASS 'D' MUST BE USED INSTEAD.
  EX - DENOTES EXISTING.
  C1 - DENOTES 600 x 600mm PIT WITH 1265mm DEPTH.
  C2 - DENOTES 450 x 450mm PIT WITH 1140mm DEPTH.
  T - DENOTES EXISTING TELSTRA PIT
  T1 - DENOTES P5 TYPE NBN APPROVED PIT 715 (L) x 465(W)mm WITH 635mm DEPTH, LID LABELLED "NBN"
- ROD SUSPENDED CABLE TRAY DEDICATED FOR COMMUNICATION SERVICES. UNISTRUT SUPATRAY OR SIMILAR
- IR — INFRA RED ILLUMINATOR FOR HEARING AUGMENTATION AT 2500mm AFFL..
- MDF — MAIN DISTRIBUTION FRAME/ TEST POINT FRAME.
- PCD — NBN EQUIPMENT: PREMISES CONNECTION DEVICE
- NBN — NBN EQUIPMENT: NETWORK TERMINATION DEVICE
- CR FRONT — COMMUNICATION RACK
- — HL — — INDUCTION HEARING LOOP

NSW AMBULANCE RADIO

- NSWAR — NSW AMBULANCE RADIO EQUIPMENT
- UHF RADIO — UHF RADIO ANTENNA. PROVIDE BRACKET TO MOUNT ON ROOF AS REQUIRED.

GENERAL NOTES

GENERAL

1. ALL WORK TO BE IN ACCORDANCE WITH SAA WIRING RULES, AS/NZS 3000:2018.
2. MARK ALL EQUIPMENT INCLUDING SWITCHES, POWER OUTLETS, ETC., WITH DISTRIBUTION BOARD NUMBER/CIRCUIT NUMBER AND DESTINATION AREAS.
3. LOCATIONS OF ELECTRICAL EQUIPMENT SHOWN ARE INDICATIVE ONLY. CO-ORDINATE FINAL ELECTRICAL EQUIPMENT LOCATIONS WITH ALL OTHER SERVICES DETAILS AND TRADE DISCIPLINES ON SITE AND WITH REFERENCE TO ARCHITECTURAL, HYDRAULIC AND MECHANICAL DRAWINGS.
4. PENETRATIONS THROUGH FIRE RATED WALLS AND FLOORS ARE TO BE SEALED WITH FIRE STOPPING MATERIAL EQUAL TO THE LEVEL OF PROTECTION OF THE SURROUNDING BARRIER.
5. MOUNT DISTRIBUTION SWITCHBOARDS 1800mm AAFL TO TOP, UNO.
6. PLACE ALL CONTROLS WITHIN DISTRIBUTION BOARD, UNO.
7. ENSURE SEGREGATION BETWEEN LV, ELV CABLING IS SEPERATED TO COMMUNICATIONS CABLING TO S-009 REQUIREMENTS & THE BTS STRUCTURED CABLING SPECIFICATION.
8. PROVIDE ACOUSTIC WALL BOXES TO ALL POWER & DATA OUTLETS TO ALL ACOUSTICALLY RATED AREAS.

LIGHTING

1. WHERE LIGHT SWITCH WIRE LINES ARE NOT SHOWN, SWITCH FITTINGS BY SWITCH(ES) ADJACENT TO ROOM ENTRANCE DOOR. PROVIDE MINIMUM OF ONE LIGHT SWITCH TO OPERATE ALL LIGHTS WITHIN EACH ROOM, UNO. MOUNT ALL LIGHT SWITCHES AT 1000mm AAFL, TO CENTRELINE UNO.
2. MOUNT EXIT LIGHTS ON CEILING ONLY.
3. PROVIDE 30mA RCD PROTECTION TO ALL LIGHTING & POWER CIRCUITS AS PER AS/NZS 3000:2018.
4. LOCATE THE LIGHTING CONTROL EQUIPMENT WITHIN DISTRIBUTION BOARD.
5. UNLESS NOTED OTHERWISE ALL SWITCHPLATES SHALL BE CLIPSAL C2000 SERIES COMPLETE WITH SNAP ON STAINLESS STEEL COVERPLATES & WHITE KEY INPUT UNITS. THE POSITION OF THE LIGHT SWITCHES, AC CONTROL PANELS, PA/PR ATTENUATORS, ETC ARE TO BE POSITIONED TOGETHER BY THE ENTRY DOOR OF EACH ROOM, UNLESS OTHERWISE INSTRUCTED.

POWER

1. MOUNT ALL OUTLETS AT 400mm AAFL TO CENTRE, UNO., OR AS REQUIRED BY AS/NZS 3000:2018.
2. UNLESS ARCHITECTURAL JOINERY DRAWINGS SHOW OTHERWISE , MOUNT ALL OUTLETS MARKED "AB" AT 150 TO BOTTOM OF OUTLET ABOVE BENCH TOP. REFER TO ARCHITECTURAL JOINERY DWGS FOR EXACT LOCATIONS.
3. MOUNT OUTLETS LOCATED NEAR SINKS AND TUBS, OUTSIDE THE "DAMP AREAS RESTRICTED ZONE" AS REQUIRED BY AS/NZS 3000:2018.
4. INSTALL AN ISOLATOR ADJACENT TO ALL EQUIPMENT THAT IS NOT IN THE IMMEDIATE VICINITY OF ITS CONTROL PANEL OF EQUIPMENT AS REQUIRED BY AS/NZS 3000:2018.
5. PROVIDE COMBINED RCD/CIRCUIT BREAKER FOR ALL POWER AND LIGHTING CIRCUITS THROUGHOUT AS DETAILED IN SPECIFICATION AND AS/NZS 3000:2018.
6. ALL NON WORKSTATION MOUNTED POWER OUTLETS SHALL BE CLIPSAL C2000 SERIES COMPLETE WITH SNAP ON COVER PLATES & WHITE MECHANISMS.
7. AVOID BACK TO BACK OUTLETS IN ALL ACOUSTIC & FIRE RATED WALLS. ENSURE A SEPARATION OF A MIN OF 600MM BETWEEN SUCH OUTLETS.

CABLE WAYS

1. SEPARATE COMMUNICATIONS CABLING FROM POWER CABLING BY MINIMUM OF 300mm, EXCEPT WHERE ENCLOSED IN METAL DUCT OR METAL CONDUIT. CABLES MAY CROSS EACH OTHER WITH A 50mm SEPARATION.

EARTHING

1. INSTALL EQUIPOTENTIAL BONDING TO METALLIC PIPING, CABLE TRAYS, METAL DUCTS, COMMUNICATIONS EARTHING SYSTEMS AND OTHER METALLIC SYSTEMS.

GENERAL ABBREVIATIONS

15A	- DENOTES 15A OUTLET
AB	- DENOTES ABOVE BENCH (AB HEIGHT APPROX 820MM AFFL TO CENTRE OF OUTLET)
AEC	- DENOTES AMBULANCE ELECTRICAL CHARGING UNIT
BC	- DENOTES MOUNTED ON BOXED OUT COLUMN
BOL	- DENOTES POWER BOLLARD MOUNTED
BWU	- DENOTES BOILING WATER UNIT
CAP	- DENOTES CAPTIVE LOCKING PENDANT OUTLET
CL	- DENOTES CLEANERS OUTLET
CM	- DENOTES CEILING MOUNTED
CS	- DENOTES CEILING SPACE
CT	- DENOTES COOKTOP
DW	- DENOTES DISHWASHER OUTLET. LOCATED UNDER BENCH. NOT TO BE LOCATED DIRECTLY BEHIND DISHWASHER.
DSI	- DENOTES DSI DIMMABLE BALLASTS.
FR	- DENOTES FRIDGE OUTLET
HD	- DENOTES OUTLET DEDICATED FOR HAND DRIER.
HWU	- DENOTES HOT WATER UNIT
HPS	- HIGH PRESSURE HOSE
IP56	- DENOTES IP56 RATED OUTLET (INDUSTRIAL TYPE)
IRON	- DENOTES OUTLET FOR IRON. MOUNT TO SUIT IRONING BOARD
J	- OUTLETS MOUNTED ON JOINERY TO THE ARCHITECTURE DETAILS
LM	- DENOTES LAUNDRY WASHING MACHINE
MW	- DENOTES MICROWAVE
P	- DENOTES PENDANT OUTLET, SUSPENDED TO 2000MM
PD	- DENOTES HANGING PENDANT OUTLET SUSPENDED TO 2000MM AFFL. SIMILAR TO CLIPSAL SS15N
PE	- DENOTES PEDESTAL MOUNTED.
PJ	- DENOTES OUTLET DEDICATED FOR A CEILING MOUNTED PROJECTOR. LOCATED IN CEILING.
PS	- DENOTES MOUNTED IN CEILING FOR THE OPERATION OF A PROJECTOR SCREEN. PROVIDE DOWN/UP MOMENTARY PUSH BUTTON AT NOMINATED LOCATION ON WALL.
RH	- DENOTES RANGE OUTLET
SD	- DENOTES SLIDING DOOR
SIP	- DENOTE SPEAKER IN PHONE FOR A SEPARATE SPEAKER FOR THE PHONE
SK	- DENOTES MOUNTED ON SKIRTING DUCT.
SP	- DENOTES SERVICE POLE MOUNTED
SS	- DENOTES STARTER SOCKET FOR WORKSTATION SOFT-WIRING
SUS	- DENOTES SUSPENDED
SWP	- DENOTES CONTROL PANEL FOR SEWER PUMP
TC	- DENOTES TASER CHARGING PROVIDED CLIPSAL GANGBUSTER OUTLETS.
UB	- DENOTES UNDER BENCH
V	- DENOTES VANDAL RESISTANT.
VM	- DENOTES VENDING MACHINE OUTLET (DEDICATED CIRCUIT)
W	- DENOTES OUTLET MOUNTED ON WORKSTATION & SOFT-WIRED TO LOCAL STARTER SOCKET.
WIDE	- DENOTES WIDE SWITCH TOGGLE TYPE (35MM).
WM	- DENOTES WALL MOUNTED
WP	- DENOTES WEATHERPROOF

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CLIENT: NSW GOVERNMENT Health Infrastructure; NSW Ambulance

ARCHITECT: djrd architects — T +612 9319 2955, ABN: 48 942 921 969, Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192, 64 Rose Street, Chippendale NSW 2008, Sydney Australia, djrd.com.au

CONSULTANT: JHA — Level 23, 101 Miller Street, North Sydney NSW 2060 Australia, +61 (02) 9437 1000, general@jhaengineers.com.au, www.jhaservices.com

PROJECT: RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE: ELECTRICAL SERVICES ELECTRICAL LEGEND

PRELIMINARY ISSUE — NOT TO BE USED FOR CONSTRUCTION

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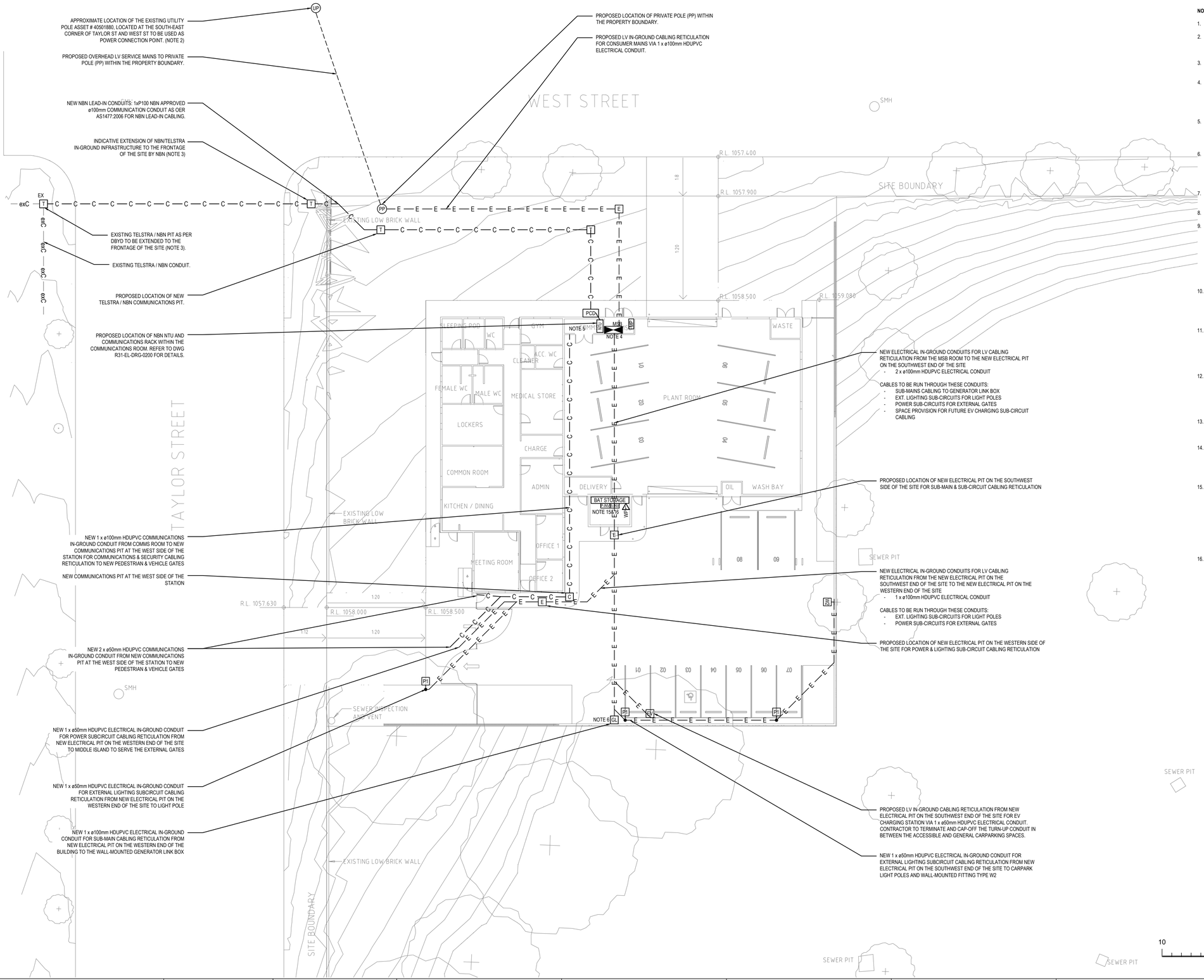

NOTES:

1. FOR LEGEND AND NOTES, REFER TO DRAWING R31-EL-DRG-0001.
2. ELECTRICAL CONNECTION POINT LOCATION AND PROPOSED STRATEGY IS INDICATIVE ONLY, SUBJECT TO REVIEW AND APPROVAL OF ESSENTIAL ENERGY.
3. TELECOMUNICATIONS LEAD-IN PATHWAY IS INDICATIVE ONLY, SUBJECT TO REVIEW AND APPROVAL OF NBN CO/TELSTRA.
4. AUTHORITY METER PANEL TO BE LOCATED WITHIN THE MSB CUPBOARD. CONTRACTOR TO ENSURE TO LOCATE AND SIZE THE EQUIPMENT SO THAT THE MINIMUM SPACE CLEARANCES REQUIRED IN AS/NZS 3000-2018 AND NSW SERVICE AND WIRING RULES ARE COMPLIANT.
5. COMMUNICATIONS ROOM TO ACCOMMODATE 1xNTD, 1x 1000(D)x800(W)x2000(H)mm COMMUNICATIONS RACK, AND SECURITY DATA GATHERING PANELS AS REQUIRED. REFER TO DWG R31-EL-DRG-0200 FOR FURTHER DETAILS
6. FINAL LOCATION OF PORTABLE GENERATOR LINK POINT. SUCH LOCATION SHOULD BE THAT THE PARKING OF THE PORTABLE GENERATOR SHOULD NOT OBSTRUCT THE AMBULANCE VEHICLE ENTERING AND EXITING THE BUILDING. THE CABLING RETICULATION TO MSB TO BE VIA 1 x ø100mm HDUPVC ELECTRICAL CONDUIT.
7. RESURFACE, BACKFILL & MAKE GOOD ALL SURFACES TO MATCH EXISTING EXCAVATED AS PART OF THESE WORKS.
8. PROVIDE DRAW ROPES FOR ALL NEW CONDUITS.
9. CONDUIT ROUTES ARE INDICATIVE. CONTRACTOR TO CARRY OUT UNDERGROUND SERVICES. SEARCH PRIOR TO EXCAVATION AND ROUGH IN. CONTRACTOR TO ENSURE ALL EXISTING SERVICES ARE ACCOUNTED FOR & PROVIDE SHOP DRAWING OF CONDUIT PLAN TO VERIFY. COORDINATION HAS BEEN CARRIED OUT. ALLOW TO CARRY OUT UNDERGROUND SERVICES SEARCH. VARIATION AS A RESULT OF NOT DOING SO WILL NOT BE ACCEPTED. ALSO, CONTRACTOR SHALL COORDINATE WITH CIVIL TRADE THE FINAL LOCATION OF THE ELECTRICAL AND COMMS PITS ACROSS THE SITE.
10. CONDUITS ENTERING A BUILDING FROM ACCESS HOLES OR PITS SHALL BE APPROPRIATELY INSTALLED AND/OR PLUGGED WITH MANUFACTURED PRE-FABRICATED PLUGS/CAPS AT THE BUILDING END (TURN UP END INSIDE ROOM/RISER). TO INHIBIT THE ENTRY OF FLUID, GAS. RODENTS INTO THE BUILDING.
11. COMMS CONDUITS SHALL BE TRENCHED DEEP ENOUGH TO PROVIDE A MINIMUM OF 500mm COVER ABOVE THE CONDUIT. ELECTRICAL CONDUITS TO BE MIN 600mm DEEP. THE CONDUIT SHALL BEDDED ON TOP OF 100mm OF SAND. COVERED WITH 100mm OF SAND AND 200/300mm OF CLEAN FILL. PROVIDE COMMS/ELECTRICAL WARNING MARKER TAPE ABOVE CLEAN FILL.
12. ALL CONDUIT SHALL BE INSTALLED SUCH THAT THEY DRAIN INTO A PIT. CONTRACTOR TO ENSURE NO CONDUIT ALLOW WATER TO TRAP IN ANY CONDUITS. PROVIDE 2xø50mm CONDUITS AT THE BOTTOM OF THE PIT FOR DRAINAGE. DRAINAGE CONDUITS SHALL BE EXTENDED TOWARDS THE NATURAL TERRAIN SLOPE AND TERMINATE ON A BLUE METAL DRAINAGE BED.
13. UNDERGROUND ELECTRICAL AND COMMS CONDUITS SHALL BE SEPARATED BY NO LESS THAN 100mm WHERE CONDUITS CROSS OVER OR SHARE A TRENCH.
14. ALL CONDUITS FOR ELECTRICAL AND COMMUNICATIONS SHALL ENTER 10-15mm INTO PIT WALLS, CUT TRUE AND SQUARE WITH NO SHARP/ROUGH EDGES. FOR CARRIER COMMUNICATION CONDUITS ENTERING INTO PIT SHALL HAVE FLUSH BELL/TURN MOUTH ENDS. SEPARATE WALL PENETRATION/CAVITY FOR EACH CONDUIT.
15. CONTRACTOR TO SUPPLY AND INSTALL A 30.14kW PV SYSTEM ON THE ROOF SPACE AS DENOTED IN THE ROOF PLAN R31-EL-DRG-0201. THIS SYSTEM SHALL BE CONNECTED TO 1-OFF 3-PHASE 20kW PV INVERTER FOR SELF-CONSUMPTION AND 1-OFF 1-PHASE 5kW INVERTER TO CHARGE THE BATTERY STORAGE UNIT. CONTRACTOR TO PROVIDE A LOAD CENTRE (DB-B) TO POWER SUPPLY THE EXIT ROLLER SHUTTER, THE COMMUNICATIONS RACK AND THE LIGHT FITTINGS IN THE COMMS ROOM AND ADMIN AREA. REFER TO JHA SPECIFICATION, DWG R31-EL-DRG-0100, DWG R31-EL-DRG-0200 & DWG R31-EL-DRG-0300 FOR FURTHER DETAILS.
16. CONTRACTOR TO SUPPLY AND INSTALL A 14kWh BATTERY STORAGE UNIT SIMILAR TO TESLA POWERWALL 2 AND ASSOCIATED CABLING AND ACCESSORIES. A 40% OF THE ENERGY STORAGED WILL BE USED TO POWER SUPPLY THE EXIT ROLLER SHUTTER WITHIN THE AMBULANCE PLANT ROOM, THE COMMUNICATIONS RACK AND 4-OFF LIGHT FITTINGS VIA A NEW LOAD CENTRE (DB-B) LOCATED INSIDE THE SERVICE ENCLOSURE. SUR-PLUS ENERGY IS TO BE USED FOR SELF-CONSUMPTION. REFER TO JHA SPECIFICATION AND DWG R31-EL-DRG-0200 FOR FURTHER DETAILS.

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CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

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PROJECT: **RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES**

TITLE: **ELECTRICAL SERVICES** SITE PLAN

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

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DRAWING No. R31-EL-DRG-0002		REV P1

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NOTES:

1. FOR LEGEND AND NOTES, REFER TO DRAWING R31-EL-DRG-0001.
2. FINAL LOCATION OF ALL EQUIPMENT SHALL BE CONFIRMED ON SITE AND WITH REFERENCE TO ARCHITECTURAL ROOM DATA SHEETS.
3. THE ELECTRICAL CONTRACTOR MUST CO-ORDINATE WITH THE OTHER TRADES BEFORE INSTALLING ELECTRICAL DEVICES AND EQUIPMENT.
4. ALL SMOKE/HEAT ALARMS TO BE SIMILAR TO BROOKS EIB650IWX (SMOKE) AND EIB603CX (HEAT) WITH INTERFACE BASE BAX16. DEVICES TO BE CONNECTED TO THE RESIDENTIAL FIRE CONTROL PANEL
5. SMOKE AND THERMAL ALARMS TO BE CONNECTED TO BUILDING OCCUPANT WARNING SYSTEM (BOWS) TO INITIATE WARNING SYSTEM IN CASE ANY OF THE SMOKE/ THERMAL ALARM IS TRIGGERED.
6. SMOKE/THERMAL ALARM SYSTEM TO BE CONNECTED TO THE SECURITY SYSTEM AND INITIATE SIGNAL TO THE OFF SITE SECURITY COMPANY IN CASE IF SMOKE/THERMAL ALARM SYSTEM IS NOT RESETTED IN CLIENT DEFINE TIME.
7. SEMI-RECESSED RESIDENTIAL FIRE CONTROL PANEL WITH INTEGRATED BACK-UP BATTERY, SIMILAR TO BROOKS RFP12V2 (WITH ZONE OUTPUT CARD SUB365). BATTERY TO BE SIZED TO PROVIDE POWER TO RFP PANEL FOR AT LEAST 72 HOURS.
8. CONTRACTOR TO ADD ADDITIONAL SMOKE DETECTORS (IF REQUIRED) IN ANY CONCEALED AREA ABOVE THE CEILING WHERE THE HEIGHT IS MORE THAN 800mm. FOR TENDER PURPOSES, CONTRACTOR TO ALLOW FOR 15-OFF CONCEALED SMOKE DETECTORS WITH FAMCO BRACKETS
9. PERIMETER EXTERNAL WALL MOUNTED FITTINGS TYPE W1 & W2 AND EXTERNAL SURFACE-MOUNTED FITTINGS TYPE F4 TO BE CONTROLLED BY THE TIME SWITCH / PHOTOCELL WITH AN OVERRIDE OFF SWITCH LOCATED IN LCP IN THE AMBULANCE PLANT ROOM
10. PERIMETER INTERNAL WALL MOUNTED FITTINGS TYPE F3 TO BE MOUNTED AT 3.5m AFFL. LIGHT FITTINGS TYPE X1 TO BE SURFACE MOUNTED ON THE UNDERSIDE OF THE ROOF. THESE FITTINGS ARE TO BE CONTROLLED BY THE LIGHTING CONTROL PANEL (LCP) IN THE AMBULANCE PLANT ROOM. THE LCP TO BE A 2-WAY, 4-GANG LIGHT SWITCH.
11. REFER TO DWG R31-EL-DRG-0002 FOR REFERENCE TO THE EXTERNAL LIGHTING FOR THE ON-GRADE CARPARK AND DRIVEWAY. SUCH LIGHT FITTINGS ARE TO BE CONTROLLED BY THE TIME SWITCH / PHOTOCELL WITH AN OVERRIDE OFF SWITCH LOCATED IN LCP IN THE AMBULANCE PLANT ROOM.
12. CONTRACTOR TO SUPPLY AND INSTALL PHOTOCELL FOR EXTERNAL LIGHTING CONTROL ON THE NORTH-EAST CORNER OF THE BUILDING, EXTERNALLY.

2 1 0 2 4 6 8 m

1 : 100-A1 1 : 200-A3

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PROJECT
RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE
ELECTRICAL SERVICES
GROUND FLOOR
LIGHTING AND FIRE DETECTION LAYOUT

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

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DRAWING No. **R31-EL-DRG-0100**
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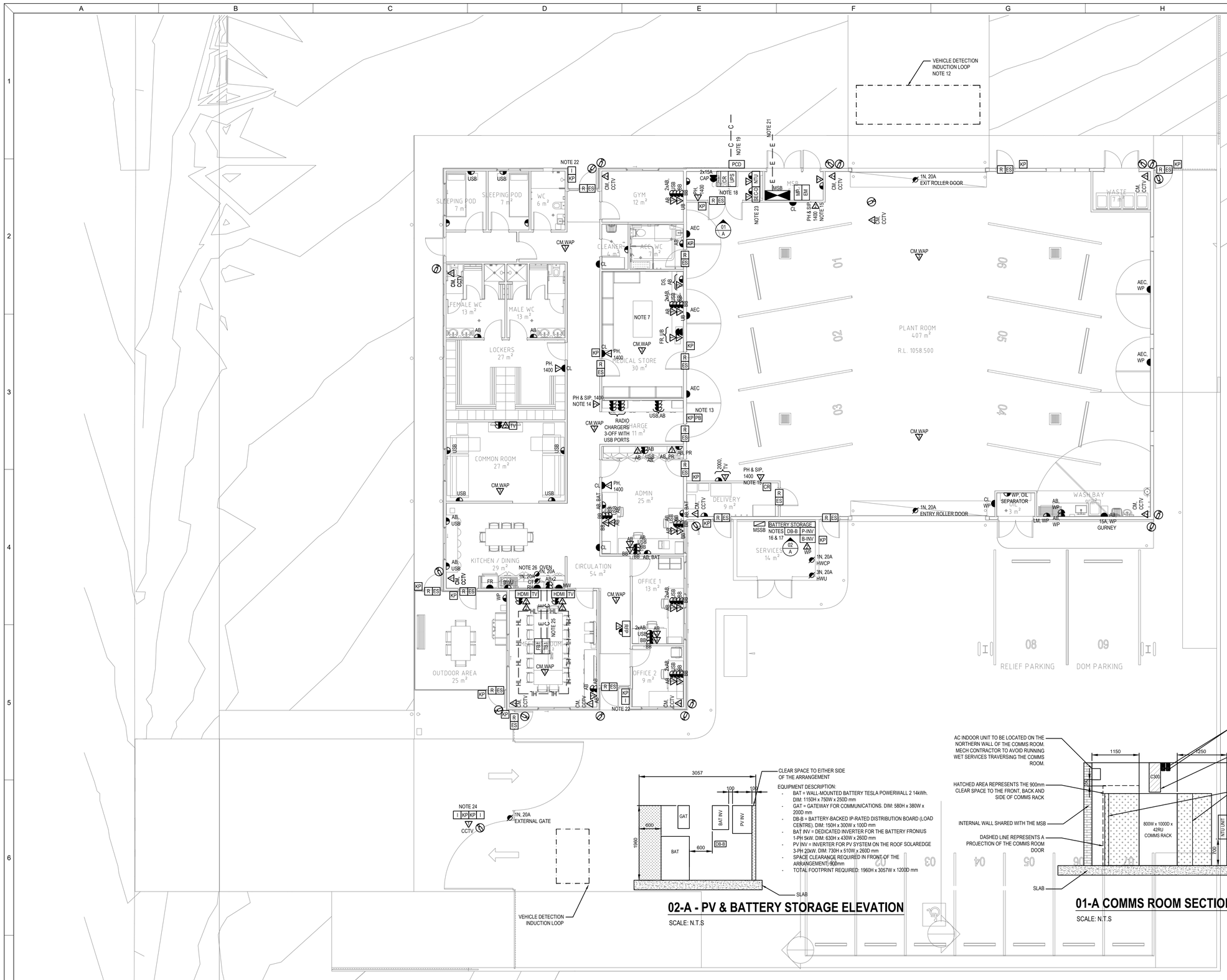
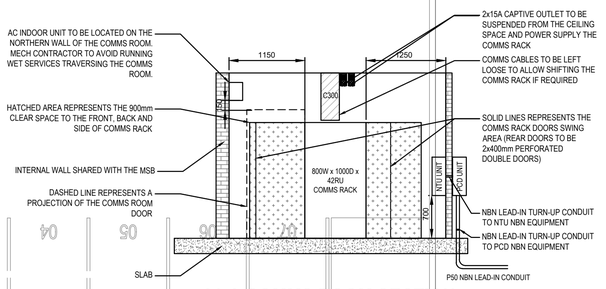


CLEAR SPACE TO EITHER SIDE OF THE ARRANGEMENT

EQUIPMENT DESCRIPTION:
- BAT = WALL-MOUNTED BATTERY TESLA POWERWALL 2 14kWh. DIM: 1150H x 750W x 250D mm
- GAT = GATEWAY FOR COMMUNICATIONS. DIM: 580H x 380W x 200D mm
- DB-B = BATTERY-BACKED IP-RATED DISTRIBUTION BOARD (LOAD CENTRE). DIM: 150H x 300W x 100D mm
- BAT INV = DEDICATED INVERTER FOR THE BATTERY FRONIUS 1-PH 5kW. DIM: 630H x 430W x 260D mm
- PV INV = INVERTER FOR PV SYSTEM ON THE ROOF SOLAREDGE 3-PH 20kW. DIM: 730H x 510W x 260D mm
- SPACE CLEARANCE REQUIRED IN FRONT OF THE ARRANGEMENT: 900mm
- TOTAL FOOTPRINT REQUIRED: 1960H x 3057W x 1200D mm

02-A - PV & BATTERY STORAGE ELEVATION

SCALE: N.T.S



01-A COMMS ROOM SECTION

SCALE: N.T.S

NOTES:

1. FOR LEGEND AND NOTES, REFER TO DRAWING R31-EL-DRG-0001.
2. THE ELECTRICAL AND COMMUNICATIONS CONTRACTORS MUST CO-ORDINATE WITH OTHER TRADES WHEN INSTALLING POWER AND DATA OUTLETS. REFER TO ARCHITECTURAL ROOM DATA SHEETS AS REQUIRED. IF UNSURE OF LOCATIONS, SUBMIT AND RFI FOR REVIEW AND CLARIFICATION.
3. FINAL LOCATION OF ALL EQUIPMENT SHALL BE CONFIRMED ON SITE AND WITH REFERENCE TO ARCHITECTURAL ROOM DATA SHEETS.
4. THE ELECTRICAL CONTRACTOR MUST CO-ORDINATE WITH THE OTHER TRADES WHEN INSTALLING POWER OUTLETS FOR THEIR EQUIPMENT. REFER TO OTHER TRADES DOCUMENTATION FOR FURTHER DETAILS.
5. GPOs DENOTED WITH THE LABEL "AB, BAT" ARE TO BE FED FROM THE BATTERY-BACKED DB DB-B. THESE OUTLETS ARE TO HAVE BLUE COVER-PLATE AND BLUE FINISH.
6. CONTRACTOR TO SUPPLY AND INSTALL A GENERATOR LINK BOX RATED AT 125A TO CONNECT A MOBILE DIESEL GENERATOR TO BACK-UP THE SITE IN CASE OF POWER OUTAGE. REFER TO DWG R31-EL-DRG-0300 FOR FURTHER DETAILS.
7. FINAL QUANTITIES AND LOCATION OF POWER AND DATA OUTLETS FOR MEDICAL STORE ROOM TO BE COORDINATED WITH SPACE LOGIC FURNITURE LAYOUTS.
8. ROLLER DOORS TO BE PROVIDED WITH INTERNAL BEAM DETECTION TO PREVENT THEM FROM CLOSING IF OBSTACLE IS IN THE WAY. ROLLER DOORS SHOULD NOT AUTOMATICALLY CLOSE WHEN ON BATTERY BACK UP POWER SUPPLY.
9. DATA OUTLETS FOR FUTURE PROVISIONS OF CCTV CAMERAS ARE TO BE PROVIDED AND INSTALLED AS SHOWN. CCTV ARE NOT REQUIRED TO BE PROVIDED AT THIS STAGE AS REQUESTED BY THE CLIENT.
10. NOT USED.
11. ALL EXTERNAL ACCESS CONTROL EQUIPMENT TO BE MINIMUM IP65 AND IK08 RATED. BUILDING PERIMETER DOORS WITH ELECTRONIC ACCESS CONTROL ARE TO BE CONFIGURED AS SAFE-SECURED.
12. VEHICLE INDUCTION LOOP TO OPERATE ONLY IN CASE THE DOOR IS IN PROCESS OF CLOSING. IF THE INDUCTION LOOP IS DETECTING VEHICLE DOOR SHOULD OPEN ONLY IN CASE IT IS IN PROCESS OF CLOSING, SIMILAR TO FUNCTIONING PRINCIPLE OF BEAM DETECTOR MOUNTED ON THE SIDE OF THE ROLLER DOORS. INDUCTION LOOP SHOULD NOT BE PASSING THROUGH ANY KIND OF CONSTRUCTION JOINTS. PROVIDE NECESSARY CONNECTION TO THE CAR PARK DOOR CONTROLLER TO MANUFACTURE'S REQUIREMENTS.
13. PUSH (MUSHROOM) BUTTON TO CONTROL EXIT AMBULANCE PLANT ROLLER SHUTTER DOOR FOR EARLY OPENING IN CASE OF EMERGENCY CALL. PROVIDE APPROPRIATE LABELING TO DIFFERENTIATE THE BUTTON.
14. DATA OUTLETS FOR PHONE AND SIP ARE TO BE ABOVE WHITEBOARDS/JOINERY. COORDINATE EXACT LOCATION ON SITE.
15. WALL MOUNTED SPEAKER ABOVE THE PHONE. SPEAKER TO BE CONNECTED TO THE PHONE BELOW. SPEAKER SHOULD AMPLIFY RING TONE OF THE PHONE SO IT WOULD BE POSSIBLE TO HEAR PHONE RINGING REGARDLESS OF THE BACKGROUND NOISE PRODUCED BY EQUIPMENT IN THE WASH BAY AND WHILE WASHING OF THE VEHICLES IS ONGOING.
16. SPACE PROVISIONS REQUIRED FOR A 3-PH 20kW & 1-PH 5kW PV INVERTERS AND 14kWh BATERY STORAGE WITHIN THE SERVICES ENCLOSURE: 1900W x 1200D x 1900H mm, INCLUDES 900mm IN FRONT OF THE ARRANGEMENT. REFER TO ELEVATION DETAIL ON THE BOTTOM RIGHT CORNER OF THIS DWG FOR AN ELEVATION VIEW OF THE PV SYSTEM ARRANGEMENT.
17. A 1-PH 14kWh BATERY STORAGE TO BE INSTALLED WITHIN THE SERVICE ENCLOSURE. REFER TO THE BOTTOM RIGHT CORNER OF THIS DWG FOR AN ELEVATION VIEW OF THE PV SYSTEM ARRANGEMENT.
18. CONTRACTOR TO SUPPLY AND INSTALL 1xø80mm HDPVC COMMUNICATIONS CONDUITS AND ASSOCIATED WEATHERPROOF ROOF PENETRATIONS FROM THE UHF AND MATV ANTENNAS IN THE ROOF TO THE COMMS ROOM (1-OFF PER ANTENNA). THESE PENETRATION SHALL BE DONE OUTSIDE THE COMMS ROOM FOOTPRINT. REFER TO DWG R31-EL-DRG-0201 FOR PROPOSED LOCATION OF EACH ANTENNA.
19. NBN LEAD-IN CONDUITS FROM THE EXTERNAL NBN PIT SHALL BE TERMINATED WITH A TURN-UP CONDUIT DIRECTLY BELOW THE PCD EQUIPMENT, EXTERNALLY TO THE BUILDING FACADE. A NEW NBN LEAD-IN CONDUIT SHALL BE INSTALLED FROM THIS POINT TO THE COMMS ROOM, AND THE TURN-UP CONDUIT SHALL BE TERMINATED ON THE TOP-RIGHT CORNER OF THE COMMS ROOM, DIRECTLY BELOW THE NTU UNIT. REFER TO DWG R31-EL-DRG-0002 FOR EXTERNAL CARRIER CABLING RETICULATION. FROM THIS POINT.
20. NOT USED.
21. ELECTRICAL CONSUMER MAINS TURN-UP CONDUITS TO BE TERMINATED BELOW THE MSB. REFER TO DWG R31-EL-DRG-0002 FOR EXTERNAL IN-GROUND CABLING RETICULATION.
22. CONTRACTOR TO PROVIDE A INTERCOM SYSTEM TO BE CONNECTED TO THE VoIP PHONE SYSTEM. REFER TO NSW AMBULANCE SECURITY SPECIFICATION FOR FURTHER DETAILS.
23. ACCESS CONTROL SYSTEM TO BE PROVIDED WITH ADDITIONAL BATTERY PACKS TO ACHIEVE A 24H AUTONOMY OF THE SYSTEM.
24. PROVIDE INTERCOM STATION & PIN/PROXIMITY CARD COMBO DEVICE, CCTV MOUNTED ON DUAL HEIGHT BOLLARD ON THE LEFT SIDE OF THE DRIVEWAY. FINAL LOCATION TO BE COORDINATED WITH THE CLIENT ON SITE.
25. CONTRACTOR TO SUPPLY AND INSTALL THE FOLLOWING IN-GROUND ELECTRICAL & COMMUNICATIONS CONDUITS TO SERVE THE FLOOR BOX FROM THE NORTHERN WALL IN MEETING ROOM: 2xø32mm ELECTRICAL & 2xø32mm COMMS CONDUITS. HDMI PORTS BEHIND DISPLAYS TO BE WIRED BACK TO TABLE BOX.
26. CONTRACTOR TO PROVIDE DOUBLE-POLE SWITCH ISOLATOR FOR THE OVEN AND COOKTOP AND LOCATE THEM ABOVE BENCH.

2 1 0 2 4 6 8 m

1 : 100-A1 1 : 200-A3

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PROJECT
RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE
ELECTRICAL SERVICES
GROUND FLOOR
POWER AND COMMUNICATIONS LAYOUT

PRELIMINARY ISSUE
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DRAWN	S.H.	SCALE @ A1
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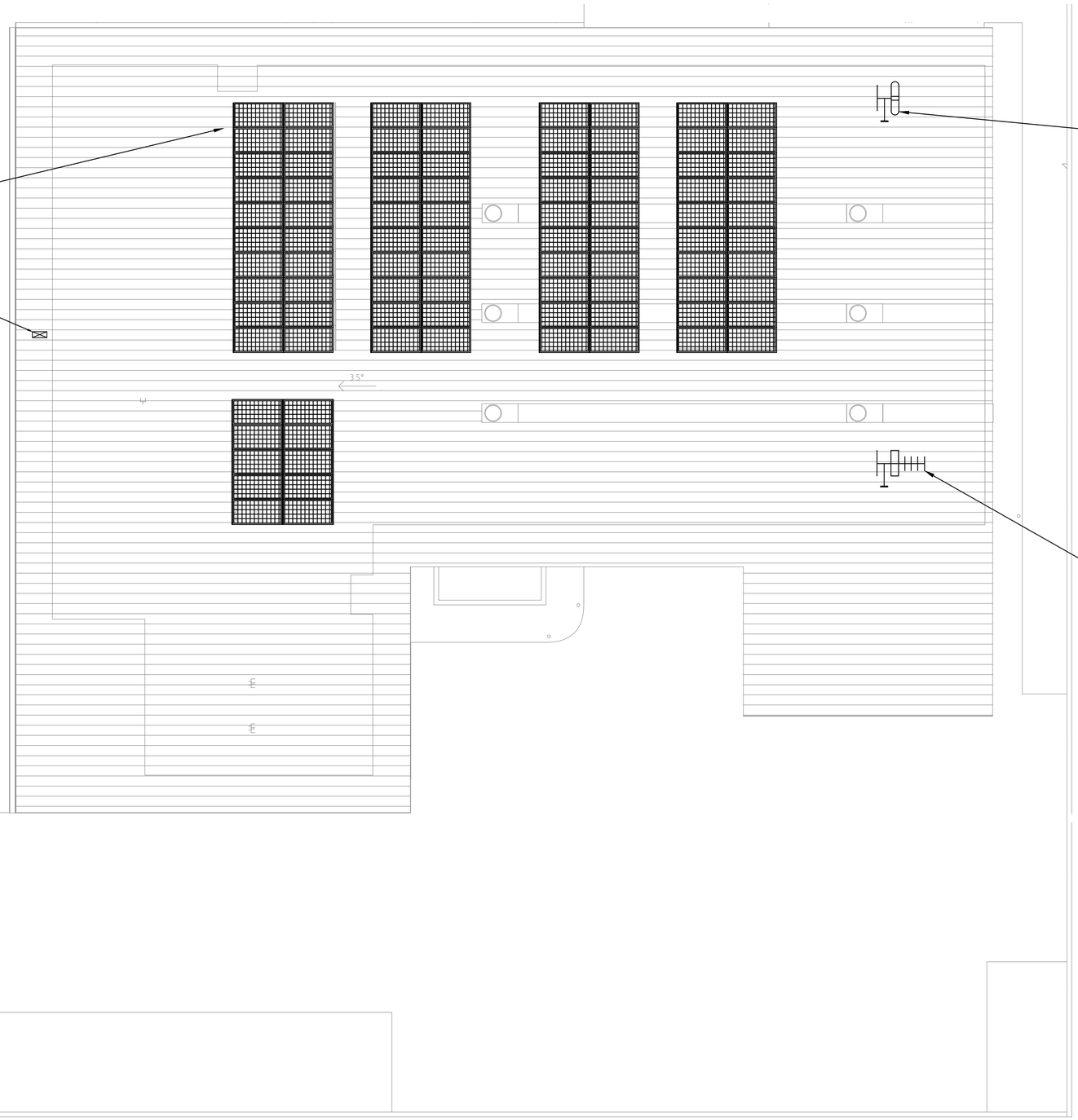
NOTES:

1. CONTRACTOR TO SUPPLY AND INSTALL A 30.14kW PV SYSTEM ON THE ROOF SPACE AS DENOTED IN THE SITE PLAN. THIS SYSTEM SHALL BE CONNECTED TO 1-OFF 3-PHASE 20kW PV INVERTER FOR SELF-CONSUMPTION AND 1-OFF 1-PHASE 5kW INVERTER TO CHARGE THE BATTERY STORAGE UNIT. REFER TO JHA SPECIFICATION AND DWG R31-EL-DRG-0200 FOR FURTHER DETAILS.

2. CONTRACTOR TO SUPPLY AND INSTALL A 14kWh BATTERY STORAGE UNIT SIMILAR TO TESLA POWERWALL 2 AND ASSOCIATED CABLING AND ACCESSORIES. A 20% OF THE ENERGY STORAGED WILL BE USED TO POWER SUPPLY THE AMBULANCE PLANT ROOM ROLLER DOORS AND THE MECHANICAL AIR CONDITIONING UNIT IN THE COMMS ROOM. SUR-PLUS ENERGY IS TO BE USED FOR SELF-CONSUMPTION. REFER TO JHA SPECIFICATION AND DWG R31-EL-DRG-0200 FOR FURTHER DETAILS.



SUPPLY AND INSTALL A 30.14kW (TOTAL 90-OFF 335W PANELS OR EQUIVALENT) PV SYSTEM ON THE OFFICE ROOF AREA. PV PANELS TO BE FLAT AGAINST THE PITCHED ROOF. COORDINATE FINAL PANEL LOCATION ON SITE WITH OTHER SERVICES. PV SYSTEM TO BE CONNECTED TO A 3-PHASE 20kW PV INVERTER FOR SELF-CONSUMPTION AND 1-PHASE 5kW INVERTER FOR CHARGING THE BATTERY STORAGE UNIT.

PENETRATION ON ROOF FOR PV SOLAR SYSTEM CABLING RETICULATION TO AMBULANCE PLANT ROOM ON GROUND FLOOR. REFER TO DWG R30-EL-DRG-0200 FOR DETAILS.

PROPOSED LOCATION OF UHF BASE RADIO, HWAN & CELLULAR BOOSTER ANTENNAS (3-OFF). CONTRACTOR TO SUPPLY AND INSTALL 3-OFF 1m HEIGHT ANTENNA MASTS SPACED BY 1.5m FROM EACH OTHER IN A TRIANGULAR CONFIGURATION. CONTRACTOR TO ALLOW FOR A ø80mm COMMUNICATIONS CONDUIT FROM THE CENTRAL LOCATION OF THE 3-OFF ANTENNAS TO THE COMMS ROOM AND A WEATHERPROOF SEAL OR DEKTIPE PIPE FLASHING SYSTEM TO REDUCE RISK OF WATER LEAKING. ANTENNA MAST SUPPORT SHOULD NOT PENETRATE THE ROOF.

CONTRACTOR SHALL ALSO SUPPLY AND INSTALL 3-OFF LL 400 (50 Ohm) COAXIAL CABLES, LEAVE 2m TAILS COILED IN A WEATHERPROOF BAG AND TERMINATED WITH AN "N MALE" CONNECTOR. IN THE COMMS ROOM LEAVE 2m TAILS COILED AND TERMINATED WITH AN "FME FEMALE" CONNECTOR.

CONTRACTOR SUPPLY AND INSTALL AN MATV ANTENNA AND ASSOCIATED MAST, SUPPORTS AND CABLING TO SERVE THE STATION. ALLOW FOR A ø80mm COMMUNICATIONS CONDUIT FROM MATV ANTENNA TO COMMS ROOM AND A WEATHERPROOF SEAL OR DEKTIPE PIPE FLASHING SYSTEM TO REDUCE RISK OF WATER LEAKING. ANTENNA MAST SUPPORT SHOULD NOT PENETRATE THE ROOF.

2 1 0 2 4 6 8 m

1 : 100-A1 1 : 200-A3

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
P1	28.04.22	PRELIMINARY ISSUE	J.G.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

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Building the future response for our state

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PROJECT
RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE
ELECTRICAL SERVICES
ROOF PLAN
POWER AND COMMUNICATIONS LAYOUT

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

DRAWN	S.H.	SCALE @ A1
CHECKED	E.L.	**1:100**
APPROVED	J.G.	
CREATED	APR 2022	
JOB No.	210067	

DRAWING No. **R31-EL-DRG-0201**
REV **P1**

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RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION PROGRAM - GLEN INNES

DISCIPLINE: HYDRAULICS SERVICES

CLIENT: NSW GOVERNMENT HEALTH INFRASTRUCTURE

SITE PLAN

SCALE: N.T.S.

DRAWING LIST

R31-HY-DRG-0000	COVER SHEET AND DRAWING LIST
R31-HY-DRG-0001	HYDRAULIC LEGEND
R31-HY-DRG-0002	SITE PLAN
R31-HY-DRG-0100	GROUND FLOOR STORMWATER AND SEWER LAYOUT
R31-HY-DRG-0101	ROOF PLAN STORMWATER AND SEWER LAYOUT
R31-HY-DRG-0200	GROUND FLOOR PRESSURE SERVICES LAYOUT
R31-HY-DRG-0300	HYDRAULIC DETAIL SHEET 1

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PROJECT: RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE: HYDRAULIC SERVICES COVER SHEET AND DRAWING LIST

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

DRAWN	S.L.	SCALE @ A1
CHECKED	S.T.	N.T.S.
APPROVED	S.T.	
CREATED	APR 2022	
JOB No.	210067	

DRAWING No. R31-HY-DRG-0000 — REV P1

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HYDRAULIC LEGEND

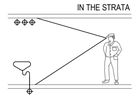
- COLD WATER SERVICE
- FIRE HOSE REEL SERVICE
- HOT WATER SERVICE
- HOT WATER FLOW
- HOT WATER RETURN
- WW — WARM WATER SERVICE
- WW — WARM WATER FLOW
- WW — WARM WATER RETURN
- FIRE HYDRANT SERVICE
- FIRE HOSE REEL SERVICE
- E — ELECTRICAL SERVICE
- e — EXISTING SERVICE
- SANITARY PLUMBING
- VENT PIPE
- SRM — SEWER RISING MAIN
- TW — TRADE WASTE DRAINAGE
- TW — TRADE WASTE PLUMBING
- TWV — TRADE WASTE VENT
- CV — CHAMBER VENT
- STORMWATER DRAINAGE
- DOWNPIPE
- OF — OVERFLOW PIPE
- EXISTING COLD WATER SERVICE
- EXISTING SEWER SERVICE
- EXISTING GAS SERVICE
- GAS SERVICE

SYSTEM ACCESSORIES LEGEND

- PUMP
- CO — CLEAROUT
- PIPELINE CONTINUES
- PIPELINE CAPPED OFF
- FHR — FIRE HOSE REEL
- FH — FIRE HYDRANT - INTERNAL
- DUAL FIRE HYDRANT - EXTERNAL
- OFG — OVERFLOW GULLY
- WM — WATER METER
- GM — GAS METER
- BT — BOUNDARY TRAP
- DRAINAGE OUTLET
  - BTFW - BUCKET TRAP FLOOR WASTE
  - FW - FLOOR WASTE
  - PDO - PLANTER DRAIN OUTLET
  - RWO - RAIN WATER OUTLET
  - VFW - VINYL FLOOR WASTE
  - SDO - SPOON DRAIN OUTLET
  - CPD - CARPARK DRAIN
  - PD - PLANTER DRAIN
- SMH — MAINTENANCE HOLE
  - SMH - SEWERAGE MAINTENANCE HOLE
  - SWMH - STORMWATER MAINTENANCE HOLE
- SWP — STORMWATER PIT WITH GRATE
- SWS — STORMWATER SUMP WITH GRATE
- PECP — PUMP ELECTRICAL CONTROL PANEL
- PENETRATION CORE THROUGH STRUCTURAL ELEMENT
- IPMF — INDUCT PIPE MICA FLAP
- NEW JUNCTION INTO EXISTING PIPELINE
- NEW BRANCH INTO EXISTING PIPELINE
- TD — TUNDISH
- O/FLOW — OVERLAND FLOW PATH
- POO PIT

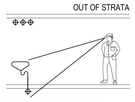
DESIGN ZONES

IN THE STRATA



SERVICES SHOWN ON THIS DRAWING ARE ABOVE SLAB

OUT OF STRATA



SERVICES SHOWN ON THIS DRAWING ARE BELOW SLAB

SYSTEM ACCESSORIES LEGEND

- BAV — BALANCING VALVE
- CV — STOP VALVE
- BV — BALL VALVE
- SV — SOLENOID VALVE
- MGV — MONITORED GATE VALVE
- PV — PATH VALVE IN CAST IRON SURFACE BOX
- GR — GAS REGULATOR
- RV — REFLUX VALVE
- NRV — NON RETURN VALVE
- DCV — DOUBLE CHECK VALVE
- TDCV — TESTABLE DOUBLE CHECK VALVE
- GV — GAS VALVE
- RPZD — REDUCED PRESSURE ZONE DEVICE
- AAV — AIR ADMITTANCE VALVE
- B — BASIN, SINK, SHOWER OR BATH TAP SET
- B — BASIN, SINK, SHOWER OR BATH CW TAP
- B — BASIN, SINK, SHOWER OR BATH HW TAP
- THERMOSTATIC MIXING VALVE
- TEMPERATURE GUARD
- H — STREET FIRE HYDRANT
- WATER METER ASSEMBLY WITH RPZD
- RISER
- DROPPER
- TEE RISER
- TEE DROPPER
- HWU — HOT WATER UNIT
- FIRE HYDRANT BRIGADE BOOSTER ASSEMBLY
- FLOW DIRECTION ARROW
- A — AMENDMENT SYMBOL
- INDICATES PIPE RISERS
- FS 100 — INDICATES SERVICE TYPE; INDICATES SERVICE SIZE
- FS 100 — INDICATES SERVICE TYPE; INDICATES SERVICE SIZE; INDICATES PIPE DROPPERS
- exFS 100 — EXISTING SERVICES IDENTIFICATION. DROPPER / RISER / SIZE
- H-001 — FOR CONTINUATION REFER DRAWING No. H-...
- 4.5KG DRY POWDER EXTINGUISHER
- 5.0KG CO2 FIRE EXTINGUISHER
- 9.0KG FOAM EXTINGUISHER
- NEW FIRE BLANKET

VALVE ABBREVIATIONS

AST	- ANGLE STOP TAP
AAV	- AIR ADMITTANCE VALVE
AP	- ACCESS PANEL
AV	- AIR ELIMINATION VALVE
BFV	- BUTTERFLY VALVE
BV	- BALL VALVE (GAS)
BAV	- BALANCING VALVE
CV	- CHECK VALVE
CV	- CONTROL VALVE
DCV	- DUAL CHECK VALVE
DV	- DRAIN OR TEST VALVE
ESOV	- EMERGENCY SHUT OFF VALVE
FCV	- CONTROL VALVE
FHV	- FIRE HYDRANT VALVE
GV	- GATE VALVE
HFV	- HANDS FREE VALVE
HT	- HOSE TAP
IV	- ISOLATION VALVE
NRV	- NON RETURN VALVE
OPSO	- OVER PRESSURE SHUT OFF REGULATOR
PLV	- PRESSURE LIMITING VALVE
PRV	- PRESSURE REDUCTION VALVE
PTR	- PRESSURE/TEMPERATURE RELIEF VALVE
RGBV	- RECESSED GAS BAYONET VALVE
RPZD	- REDUCED PRESSURE ZONE DEVICE
RST	- RECESSED STOP TAP
RV	- REFLUX VALVE
STP	- STOP TAP
SV	- STOP VALVE
TDVC	- TESTABLE DUAL CHECK VALVE
TEV	- TEMPERING VALVE
TMV	- THERMOSTATIC MIXING VALVE
TPR	- TEMPERATURE AND PRESSURE RELIEF VALVE
TV	- THROTTLING VALVE
VCG	- VALVE GROUP

FLUID FLOW AND MATERIAL ABBREVIATIONS

AHD	- AUSTRALIAN HEIGHT DATUM
Br	- BRASS
BRH	- BLUE RHINO
CI	- CAST IRON
CONC	- CONCRETE
CICL	- CAST IRON CEMENT LINED
CP	- CHROME PLATED
Cu	- COPPER
DICL	- DUCTILE IRON CEMENTED LINE
FRC	- FIBRE GLASS REINFORCED CEMENT
FU	- FIXTURE UNITS
GMS	- GALVANISED MILD STEEL
HDPE	- HIGH DENSITY POLYETHYLENE
ID	- INSIDE DIAMETER
kPa	- PRESSURE IN KILOPASCALS
kW	- KILOWATT
L	- LITRES
L/s	- FLOW IN LITRES PER SECOND
mm	- MILLIMETRES
m	- METRES
m²	- METRES SQUARES
MDPE	- MEDIUM DENSITY POLYETHYLENE
MJ	- MEGAJOULE
m/s	- VELOCITY OF FLOW IN METRES PER SECOND
mHd	- PRESSURE IN METRES HEAD
OD	- OUTSIDE DIAMETER
PE	- POLYETHYLENE
PP	- POLYPROPYLENE
RCP	- REINFORCED CONCRETE PIPE
RHS	- RECTANGULAR HOLLOW SECTION GALVANISED STEEL
SS	- STAINLESS STEEL
PVC-U	- UNPLASTICISED POLYVINYL CHLORIDE
VCP	- VITRIFIED CLAY PIPE

GENERAL ABBREVIATIONS

AAV	- AIR ADMITTANCE VALVE
AFFL	- ABOVE FINISHED FLOOR LEVEL
AC	- AIR CONDITIONING
AD	- AERIAL DRAINAGE
B	- BASIN
BG	- BOX GUTTER
BID	- BIDET
BM	- BAIN-MARIE
BPS	- BED PAN STERLISER
BPW	- BED PAN WASHER
BT	- BOUNDARY TRAP
BU	- BUBBLERS
BRT	- BUBBLER TROUGH
BTH	- BATH
BWU	- BOILING WATER UNIT
CHW	- CHILLED WATER
CL	- CEILING LEVEL
CO	- CLEAROUT
CP	- CHROME PLATED
CS	- CLEANERS SINK
CTE	- CONNECT TO EXISTING
CV	- CHAMBER VENT
CW	- COLD WATER
D	- DRAINAGE
DCP	- DISCHARGE CONTROL PIT
DE	- DIESEL EXHAUST
DF	- DRINKING FOUNTAIN
DGGP	- DOUBLE GRATED GULLY PIT
DHB	- DISABLED PERSONS HANDWASH BASIN
DL	- DILUTION PIT
DP	- DOWNPIPE
DTU	- DRAINAGE TURN-UP
DW	- DISHWASHER MACHINE
DWC	- DISABLED PERSONS WATER CLOSET
DWG No.	- DRAWING NUMBER
DWV	- DRAINAGE WASTE AND VENT
EG	- EAVES GUTTER
EJ	- EXPANSION JOINT
EKI	- EXTENDED KERB INLET
EX	- EXISTING
EW	- EYE WASH
FD	- FIRE DRENCHER
FFL	- FINISHED FLOOR LEVEL
FGL	- FINISHED GROUND LEVEL
FH	- FIRE HYDRANT
FHBV	- FIRE HYDRANT BOOSTER VALVE
FHR	- FIRE HOSE REEL
FU	- FIXTURE UNIT
FW	- FLOOR WASTE
G	- GAS
GA	- GREASE ARRESTOR
GD	- GRATED DRAIN
GFW	- GARBAGE FLOOR WASTE
GST	- GREASE STACK
GT	- GAS TURRET
GL	- GROUND LEVEL
GO	- GUTTER OUTLET
GW	- GREASE WASTE
GWV	- GREASE WASTE VENT
GW	- GLASS WASHER
HD	- HEAVY DUTY
HP	- HIGH POINT
HP	- HOT PLATE
HL	- HIGH LEVEL
HR	- HALF ROUND
HT	- HOSE TAP
HW	- HOT WATER
HWF	- HOT WATER FLOW
HWH	- HOT WATER HEATER
HWR	- HOT WATER RETURN
HWU	- HOT WATER UNIT
IPMF	- INDUCT PIPE MICA FLAP
IRR	- IRRIGATION
IS	- INSPECTION SHAFT
IL	- INVERT LEVEL
IM	- ICE MACHINE
IO	- INSPECTION OPENING
K	- KAMLOK FITTING WITH CAP & CHAIN
KB	- KITCHEN BASIN
KHW	- KITCHEN HOT WATER
KIP	- KERB INLET PIPE
KS	- KITCHEN SINK
LD	- LIGHT DUTY
LL	- LOW LEVEL
LS	- LAB SINK
LT	- LAUNDRY TUB
LTG	- LONGITUDINAL TRENCH GRATE
MD	- MEDIUM DUTY
ML	- MID LEVEL
NPCW	- NON-POTABLE COLD WATER
No.	- NUMBER
OF	- OVERFLOW
OFG	- OVERFLOW GULLY
OSD	- ON SITE DETENTION TANK
PA	- PLASTER ARRESTOR
PCW	- POTABLE COLD WATER
PRO	- PARAPET RAINWATER OUTLET
QT	- QUENCHING TANK
REF	- REFRIGERATOR
RL	- REDUCED LEVEL
RPZD	- REDUCED PRESSURE ZONE DEVICE
RWO	- RAINWATER OUTLET
RV	- RELIEF VENT
SBF	- STANDARD BAYONET FITTING
SD	- SAFE DRAIN
SDU	- SANITARY NAPKIN DISPOSAL UNIT
SEP	- SIDE ENTRY PIT
SEW	- SEWER
SH	- SLOP HOPPER
SHR	- SHOWER
SIP	- SEWER INSPECTION PIT
SK	- SINK
SMH	- SEWER MANHOLE
SP	- SOIL PIPE
SRM	- SEWER RISING MAIN
SRO	- SIDE ROOF OUTLET
SS	- SUB-SOIL PIPE
SSHR	- SAFETY SHOWER
SSL	- STRUCTURAL SLAB LEVEL
ST	- SANITARY/DRAINAGE STACK
SW	- STORM WATER
SWMH	- STORMWATER MANHOLE
SWP	- STORM WATER PIT
SWRM	- STORMWATER RISING MAIN
TD	- TUNDISH
TK	- TOP OF KERB
TTD	- TRAPPED TUNDISH
TTG	- TRENCH GRATE
TW	- TRADE WASTE
TWL	- TOP WATER LEVEL
TYP	- TYPICAL
U/G	- UNDERGROUND
UNO	- UNLESS NOTED OTHERWISE
UR	- URINAL
U/S	- UNDERSIDE
USFL	- UNDERSIDE FLOOR LEVEL
VB	- VACUUM BREAKER
VB	- VANITY BASIN
VFW	- VINYL FLOOR WASTE
VP	- VENT PIPE
WC	- WATER CLOSET
WD	- WINDOW DRENCHER
WL	- WATER LEVEL
WM	- WASHING MACHINE
WME	- WATER METER
WP	- WASTE PIPE
WT	- WASH TROUGH
WW	- WARM WATER
WWF	- WARM WATER FLOW
WWR	- WARM WATER RETURN
YG	- YARD GULLY
Ø	- DIAMETER

GENERAL NOTES

1. THIS PLAN MUST NOT BE COPIED OR REPRODUCED IN ANY FORM OR USED FOR ANY PURPOSE OTHER THAN ORIGINALLY INTENDED WITHOUT APPROVAL FROM JHA CONSULTING ENGINEERS.
2. THIS PLAN SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL, OTHER CONSULTANTS DRAWINGS, SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE. REFER TO THE ARCHITECT FOR DECISIONS BEFORE PROCEEDING WITH ANY WORK.
3. ALL WORKS TO BE IN ACCORDANCE WITH THE HYDRAULIC SERVICES SPECIFICATION, AUTHORITIES REQUIREMENTS, PLUMBING CODE OF AUSTRALIA, AS3500, AS5601, AS 2444, AS 2419, AS 2118.1, AS2441, AS1530, CURRENT NCC & NSW HEALTH DEPT.
4. CONFIRM LOCATION, SIZE AND LEVELS OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK.
5. DISCONNECT AND REMOVE ALL EXISTING REDUNDANT SERVICES TO AUTHORITIES APPROVAL.
6. LOCATIONS & FIXING OF PIPEWORK SHALL BE SUBJECT TO CO-ORDINATION WITH OTHER DESIGN DISCIPLINES, ie STRUCTURAL, MECHANICAL, ELECTRICAL AND OTHER SERVICES ENGINEERS.
7. ALL LOCATIONS OF EXISTING SERVICES MAINS TO BE CONFIRMED BY MEANS OF DIAL BEFORE YOU DIG, PIPE LOCATOR AND TRACING PRIOR TO COMMENCEMENT OF WORKS.
8. ALL WORKS TO INCLUDE TESTING & INSPECTIONS. OBTAIN REQUIRED CERTIFICATES ON COMPLETION & PAYMENT OF RELEVANT FEES.
9. THE HYDRAULIC CONTRACTOR SHALL ALLOW IN THE TENDER TO SUBMIT PHOTO BASED INSPECTION AND TEST PLANS ESPECIALLY FOR SERVICE PENETRATIONS THROUGH FIRE AND SMOKE WALLS. REFER TO ARCHITECTURAL DRAWINGS FOR DEMOLITION PLAN AND SCOPE OF WORKS.
10. ALLOW TO CLEAN / FLUSH OUT ALL EXISTING STORMWATER DRAINAGE.
11. ALLOW TO SAWCUT/REMOVE HARD SURFACES AREAS AS REQUIRED TO COMPLETE THE INSTALLATION. ALLOW TO MAKE GOOD SURFACES UPON COMPLETION.
12. CHECK EXISTING ELECTRICAL EARTHING TO METALLIC PLUMBING SERVICES. PROVIDE TEMPORARY EARTHING CABLES BETWEEN SERVICES WHICH ARE TO BE CUT, TERMINATED OR EXTENDED. CONFIRM WITH SITE ELECTRICIAN FOR SAFE PROCEDURES.
13. CONTRACTOR IS TO SET OUT & DIMENSION ALL PENETRATIONS & GAIN APPROVAL FROM STRUCTURAL ENGINEER BEFORE WORK COMMENCES. PROVIDE SEPARATE PENETRATION FOR EACH SERVICE SO AS TO ENSURE ADEQUATE FIRE STOPPING. ALL PIPE PENETRATIONS SHALL BE FITTED WITH APPROVED FIRE STOP COLLARS/ DEVICES TO CONFORM TO AS1530.
14. WATER, WASTE & GAS PIPES LOCATED WITHIN JOINERY CABINETS, SINK CUPBOARD etc. SHALL BE ARRANGED IN A MANNER SO AS NOT TO OBSTRUCT THE FREE SPACE AS FAR AS PRACTICAL INSTALLATION PERMITS.
15. PROVIDE FLOW CONTROL TO ALL FIXTURES. REFER FIXTURE/FAUCET SCHEDULE.
16. ALL WORK IS TO COMPLY WITH ALL AUTHORITY REQUIREMENTS, RELEVANT AUSTRALIAN STANDARDS AND THE NATIONAL CONSTRUCTION CODE.
17. THE DOCUMENTS REPRESENT DESIGN CONCEPT ONLY. IT IS THE SUB CONTRACTORS RESPONSIBILITY TO DEVELOP DETAILED DRAWINGS, FULLY CO-ORDINATED WITH ALL SERVICE DISCIPLINES, NEW AND EXISTING STRUCTURE AND ARCHITECTURAL DOCUMENTATION.
18. THE SUB-CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE DETAILED DESIGN, CALCULATIONS AND SUBMISSIONS, SUPPLY AND INSTALLATION OF ALL SERVICES, CERTIFICATION AND APPROVALS, COMMISSIONING, TESTING & HANDOVER.
19. THE SUB-CONTRACTOR IS TO ALLOW FOR THE PAYMENT OF ALL FEES AND CHARGES LEVIED BY THE VARIOUS AUTHORITIES AND PREPARE ALL SUBMISSIONS AS REQUIRED TO FACILITATE THE CONSTRUCTION OF ALL SERVICES.
20. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS GOVERN.
21. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
22. ALL DIMENSIONS SHALL BE VERIFIED ON SITE BEFORE PROCEEDING WITH THE WORK. THE CLIENT SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES.
23. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATIONS, REPORTS AND DRAWINGS.

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PROJECT

RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE

HYDRAULIC SERVICES
HYDRAULIC LEGEND

PRELIMINARY ISSUE
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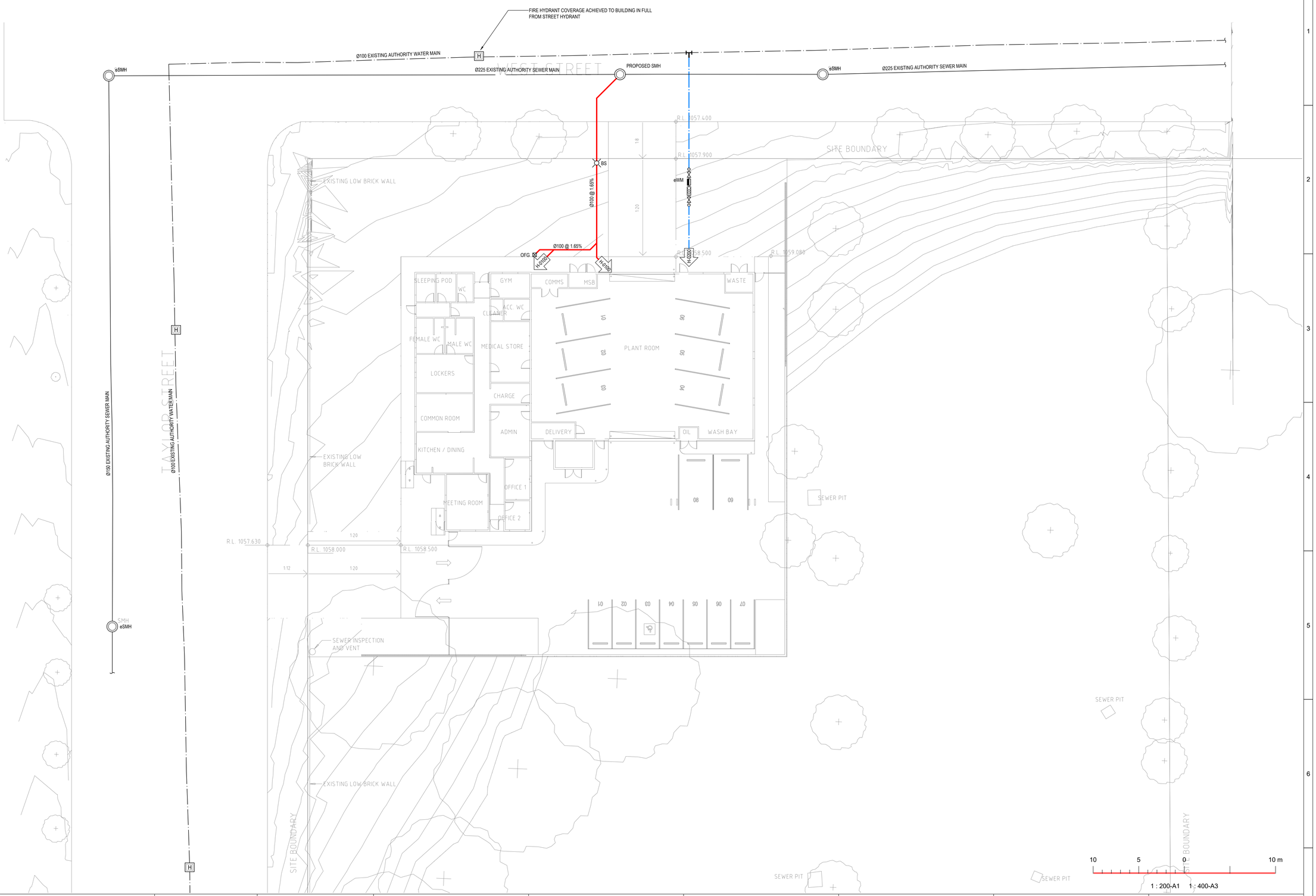

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Building the future response for our state

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PROJECT
RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE
HYDRAULIC SERVICES
SITE PLAN

PRELIMINARY ISSUE
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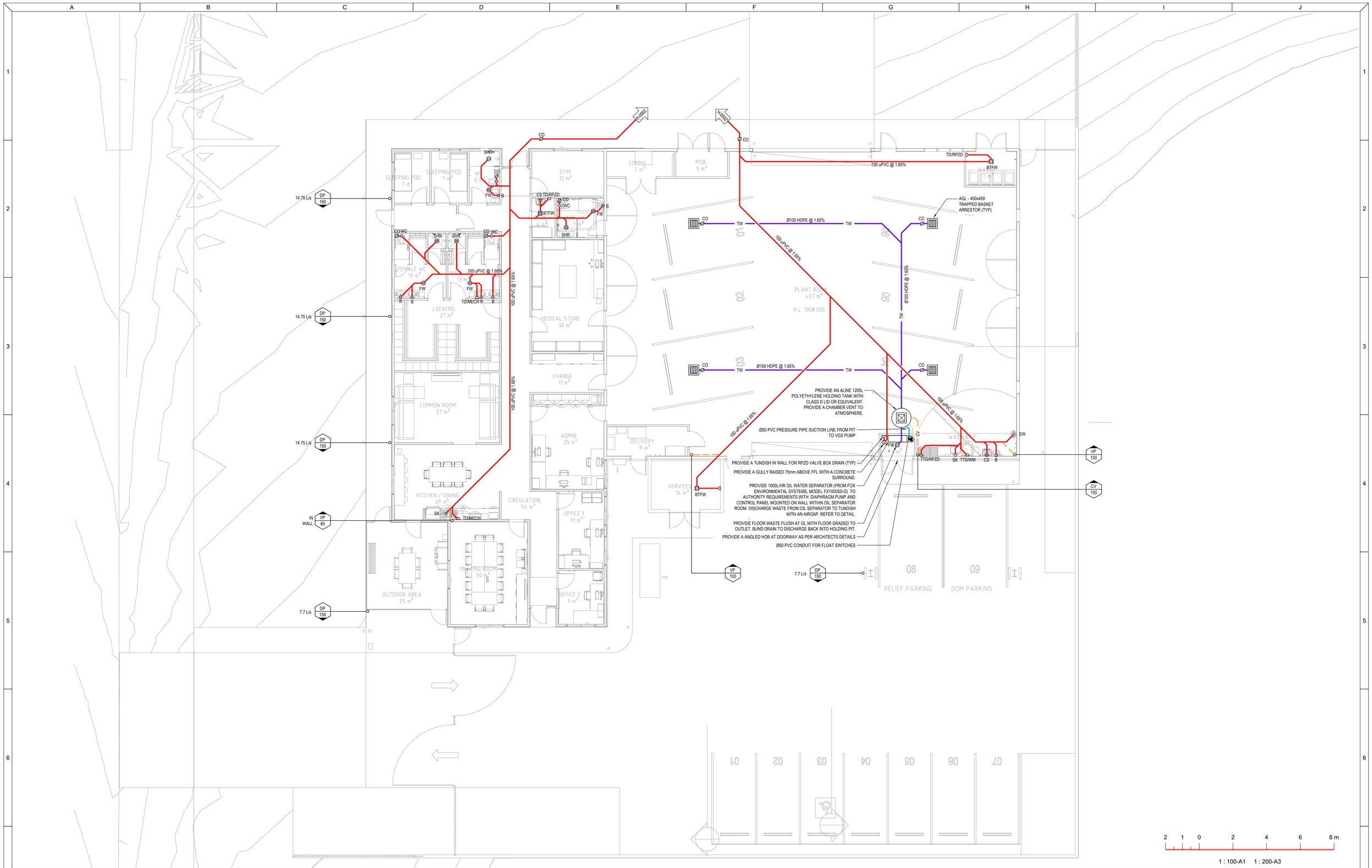

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PROJECT
RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE
HYDRAULIC SERVICES
GROUND FLOOR
STORMWATER AND SEWER
LAYOUT

PRELIMINARY ISSUE
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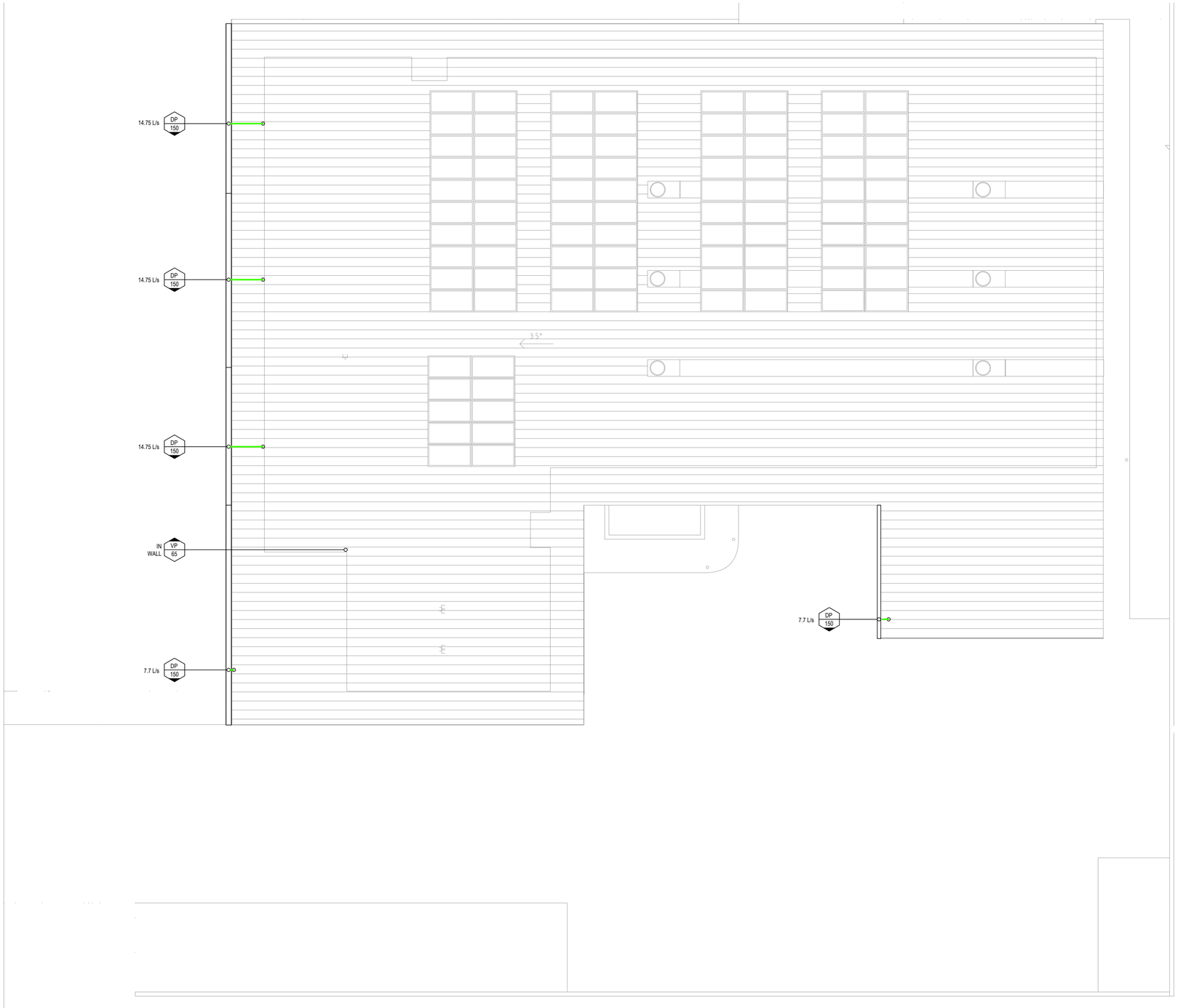

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PROJECT

RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE

HYDRAULIC SERVICES
ROOF PLAN
STORMWATER AND SEWER LAYOUT

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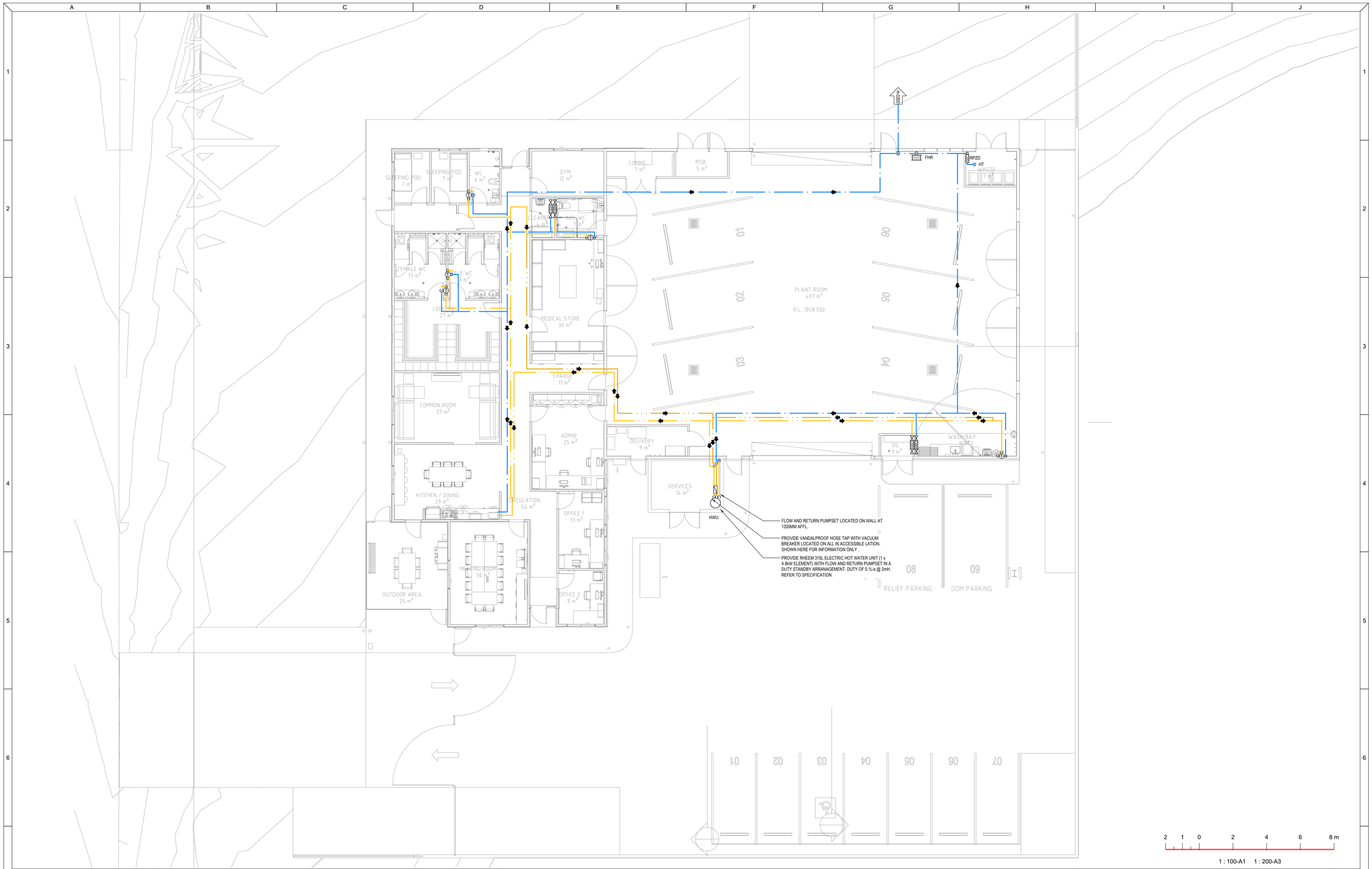

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PROJECT

RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE

HYDRAULIC SERVICES
GROUND FLOOR
PRESSURE SERVICES
LAYOUT

PRELIMINARY ISSUE
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RURAL AMBULANCE INFRASTRUCTURE RECONFIGURATION PROGRAM - GLEN INNES

DISCIPLINE: MECHANICAL SERVICES

CLIENT: NSW GOVERNMENT HEALTH INFRASTRUCTURE

DRAWING LIST

R31-ME-DRG-0000	COVER SHEET AND DRAWING LIST
R31-ME-DRG-0001	MECHANICAL LEGEND
R31-ME-DRG-0100	GROUND FLOOR AIR CONDITIONING AND VENTILATION LAYOUT
R31-ME-DRG-0101	ROOF PLAN AIR CONDITIONING AND VENTILATION LAYOUT

SITE PLAN

SCALE: N.T.S.

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PROJECT

RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE

MECHANICAL SERVICES
COVER SHEET
AND DRAWING LIST

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LEGEND

AxB — RECTANGULAR SHEET METAL DUCTWORK, UN-INSULATED
A- DUCT SIZE (mm) SIDE VIEWED
B- DUCT SIZE (mm) SIDE IN SECOND AXES

ALL DUCTWORK SHALL COMPLY WITH AS4254 AND AS1668.
ALL DUCT DIMENSIONS INDICATED ON THE DRAWINGS ARE CLEAR INTERNAL AIRWAY SIZES.

50mm INTERNAL INSULATION

ACOUSTICALLY INSULATED SHEET METAL DUCTWORK, MINIMUM 50mm THICKNESS @ min 30kg/m³ DENSITY.

AxB — DUCT SPIGOT WITH BUTTERFLY DAMPER ON RECTANGULAR DUCTWORK

ALL DUCTWORK SHALL COMPLY WITH AS4254 AND AS1668. ALL DUCT DIMENSIONS INDICATED ON THE DRAWINGS. SQUARE, RECTANGULAR AND ROUND DUCTS ARE REPRESENT AS CLEAR INTERNAL AIRWAY SIZES UNLESS NOTED OTHERWISE FLAT OVAL DUCT DIMENSIONS REPRESENT SHEET METAL SIZE. (AN ALLOWANCE FOR INTERNAL INSULATION HAS BEEN MADE).

SHEET METAL DUCTWORK LAGGED WITH:

R1.2 — EXTERNAL / INTERNAL INSULATION AS DESCRIBED WITHIN SPECIFICATION TYPICALLY WITH A MINIMUM THERMAL INSULATION RESISTANCE OF 1.2m²K/W

R2.0 — EXTERNAL / INTERNAL INSULATION AS DESCRIBED WITHIN SPECIFICATION TYPICALLY WITH A MINIMUM THERMAL INSULATION RESISTANCE OF 2.0m²K/W

R3.0 — EXTERNAL / INTERNAL INSULATION AS DESCRIBED WITHIN SPECIFICATION TYPICALLY WITH A MINIMUM THERMAL INSULATION RESISTANCE OF 3.0m²K/W

FD — FIRE DAMPER

ROOF MOUNTED COWL

FLEXIBLE DUCTWORK CONNECTION

SUPPLY/EXHAUST FAN

NEW FLEXIBLE DUCTWORK

100 l/s 600x600 — SWIRL SUPPLY AIR DIFFUSER, SUPPLYING 100 l/s, 600x600 FACE, WITH PLENUM BOX.

RETURN / EXHAUST EGGCRATE C/W RETURN AIR PLUNUM.

ACCESS PANEL, BY BUILDING TRADE

MSSB - MECHANICAL SERVICES SWITCHBOARD (MSSB)

CEILING MOUNTED DUCTED FAN COIL UNIT

CEILING MOUNTED CASSETTE A/C UNIT

WALL MOUNTED A/C UNIT

OUTDOOR CONDENSER UNIT

VRV/VRF TYPE VERTICAL DISCHARGE CONDENSER UNIT

T — WALL MOUNTED PAD WITH BUILT IN TEMPERATURE SENSOR

S — IN DUCT SMOKE PROBE

EF- EXHAUST FAN

OAF- OUTSIDE AIR FAN

FCU- INDOOR AC UNIT

CU- CONDENSER UNIT

CONDENSATE DRAIN LINE

FW — FLOOR WASTE (BY OTHERS).

TD — TUNDISH (BY OTHERS).

C — REVISION

20mm UNDERCUT TO DOOR, BY BUILDING TRADE

DOOR RELIEF GRILLE SUPPLIED BY MECHANICAL TRADE FOR INSTALLATION BY BUILDING TRADE

A A — SECTION

REFRIGERANT DETECTION ALARM / GAS LEAK DETECTION SENSOR

WALL MOUNTED AC MASTER CONTROLLER

VOLUME CONTROL DAMPER

TRANSFER AIR DUCT

FLEXIBLE DUCT SIZING SCHEDULE

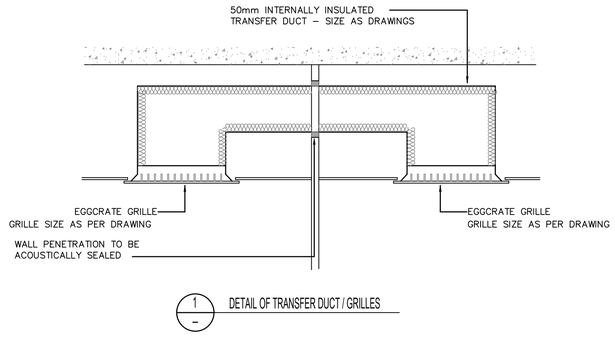
AIR QUANTITY (L/S)	FLEX. DUCT DIAM. (MM)
0 to 100	200 DIA
101 to 150	250 DIA
151 to 220	300 DIA
221 to 330	350 DIA
331 to 425	400 DIA

DOOR GRILLE SIZING SCHEDULE

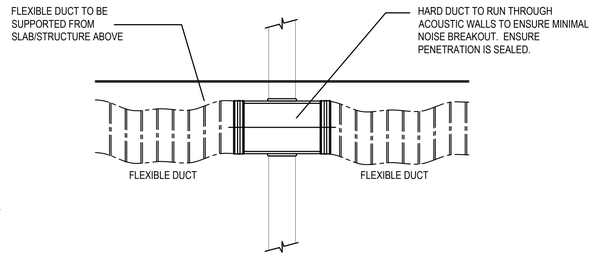
AIR FLOW (L/S)	SIZE (MM x MM)
0 to 150	600 x 150
151 to 200	600 x 200
201 to 300	600 x 300
301 to 500	600 x 450
501 to 600	600 x 600

NOTES

1. INFORMATION SHOWN IS FOR TENDER PURPOSE ONLY.
2. THE MECHANICAL TRADE SHALL CO-ORDINATE WITH ALL SERVICES ON SITE PRIOR TO MANUFACTURE AND SITE INSTALLATION.
3. ALL DUCTWORK INSULATION INCLUDING FLEXIBLE DUCTWORK TO BE AS NOTED ON DRAWINGS OR AS DESCRIBED IN THE MECHANICAL SPECIFICATIONS.
4. IF THERE IS ANY DISCREPANCY BETWEEN MECHANICAL AND ACOUSTIC REQUIREMENTS REGARDING DUCT INTERNAL INSULATION, ACOUSTIC REQUIREMENTS WILL TAKE PRECEDENCE.
5. WHERE THE DIAMETER OF THE FLEXIBLE DUCT EXCEEDS THE DEPTH OF THE RIGID DUCT IT ORIGINATES FROM, AN OVAL SPIGOT HAVING THE SAME CIRCUMFERENCE AS THE FLEXIBLE DUCT, MAY BE USED.
6. REFER TO SCHEDULE FOR FLEXIBLE DUCT DIAMETERS. THE LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 3.6m. WHERE THE DISTANCE BETWEEN OUTLET AND SPIGOT IS GREATER THAN 3.6m, A SECTION OF RIGID CIRCULAR OR OVAL DUCT OF THE SAME DIAMETER SHALL BE USED TO MAKE UP THE DIFFERENCE. THE SECTION OF RIGID CIRCULAR OR OVAL DUCT HAS NOT BEEN SHOWN ON DRAWINGS FOR CLARITY REASONS.
7. A FULL SIZE CONDENSATE DRAIN (OR 25mm DIAMETER MINIMUM) SHALL RUN FROM EACH AIR CONDITIONING UNIT TO A TUNDISH OR FLOOR WASTE. CONDENSATE DRAIN PIPES SHALL BE PVC OR COPPER. SHOULD COPPER PIPE BE USED IT SHOULD BE INSULATED WITH 10mm THICK ARMAFLEX OR APPROVED EQUAL INSULATION.
8. THE LOCATION OF GRILLES AND DIFFUSERS IN PLASTER CEILING SHOWN ON MECHANICAL DRAWINGS IS INDICATIVE ONLY. FOR EXACT LOCATION REFER TO ARCHITECTURAL REFLECTED CEILING PLAN DRAWINGS.
9. ALL ACCESS PANELS IN THE PLASTER CEILING (FOR FIRE DAMPERS, VCD's AND EQUIPMENT) TO BE PROVIDED BY THE BUILDING TRADE.
10. TUNDISHES AND/OR FLOOR WASTES ASSOCIATED WITH MECHANICAL SERVICES TO BE PROVIDED BY HYDRAULIC TRADE.
11. FAN COIL UNITS (FCU'S) SHALL BE MOUNTED ON SPRINGS TYPE SLFH FROM MASON INDUSTRIES, HAVING 25mm STATIC DEFLECTION OR EQUIVALENT. FANS SHALL BE ISOLATED FROM DUCTWORK WITH FLEXIBLE CONNECTIONS.
12. ALL CONDENSING PIPES PENETRATIONS SHALL BE ISOLATED USING A FIRE-RATED MASTIC SEALANT HAVING SPECIFIC GRAVITY OF 1.6g.

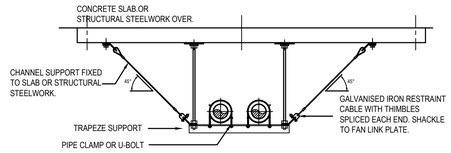


1 – DETAIL OF TRANSFER DUCT / GRILLES



WALL PENETRATION FOR FLEXIBLE DUCTWORK DETAIL

N.T.S.



HORIZONTAL PIPEWORK SEISMIC MOUNTING FROM ABOVE

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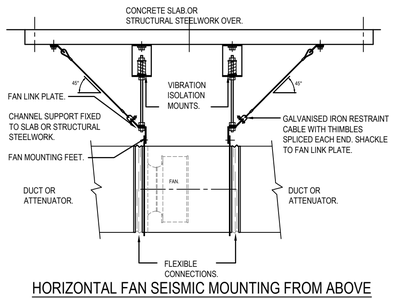

HORIZONTAL FAN SEISMIC MOUNTING FROM ABOVE

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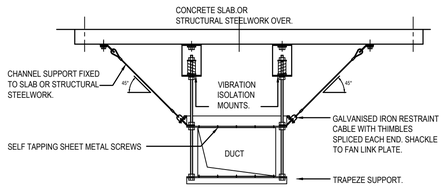

HORIZONTAL DUCT SEISMIC MOUNTING FROM ABOVE

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TITLE: MECHANICAL SERVICES
MECHANICAL LEGEND

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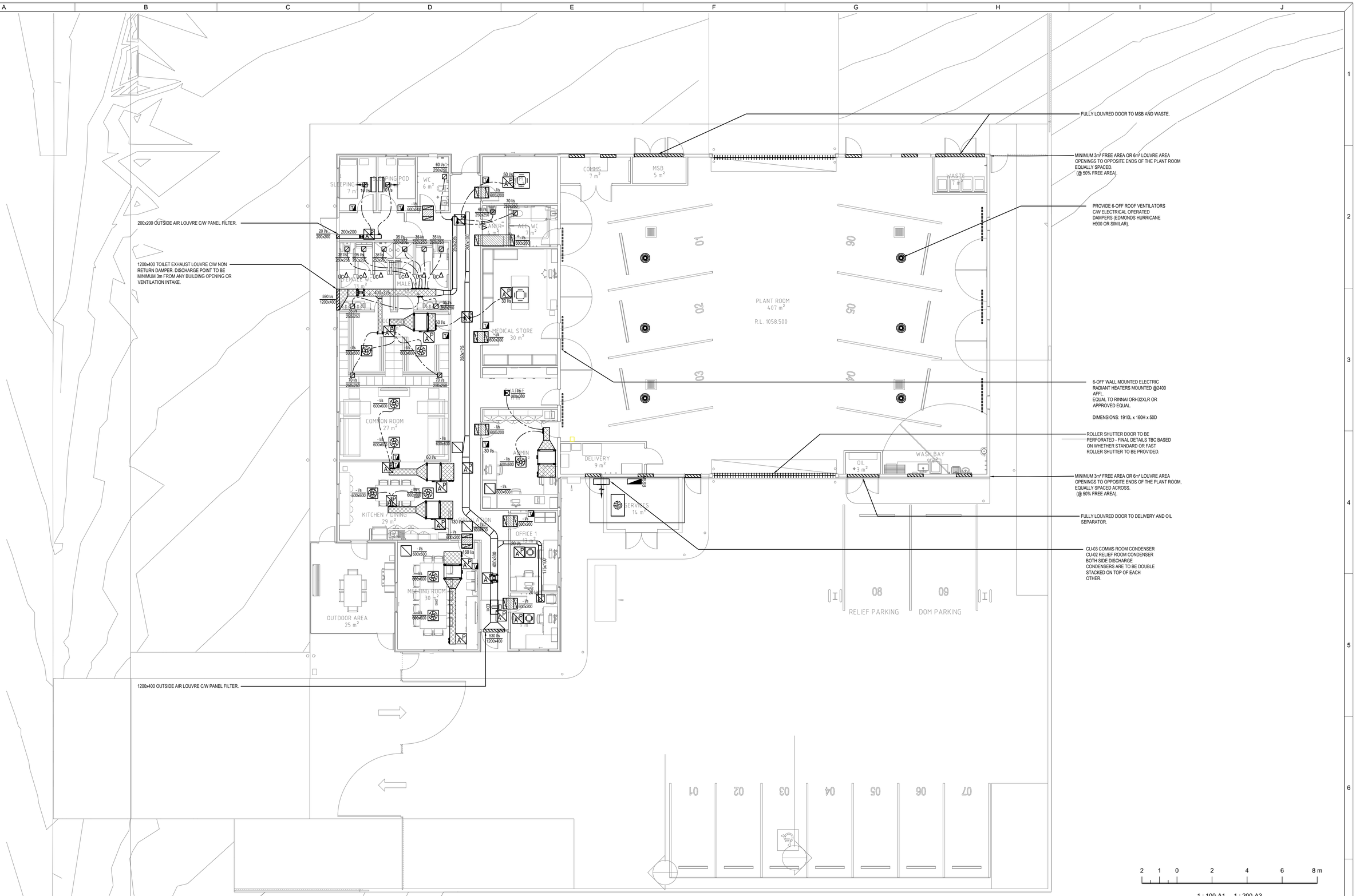

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PROJECT
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TITLE
MECHANICAL SERVICES
GROUND FLOOR
AIR CONDITIONING AND VENTILATION
LAYOUT

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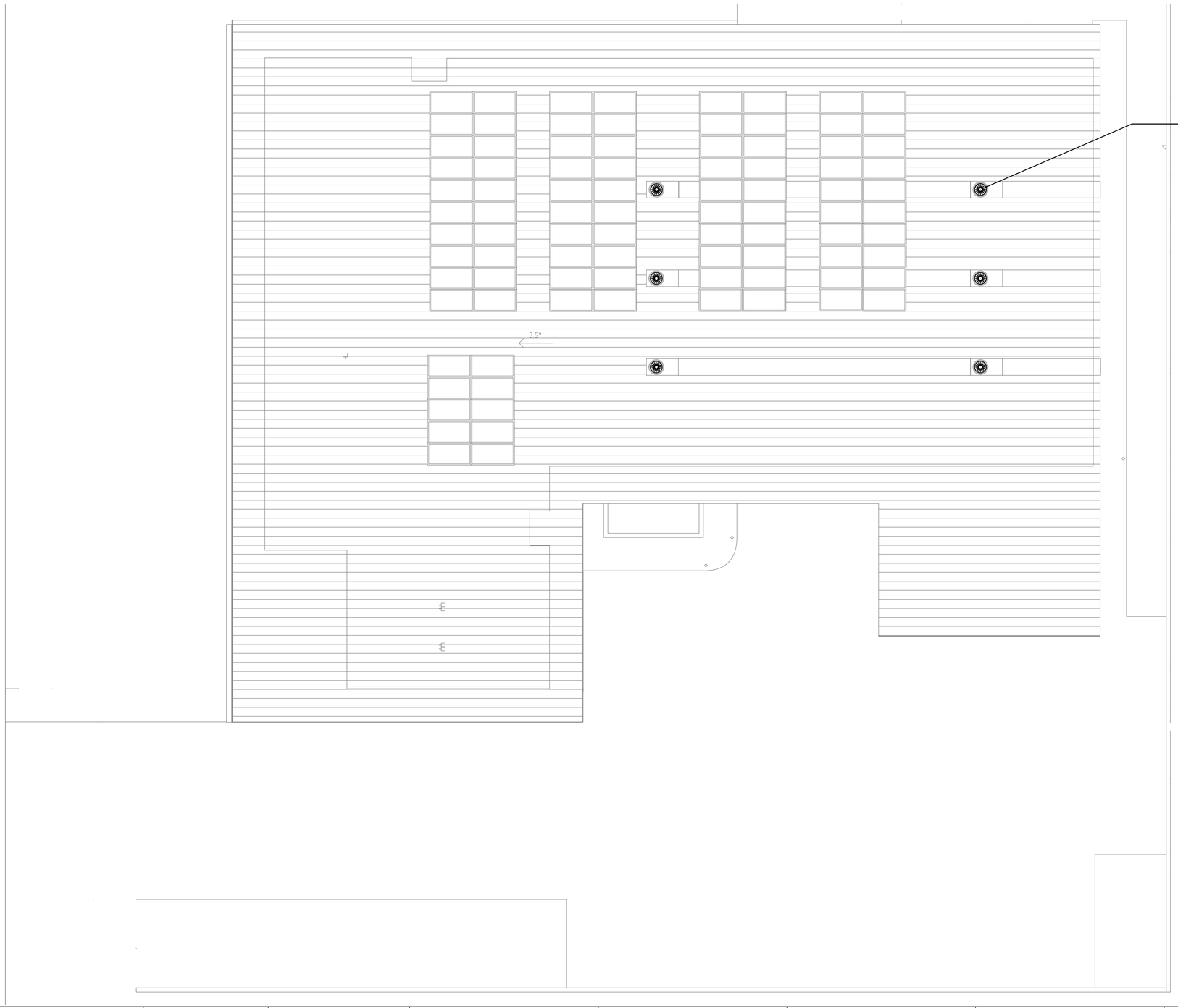

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Rev	Date	Description	Verified

NORTH

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Building the future response for our state

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PROJECT

RURAL AMBULANCE RECONFIGURATION INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

TITLE

MECHANICAL SERVICES
ROOF PLAN
AIR CONDITIONING AND VENTILATION
LAYOUT

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

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RAIR – GLEN INNES AMBULANCE STATION

GLEN INNES, NEW SOUTH WALES

TRAFFIC IMPACT ASSESMENT

PREPARED BY: ROADNET ENGINEERING PTY LTD

For: GeoLINK

12/07/2022

Document Control Sheet

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1 INTRODUCTION

RoadNet has been engaged by GeoLINK to undertake a Traffic Impact Assessment (TIA) for the proposed new Glenn Innes Ambulance Station adjacent to Glen Innes Hospital at 85 Taylor Street. Health Infrastructure (HI) is delivering new, rebuilt or updated NSW Ambulance stations as part of the Rural Ambulance Infrastructure Reconfiguration (RAIR) program to provide local paramedics with modern, fit-for-purpose infrastructure to better meet the emergency medical care needs of communities in regional and rural NSW.

This traffic impact assessment will be submitted as part of a Development Application (DA) to Glen Innes Severn Council.

The location of the subject site is shown in Figure 1.1 below.

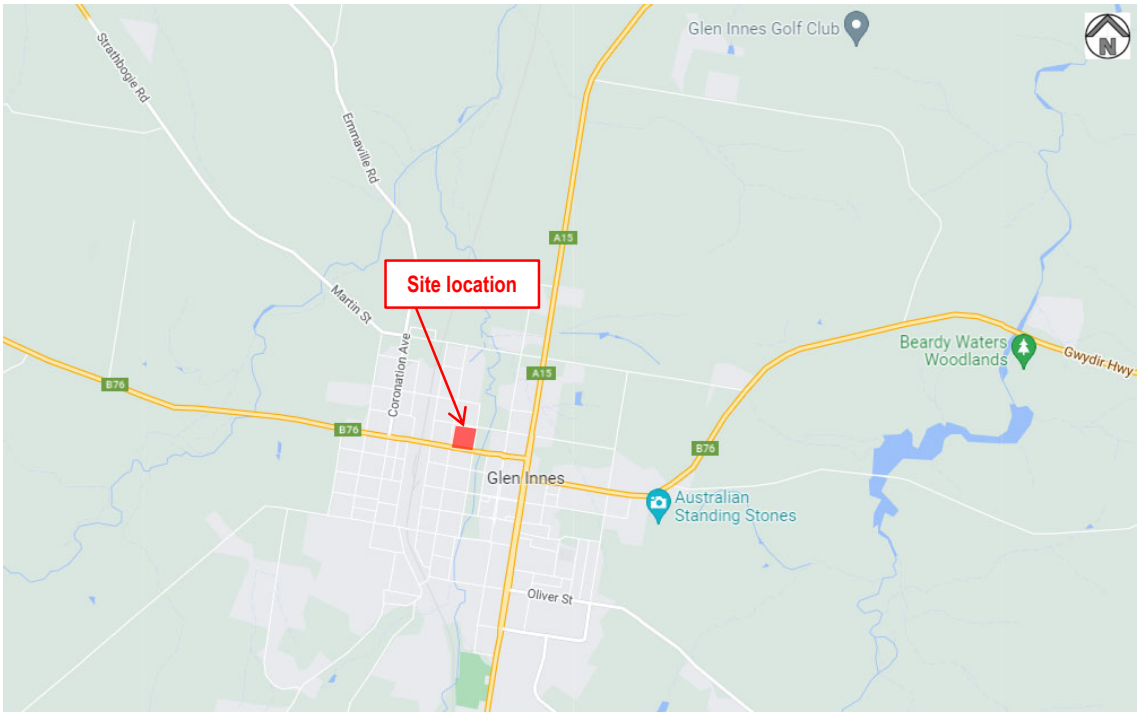


Figure 1.1- Site location (Source: Google Maps May. 2022)

The purpose of this report is to document the assessment of the proposed car park, vehicular access and internal circulation arrangements and its compliance with the relevant Australian Standards, Glenn Innes Severn Council and Transport for New South Wales (TfNSW) standards.

1.1 Scope of the report

The scope of this TIA includes the following tasks:

- Reviewing existing conditions surrounding the subject site, including public and active transport provisions and connections to the surrounding road network.

- Estimating the development's traffic generation for qualitative assessment of the surrounding road network.
- Assessing the on-site parking provisions and geometric layout against Glen Innes Severn Council Development Control Plan (DCP) and Australian Standards AS2890 requirements.
- Reviewing the refuse and service vehicle operations in accordance with Council's DCP.

2 BACKGROUND

2.1 Development Proposal

The proposal involves the construction of a new ambulance station on 85 Taylor Street, Glen Innes in New South Wales (NSW). The development comprises part of a Heath Infrastructure (HI) program referred to as the Rural Ambulance Infrastructure Reconfiguration (RAIR) program, which includes the delivery of upgraded, rebuilt or construction of new regional and rural ambulance stations across rural NSW.

The key transport elements of the proposed ambulance station are outlined in

Table 2-1.

Table 2-1 – Development Components

Component	Proposed Ambulance Station

Hours of operation	24/7 morning shift / night shift
No. of full time equivalent (FTE) staff	24
No. of Directorate Of Management (DOM)	1
Maximum number of staff on site at any one time	6 (As advised by HI)
No. of car parking spaces (internal)	Six (6) x ambulance spaces
No. of car parking spaces (external)	Ten (10) car parking spaces → One (1) DOM → One (1) Relief → One (1) Wash Bay → One (1) accessible bay → Six (6) parking bays
Access	Two (2) Station access: → One (1) all movements access on Taylor Street for staff and Ambulance vehicles. → One (1) exit only driveway on West Avenue for Ambulance vehicles only

Details of the proposal are presented on the architectural drawings prepared by DJRD Architects provided in Appendix A.

2.2 Site Context

The subject site is located in the corner of Taylor Street and West Avenue, Glen Innes, NSW, and comprises one property at 85 Taylor Street which is described as 2/-/DP1208729. The site is currently occupied on the southwest corner by a series of buildings that comprises the Glen Innes District Health Service. On the northeast corner the site is mostly empty with some large trees and bushes. The proposed development has a frontage of approximately 52m onto Taylor Street and an area of approximately 0.3 Ha with side access from West Avenue. (See Figure 2.1).

Figure 2.1- Aerial view of Site and surrounds (Source: Nearmap, 2022)

2.3 Land Uses

As indicated by the NSW Online Planning Portal, the subject site is currently zoned as R1 - General Residential. (Refer to

Nearby land uses surround the site by a range of residential and public recreation uses as detailed below:

- To the east, a RE1 'Public Recreation' areas; and
- To the north, south and west, R1 'General residential'.

Figure 2.2- Zoning map (Source: NSW Online Portal Viewer, 2022)

3 Existing Transport Conditions

3.1 Surrounding Road Network

To manage the extensive network of roads for which councils are responsible under the Roads Act 1993, TfNSW in partnership with local governments established an administrative framework of State, Regional, and Local Road categories summarized below:

- **State Roads**: State Roads are the major arterial links through NSW and within major urban areas. State Roads are managed and financed by TfNSW.

- **Regional Roads**: Regional Roads are routes of secondary importance between State and Local Roads which together with State Roads, provide the main connections to and between smaller towns and districts and perform an intermediate function between the main arterial network of State Roads and Council controlled Local Roads.

  Regional Roads are managed and financed by councils. Due to their network significance RMS provides financial assistance to councils for the management of their Regional Roads.

  The Regional Road category comprises two subcategories: those Regional Roads that are classified pursuant to the Roads Act 1993, and those Regional Roads that are unclassified.

- **Local Roads**: Local Roads comprise the remaining council-controlled roads which provide for local circulation and access. Local Roads are managed and financed by councils.

The subject site, located in Glen Innes, is bound by Taylor Street to the North and West Avenue on the East. The road network immediately surrounding the subject site is predominantly comprised of Local Roads, under the jurisdiction of Glen Innes Severn Council. (Refer to Figure 3.1)

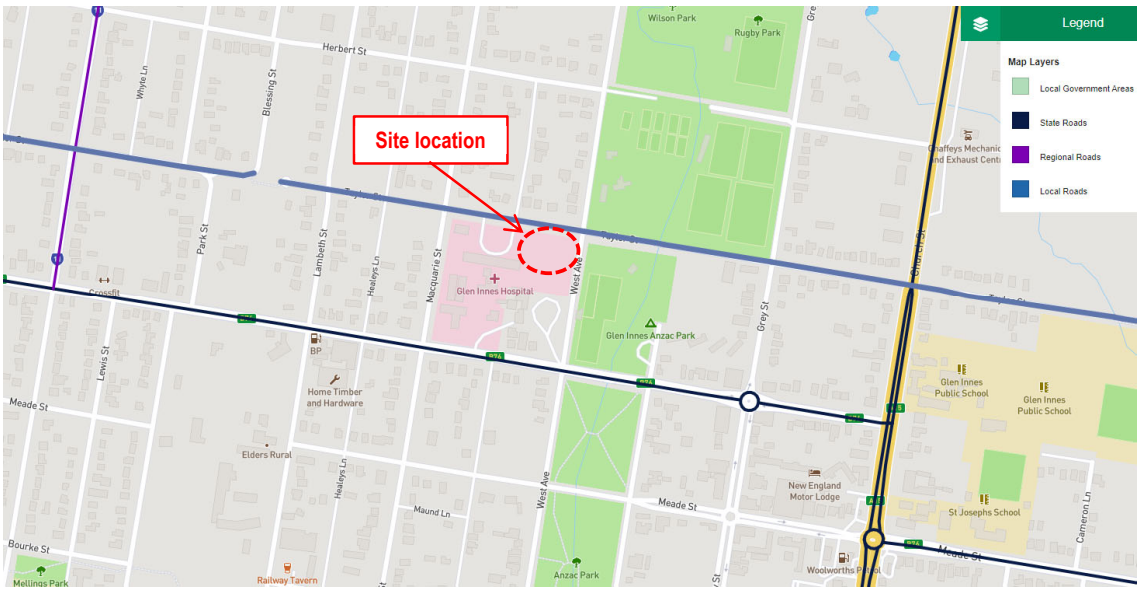


Figure 3.1- Transport for NSW Road Network Classifications adjacent to the subject site.

Details of the surrounding road network adjacent to the subject site have been provided below.

Table 3-1 – Existing Conditions – Taylor Street

Taylor Street	
Road classification	Local Road
Jurisdiction	TfNSW and Glen Innes Severn Council
Number of lanes	One (1) lane in each direction
Carriageway type	Undivided
Carriageway width	Approx. 20m
Speed Limit	50km/h
Closest intersections	60m east – West Avenue intersection 150m west – Macquarie Street intersection

Figure 3.2- Streetview Taylor Street Western approach. Source: Google Street View, 2022

Figure 3.3- Streetview Taylor Street Eastern approach including West Avenue intersection. Source: Google Street View, 2022

Table 3-2 – Existing Conditions – West Avenue

Taylor Street	
Road classification	Local Road
Jurisdiction	TfNSW and Glen Innes Severn Council
Number of lanes	One (1) lane in each direction
Carriageway type	Undivided
Carriageway width	9m
Speed Limit	50km/h
Closest intersections	220m south – Gwydir Hwy intersection 220 north – Herbert St intersection

Figure 3.4- Streetview West Avenue northern approach. Source: Google Street View, 2022

Figure 3.5- Streetview West Avenue southern approach. Source: Google Street View, 2022

3.2 Crash History

Crash data obtained from Transport for New South Wales (TfNSW) *Centre for Road Safety* indicates that within the five (5) year period from 2016 to 2020, no crashes or casualties were recorded within the areas surrounding the subject site. Refer to Figure 3.6. below.

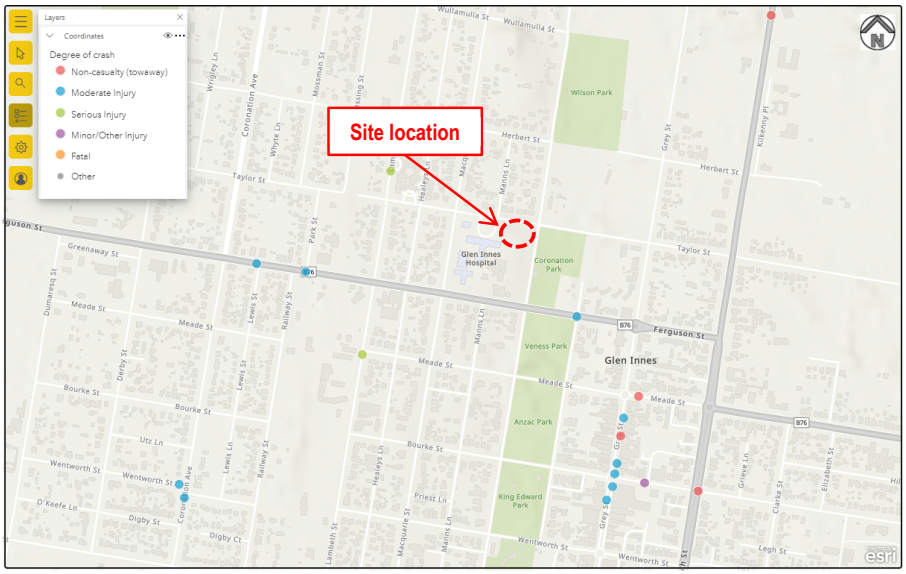


Figure 3.6- TfNSW Crash and Casualty Statistics adjacent to subject site. Source: TfNSW Centre for Road Safety

3.3 Background Traffic Volumes

As advised by Glen Innes Severn Council Shire Council Design Officer, traffic data captured in 2016 at approximately 250m east from the site indicates a AADT equivalent to 749 veh/day with an average AM peak (8-9am) of 76.1v/hr and an average PM Peak (3-4pm) equivalent to 89.3veh/hr. Since no other historical traffic data is available, a linear traffic growth rate of 2% per annum (applied from the corresponding base year) has been adopted to factor up the background traffic volumes to future year values. Given the rural nature of the location of the proposed development, a growth rate of 2% per annum over the longer term is expected to provide a conservative basis against to assess the potential upgrades required on the external road network as a result of the proposed development.

A summary of the estimated traffic volumes (2023) is included in Table 3-3.

Table 3-3 – Existing Traffic volumes

Traffic volumes	2016	2023
AADT (Veh/day)	749	854
Average AM Peak (Veh/hr)	76.1	87
Average PM Peak (Veh/hr)	89.3	102

3.4 Public Transport

The subject site area has been assessed in regards to the available forms of public transport within a comfortable walking distance of 400-800m (As suggested by the NSW Guideline to Walking & Cycling-2004), that can potentially be used by the proposed Ambulance Station staff members as well as the wider community.

3.4.1 Bus Services

Regional public transport connecting Glenn Innes, Armidale, Inverell and Tenterfiled can be accessed from the Glen Innes Tourist Centre on Church St located 1.1km from the proposed ambulance station. There are no other bus stops within 400-800m walking distance from the subject site.

3.4.2 Active Transport

The subject site is also assessed for its active transport potential. Active Transport is the most basic form of travel, relying on human power, primarily walking and cycling.

Taylor Street and West Avenue does not include formal concrete footpaths on either side of the road.

No formal cycleway routes (on or off road) are identified by the Glen Innes Severn Council.

4 Traffic Assessment

4.1 Development Traffic Generation

The Roads and Maritime Services *Guide to Traffic Generating Developments* does not specify trip generation rates for ambulance station land use. Therefore, traffic generation for the proposed development has been estimated based on a first principles analysis of provided information.

4.1.1 Ambulance Traffic Generation

The advice provided by HI indicates that the average case load per month for 2022 has been 136 per month with 50% of these cases occurring out of hours (i.e., 11pm to 7am). It has also been assumed that the trip generation has a 50/50 split between the AM and PM peaks.

The following peak hour trip generation has been estimated for 2023.

Table 4-1 – Traffic volumes generated by the development 2023

Time Period	2023	
	Ambulance monthly call outs during peak hour	Average daily call out during peak hour
AM Peak	68	2
PM Peak	68	2

Based on the above, a trip generation of two (2) trips per hour during the AM peak period and two (2) trips per hour during the PM peak hour has been adopted. Note that for the purpose of the analysis, it has been assumed that there is a trip in an out of the proposed ambulance station for each daily call, thereby assuming that the ambulances return to the station after each call out.

4.1.2 Staff Traffic Generation

To estimate traffic generated by the staff component of the proposed development, the following details are recalled from Table 2-1:

- The number of full-time equivalent (FTE) staff at the station will be 24
- The maximum number of staff on site at any one time will be 6 (as advised by HI).

With respect to this, it has been assumed that:

- Due to the unavailability of public transport, bus stops and absence of active transport infrastructure adjacent to the site, it has been assumed that all staff commute to work in a private vehicle.
- No formal on-street parking is currently available within close proximity to the development.

Based on the above, traffic generation for staff component of the proposed ambulance station is detailed in Table 4-2.

Table 4-2 – Traffic generation 2023

Trip Generation	Number of staff on site at any one time	AM and PM trip rate	AM trips	PM trips
Staff	6	One (1) trip per staff	6	6
Emergency Responses	N/A		2	2
TOTAL			8	8

4.2 Traffic Impact

With reference to the above, the proposed ambulance station is estimated to generate 8 trips during both peak hours, equating to approximately one (1) vehicle every six (7) minutes during the peak hour periods. It is noted that while shift changeovers during the morning period are expected to coincide with the road network peak, shift changeovers at during the night are not expected to coincide with the road network peak.

Based on the above, the additional volume of traffic generated by the development is not expected to result in any significant adverse impacts on the operation or safety of the surrounding road network.

5 Parking Assessment

5.1 Proposed Parking Provisions

The following table summarizes the total number of proposed parking spaces to be provided for the development.

Table 5-1 – Proposed parking provision.

Parking Allocation	Proposes number of spaces
Ambulance parking	Six (6)
Wash Bay	One (1)
Staff parking	Six (6)
DOM parking	One (1)
Accessible parking	One (1)

With respect the above, an assessment has been undertaken to determine the appropriateness of the proposed parking provisions.

5.2 Emergency Vehicle Provisions

As part of the Glenn Innes RAIR ambulance station return brief (Appendix C), it has been determined that six (6) ambulance bays, and (1) wash bay are appropriate to cater for the estimated demand of internal vehicles.

5.3 Staff Car Parking

Glen Innes Severn Council Development Control Plan does not specify a parking rate for an ambulance station land use. As such, the *Regional Ambulance Infrastructure Reconfiguration (RAIR) Program* ratio of full-time equivalent staff versus station requirements as detailed on the return brief has been adopted to assess the car parking requirements for the proposed development. In this regard, the minimum staff car parking requirements for the proposed development are as follows:

- Six (6) staff car parking spaces for 24 full-time equivalent staff.

With respect to this requirement, the architectural drawings provided in Appendix A show that six (6) car parking spaces will be provided for staff, thereby satisfying the RAIR requirements.

6 Access and Design Review

6.1 Off-Street Car Parking

The access and car parking layout arrangements of the proposed development, as shown within the architectural plans (see Appendix A) have been reviewed against the relevant sections of Australian Standards AS2890 and Glen Innes Severn Development Control Plan (DCP), with key requirements summarized below in Table 6-1 and Table 6-2**Error! Reference source not found.**.

Table 6-1 – Off-Street Car Parking Requirements

Design Element	AS2890/DCP requirement	Compliance
Class 1A car parking space	2.4m wide x 5.4m long	**Yes**
Class 6 car parking space	2.4m wide x 5.4m long plus a shared area of equal dimensions	**Yes**
Service bay	3.5m wide x 6.4m long	**Yes**
Height clearance (general traffic)	2.2m minimum to overhead structures and services	Shall comply
Height clearance (PWD)	2.5m minimum above parking spaces	
Height clearance (service bay)	5.0m above service bay and path of travel	
Parking aisle width	5.8m minimum plus clearances to vertical obstructions	**Yes**
Blind aisle extension	1.0m	N/A
Internal roadway width	5.5m minimum plus clearances to vertical obstructions	**Yes**

Design Element	AS2890/DCP requirement	Compliance
Grades (entry)	1:20 maximum for the first 6m into the site from the property boundary	Yes
Grades (car parking modules)	1:20 maximum measured parallel to the angle of the bay	Shall comply
Grades (ramps)	1:4 maximum plus transitions	Shall comply
Grades (ramp transitions)	1:8 maximum – summit 1:6.7 maximum – sag	Shall comply

6.2 Access

6.2.1 Access Design

The proposed ambulance station provides one (1) all movement access on Taylor Street and one (1) egress only on West Avenue. Details of the proposed accesses is detailed in Table 6-2 below.

Table 6-2 – Access Details

Design Element	Details
Access facility category	Type 1 as per AS2890.1 (i.e., User Class 1/1A, less than 25 car parking spaces and local road frontage)
Crossover form	Crossover shall be designed in accordance with Institute of Public works Engineering Australia – Heavy Duty Vehicle Crossing SEQ R-051
Pedestrian sight triangle	Pedestrian sight triangles shall be made available on both sides of the driveway at 2m along the property boundary and 2.5m into the site. In accordance with AS2890.1 the areas within the triangles is to remain clear of all obstructions to visibility.

6.2.2 Sight Distance

A review of sight distance at the access on Taylor Street and West Avenue has been undertaken in accordance with AS2890.1 and shown in Figure 6.1. and Figure 6.2. Also included in Appendix E.

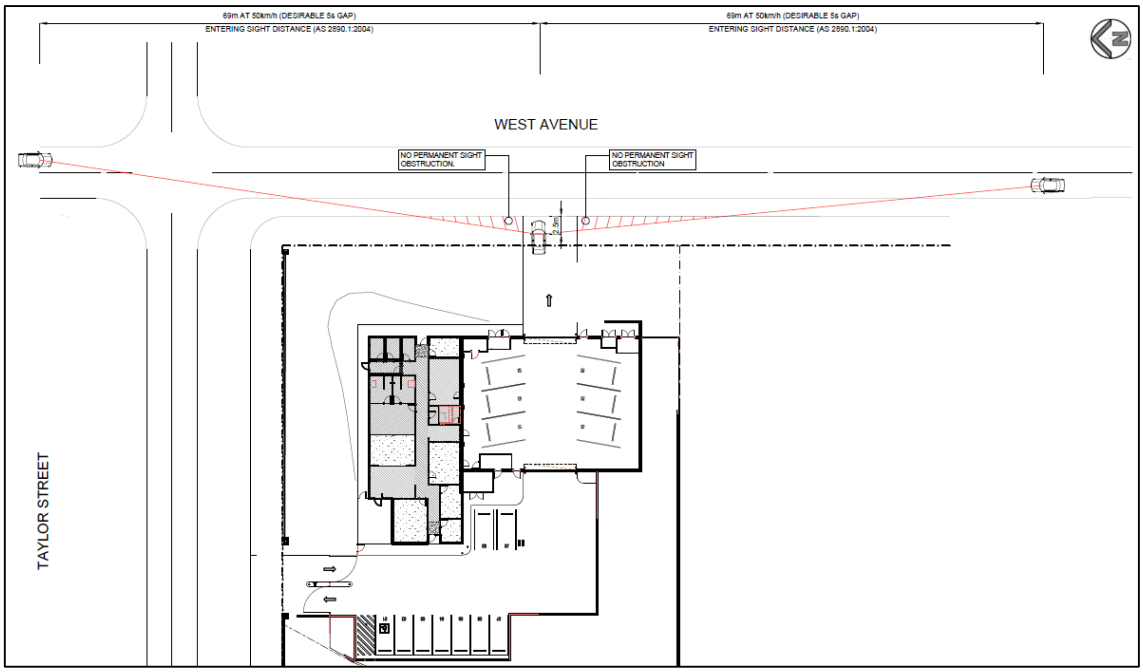


Figure 6.1- Sight Distance Envelope Egress Driveway – West Avenue (North and South)

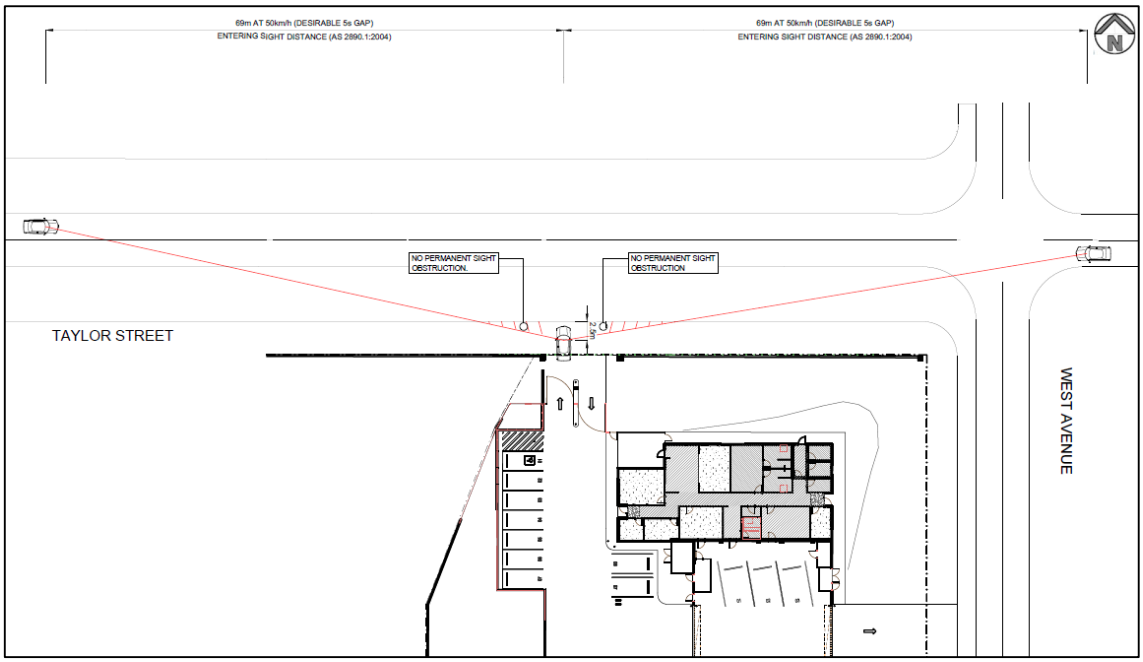


Figure 6.2- Sight Distance Envelope Access Driveway – Taylor Street (East and West)

It is noted that a series of medium size bushes are planted along Taylor Street. To maintain adequate levels of sight distance adjacent to the proposed driveway, a few of the existing vegetation might need to be removed either side of the driveway. Refer to Figure 6.3.

Figure 6.3- Existing vegetation on Taylor Street

A summary of the available sight distance is detailed in Table 6-3.

Table 6-3 – Accesses – Sight Distance

Access	Direction	Posted speed limit	AS2890.1 Requirement	Available sight distance	Compliance
Taylor Street	East	50km/hr	69m	Greater than 69m	**Yes**
	West	50km/hr	69m	Greater than 69m	**Yes**
West Avenue	North	50km/hr	69m	Greater than 69m	**Yes**
	South	50km/hr	69m	Greater than 69m	**Yes**

As indicated above the available sight distance exceeds the minimum requirements stipulated by AS2890.1.

6.3 Servicing

The proposal includes a service bay for maintenance and delivery vehicles and is suitable for a Medium Rigid Vehicle (MRV).

A swept path analysis has been undertaken demonstrating the ability for the ambulance vehicles to access and manoeuvre through the site. The design vehicle used corresponds to “Mercedes Sprinter Panel Van 518CDI Extra Long Super High Roof”, which most closely resembles the size of the existing ambulances within the NSW Ambulance fleet (based on dimensions provided on the NSW Ambulance website. Refer to Appendix D for NSW Ambulance Vehicle and Stretcher Dimensions)

A swept path analysis was undertaken for the proposed parking bays for both: front and reverse parking. Due to the ambulance parking bays layout, front parking is not suitable and it is therefore recommended that ambulance vehicles use reverse parking only. Refer to Appendix E.

6.4 Waste Collection

Waste collection activities are proposed to be conducted kerbside, consistent with the surrounding environment. Waste bins will be wheeled from the waste storage area, within the site, to the kerb on West Avenue by staff prior to collection day/time and wheeled back to the storage area following collection.

7 Conclusion

Key findings from this traffic impact assessment are as follows:

- The proposed ambulance station at Glen Innes is estimated to generate 8 trips during both peak hours, equating to approximately one (1) vehicle every seven (7) minutes during the peak hour periods. The additional traffic generated by the proposed development is not expected to result in any substantial impact on the operation or safety of the surrounding road network.

- The Glen Innes ambulance station proposes to provide six (6) staff car parking spaces, one (1) accessible parking, one (1) wash bay, one (1) relief bay, one (1) Directorate of Management (DOM) covered parking bay and six (6) ambulance parking bays, satisfying the requirements of the Glen Innes RAIR Ambulance Station Return Brief.

- The Glen Innes ambulance station proposes to provide one (1) service bay, compliant with the requirements of Glen Innes Severn Council Development Control Plan (DCP).

- The off-street geometric layout is generally provided in accordance with the relevant requirements of Glen Innes Severn Council DCP and Australian Standard AS2890.1 *Parking Facilities – Part 1: Off-street car parking*.

- The proposed Glen Innes Ambulance Station includes two driveways: one (1) access driveway on Taylor Street to allow for all movements access for both staff and ambulance vehicles; and one (1) egress only on West Avenue for ambulance vehicles egress only. Sight distance requirements for both accesses have been assessed to be in accordance with the requirements of AS2890.1. To maintain safe egress from the proposed driveway on Taylor Street, it is recommended to remove some of the adjacent vegetation at either side of the driveway.

- A swept path analysis for the ambulance internal movements using a 'Mercedes Sprinter Panel Van 518CDI Extra Long Super High Roof', which most closely resembles the size of the existing larger ambulances within the NSW Ambulance fleet was undertaken demonstrating that the ambulance vehicles are able to access the provided parking bays and maneuver through the site.

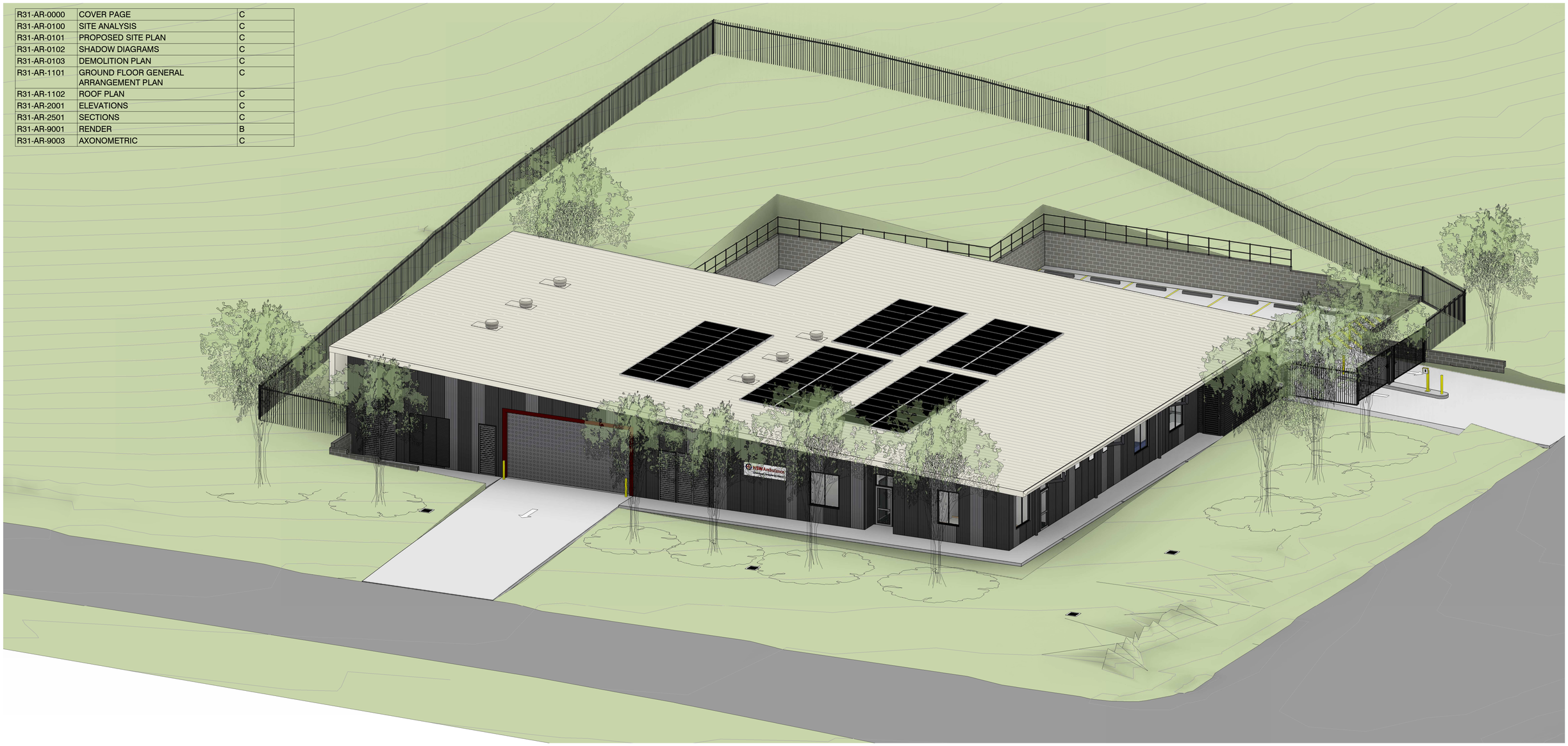
APPENDIX A – Architectural Drawings

RAIR - RURAL AMBULANCE INFRUSTRUCTURE RECONFIGURATION PROGRAM

R31 GLEN INNES - TAYLOR STREET GLEN INNES

SHEET LIST

Sheet Number	Sheet Name	Current Revision
R31-AR-0000	COVER PAGE	C
R31-AR-0100	SITE ANALYSIS	C
R31-AR-0101	PROPOSED SITE PLAN	C
R31-AR-0102	SHADOW DIAGRAMS	C
R31-AR-0103	DEMOLITION PLAN	C
R31-AR-1101	GROUND FLOOR GENERAL ARRANGEMENT PLAN	C
R31-AR-1102	ROOF PLAN	C
R31-AR-2001	ELEVATIONS	C
R31-AR-2501	SECTIONS	C
R31-AR-9001	RENDER	B
R31-AR-9003	AXONOMETRIC	C



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This drawing should be read in conjunction with all relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

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22 417	R31- AR-0000	C

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

GLEN INNES CLIMATE

Long Term Averages

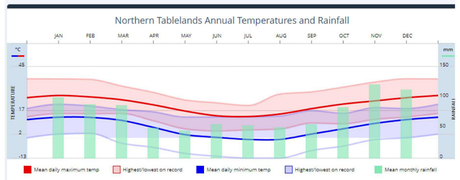
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean Max (°C)	26.7	25.8	24.0	20.8	16.9	13.9	13.4	15.0	18.4	21.3	23.3	25.3	20.4
Mean Min (°C)	13.0	12.9	11.0	6.6	2.0	0.3	-1.0	-1.0	2.4	5.7	9.1	11.5	6.0
Mean Rain (mm)	98.9	87.7	86.3	49.3	44.7	55.2	53.3	49.9	55.0	82.9	120.1	111.7	892.8
Median Rain (mm)	66.6	88.6	54.4	46.4	21.4	37.0	37.4	36.4	45.6	75.5	108.2	102.6	864.4
Mean Rain Days	11.0	11.2	11.8	9.9	12.5	15.7	14.0	11.0	9.0	10.9	11.9	12.4	141.4

Daily Records

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	37.2	36.9	32.7	28.7	23.9	22.1	20.4	27.7	29.0	32.0	35.2	37.3	37.3
Low Max (°C)	15.3	15.2	15.3	10.7	5.6	4.3	4.9	5.5	9.3	8.8	11.6	13.1	4.3
High Min (°C)	21.2	20.1	17.8	16.4	13.1	13.2	13.2	13.8	17.2	15.5	19.1	18.5	21.2
Low Min (°C)	2.3	2.8	-3.4	-6.0	-9.8	-11.6	-12.8	-12.8	-8.0	-5.2	-1.1	0.0	-12.8
High Rain (mm)	98.4	64.0	91.2	88.6	121.4	63.2	83.2	59.4	72.4	96.6	87.4	92.2	121.4

Monthly Records

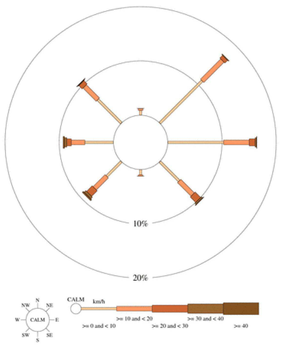
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	30.6	28.3	28.0	23.5	20.1	15.6	15.5	17.8	21.4	24.1	27.6	29.8	22.7
Low Max (°C)	23.8	22.9	22.2	18.2	15.1	11.4	11.7	12.4	15.8	18.1	18.9	21.3	18.9
High Mean (°C)	15.7	14.4	12.7	9.0	4.5	3.4	2.5	3.4	5.6	8.7	11.5	13.2	7.1
Low Mean (°C)	10.9	10.5	7.8	3.6	-1.7	-3.1	-5.7	-3.8	0.5	3.3	6.5	9.6	5.0
High Rain (mm)	233.4	166.8	297.8	221.8	156.0	150.0	211.0	152.0	171.8	203.4	264.8	178.4	1458.4
Low Rain (mm)	27.6	3.0	1.0	1.2	1.6	9.4	3.8	3.0	4.8	16.2	19.6	16.2	369.8

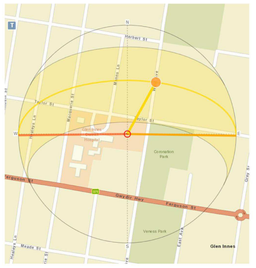


Average Number of Days with Temperatures

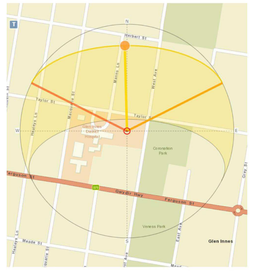
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
≥ 40.0°C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
≥ 35.0°C	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
≥ 30.0°C	6.0	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0	3.0	15.8
≤ 2.0°C	0.0	0.0	0.3	4.1	15.4	19.1	23.1	23.1	14.8	6.3	1.1	0.2	107.4
≤ 0.0°C	0.0	0.0	0.1	1.8	10.4	14.5	18.5	18.6	8.5	2.5	0.3	0.1	75.1

YEARLY WIND ROSE

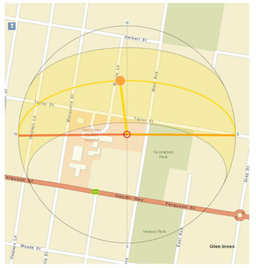




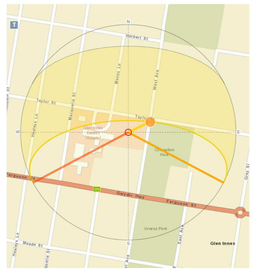
MARCH 20TH- 12PM SUN PATH



JUNE 21TH- 12PM SUN PATH

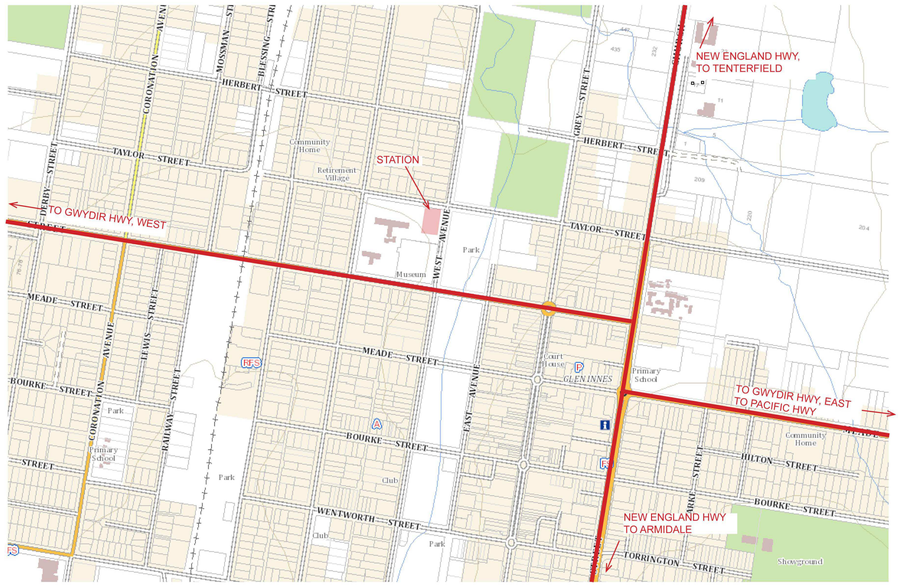


SEPTEMBER 23RD- 12PM SUNPATH



DECEMBER 22ND- 12PM SUNPATH

1:1000 SETBACK, VIEWS, VEGETATION



1:10000 MAJOR ROADS RELATED TO STATION

VIEW 1 - WEST AVENUE , FACING NORTH-WEST

VIEW 2 - WEST AVENUE, FACING SITE

VIEW 3 - TAYLOR STREET, FACING SITE

VIEW 4- TALOR STREET, FACING EAST

DATE PRINTED: 18/05/2022 10:46:08

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

SERVICES: 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000 — JHA

PROJECT MANAGER: LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555 — mace

STRUCTURE & CIVIL: LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400 — BONACCI

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

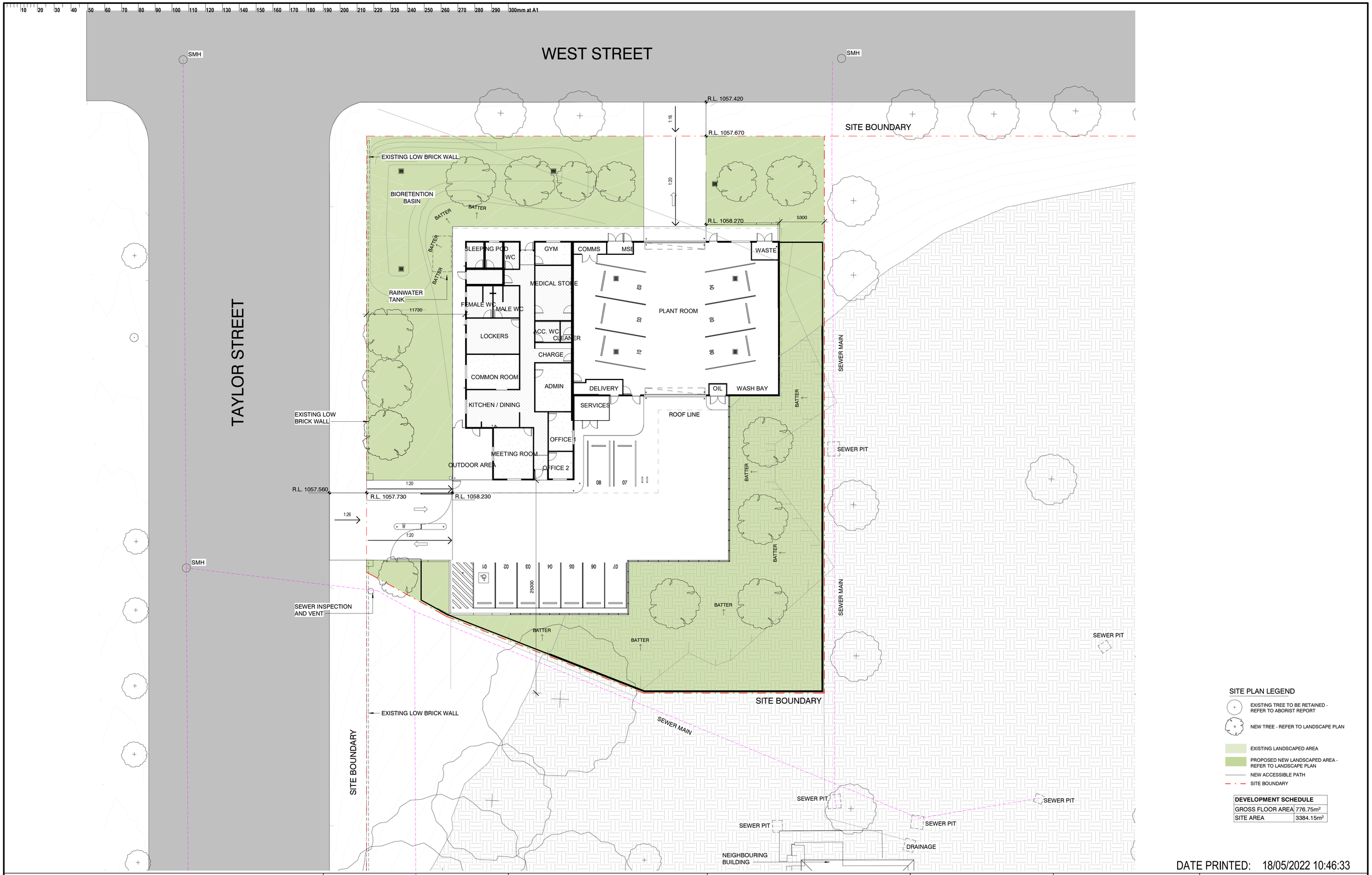
PROJECT ADDRESS: TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
63 Myrtle Street, Chippendale NSW 2008, Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1

DESCRIPTION: SITE ANALYSIS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0100	C



SITE PLAN LEGEND

- EXISTING TREE TO BE RETAINED - REFER TO ABORIST REPORT
- NEW TREE - REFER TO LANDSCAPE PLAN
- EXISTING LANDSCAPED AREA
- PROPOSED NEW LANDSCAPED AREA - REFER TO LANDSCAPE PLAN
- NEW ACCESSIBLE PATH
- SITE BOUNDARY

DEVELOPMENT SCHEDULE	
GROSS FLOOR AREA	776.75m²
SITE AREA	3384.15m²

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ISSUE	DATE	SUBJECT	AUTHORISED
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RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

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STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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TRUE NORTH

1:100 — 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
63 Myrtle Street, Chippendale NSW 2008, Sydney Australia
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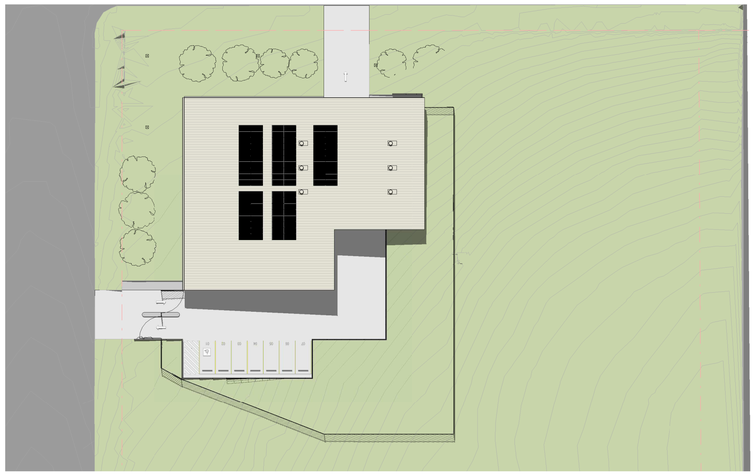
DRAWN BY	SCALE AT A1
AF	1 : 200

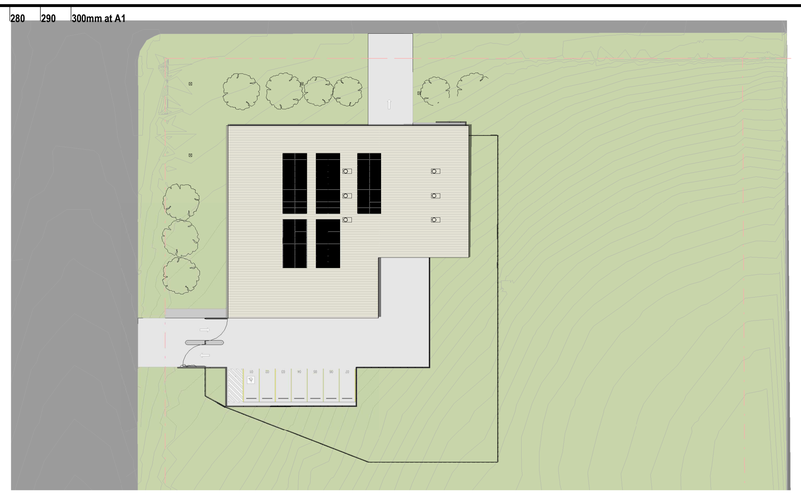
DESCRIPTION
PROPOSED SITE PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0101	C

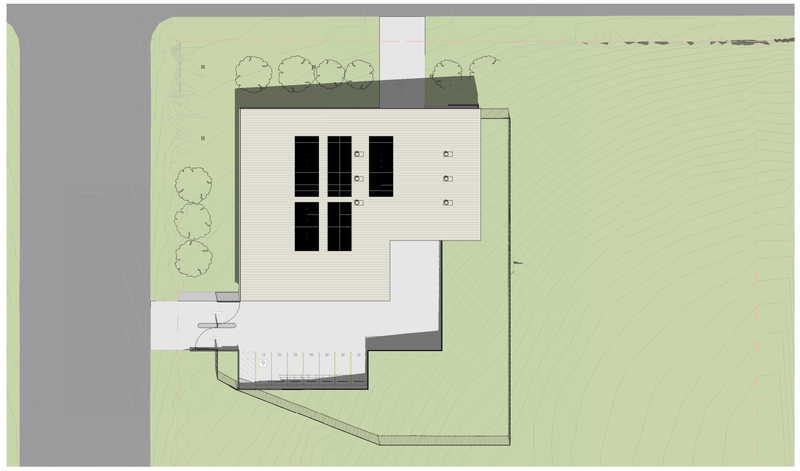
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1



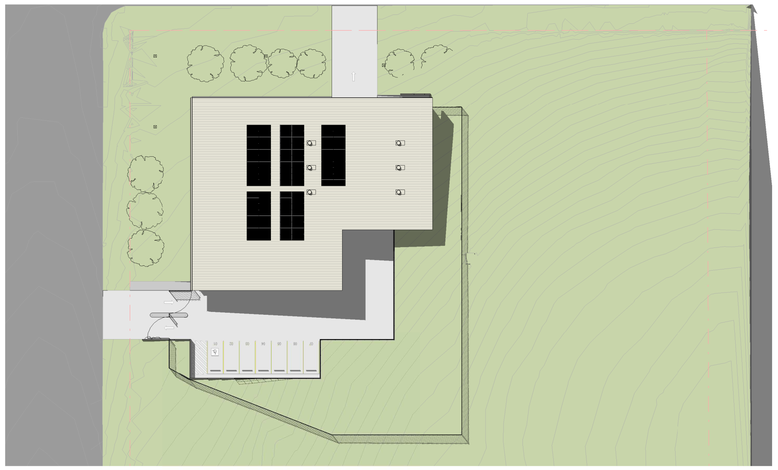
01 AR-2007 9am SUMMER
1 : 500



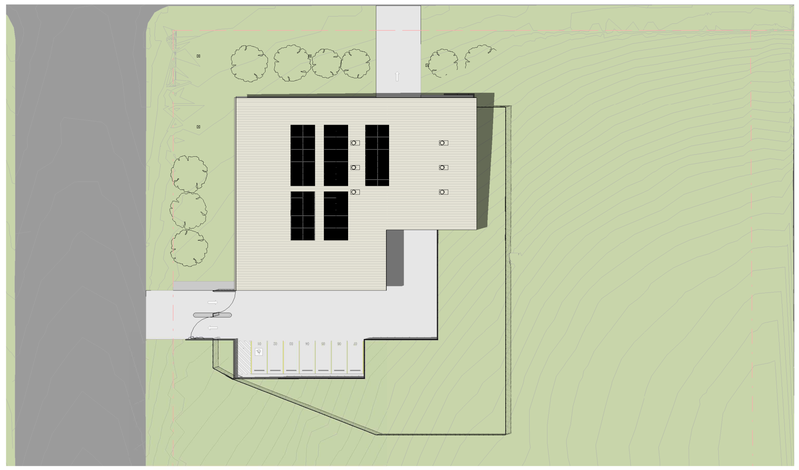
02 AR-2007 12pm SUMMER
1 : 500



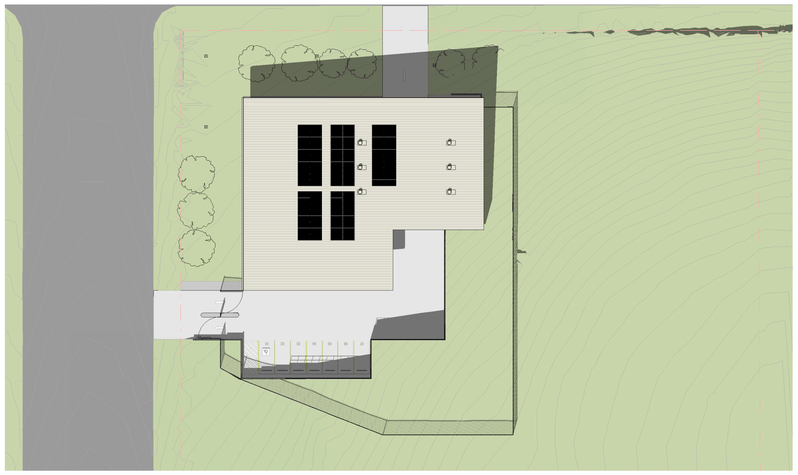
03 AR-2007 3pm SUMMER
1 : 500



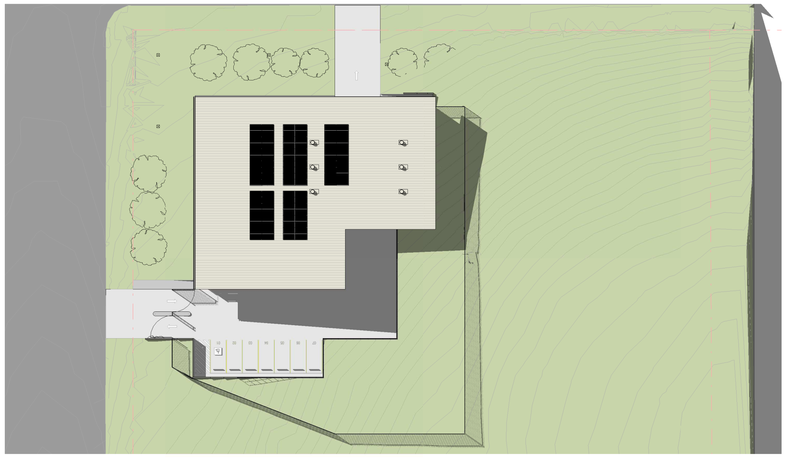
04 AR-2007 9am EQUINOX
1 : 500



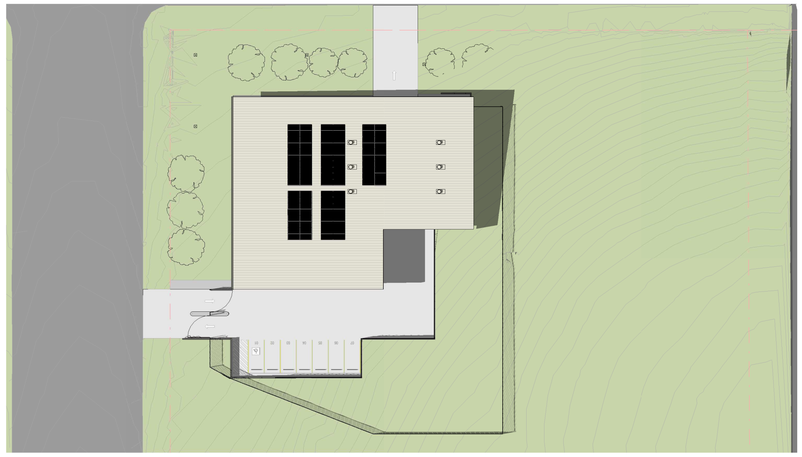
05 AR-2007 12pm EQUINOX
1 : 500



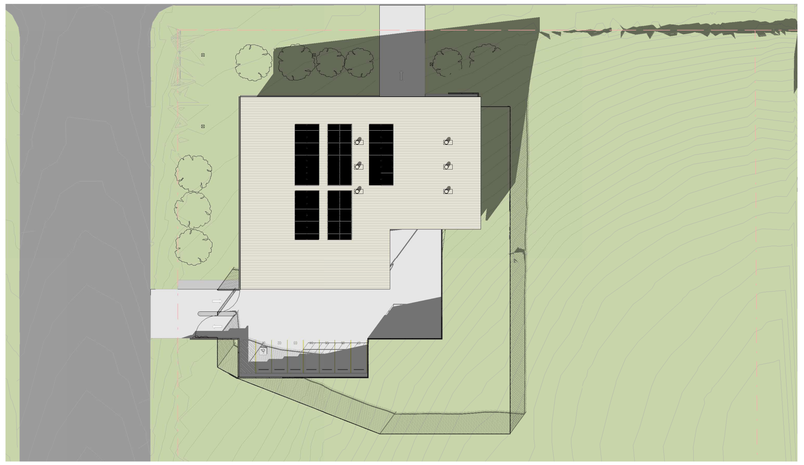
06 AR-2007 3pm EQUINOX
1 : 500



07 AR-2007 9am WINTER
1 : 500



08 AR-2007 12pm WINTER
1 : 500



09 AR-2007 3pm WINTER
1 : 500

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ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

PROJECT MANAGER
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SERVICES
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NORTH SYDNEY NSW 2060
T +61 2 9437 1000

STRUCTURE & CIVIL
BONACCI
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SYDNEY NSW 2000
T +61 2 8247 8400

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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

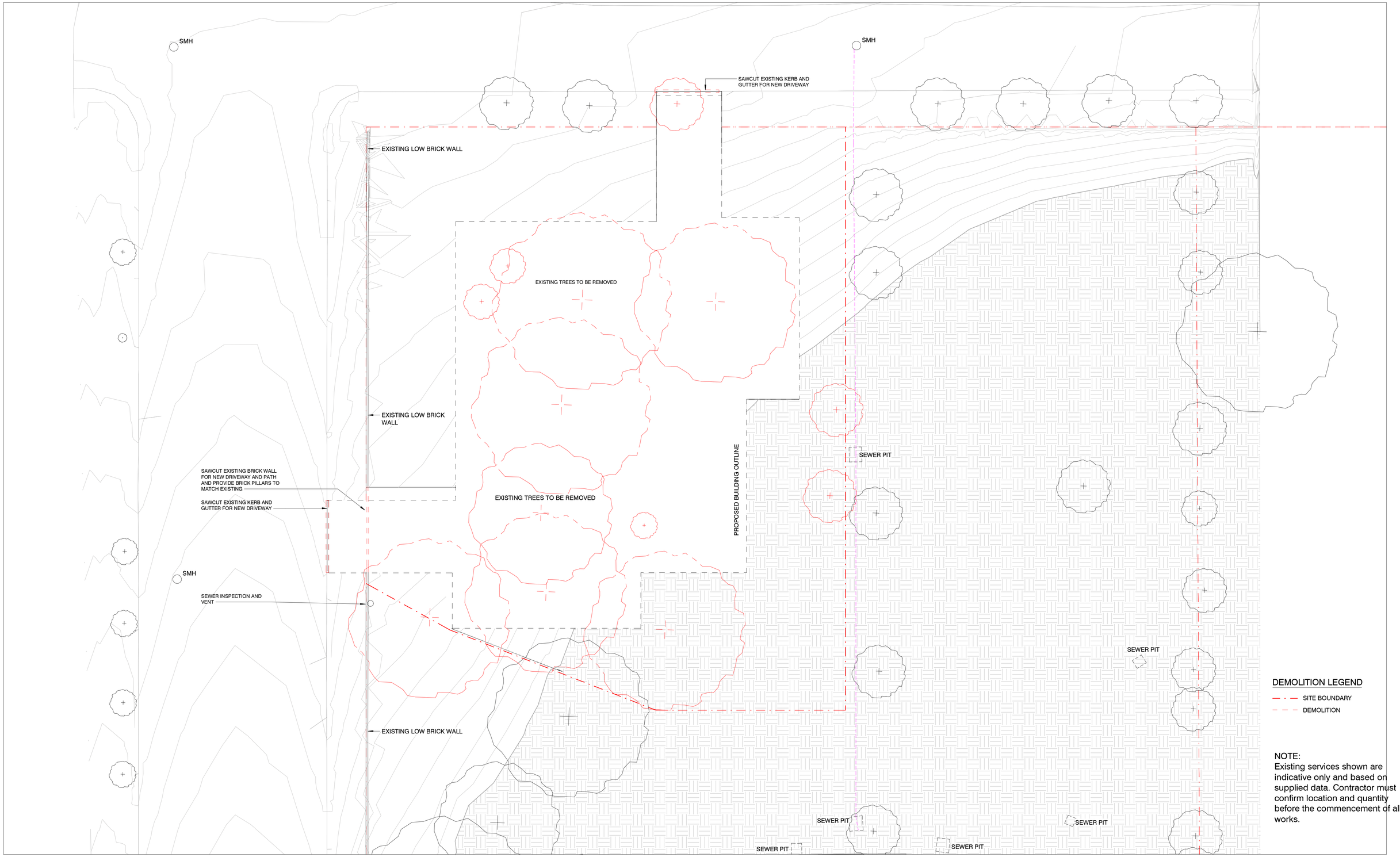
PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT
djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects:
Andrew Hipwell 6562
Daniel Beekwilder 6192
63 Myrtle Street
Chippendale NSW 2008
Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1: 1 : 500
DESCRIPTION: SHADOW DIAGRAMS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0102	C

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1



DEMOLITION LEGEND

- SITE BOUNDARY
- DEMOLITION

NOTE:
Existing services shown are indicative only and based on supplied data. Contractor must confirm location and quantity before the commencement of all works.

DATE PRINTED: 18/05/2022 11:19:49

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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C	18.05.22	UPDATED REF	MR

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

SERVICES: JHA — 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000

STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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TRUE NORTH

1:200 — 0 2 4 6 8 10 20m

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
63 Myrtle Street, Chippendale NSW 2008, Sydney Australia
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DRAWN BY	SCALE AT A1
AF	1 : 200

DESCRIPTION
DEMOLITION PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0103	C

DATE PRINTED: 18/05/2022 10:48:29

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

PROJECT MANAGER
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SERVICES
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JHA

STRUCTURE & CIVIL
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SYDNEY NSW 2000
T +61 2 8247 8400
BONACCI

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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT
djrd
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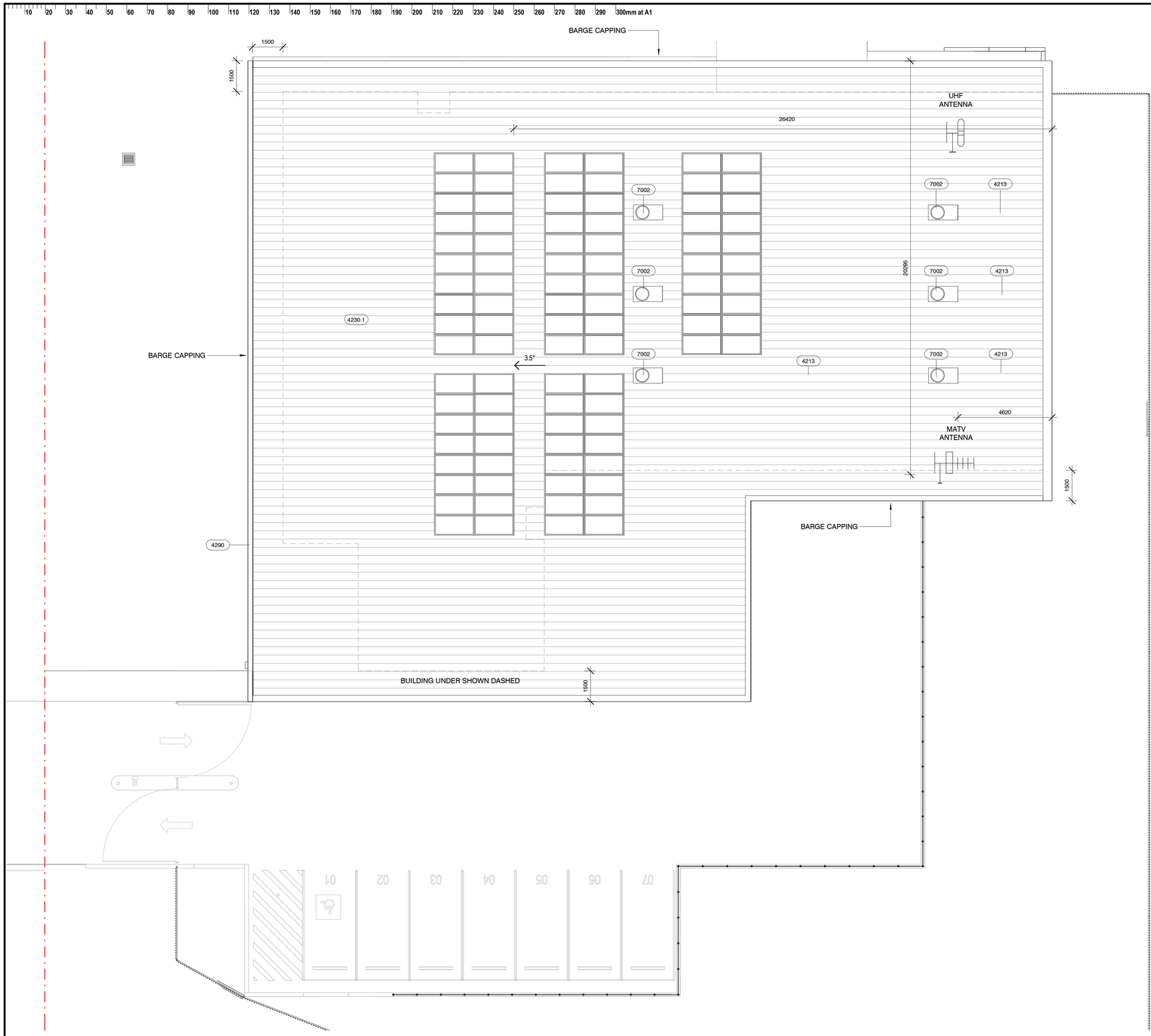
ABN: 48 942 921 969
Nominated Architects:
Andrew Hipwell 6562
Daniel Beekwilder 6192
63 Myrtle Street
Chippendale NSW 2008
Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1: 1 : 100

DESCRIPTION
GROUND FLOOR GENERAL ARRANGEMENT PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1101	C



KEYNOTE LEGEND

4213	ROOF BACK FLASHING
4230.1	ROOF SHEETING TYPE 1
4290	HALF ROUND EAVES GUTTER
7002	ROOF VENTILATOR

DATE PRINTED: 18/05/2022 10:48:40

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

PROJECT MANAGER
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mace

SERVICES
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NORTH SYDNEY NSW 2060
T +61 2 9437 1000
JHA

STRUCTURE & CIVIL
LEVEL 4
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SYDNEY NSW 2000
T +61 2 8247 8400
BONACCI

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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE
INFRASTRUCTURE PROGRAM (RAIR)
GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT
djrd
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T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects:
Andrew Hipwell 6562
Daniel Beekwilder 6192
63 Myrtle Street
Chippendale NSW 2008
Sydney Australia
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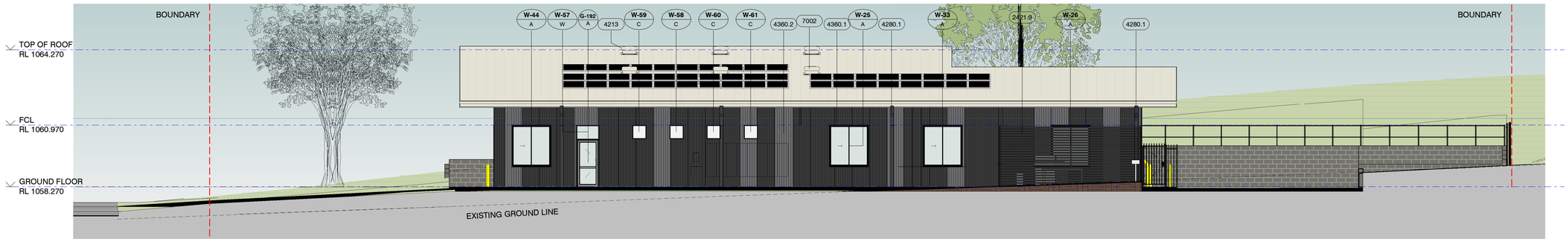
DRAWN BY	SCALE AT A1
AF	1 : 100

DESCRIPTION
ROOF PLAN

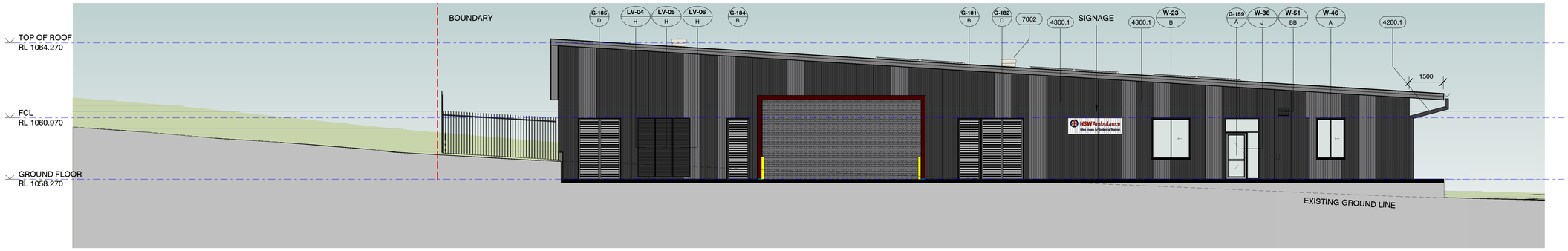
PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1102	C

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

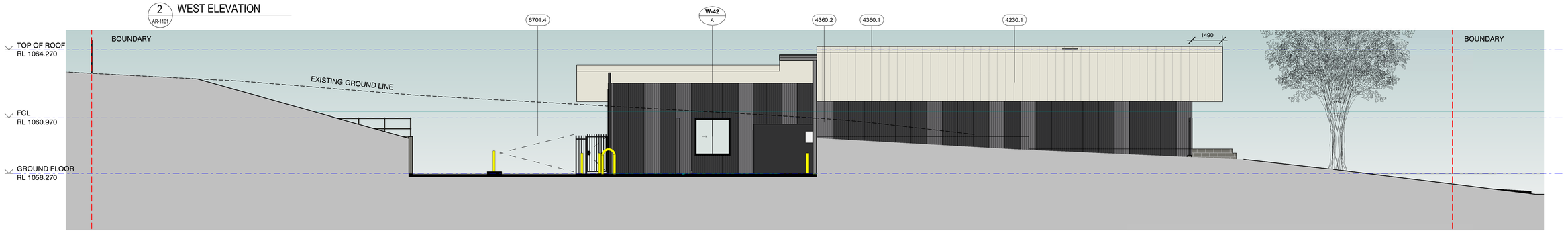
KEYNOTE LEGEND	
2421.3	FENCE TYPE C
4213	ROOF BACK FLASHING
4230.1	ROOF SHEETING TYPE 1
4280.1	DOWNPIPE TYPE 1
4360.1	METAL WALL SHEETING TYPE 1
4360.2	METAL WALL SHEETING TYPE 2
6701.4	PAINT TYPE 4
7002	ROOF VENTILATOR



1 AR-1101 SOUTH ELEVATION



2 AR-1101 WEST ELEVATION



3 AR-1101 NORTH ELEVATION

4 AR-1101 EAST ELEVATION

GENERAL NOTES:

1. Requirements of gates and fences dependent on security desktop review per site

DATE PRINTED: 18/05/2022 10:49:12

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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C	18.05.22	UPDATED REF	MR

RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
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SM	1 : 100

DESCRIPTION
ELEVATIONS

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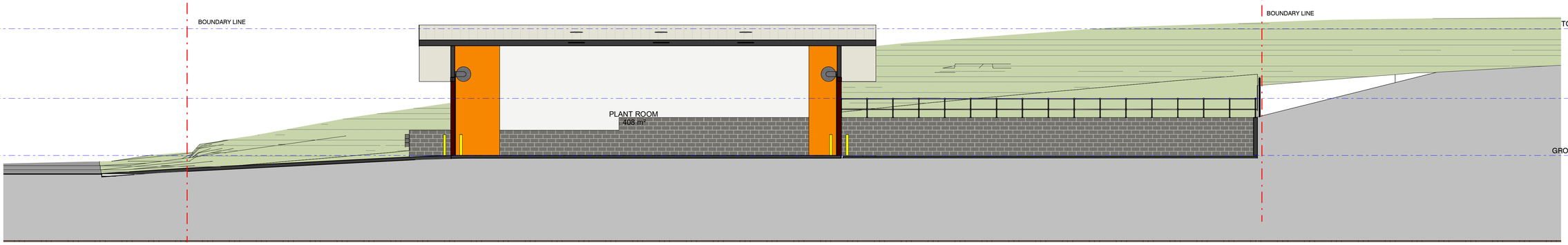

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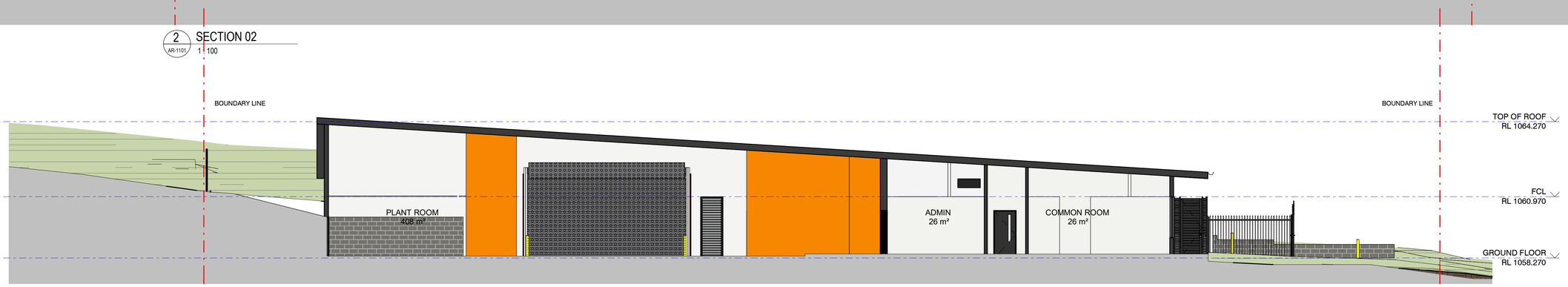

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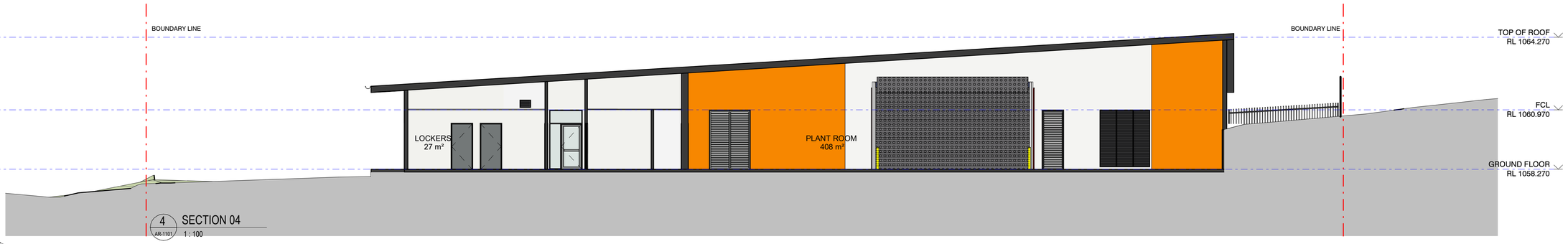

4 AR-1101 SECTION 04
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GENERAL NOTES:

1. Requirements of gates and fences dependent on security desktop review per site

DATE PRINTED: 18/05/2022 10:49:38

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR

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DESCRIPTION: SECTIONS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-2501	C

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LYSAGHT CUSTOM ORB METAL CLADDING
- MONUMENT
4360.1

LYSAGHT CUSTOM ORB METAL CLADDING
- BASALT
4360.2

LYSAGHT ROOF SHEETING
- SURFMIST
4230.1

FEATURE TRIM DULUX PAINT FINISH TO MATCH COLORBOND
- MANOR RED
6701.5

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GLEN INNES

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SCALE AT A1

DESCRIPTION
RENDER

PROJECT No	DRAWING No	REVISION
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DESCRIPTION
AXONOMETRIC

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-9003	C

APPENDIX B – Traffic Data

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-339 -- English (ENA)

Datasets:
Site: **[101] Taylor Street**
Attribute:
Direction: 6 - West bound A>B, East bound B>A. **Lane:** 1
Survey Duration: 13:00 Monday, 25 July 2016 => 11:46 Friday, 5 August 2016,

In profile: Vehicles = 7487 / 7494 (99.91%)

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
0000-0100	3.0	2.5	1.5	1.5	1.5	3.0	2.0	1.9	2.0
0100-0200	1.0	1.5	0.5	1.0	0.5	2.0	2.0	0.9	1.1
0200-0300	0.0	0.0	0.5	0.0	1.5	0.0	0.0	0.4	0.4
0300-0400	2.0	0.5	0.5	0.0	0.0	0.0	0.0	0.4	0.4
0400-0500	0.0	0.5	0.5	1.0	1.5	1.0	1.0	0.8	0.8
0500-0600	5.0	7.0	3.5	5.5	5.0	0.0	0.0	5.2	4.3
0600-0700	19.0	16.0	16.0	14.0	15.5	5.0	4.0	15.8	13.7
0700-0800	20.0	19.0	21.5	19.5	21.0	5.0	7.0	20.2	17.6
0800-0900	**69.0**	**81.5**	**81.0**	**70.5**	**75.0**	28.0	23.0	**76.1**	**66.9**
0900-1000	56.0	57.0	62.0	55.0	56.5	51.0	26.0	57.4	54.0
1000-1100	28.0	41.0	47.5	38.5	41.5	63.0	41.0	40.6	42.6
1100-1200	44.0	45.0	61.5	50.5	31.0	**63.0**	**44.0**	46.7	47.9
1200-1300	54.0	55.0	50.0	49.0	52.0	**80.0**	45.0	51.8	53.9
1300-1400	31.5	51.0	48.5	50.5	53.0	59.0	45.0	46.2	47.3
1400-1500	49.0	59.5	57.5	47.0	57.0	68.0	39.0	53.7	53.6
1500-1600	**89.5**	**100.5**	**89.5**	**78.5**	**88.0**	64.0	**56.0**	**89.3**	**84.0**
1600-1700	56.5	63.0	60.0	35.5	60.0	57.0	42.0	54.4	53.5
1700-1800	46.0	51.5	39.5	57.0	61.0	39.0	41.0	49.9	48.1
1800-1900	26.5	30.5	32.5	32.0	28.0	27.0	26.0	30.1	29.5
1900-2000	16.5	21.5	32.0	19.5	18.0	19.0	25.0	21.9	21.9
2000-2100	12.0	19.5	16.5	16.5	23.0	10.0	14.0	16.9	16.0
2100-2200	10.5	11.0	9.0	10.0	10.0	12.0	16.0	10.1	10.8
2200-2300	9.0	8.0	15.5	10.0	8.0	10.0	13.0	10.3	10.5
2300-2400	5.5	6.0	6.5	4.5	2.0	0.0	4.0	5.2	4.6
Totals									
0700-1900	570.0	654.5	651.0	583.5	624.0	604.0	435.0	616.4	599.0
0600-2200	628.0	722.5	724.5	643.5	690.5	650.0	494.0	681.1	661.4
0600-0000	642.5	736.5	746.5	658.0	700.5	660.0	511.0	696.6	676.6
0000-0000	653.5	748.5	753.5	667.0	710.5	666.0	516.0	706.3	685.5
AM Peak	0800	0800	0800	0800	0800	1100	1100		
	69.0	81.5	81.0	70.5	75.0	63.0	44.0		
PM Peak	1500	1500	1500	1500	1500	1200	1500		
	89.5	100.5	89.5	78.5	88.0	80.0	56.0		

*** - No data.**

APPENDIX C - Return Brief

Glen Innes RAIR Ambulance Station ~ Return Brief

1. Reference Documents

This return brief has been prepared to suit the targeted staffing capacity & outlined for year 2031 based on the following Reference Documents;

a. RAIR Glen Innes Population, Demand and Capacity Assessment
b. RAIR Staff Ratio Appendix - FTE vs Station Requirements

2. Outline of Requirements

Ambulance Station

To be typically based on the Rural Ambulance Station Facilities Design Guidelines / Revision L / Medium Station Template M-01 / 02.1AR1101 - modified to suit required FTE staff levels in accordance with RAIR Staff Ratio Appendices Spreadsheet V5

Staffing			
	Full Time Equivalent Staff	**24**	*As per NSWA Correspondence*
	DOM	**1**	
Provision for Staff			*As per RAIR Staff Ratio Appendix*
	Locker Room – provision for	**30**	Lockers *(24x 1.23 FTE)*
	Common Area Lounge – provision for	**8**	Staff
	Common Area Dining – provision for	**10**	Staff
	Admin Space (Peak by half) – provision for	**3**	staff
Equipment			*As per RAIR Staff Ratio Appendix*
	Computers – provision for	**3**	pcs in admin area
	Basic Printer – provision for	**1**	Basic printer in admin area
Amenities Male			*As per RAIR Staff Ratio Appendix*
	WC	**1**	
	Shower	**1**	
	Change Cubicle	**1**	
Amenities Female			*As per RAIR Staff Ratio Appendix*
	WC	**1**	
	Shower	**1**	
	Change Cubicle	**1**	
Accessible Amenities			*As per RAIR Staff Ratio Appendix*
	Combined Accessible WC + Shower	**1**	*in accordance with AS1428*

Additional Modules		*As per RAIR Design Guidelines*
Zone & Sector Management Module	**1**	Tier 1 – 1 x shared DOM office – 12m2 and 1 x 9m2 S/O office
Fleet Maintenance		Tier 1 as noted in Plant Room below
Relief Quarters Module	**1**	Required 1 bed
Education Module	**1**	Tier 2 –30m^2
Gym Space Module	**1**	Approx. 12m2 – may be internal or external protected from the elements

Plant Room

To be typically based on the Rural Ambulance Station Facilities Design Guidelines / Revision L / Medium Station Template M-01 / 02.1AR1101 – modified to suit site as follows;
1. to suit required # of parking bays as outlined on the RAIR Endorsement sheet
2. to suit endorsed schedule of accommodation in approved Return Brief
3. to suit site size & geometry

Internal Vehicles		*As per NSWA Correspondence*
Ambulance	**6**	Internal bays
Fleet Maintenance Bay	**Included**	Tier 1
Total Internal Vehicles	**(6) 6 ambulance bays**	

External Vehicles (Covered)		*As per RAIR Design Guidelines*
DOM Bay	**1**	Operation Frontline Vehicle (Car) – 2.7x5.4m Large Car Park
Relief	**1**	
External Wash Bay	**1**	
Total External (Covered) Vehicles	**(3) 1 DOM bay + 1 Relief bay + Wash bay**	

Other Parking (Not Covered)		*Standard Car Parking Bay size: 5.4x2.4m*
Accessible Parking Bay + Circulation Area	**1**	statutory requirement in accordance with AS2890.6
Parking bays	**6**	*As per RAIR Staff Ratio Appendix*
Total	**(7) 1 acc. + 6 parking bays**	

Indicative Schedule of Areas				
Ambulance Station				
1	x	3 staff	Admin	To suit required number of staff
1	x	30 m²	Combined Medical Equipment Store	*As per RAIR Staff Ratio Appendix*
1	x	> 7m²	Comms Cupboard	To suit NSWA ITC Reqs
1	x	4m²	Cleaner's Sink / Store	
1	x	9m²	Office	
1	x	12m²	DOM Office	Shared Office
		-	Circulation	
			Amenities	
1	x	8 staff	Common Room	To suit required number of staff
1	x	10 staff	Meals	To suit required number of staff
1	x	7 m²	Accessible WC with shower	
1	x	14 m²	Male WC	
1	x	incl	Male Shower	
1	x	incl	Male Change	
1	x	14 m²	Female WC	
1	x	incl	Female Shower	
1	x	incl	Female Change	
1	x	30 lockers	Locker Room	To suit required number of lockers
1	x	11 m²	Charge	
1	x	12m2	Gym	
Bolt On Module: T2 Education				
1	x	30m²	Multi-purpose Classroom	
Bolt On Module: Relief Quarter				
1	x	29m²	Relief incl. WC	
Associated External Spaces				
1	x	28m²	Outdoor Area	Adjacent to common room
1	x	7m²	Services	Confirm if Bolton Modules require this to be larger
1	x	6m²	Waste	Confirm if Bolton Modules require this to be larger
Vehicle Plant Room				
1	x	Variable	Plant Room	Drive through configuration to suit 5 SEV
1	x	8m²	Delivery	
1	x	4m²	Main Switchboard	
1	x	2m²	Oil Separator	
Parking Allocation Covered				
1	x		Relief Bay	*2.7x5.4m Large Car Park*
1	x		DOM Bay	*2.7x5.4m Large Car Park* TBC
1	x	50m2	Wash Bay	External Wash Bay
Parking Allocation Not Covered				
1	x		Accessible Parking Bay + Circulation	*Standard Car Parking Bay size: 5.4x2.4m*
6	x		Parking Bays – Ambulance Station	*Standard Car Parking Bay size: 5.4x2.4m*

APPENDIX D – NSW Ambulance Vehicle and Stretcher Dimensions

NSW Ambulance

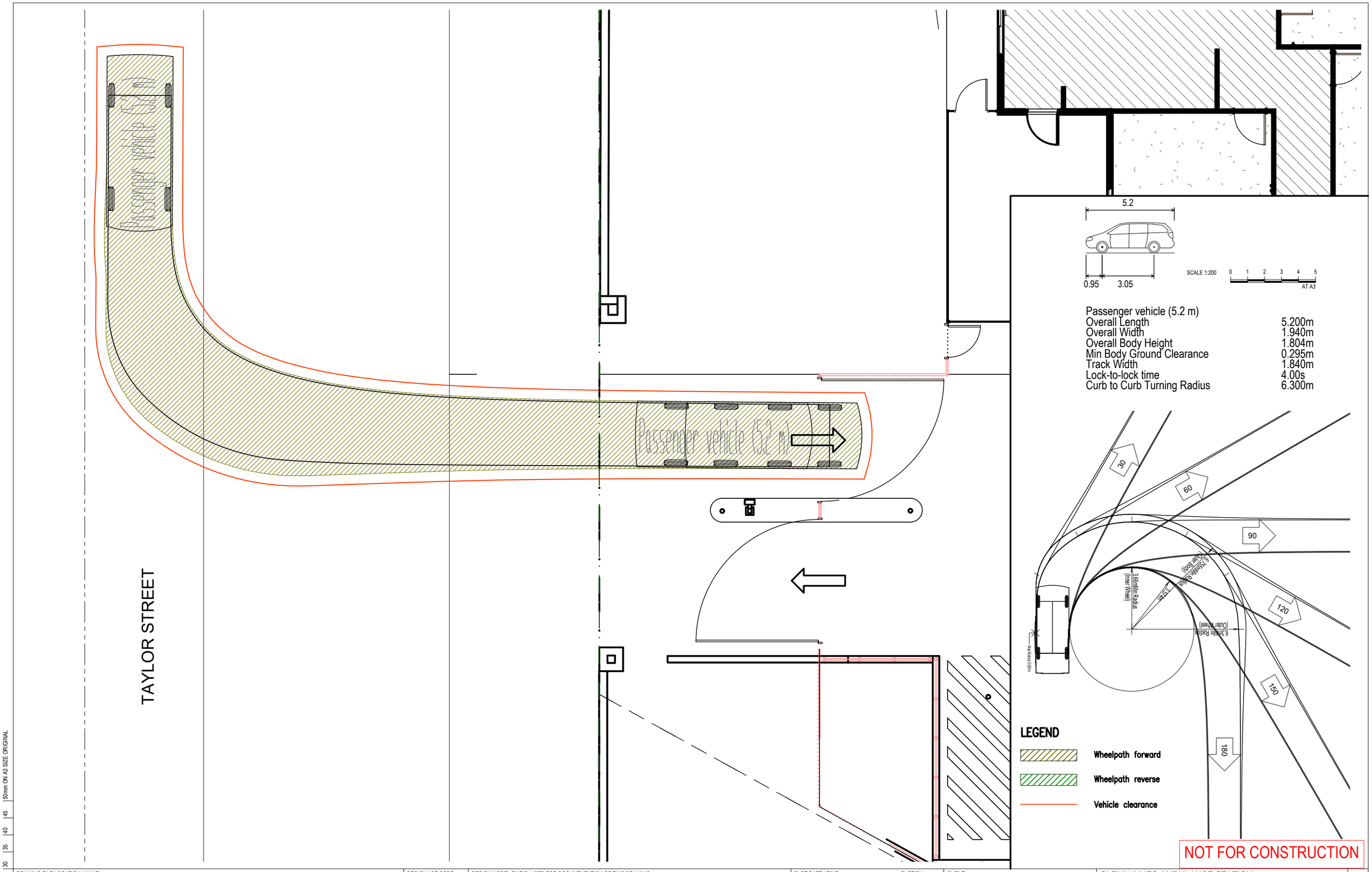
Vehicle and Stretcher Dimensions

Vehicle Dimensions	2WD – Mercedes Benz Sprinter 316	2WD – Mercedes Benz Sprinter 319	2WD – Mercedes Benz Sprinter 419 VS30	2WD – Mercedes Benz Sprinter 419 Bariatric General	2WD - Mercedes Benz Sprinter 519 Bariatric Specialist	AWD – Mercedes Benz Sprinter 316	AWD – Mercedes Benz Sprinter 419 VS30	Landcruiser	4WD - Hi-Ace
Height (including aerial)	2630 mm	2630 mm	2700 mm	2690 mm	3200 mm	2720 mm	2790 mm	2440 mm	3100 mm
Width (including external mirrors)	2380 mm	2380 mm	2400 mm	2500 mm	2600 mm	2350 mm	2400 mm	1850 mm	2400 mm
Length	6025 mm	6025 mm	6500 mm	7300 mm	7020 mm	5770 mm	6500 mm	5290 mm	5800 mm
Tare Weight	2840 kg	3100 kg	3180 kg	3700 kg	3720 kg	2840 kg	3180 kg	2650 kg	3030 kg
GVM	3880 kg	4050 kg	4100 kg	4490 kg	4490 kg	3550 kg	4100 kg	3300 kg	3750 kg
Turning Circle	15.3 m	15.3 m	15.3 m	15.3 m	15.6 m	15.3 m	15.3 m	13.4 m	12.4 m

Stretcher Dimensions	DHS 302	DHS 304	DHS 305	Stretcher Bariatric Specialist	Stretcher Stryker Power Pro XT	Bariatric Ambulance Wheelchair
Height						
Fully standing						
(ground to top of mattress)	920 mm	950 mm	950 mm	1140 mm	930 mm	1010 mm
Fully Standing with patient						
(generous measurement)	1420 mm	1450 mm	1450 mm	1620 mm		
Half Height					Lowest Height	
(ground to top of mattress)	610 mm	570 mm	360 mm	380 mm	400 mm	
Width	580 mm	555 mm	547 mm	750 mm	580 mm	820 mm
Length						
Standing	2010 mm	1940 mm	1925 mm	2000 mm	2060 mm	1200 mm
Standing – reduced length	1850 mm	1680 mm	1600 mm	1690 mm	1600 mm	
Weight	47 kg	56 kg	52 kg	128 kg	65 kg	25 kg
Work Load Limit	160 kg	160 kg	160 kg	500 kg	318 kg	295 kg

updated 2019-04-01

APPENDIX E – Swept Path and Sight Distance Diagrams



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	1	31.05.2022	INITIAL ISSUE		

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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
***		
***		
***		
***		
***		

PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

TURNING PATH ANALYSIS

STREET ACCESS - DRIVEWAY ENTRY

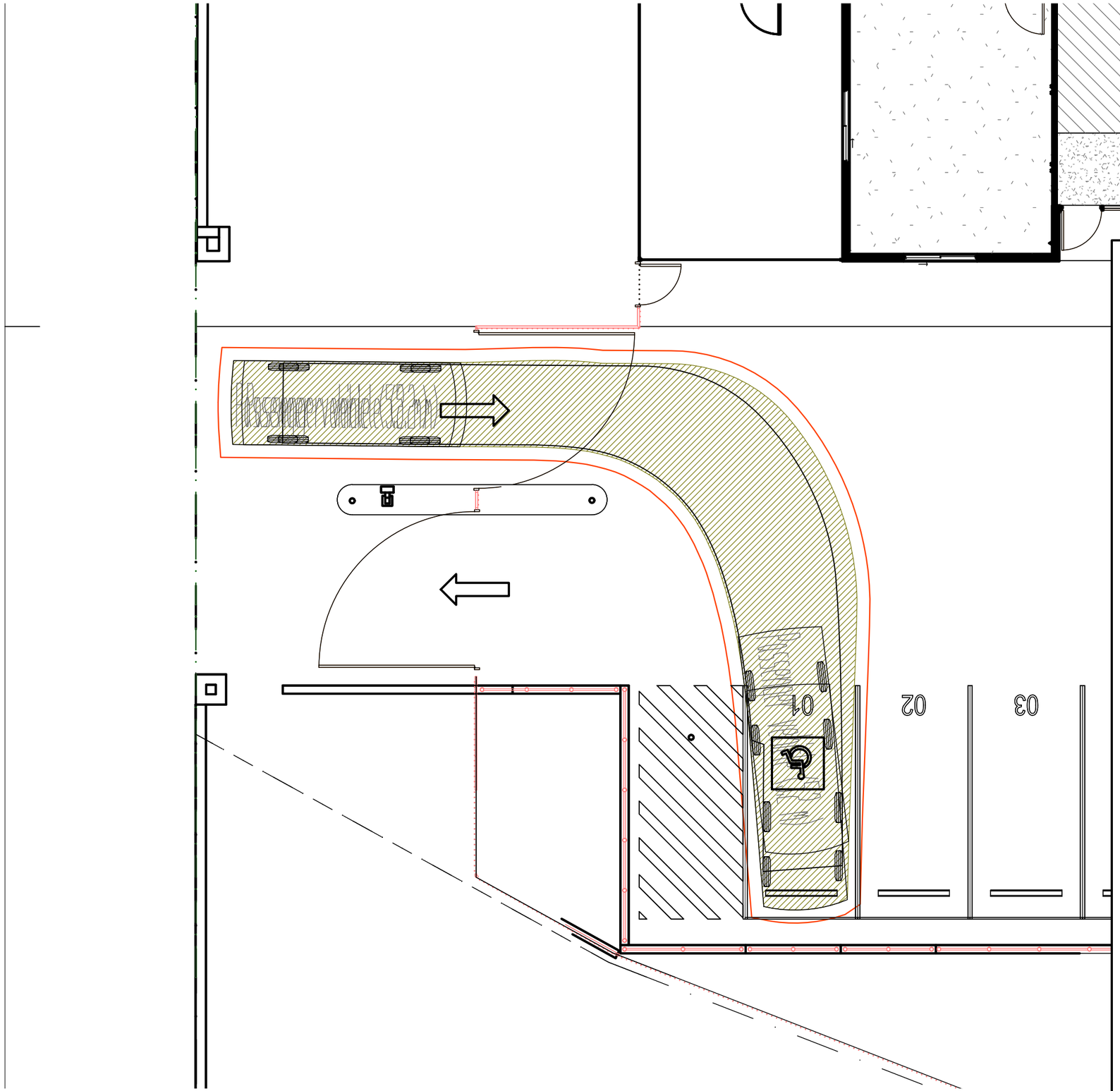
5.2m PASSENGER VEHICLE

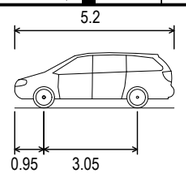
SHEET 1 OF 12

RMS REGISTRATION No.	PART
-	1

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
INITIAL ISSUE	-	TP-1001	1

Transport for NSW

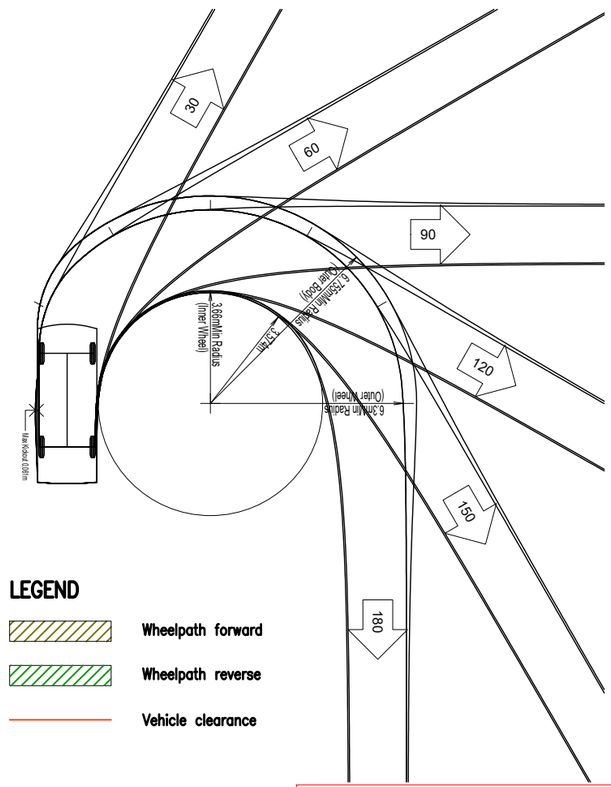




SCALE 1:200 0 1 2 3 4 5 AT A3

Passenger vehicle (5.2 m)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.295m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m



LEGEND

- Wheelpath forward
- Wheelpath reverse
- Vehicle clearance

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TITLE	NAME	DATE
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GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

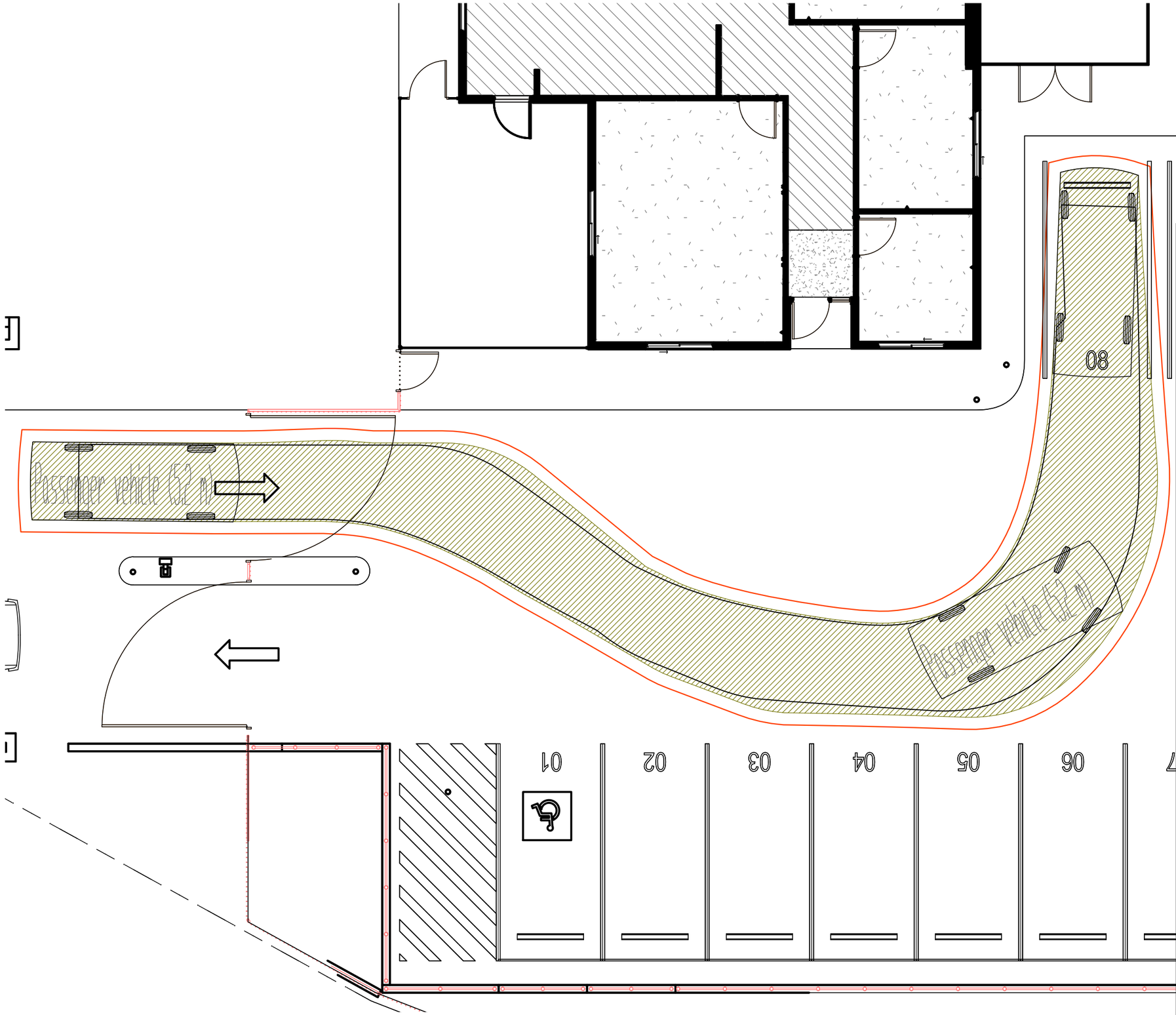
TURNING PATH ANALYSIS
PARKING SPACE ACCESS
5.2m PASSENGER VEHICLE

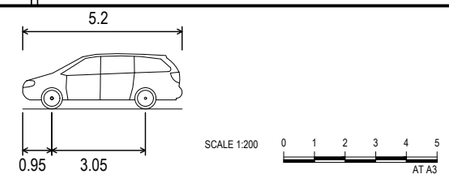
SHEET 2 OF 12

RMS REGISTRATION No. - | PART 1

ISSUE STATUS: INITIAL ISSUE | EDMS No. - | SHEET No. TP-1002 | ISSUE 1

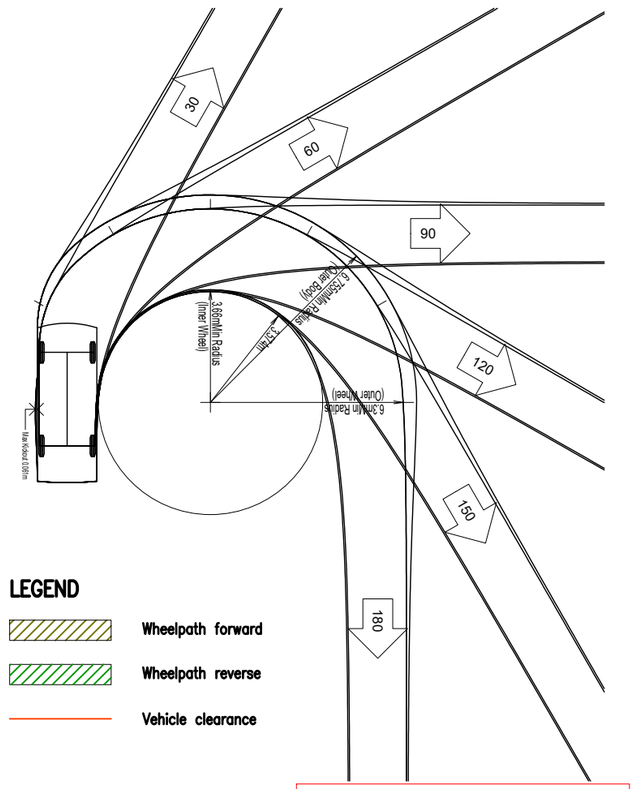
Transport for NSW





Passenger vehicle (5.2 m)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.295m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m



LEGEND

- Wheelpath forward
- Wheelpath reverse
- Vehicle clearance

NOT FOR CONSTRUCTION

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME	PLOT BY	CLIENT
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EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:100 0 0.5 1 1.5 2 2.5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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E: gold.coast@roadnet.com.au

TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
***		
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PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

TURNING PATH ANALYSIS
PARKING SPACE ACCESS
5.2m PASSENGER VEHICLE

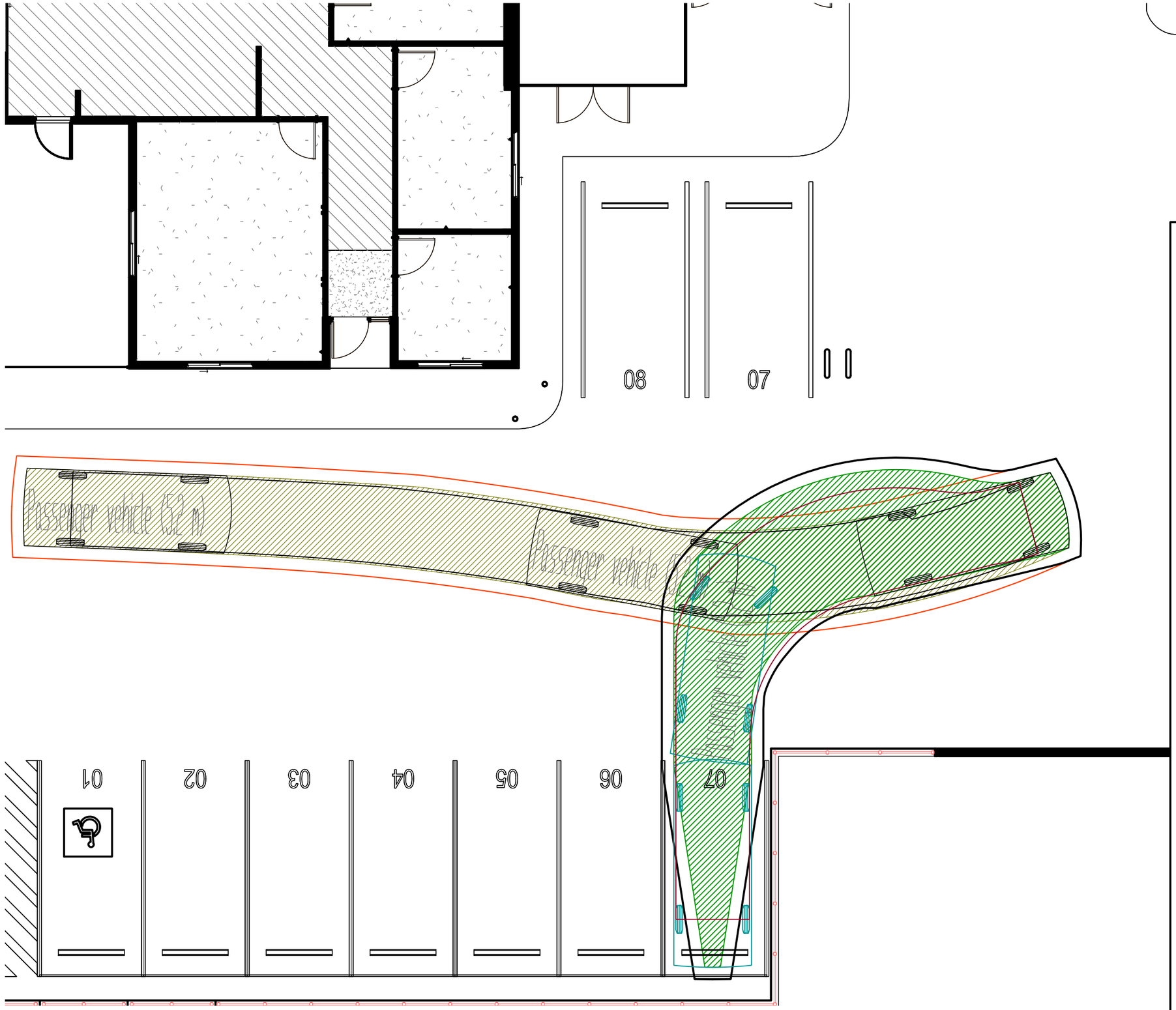
SHEET 3 OF 12

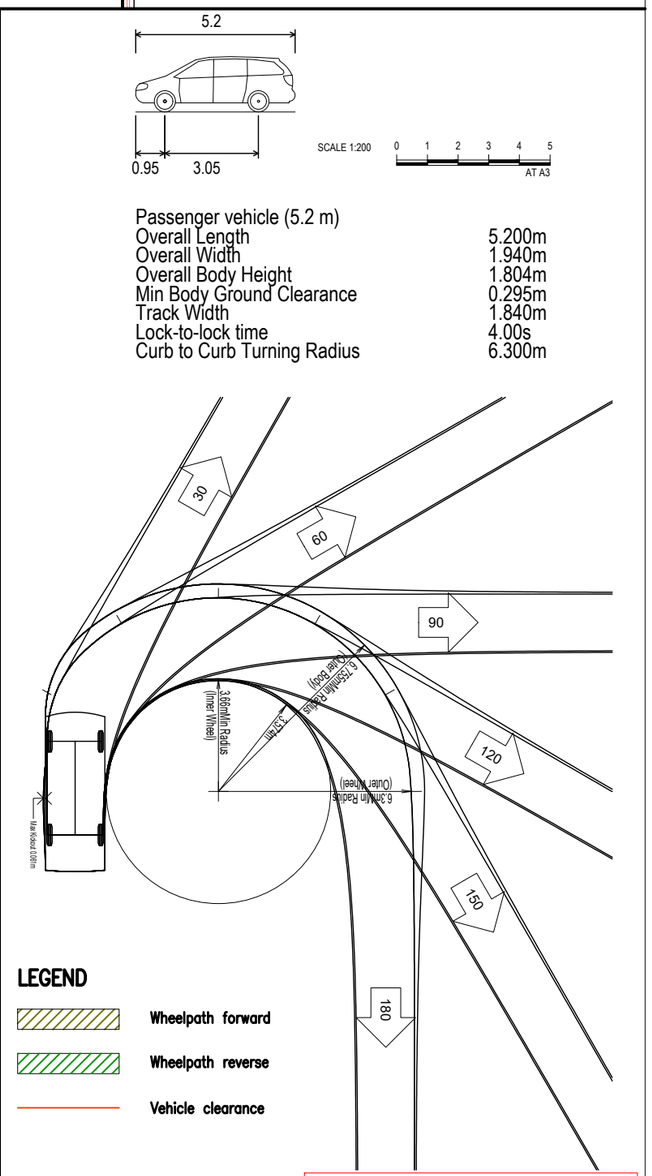
RMS REGISTRATION No. -

PART 1

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
INITIAL ISSUE	-	TP-1003	1

Transport for NSW





Passenger vehicle (5.2 m)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.295m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

LEGEND

- Wheelpath forward
- Wheelpath reverse
- Vehicle clearance

NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME	PLOT BY	CLIENT
X: 2022Jobs 22025 - Glen Innes Ambulance Station TIA DESIGN AutoCAD TP-1000.dwg	-	-	18/11/2021 1:39:15 PM	DeclanB	

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:100 — 0 0.5 1 1.5 2 2.5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
***		
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PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

TURNING PATH ANALYSIS

PARKING SPACE ACCESS

5.2m PASSENGER VEHICLE

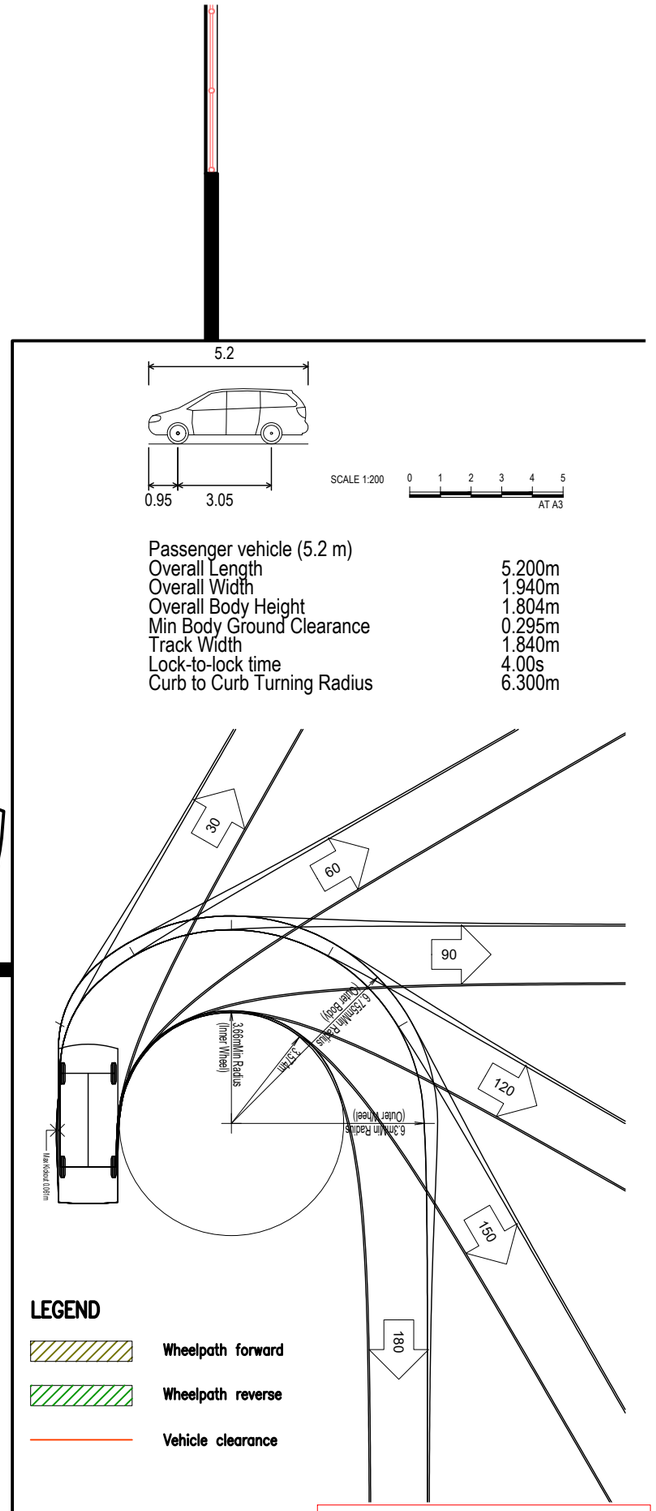
SHEET 4 OF 12

RMS REGISTRATION No. -

PART 1

ISSUE STATUS: INITIAL ISSUE | EDMS No. - | SHEET No. TP-1004 | ISSUE 1

Transport for NSW



Passenger vehicle (5.2 m)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.295m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

LEGEND

- Wheelpath forward
- Wheelpath reverse
- Vehicle clearance

NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME	PLOT BY	CLIENT
X: 2022Jobs 22025 - Glen Innes Ambulance Station TIA DESIGN AutoCAD TP-1000.dwg	-	-	18/11/2021 1:39:15 PM	DeclanB	

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:100 0 0.5 1 1.5 2 2.5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
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PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

TURNING PATH ANALYSIS

PARKING SPACE ACCESS

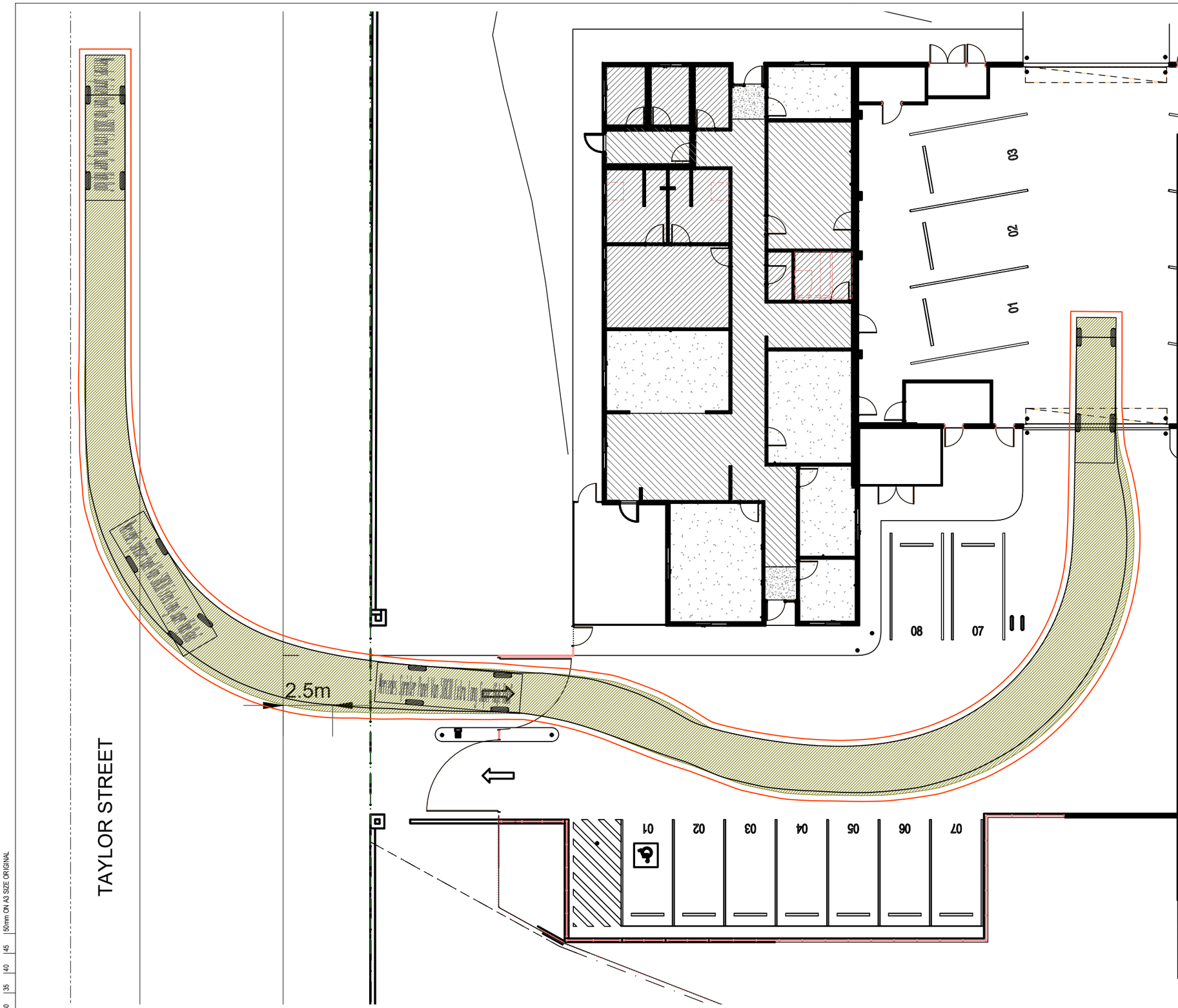
5.2m PASSENGER VEHICLE

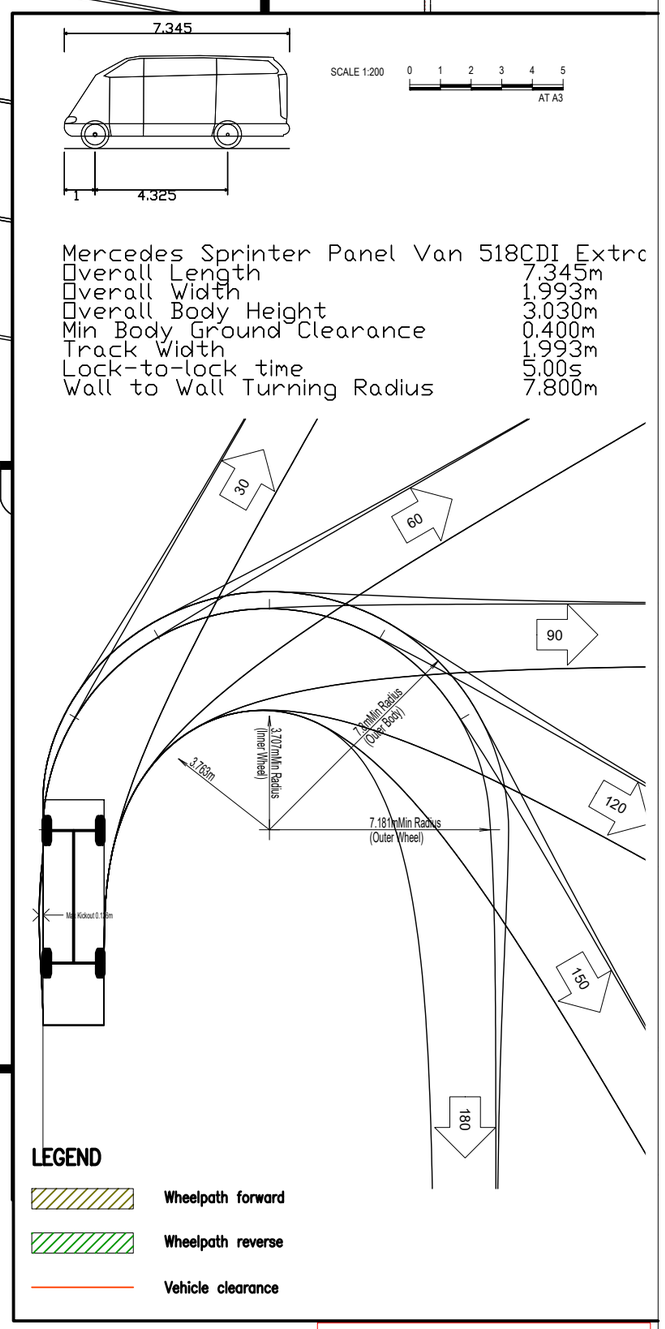
SHEET 5 OF 12

RMS REGISTRATION No.	PART
-	1

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
INITIAL ISSUE	-	TP-1005	1

Transport for NSW





Mercedes Sprinter Panel Van 518CDI Extra

Overall Length	7.345m
Overall Width	1.993m
Overall Body Height	3.030m
Min Body Ground Clearance	0.400m
Track Width	1.993m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	7.800m

NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME	PLOT BY	CLIENT
X: 2022Jobs 22025 - Glen Innes Ambulance Station TIA DESIGN AutoCAD TP-1000.dwg	-	-	18/11/2021 1:39:15 PM	DeclanB	

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:200 0 1 2 3 4 5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
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PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

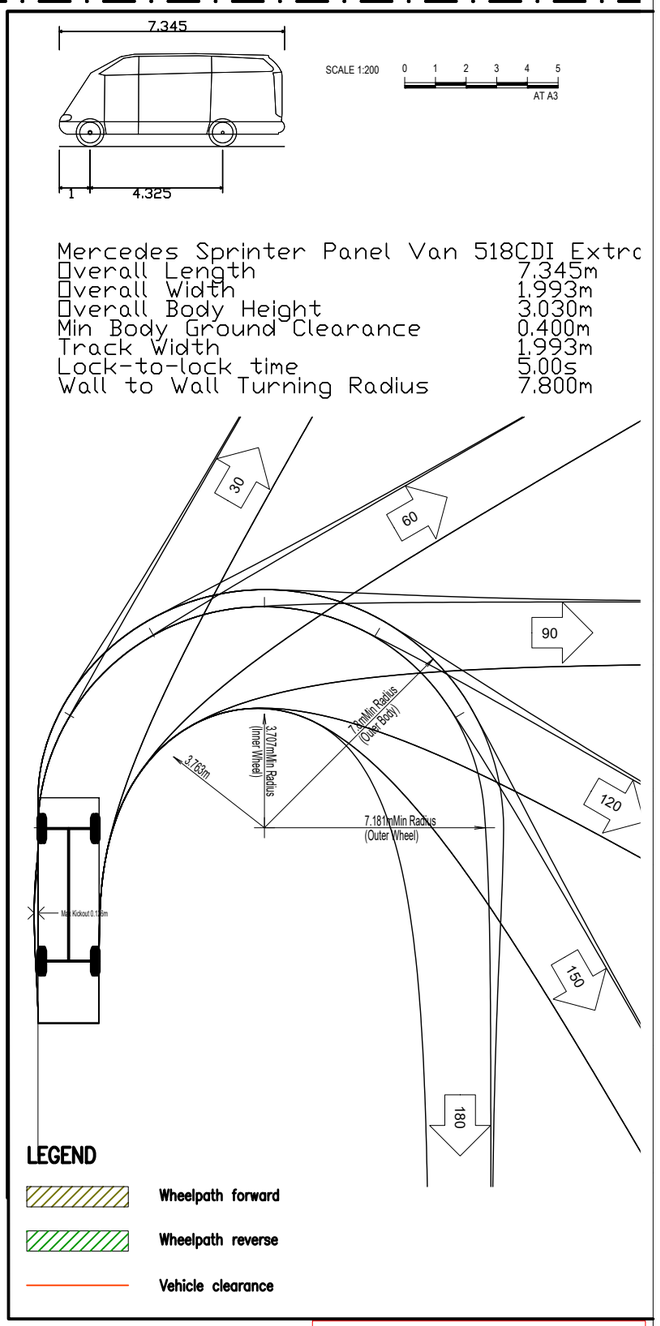
TURNING PATH ANALYSIS
PARKING SPACE ACCESS
7.345m MERCEDES SPRINTER VAN

SHEET 6 OF 12

RMS REGISTRATION No. - PART 1

ISSUE STATUS: INITIAL ISSUE | EDMS No. - | SHEET No. TP-1006 | ISSUE 1

Transport for NSW



Mercedes Sprinter Panel Van 518CDI Extra

Overall Length	7.345m
Overall Width	1.993m
Overall Body Height	3.030m
Min Body Ground Clearance	0.400m
Track Width	1.993m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	7.800m

NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: X: 2022Jobs 22025 - Glen Innes Ambulance Station TIA DESIGN AutoCAD TP-1000.dwg

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PLOT DATE / TIME: 18/11/2021 1:39:15 PM

PLOT BY: DeclanB

CLIENT:

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:200 0 1 2 3 4 5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
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PREPARED FOR:

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

TURNING PATH ANALYSIS
PARKING SPACE ACCESS
7.345m MERCEDES SPRINTER VAN

SHEET 7 OF 12

RMS REGISTRATION No.: -

PART: 1

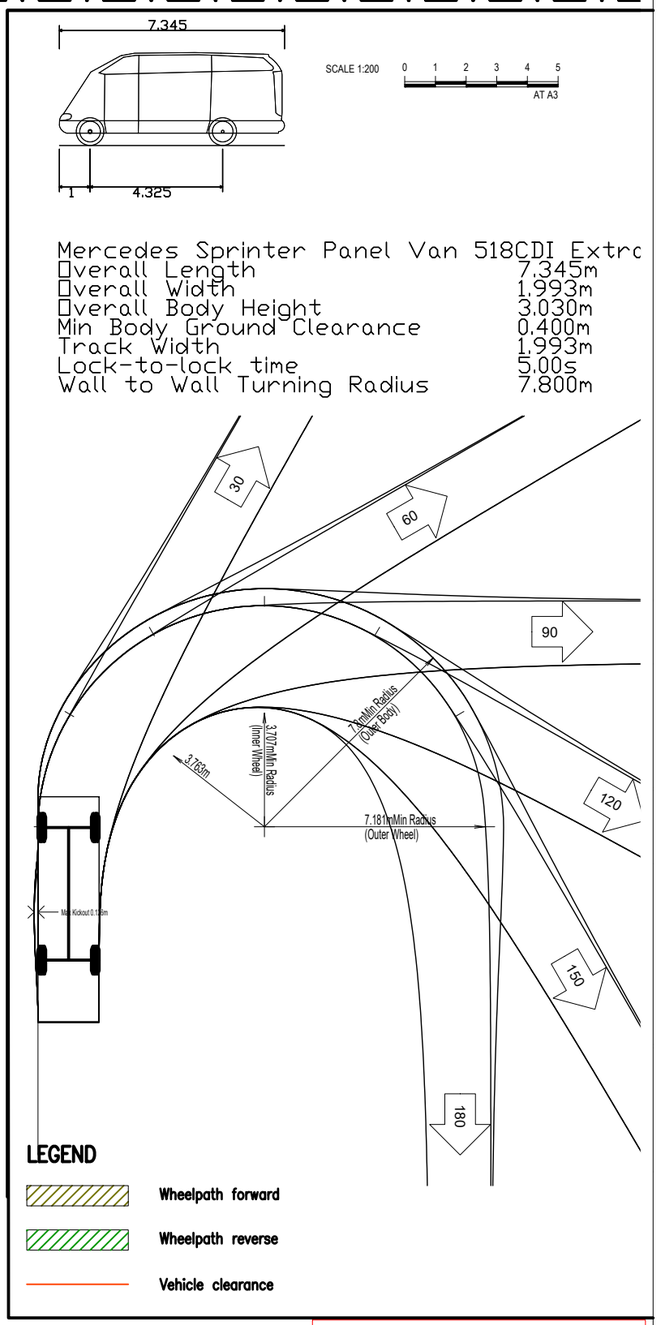
ISSUE STATUS: INITIAL ISSUE

EDMS No.: -

SHEET No.: TP-1007

ISSUE: 1

Transport for NSW



Mercedes Sprinter Panel Van 518CDI Extra

Overall Length	7.345m
Overall Width	1.993m
Overall Body Height	3.030m
Min Body Ground Clearance	0.400m
Track Width	1.993m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	7.800m

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50mm ON A3 SIZE ORIGINAL

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DESIGN LOT CODE: -

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: -

PLOT DATE / TIME: 18/11/2021 1:39:15 PM

PLOT BY: DeclanB

CLIENT:

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:200 0 1 2 3 4 5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
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PREPARED FOR:

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

TURNING PATH ANALYSIS
PARKING SPACE ACCESS
7.345m MERCEDES SPRINTER VAN

SHEET 8 OF 12

RMS REGISTRATION No.: -

PART: 1

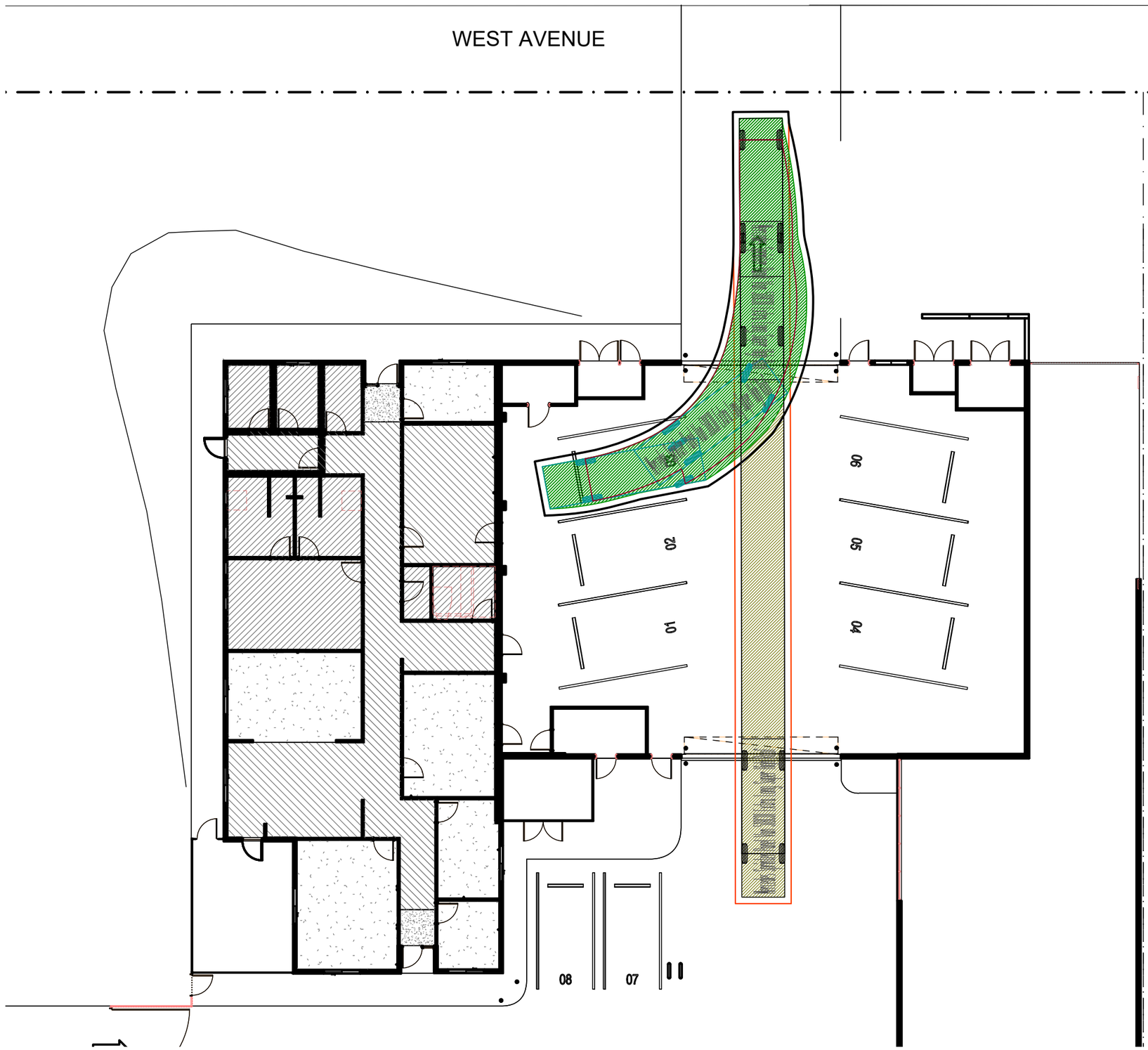
ISSUE STATUS: INITIAL ISSUE

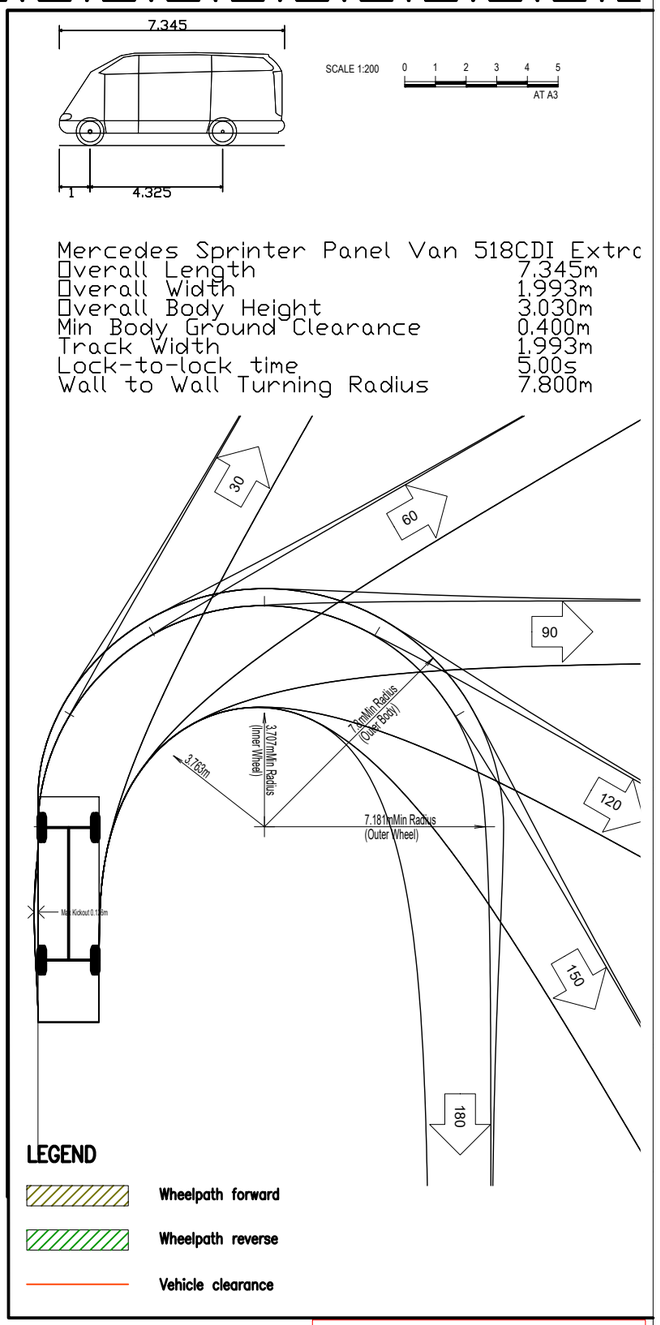
EDMS No.: -

SHEET No.: TP-1008

ISSUE: 1

Transport for NSW





Mercedes Sprinter Panel Van 518CDI Extra

Overall Length	7.345m
Overall Width	1.993m
Overall Body Height	3.030m
Min Body Ground Clearance	0.400m
Track Width	1.993m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	7.800m

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME	PLOT BY	CLIENT
X: 2022Jobs 22025 - Glen Innes Ambulance Station TIA DESIGN AutoCAD TP-1000.dwg	-	-	18/11/2021 1:39:15 PM	DeclanB	

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:200 0 1 2 3 4 5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
***		
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PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

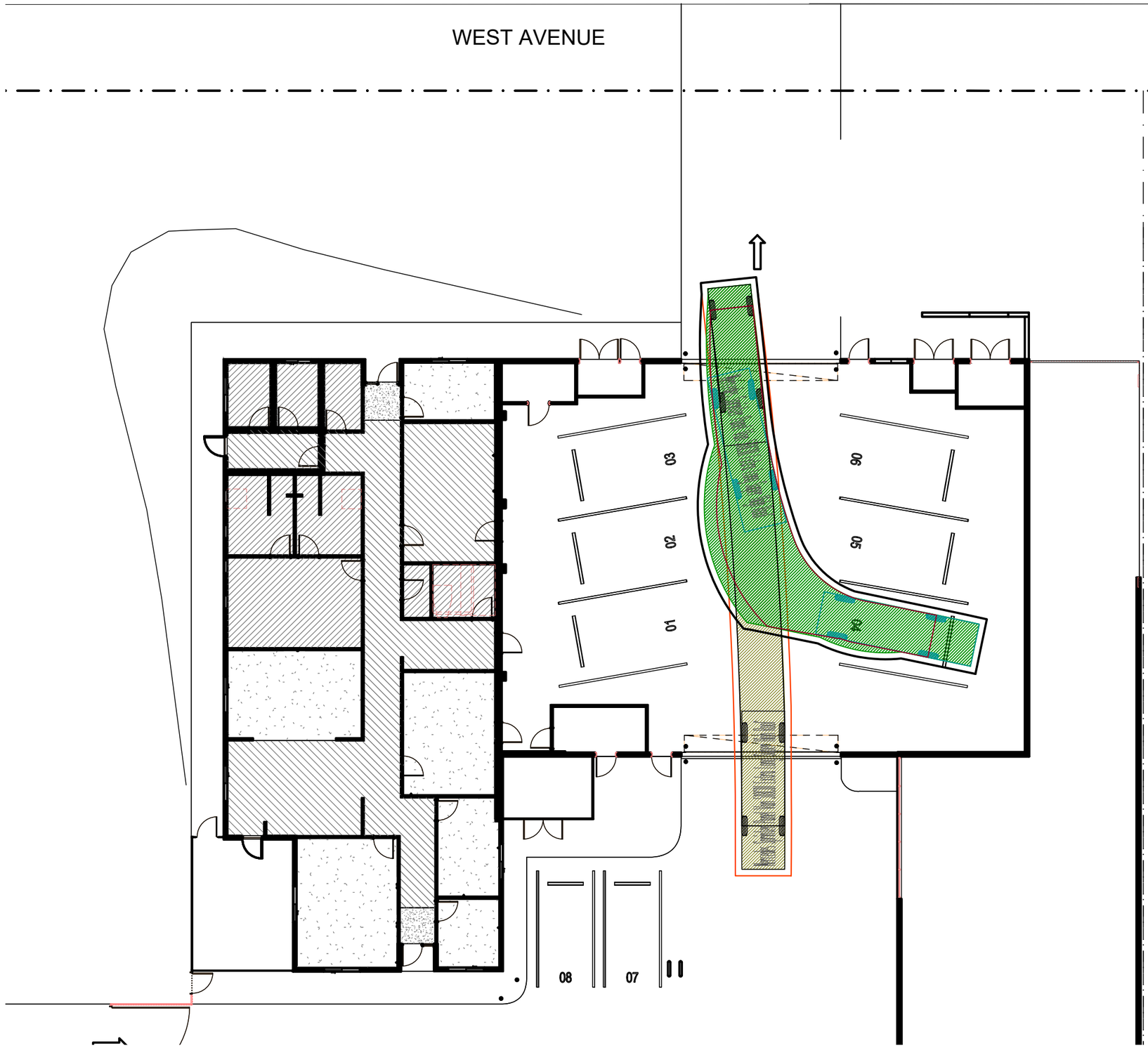
TURNING PATH ANALYSIS
PARKING SPACE ACCESS
7.345m MERCEDES SPRINTER VAN

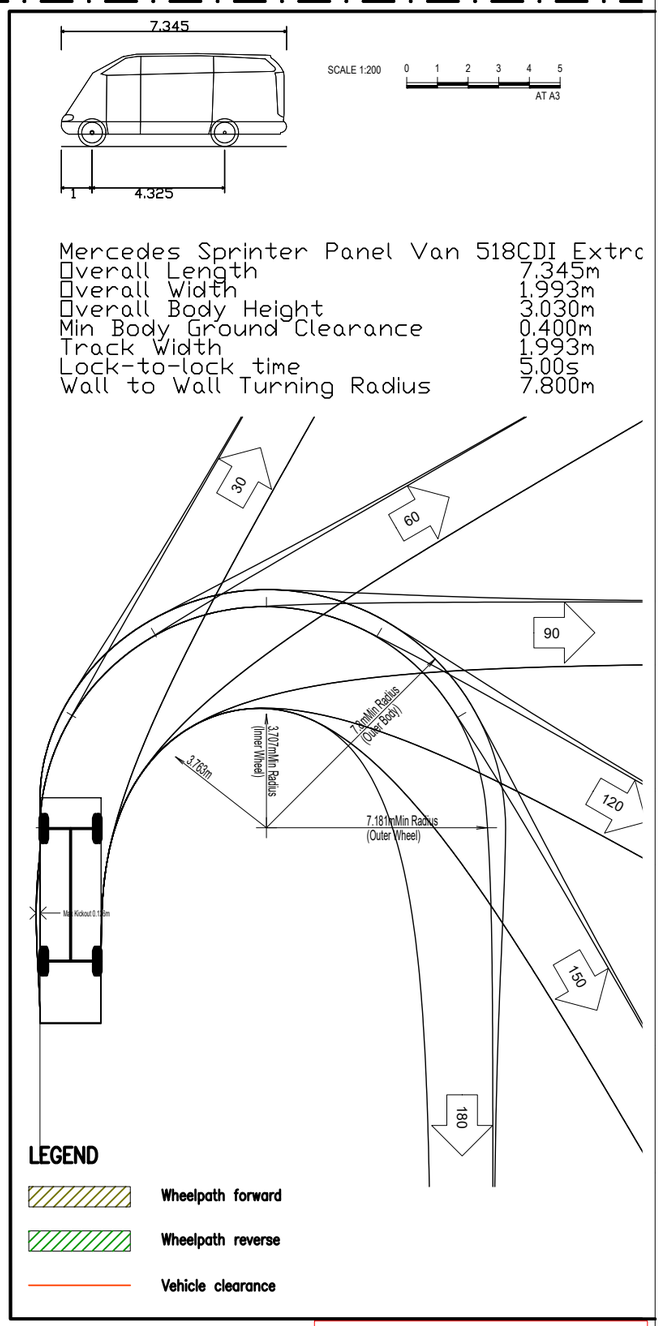
SHEET 9 OF 12

RMS REGISTRATION No. - PART 1

ISSUE STATUS: INITIAL ISSUE | EDMS No. - | SHEET No. TP-1009 | ISSUE 1

Transport for NSW





Mercedes Sprinter Panel Van 518CDI Extra

Overall Length	7.345m
Overall Width	1.993m
Overall Body Height	3.030m
Min Body Ground Clearance	0.400m
Track Width	1.993m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	7.800m

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: X: 2022Jobs 22025 - Glen Innes Ambulance Station TIA DESIGN AutoCAD TP-1000.dwg

DESIGN LOT CODE: -

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: -

PLOT DATE / TIME: 18/11/2021 1:39:15 PM

PLOT BY: DeclanB

CLIENT:

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:200 0 1 2 3 4 5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
***		
***		
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***		

PREPARED FOR:

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

TURNING PATH ANALYSIS

PARKING SPACE ACCESS

7.345m MERCEDES SPRINTER VAN

SHEET 10 OF 12

RMS REGISTRATION No.: -

PART: 1

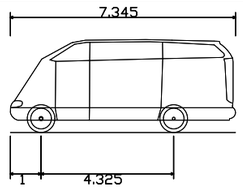
ISSUE STATUS: INITIAL ISSUE

EDMS No.: -

SHEET No.: TP-1010

ISSUE: 1

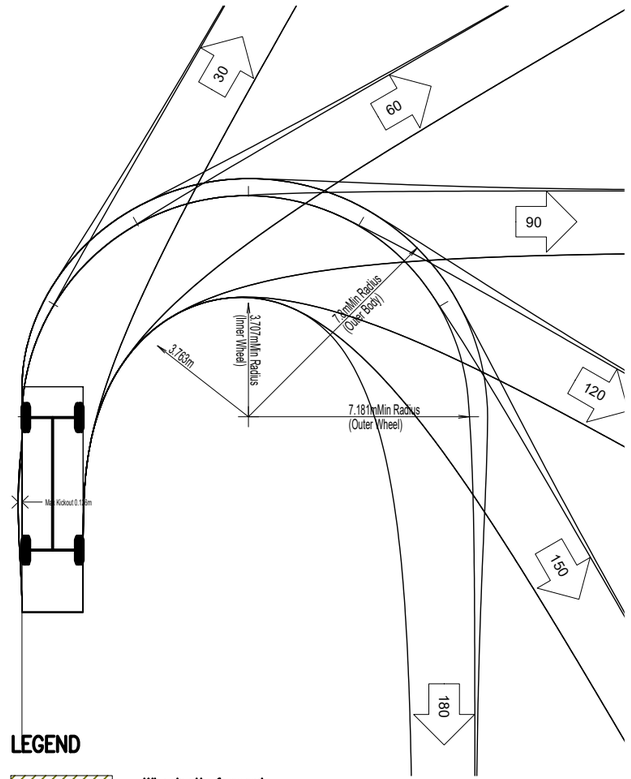
Transport for NSW



SCALE 1:200 0 1 2 3 4 5 AT A3

Mercedes Sprinter Panel Van 518CDI Extra

Overall Length	7.345m
Overall Width	1.993m
Overall Body Height	3.030m
Min Body Ground Clearance	0.400m
Track Width	1.993m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	7.800m



LEGEND

- Wheelpath forward
- Wheelpath reverse
- Vehicle clearance

NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME	PLOT BY	CLIENT
X: 2022Jobs 22025 - Glen Innes Ambulance Station TIA DESIGN AutoCAD TP-1000.dwg	-	-	18/11/2021 1:39:15 PM	DeclanB	

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:200 0 1 2 3 4 5 AT A3

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

DRAWINGS / DESIGN PREPARED BY

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F: 07 5525 7388
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TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
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PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

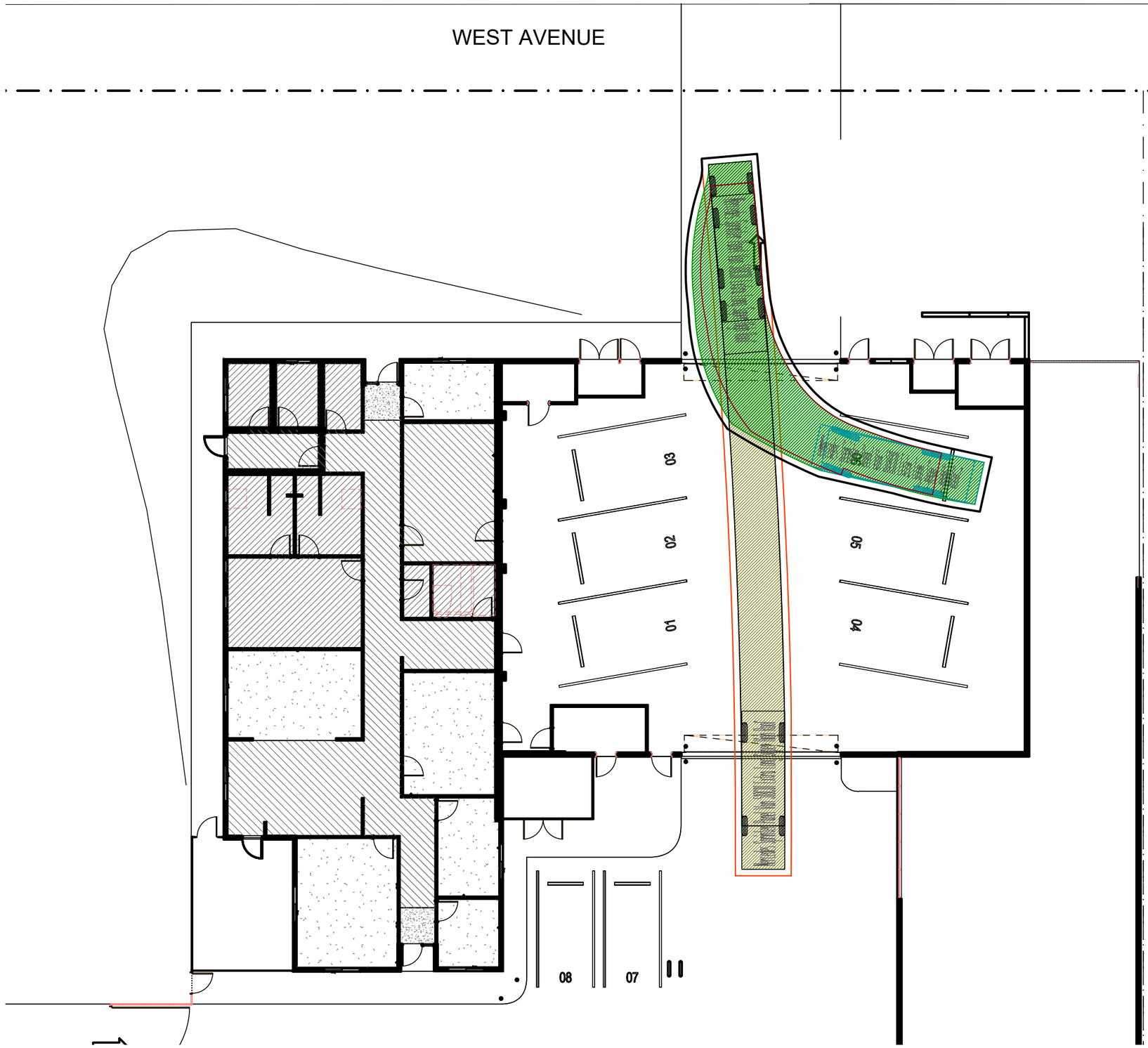
TURNING PATH ANALYSIS
PARKING SPACE ACCESS
7.345m MERCEDES SPRINTER VAN

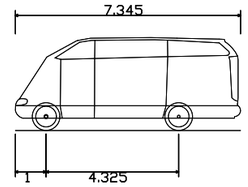
SHEET 11 OF 12

RMS REGISTRATION No. - PART 1

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
INITIAL ISSUE	-	TP-1011	1

Transport for NSW

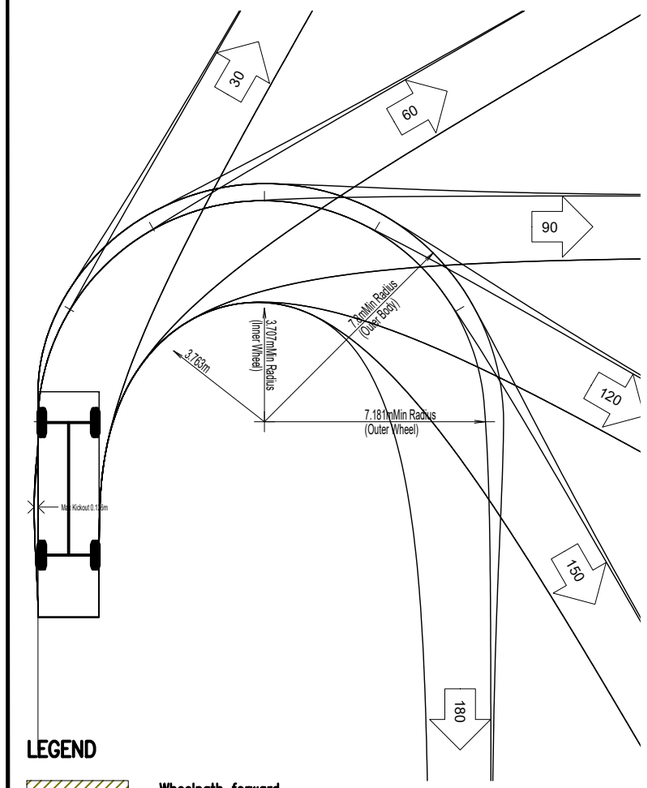




SCALE 1:200 0 1 2 3 4 5 AT A3

Mercedes Sprinter Panel Van 518CDI Extra

Overall Length	7.345m
Overall Width	1.993m
Overall Body Height	3.030m
Min Body Ground Clearance	0.400m
Track Width	1.993m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	7.800m



LEGEND

- Wheelpath forward
- Wheelpath reverse
- Vehicle clearance

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TITLE	NAME	DATE
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PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

TURNING PATH ANALYSIS

PARKING SPACE ACCESS

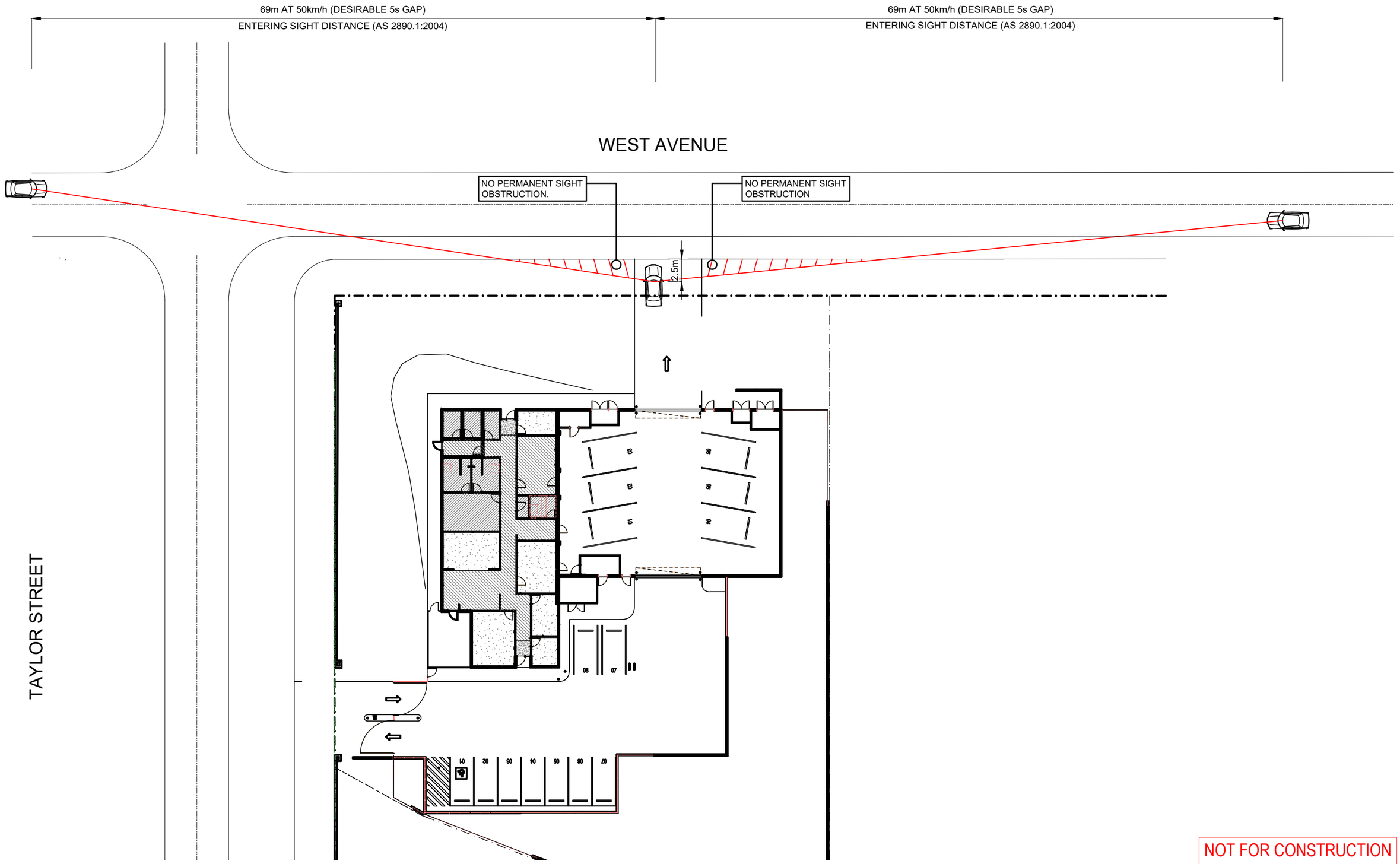
7.345m MERCEDES SPRINTER VAN

SHEET 12 OF 12

RMS REGISTRATION No. - PART 1

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
INITIAL ISSUE	-	TP-1012	1

Transport for NSW



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PREPARED FOR

GLENN INNES AMBULANCE STATION
TAYLOR STREET, GLENN INNES

A3

SIGHT DISTANCE ANALYSIS

SHEET 1 OF 2

RMS REGISTRATION No. -

PART 1

ISSUE STATUS: INITIAL ISSUE | EDMS No. - | SHEET No. SD-01 | ISSUE 1

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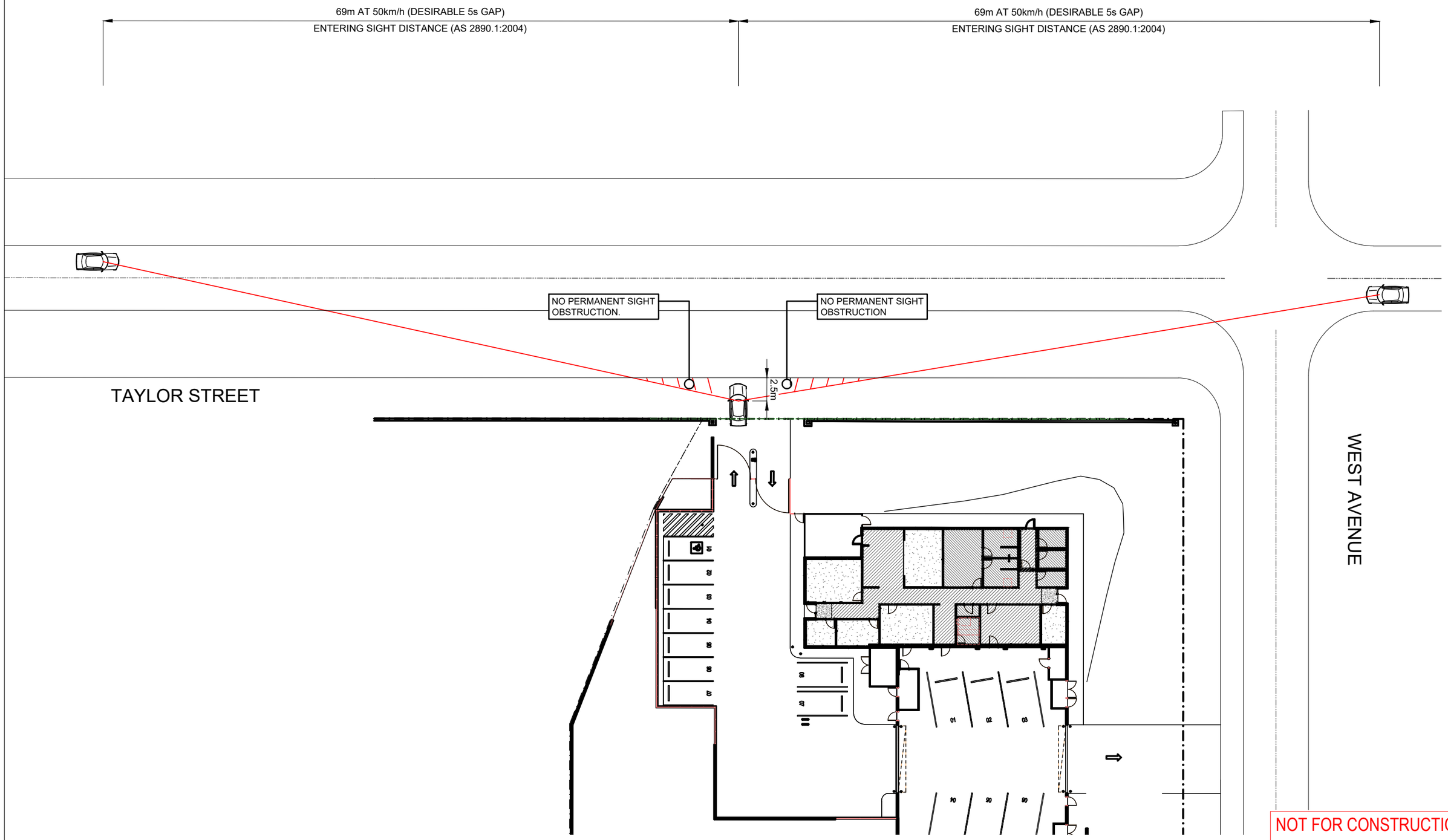

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X: 2022Jobs 22025 - Glen Innes Ambulance Station TIA DESIGN AutoCAD TP-1000.dwg	-	-	18/11/2021 1:39:15 PM	DeclanB		SIGHT DISTANCE ANALYSIS	

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	1	31.05.2022	INITIAL ISSUE		

SCALES ON A3 SIZE DRAWING: SCALE 1:400 (0 2 4 6 8 10 AT A3)

CO-ORDINATE SYSTEM: - HEIGHT DATUM: -

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ABN 51 522 449 578
8 Sixth Avenue
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P: 07 5525 7377
F: 07 5525 7388
E: gold.coast@roadnet.com.au

TITLE	NAME	DATE
DRAWN	D. KERWICK	31.05.22
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SHEET 2 OF 2

RMS REGISTRATION No.	PART	ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
-	1	INITIAL ISSUE	-	SD-02	1

Transport for NSW

3730-1374

8 June 2022

General Manager

Glen Innes Severn Council

PO BOX 61

GLEN INNES NSW 2370

Email: council@gisc.nsw.gov.au

Att: Planning Department or whom it may concern.

RE: Notification of Activity – New Ambulance Station at 85 Taylor Street, Glen Innes NSW.

I refer to previous correspondence to Council dated 12 July 2021 regarding demolition and refurbishments, alterations and additions to the existing NSW Ambulance facility at 106 Bourke Street (Lot 5 DP5003 and Lot 1 DP963575), Glen Innes. I wish to advise you that NSW Ambulance have decided not to pursue this proposal and will now be pursuing a new station at the Glen Innes Hospital Site. The plans for the new facility are attached to this letter for your review.

NSW Health Infrastructure (HI), is proposing to construct a new ambulance station at the Glen Innes Hospital Campus site, located at 85 Taylor Street, Glen Innes, NSW 2370 (Lot 2 DP1208729).

While this proposal does not require development consent from Council, we are required to assess its likely impacts in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979*. In accordance with Section 2.11 *'Consultation with councils-development with impacts on local heritage'* and 2.52(7) of the *State Environmental Planning Policy (Transport and Infrastructure) 2021*, we are notifying Council of our intention to carry out the activity and ask that you provide any comments on the proposal within 21 days from the date of this letter. These comments will then be considered in our assessment of the proposal.

For your information, a plan indicating the location and extent of the work is enclosed. In summary, the proposed activity comprises construction of a new ambulance station providing for six ambulance parking bays and associated works including: demolition to existing brick wall, kerbs and gutters to allow for access/driveways, tree removal, car parking, hardstand, and ancillary infrastructure.

If you wish to comment on the proposal, please provide your feedback to Stuart Diver at hi-info@health.nsw.gov.au or NSW Health Infrastructure, Attention Stuart Diver, Locked Bag, St Leonards, NSW 1590.

Yours sincerely

Stuart Diver

Senior Project Director

Enc: Preliminary Plans

8 June 2022

The Occupier

#

#

[Address]

Dear Occupier

Notification of Activity – New Ambulance Station at 85 Taylor Street, Glen Innes NSW.

NSW Health Infrastructure (HI), is proposing to construct a new ambulance station at the Glen Innes Hospital Campus site, located at 85 Taylor Street, Glen Innes, NSW 2370 (Lot 2 DP1208729). The Ambulance Station will be delivered through the Rural Ambulance Infrastructure Reconfiguration (RAIR) program.

While this proposal does not require development consent from Council, we are required to assess the likely impacts of the proposal in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979*. In accordance with the *State Environmental Planning Policy (Transport and Infrastructure) 2021*, we are notifying occupiers of adjoining and adjacent properties of our intention to undertake the works and ask that you provide any comments on the proposal within 21 days from the date of this letter. These comments will then be considered in our assessment of the proposal.

For your information, a plan indicating the location and extent of the work is enclosed. In summary, the proposed activity comprises construction of a new ambulance station providing for six ambulance parking bays and associated works including: demolition to existing brick wall, kerbs and gutters to allow for access/driveways, tree removal, contruction of car parking, hardstand, and ancillary infrastructure.

If you wish to comment on the proposal, please provide your feedback to Stuart Diver at hi-info@health.nsw.gov.au or NSW Health Infrastructure, Attention Stuart Diver, Locked Bag 2030, St Leonards NSW 1590.

Yours sincerely,

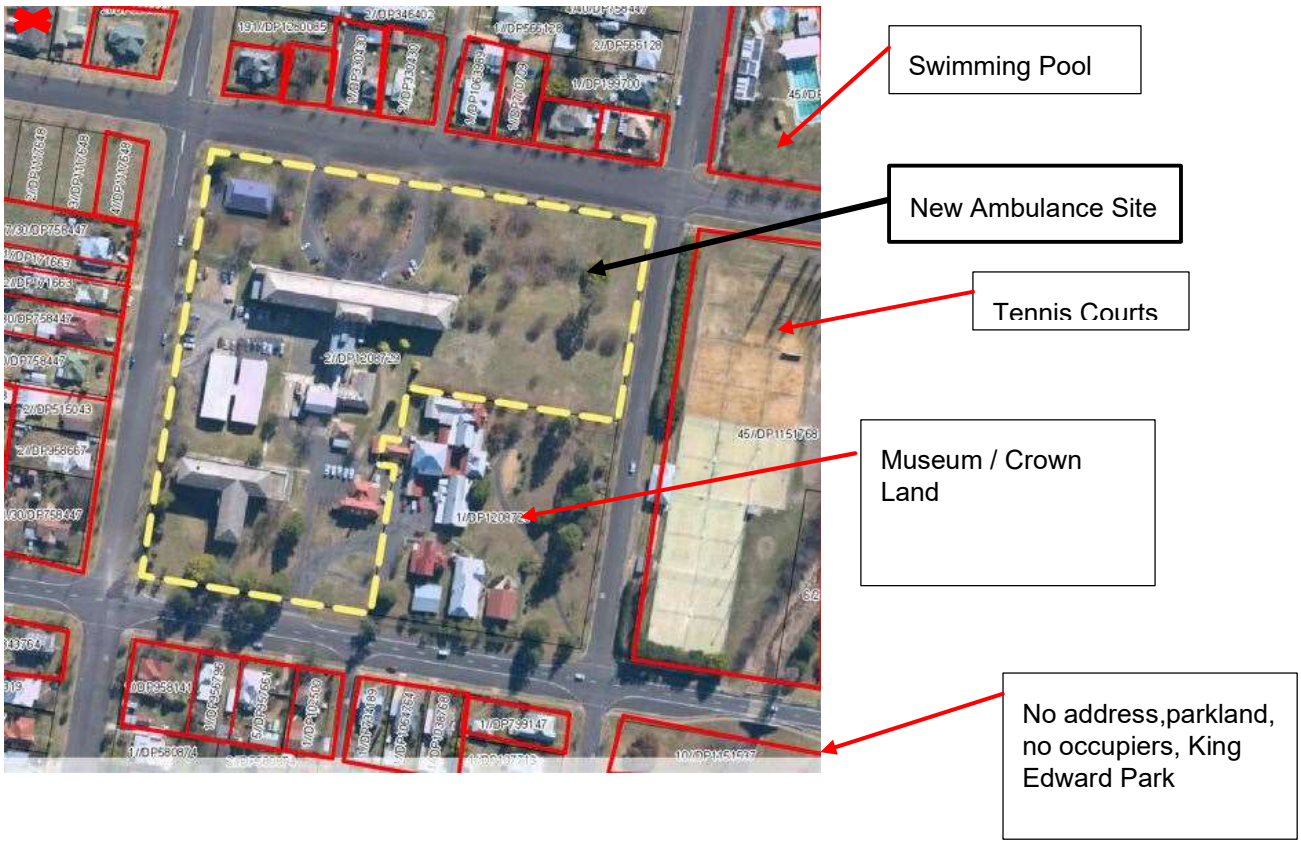
Stuart Diver

Senior Project Director

Enc: Preliminary Plans.

Glen Innes Ambulance Station – property occupiers sent notification letters

Recipient	Address
Occupier/Glen Innes Swimming Pool Att: Graham Archibald, Manager of Recreation and Open Spaces Email: council@gisc.nsw.gov.au	PO BOX 61, Glen Innes NSW 2370 *(179 West Avenue, Glen Innes, 2370)*
Occupier/Glen Innes District Tennis Association Att: Graham Archibald, Manager of Recreation and Open Spaces Email: council@gisc.nsw.gov.au	PO BOX 61, Glenn Innes NSW 2370 *(155 West Avenue, Glenn Innes, NSW 2370)*
Land of the Beardies History House Museum & Research Ctr	PO Box 371, Glenn Innes, 2370
Crown Lands	49-51 Victoria Street, Grafton, 2460
Occupier	176 West Avenue, Glen Innes 2370
Occupier	104 Taylor Street, Glen Innes, 2370
Occupier	102 Taylor Street, Glen Innes, 2370
Occupier	100 Taylor Street, Glen Innes, 2370
Occupier	96 Taylor Street, Glen Innes, 2370
Occupier	92 Taylor Street, Glen Innes, 2370
Occupier	90 Taylor Street, Glen Innes, 2370
Occupier	129 Macquarie Street, Glen Innes, 2370
Occupier	130 Macquarie Street, Glen Innes, 2370
Occupier	124 Macquarie Steet, Glen Innes, 2370
Occupier	122 Macquarie Street, Glen Innes, 2370
Occupier	120 Macquarie Street, Glen Innes, 2370
Occupier	118 Macquarie Street, Glen Innes, 2370
Occupier	116 Macquarie Street, Glen Innes, 2370
Occupier	114 Macquarie Street, Glen Innes, 2370
Occupier	110 Macquarie Street, Glen Innes, 2370
Occupier	108 Macquarie Street, Glen Innes, 2370
Occupier	213 Ferguson Street, Glen Innes, 2370
Occupier	217 Ferguson Street, Glen Innes, 2370
Occupier	219 Ferguson Street, Glen Innes, 2370
Occupier	221 Ferguson Street, Glen Innes, 2370
Occupier	223 Ferguson Street, Glen Innes, 2370
Occupier	225 Ferguson Street, Glen Innes, 2370
Occupier	227 Ferguson Street, Glen Innes, 2370
Occupier	148 West Avenue, Glen Innes, 2370


Swimming Pool
New Ambulance Site
Tennis Courts
Museum / Crown Land
No address,parkland, no occupiers, King Edward Park

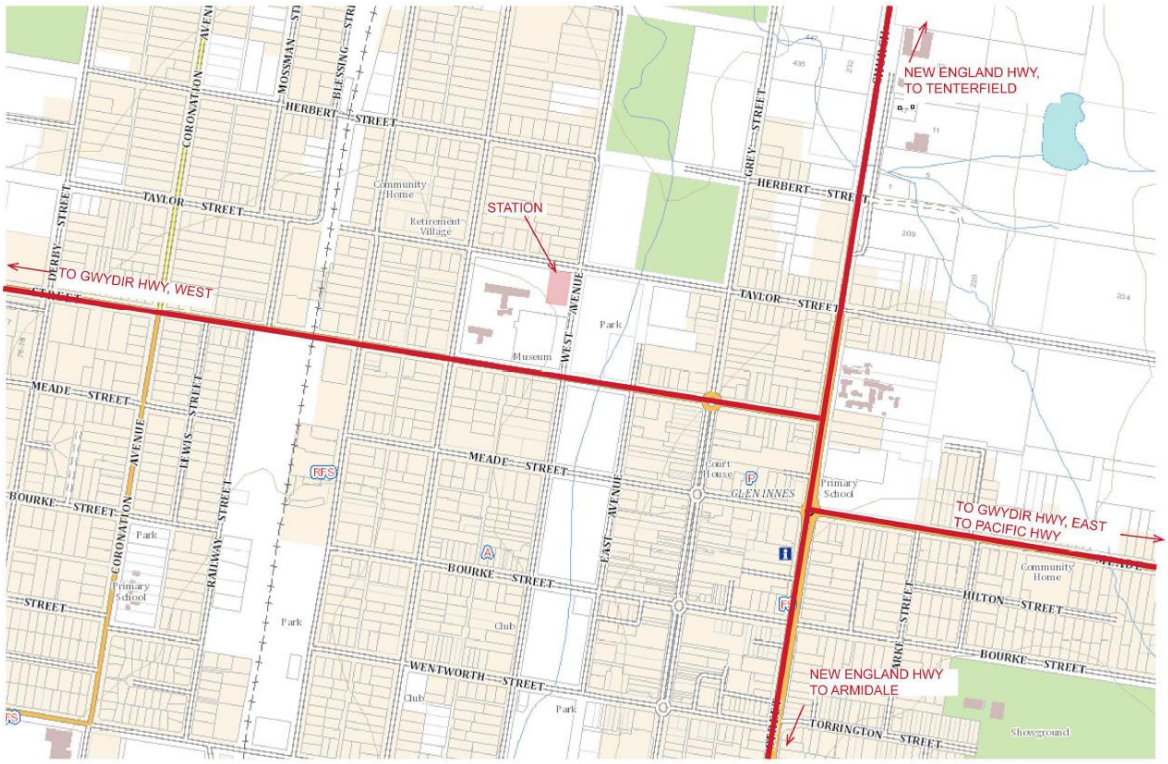
Glen Innes Ambulance Station

Design Development Report

Issue date: 08/06/22

Rev: A

Doc #: R31-AR-RP01



T + 612 9319 2955
E studio@djrd.com.au
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63 Myrtle Street
Chippendale NSW 2008
Sydney, Australia
djrd.com.au
Nominated Architects
Daniel Beekwilder 6192
Andrew Hipwell 6562

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7.1 Return Brief
7.2 Architectural PUG Drawings
7.3 Architectural Drawings
7.4 Landscape Architecture Drawings
7.5 BCA Report
7.6 DDA Report

1 Executive Summary

DJRD Architects were engaged by Health Infrastructure to undertake the design of a new ambulance station located in Glen Innes.

NSW Ambulance is a mobile health service with four key clinical areas of operation: emergency care, urgent/unscheduled care, community support and health support.

The NSW government is committed to enhancing the capacity of NSW Ambulance. In particular, rural health is a priority for the NSW government. The NSW Rural Health plan towards 2031 highlights the need to strengthen the capacity of rural health services to provide a more connected and seamless care. As part of addressing the rural health service, NSW Ambulance has identified a need to how it will deliver their services and identify the infrastructure required to support this service.

Consistent with the rest of the health system, there is a need to maintain and upgrade capital infrastructure for NSW Ambulance. Ambulance has already developed a Sydney Infrastructure Reform Strategy resulting in the SAMIS (Sydney Ambulance Metropolitan Infrastructure Strategy) program, and a similar approach for regional and rural NSW is to be adopted. This project has been named the Rural Ambulance Infrastructure Reconfiguration (RAIR) program.

24 upgraded, rebuilt or new regional and rural ambulance stations were delivered under the RAIR Stage 1 program – this represents the largest delivery of NSW Ambulance regional and rural infrastructure in the organisation's history. Construction is complete on 24 Stage 1 projects.

Following on from the success of Stage 1 of the program, the NSW Government has announced an additional $100 million to deliver upgraded, rebuilt or entirely new NSW Ambulance stations in rural and regional NSW as part of Stage 2 of the program, and Glen Innes is part of Stage 2.

2 Glen Innes Ambulance Station

Glen Innes Ambulance Station has been designed in accordance with template guidelines titled "Rural Ambulance Station Facilities Design Guidelines Part A, B & C". In 2019 the Design Guidelines were updated to incorporate lessons learnt from previous stations and they comprise template designs for small, medium and large stations as well as modules for Education, Fleet and Zone/Sector.

2.1 Project Scope

The project scope of the Glen Innes ambulance station includes the construction of a new Medium Ambulance Station comprising of six (6) internal ambulance parking spaces including one (1) internal vehicle wash bay; two (2) external covered parking bays for relief and DOM parking; seven (7) external staff parking spaces, including one accessible space; Ambulance administration and storage areas; Ambulance amenity facilities including lockers, toilets, kitchen and common room; two sleeping pods with an adjacent shower and WC, and a gym room.

3 Project Team

The consultant team are as follows;

Health Infrastructure	Client
NSW Ambulance	Client
Mace	Project Manager
DJRD	Architect
MBM	Cost management
Meinhardt-Bonacci	Structural and Civil
JHA	Mechanical, Electrical, ICT, Comms, ESD (Section J), Hydraulic and Acoustic
Geolink	Traffic
Geolink	Town Planner
Site Image	Landscape Architect
Monteath & Powys	Surveyor
BCA Logic	BCA

3.1 Service Planning

Through a consultation process with NSW Ambulance, DJRD prepared a series of return briefs and schedules of accommodation for Glen Innes Ambulance Station. The final version of the return brief was issued in May 2022.

The station requirements are based off the medium station templates, as well as the principles of the RAIR program addressing service planning towards 2031.

3.2 Site Assessment and Due Diligence

A site was chosen and Due Diligence was carried out before Concept Design began. The Due Diligence can include desktop studies on services, contamination, and traffic and involve test fits on how the building can be located on the site. The test fits are based upon the Guidelines and “template” station designs.

3.3 Safety in Design

A Safety in Design risk matrix has been prepared for the project, and will be reviewed with the design team. In compiling this report, the specific and unusual workplace hazards which have been identified by DJRD have been assessed, and control measures have been recommended to manage those risks. It has been assumed that the usual workplace hazards (i.e., those that are common to all buildings & construction sites) are already sufficiently managed through the engagement of competent and qualified contractors and subcontractors who work to industry standard practice throughout the duration of their engagement.

3.3.1 Risk Assessment Matrix

Determining the level of risk.
This matrix has been used to identify the level of risk and help to prioritise any control measures.
The **consequences** and **likelihood** for each of the identified hazards have been considered and the table has been used to obtain the risk level.

			Consequences				
			1 Insignificant Dealt with by in-house first aid, etc	2 Minor Medical help needed. Treatment by medical professional/hospital outpatient, etc	3 Moderate Significant non-permanent injury. Overnight hospitalisation (inpatient)	4 Major Extensive permanent injury (e.g. loss of finger/s) Extended hospitalisation	5 Catastrophic Death. Permanent disabling injury (e.g. blindness, loss of hand/s, quadriplegia)
Likelihood	5	Almost certain to occur in most circumstances	High (H)	High (H)	Extreme (X)	Extreme (X)	Extreme (X)
	4	Likely to occur normally	Moderate (M)	High (H)	High (H)	Extreme (X)	Extreme (X)
	3	Possible and likely to occur sometime	Moderate (M)	Moderate(M)	High (H)	High (H))	Extreme (X)
	2	Unlikely to occur but could happen	Low (L)	Moderate(M)	Moderate(M)	High (H)	High (H))
	1	May occur but only in rare and exceptional circumstances	Low (L)	Low (L)	Moderate (M)	Moderate(M)	High (H)

Figure 1 – risk assessment matrix

Risks relating to the building's construction phase include but are not limited to:

- Possible cutting of below ground services.
- Fire due to hot work on site causing injury and/or damage.
- Various potential contaminants in fill soils
- Release of contaminants onto site, health issue and delays

Risks relating the building when operational include but are not limited to:

- Collision between vehicles and building resulting in damage to and possible collapse of structure
- Disruption of traffic and collisions with pedestrians and disruption to services.
- Collision between ambulances and people/other vehicles causing permanent injury/death.
- Staff rushing to ambulances/Staff restocking of vehicles, movement of stretchers resulting in injury

4 Project User Groups

Project User Group (PUG) 1 for the Glen Innes Ambulance Station was held on Wednesday the 18th of May 2022. PUG 1 focused on presenting the brief, overall layout and functional relationships of the proposed building, while sections, elevations and 3D views were also presented for staff feedback.

5 Design Team Meetings

Weekly RAIR Design Team Meetings have been held online over the course of the project.

6 Design Statement

6.1 Site

Glen Innes is a parish and town on the Northern Tablelands, in the New England region of New South Wales. Located at the intersection of the New England Highway and Gwydir Highway, it is the centre of the Glen Innes Severn Shire Council. Glen Innes has a population of approximately 6,155 (2016). Glen Innes is located roughly one hour north of Armidale, and three hours west of Coffs Harbour. The Ngoorabul people are the traditional custodians of the Glen Innes Highlands area.

The proposed Glen Innes Ambulance Station site is located on the existing Health campus, on the corner of Taylor Street and West Avenue. Residential dwellings are currently located to the on the northern side of Taylor Street.

Figure 2: Aerial view of site showing neighbouring buildings

6.2 Architectural Design

The proposed ambulance facility has been designed to meet the functional requirements of NSW Ambulance and to have a positive aesthetic impact on its context. Site analysis was carried out to determine the climatic, geographical, historical, legal, and infrastructural context of the site. These factors were taken into account during the design phase so that the proposed building could respond effectively to them.

Long Term Averages

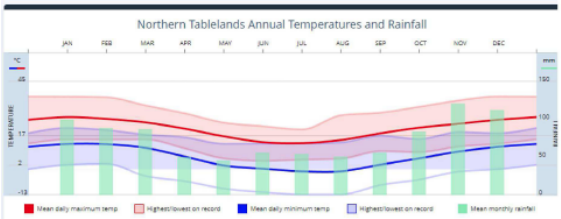
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean Max (°C)	26.7	25.8	24.0	20.8	16.9	13.9	13.4	15.0	18.4	21.3	23.3	25.3	20.4
Mean Min (°C)	13.0	12.9	11.0	6.6	2.0	0.3	-1.0	-1.0	2.4	5.7	9.1	11.5	6.0
Mean Rain (mm)	98.9	87.7	86.3	49.3	44.7	55.2	53.3	49.9	55.0	82.9	120.1	111.7	892.8
Median Rain (mm)	66.6	88.6	54.4	46.4	21.4	37.0	37.4	36.4	45.6	75.5	108.2	102.6	864.4
Mean Rain Days	11.0	11.2	11.8	9.9	12.5	15.7	14.0	11.0	9.0	10.9	11.9	12.4	141.4

Daily Records

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	37.2	36.9	32.7	28.7	23.9	22.1	20.4	27.7	29.0	32.0	35.2	37.3	37.3
Low Max (°C)	15.3	15.2	15.3	10.7	5.6	4.3	4.9	5.5	9.3	8.8	11.6	13.1	4.3
High Min (°C)	21.2	20.1	17.8	16.4	13.1	13.2	13.2	13.8	17.2	15.5	19.1	18.5	21.2
Low Min (°C)	2.3	2.8	-3.4	-6.0	-9.8	-11.6	-12.8	-12.8	-8.0	-5.2	-1.1	0.0	-12.8
High Rain (mm)	98.4	64.0	91.2	88.6	121.4	63.2	83.2	59.4	72.4	96.6	87.4	92.2	121.4

Monthly Records

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	30.6	28.3	28.0	23.5	20.1	15.6	15.5	17.8	21.4	24.1	27.6	29.8	22.7
Low Max (°C)	23.8	22.9	22.2	18.2	15.1	11.4	11.7	12.4	15.8	18.1	18.9	21.3	18.9
High Mean (°C)	15.7	14.4	12.7	9.0	4.5	3.4	2.5	3.4	5.6	8.7	11.5	13.2	7.1
Low Mean (°C)	10.9	10.5	7.8	3.6	-1.7	-3.1	-5.7	-3.8	0.5	3.3	6.5	9.6	5.0
High Rain (mm)	233.4	166.8	297.8	221.8	156.0	150.0	211.0	152.0	171.8	203.4	264.8	178.4	1458.4
Low Rain (mm)	27.6	3.0	1.0	1.2	1.6	9.4	3.8	3.0	4.8	16.2	19.6	16.2	369.8



Average Number of Days with Temperatures

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
≥ 40.0°C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
≥ 35.0°C	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
≥ 30.0°C	6.0	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0	3.0	15.8
≤ 2.0°C	0.0	0.0	0.3	4.1	15.4	19.1	23.1	23.1	14.8	6.3	1.1	0.2	107.4
≤ 0.0°C	0.0	0.0	0.1	1.8	10.4	14.5	18.5	18.6	8.5	2.5	0.3	0.1	75.1

MARCH 20TH- 12PM SUN PATH

SEPTEMBER 23RD- 12PM SUNPATH

JUNE 21TH- 12PM SUN PATH

DECEMBER 22ND- 12PM SUNPATH

6.2.1 Return Brief

Glen Innes Ambulance Station was designed to achieve the requirements of the Return Brief dated 08/06/22. The return brief is included in appendix 7.1

1. Reference Documents

This return brief has been prepared to suit the targeted staffing capacity & outlined for year 2031 based on the following Reference Documents;

a. RAIR Glen Innes Population, Demand and Capacity Assessment
b. RAIR Staff Ratio Appendix - FTE vs Station Requirements

2. **Outline of Requirements**

Ambulance Station			
To be typically based on the Rural Ambulance Station Facilities Design Guidelines / Revision M / Medium Station Template M-01 / 02.1AR1101 - modified to suit required FTE staff levels in accordance with RAIR Staff Ratio Appendices Spreadsheet V5			
Staffing			
	Full Time Equivalent Staff	**24**	*As per NSWA Correspondence*
	DOM	**1**	
Provision for Staff			*As per RAIR Staff Ratio Appendix*
	Locker Room – provision for	**30**	Lockers *(24x 1.23 FTE)*
	Common Area Lounge – provision for	**8**	Staff
	Common Area Dining – provision for	**10**	Staff
	Admin Space (Peak by half) – provision for	**3**	staff
Equipment			*As per RAIR Staff Ratio Appendix*
	Computers – provision for	**3**	pcs in admin area
	Basic Printer – provision for	**1**	Basic printer in admin area
Amenities Male			*As per RAIR Staff Ratio Appendix*
	WC	**1**	
	Shower	**1**	
	Change Cubicle	**1**	
Amenities Female			*As per RAIR Staff Ratio Appendix*
	WC	**1**	
	Shower	**1**	
	Change Cubicle	**1**	
Accessible Amenities			*As per RAIR Staff Ratio Appendix*
	Combined Accessible WC + Shower	**1**	*in accordance with AS1428*

Additional Modules		*As per RAIR Design Guidelines*
Zone & Sector Management Module	**1**	Tier 1 – 1 x shared DOM office – 12m2 and 1 x 9m2 S/O office
Fleet Maintenance		Tier 1 as noted in Plant Room below
Sleeping Pod	**2**	Required 1 bed per pod
Education Module	**1**	Tier 2 –30m^2
Gym Space Module	**1**	Approx. 12m2 – may be internal or external protected from the elements

Plant Room

To be typically based on the Rural Ambulance Station Facilities Design Guidelines / Revision M / Medium Station Template M-01 / 02.1AR1101 – modified to suit site as follows;
1. to suit required # of parking bays as outlined on the RAIR Endorsement sheet
2. to suit endorsed schedule of accommodation in approved Return Brief
3. to suit site size & geometry

Internal Vehicles		*As per NSWA Correspondence*
Ambulance	**6**	Internal bays
Fleet Maintenance Bay	**Included**	Tier 1
Wash Bay	**1**	Internal
Total Internal Vehicles	**(6) 6 ambulance bays**	

External Vehicles (Covered)		*As per RAIR Design Guidelines*
DOM Bay	**1**	Operation Frontline Vehicle (Car) – 2.7x5.4m Large Car Park
Relief	**1**	
Total External (Covered) Vehicles	**(2) 1 DOM bay + 1 Relief bay**	

Other Parking (Not Covered)		*Standard Car Parking Bay size: 5.4x2.4m*
Accessible Parking Bay + Circulation Area	**1**	statutory requirement in accordance with AS2890.6
Parking bays	**6**	*As per RAIR Staff Ratio Appendix*
Total	**(7) 1 acc. + 6 parking bays**	

Indicative Schedule of Areas				
Ambulance Station				
1	x	3 staff	Admin	To suit required number of staff
1	x	30 m^2	Combined Medical Equipment Store	*As per RAIR Staff Ratio Appendix*
1	x	> 7m^2	Comms Cupboard	To suit NSWA ITC Reqs
1	x	4m^2	Cleaner's Sink / Store	
1	x	9m^2	Office	
1	x	12m^2	DOM Office	Shared Office
		-	Circulation	
			Amenities	
1	x	8 staff	Common Room	To suit required number of staff
1	x	10 staff	Meals	To suit required number of staff
1	x	7 m^2	Accessible WC with shower	
1	x	14 m^2	Male WC	
1	x	incl	Male Shower	
1	x	incl	Male Change	
1	x	14 m^2	Female WC	
1	x	incl	Female Shower	
1	x	incl	Female Change	
1	x	30 lockers	Locker Room	To suit required number of lockers
1	x	11 m^2	Charge	
1	x	12m2	Gym	
Bolt On Module: Sleeping Pod				
1	x	7m^2	Sleeping Pod	
1	x	7m^2	Sleeping Pod	
1	x	6m^2	WC & Shower	Adjacent to sleep pods
Bolt On Module: T2 Education				
1	x	30m^2	Multi purpose classroom	
Associated External Spaces				
1	x	28m^2	Outdoor Area	Adjacent to common room
1	x	7m^2	Services	Confirm if Bolton Modules require this to be larger
1	x	6m^2	Waste	Confirm if Bolton Modules require this to be larger
Vehicle Plant Room				
1	x	Variable	Plant Room	Drive through configuration to suit 6 SEV
1	x	8m^2	Delivery	
1	x	4m^2	Main Switchboard	
1	x	2m^2	Oil Separator	
1	x		Internal Wash Bay	
Parking Allocation Covered				
1	x		Relief Bay	*2.7x5.4m Large Car Park*
1	x		DOM Bay	*2.7x5.4m Large Car Park TBC*
Parking Allocation Not Covered				
1	x		Accessible Parking Bay + Circulation	*Standard Car Parking Bay size: 5.4x2.4m*
6	x		Parking Bays – Ambulance Station	*Standard Car Parking Bay size: 5.4x2.4m*

RAIR Glen Innes Ambulance Station has a site area of approximately 3384m^2 and includes;

- comprising of six (6) internal ambulance parking spaces including one (1) internal vehicle wash bay; two (2) external covered parking bays for relief and DOM parking; seven (7) external staff parking spaces, including one accessible space; Ambulance administration and storage areas; Ambulance amenity facilities including lockers, toilets, kitchen and common room; two sleeping pods with an adjacent shower and WC, and a gym room.

Site Planning & Context:
The site has a rectangular footprint with approximately 52 m northern street frontage, and 54.4 m along the eastern street frontage. Vehicles enter the site from Taylor Street and exit via the plant room facing onto West Street. Car parking is provided along the eastern portion of the site. The building is oriented with the plant room exit facing east, and the administration and relief areas of the station located along the northern portion of the site. The overall width of the drive through plant room has been calculated to allow sufficient clearance behind ambulance parking spaces and to provide sufficient space for the loading/unloading of stretchers and other equipment.

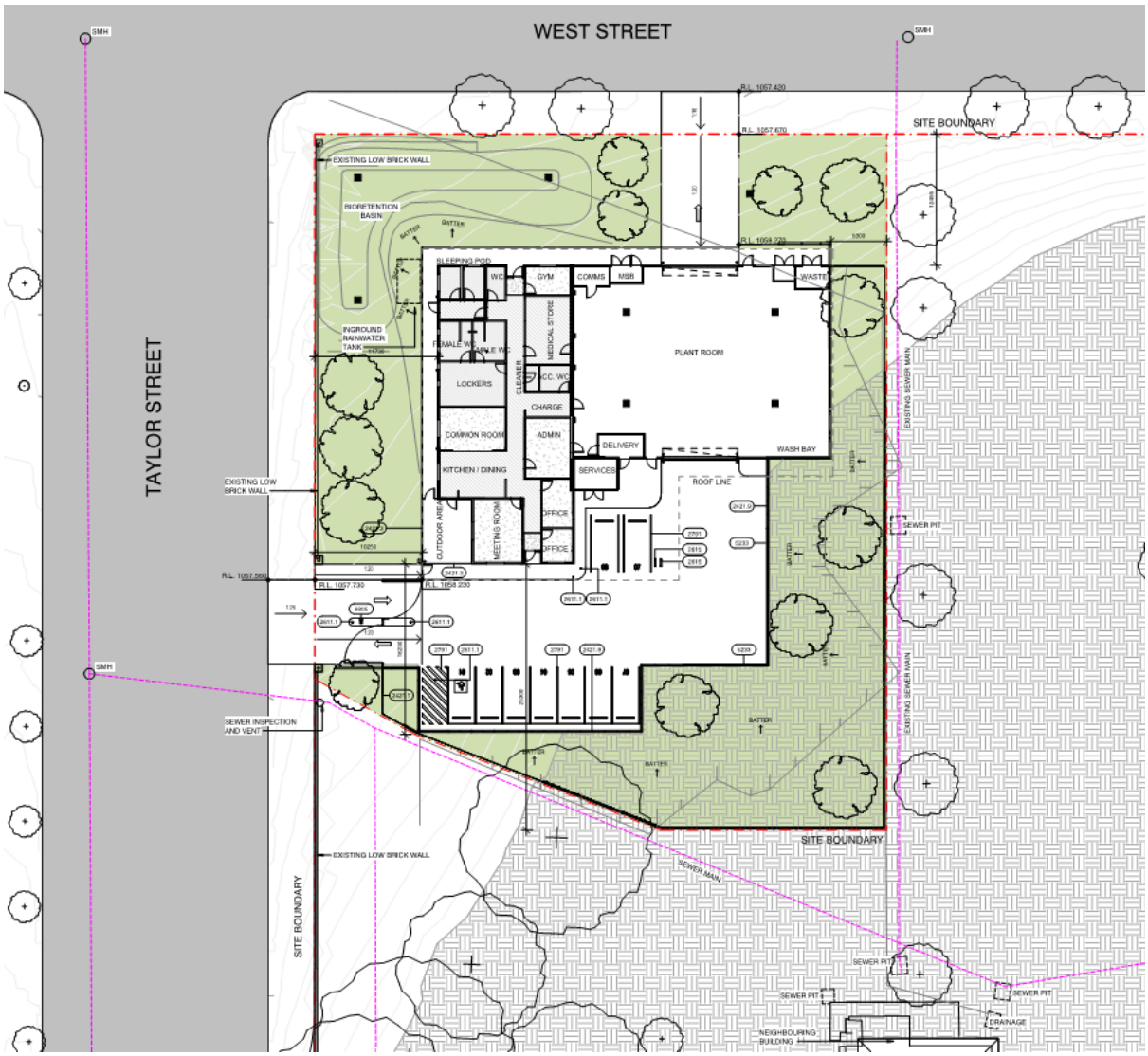


Figure 3: Site Plan

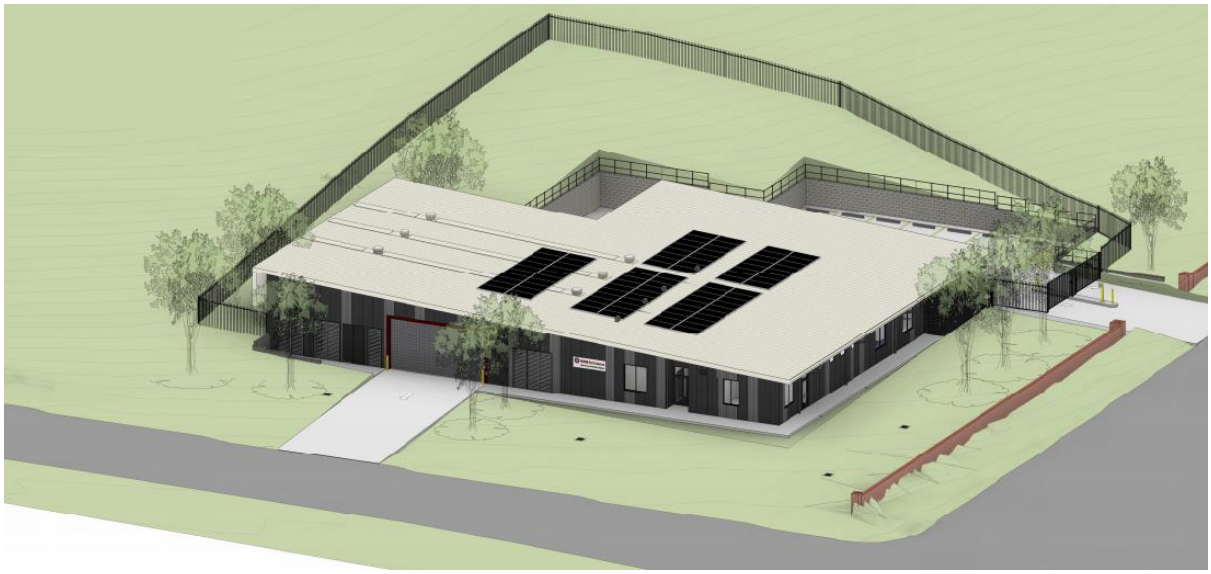


Figure 4: Exterior view

6.2.2 Architecture

The building will be used by ambulance service paramedics and administration staff. The building is not intended for public access and it is not anticipated that there will be a high number of visitors to the building. The building has been developed in conjunction with other new RAIR projects. Its overall form, material selection and aesthetics will be similar to the other RAIR stations, providing a recognisable and consistent approach for new RAIR buildings. This is considered important to reflect the cohesive nature of the ambulance service and provide staff with workplaces that do not differ significantly from one RAIR station to another. Selection of the colour of materials will be used appropriately with consideration given to the site context.

The building height and form has been simplified to maintain an efficient building shape. The roof is a skillion roof and kept to a low pitch of approximately 3.5 degrees to further refine the building form. In maintaining as small and simple a form as possible, overshadowing or overpowering adjacent buildings has been minimised. Taking into account the interior minimum height requirements and the internal clear spans of the office and plant areas an efficient steel portal frame has been incorporated as the primary structure for the building envelope. The majority of internal walls are non-load bearing to allow for future flexibility and internal rearrangement of spaces, however the fire walls are self supporting. The ambulance station administration, amenities and relief areas have been located to the west of the plant room. Office, meeting, relief, as well as the common room have been provided windows that offer natural light and outlook.

Figure 5: Exterior Perspective

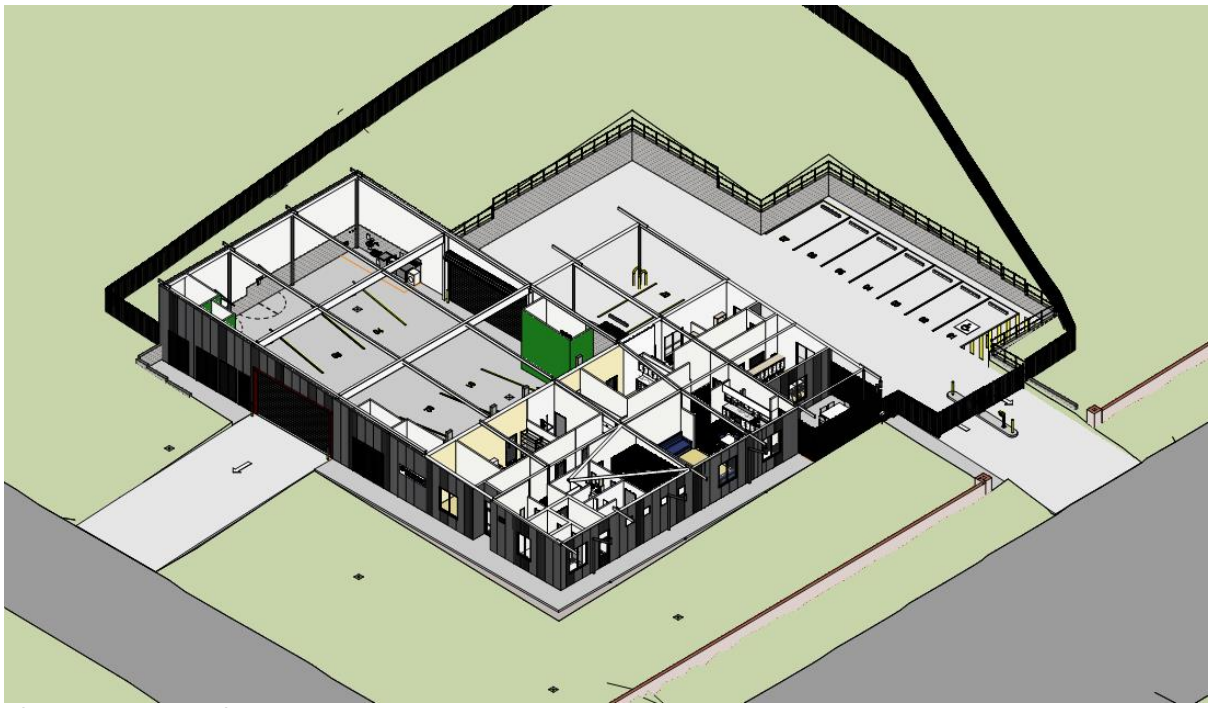


Figure 6: Axonometric

6.3 ESD

A Section J – Energy Efficiency Report is being prepared by JHA for the proposed construction of Glen Innes Ambulance Station and it outlines thermal insulation construction requirements the building.

Building Classification:

- Class 3 (relief), class 5 (office) and class 7a (carpark) in Climate zone 6

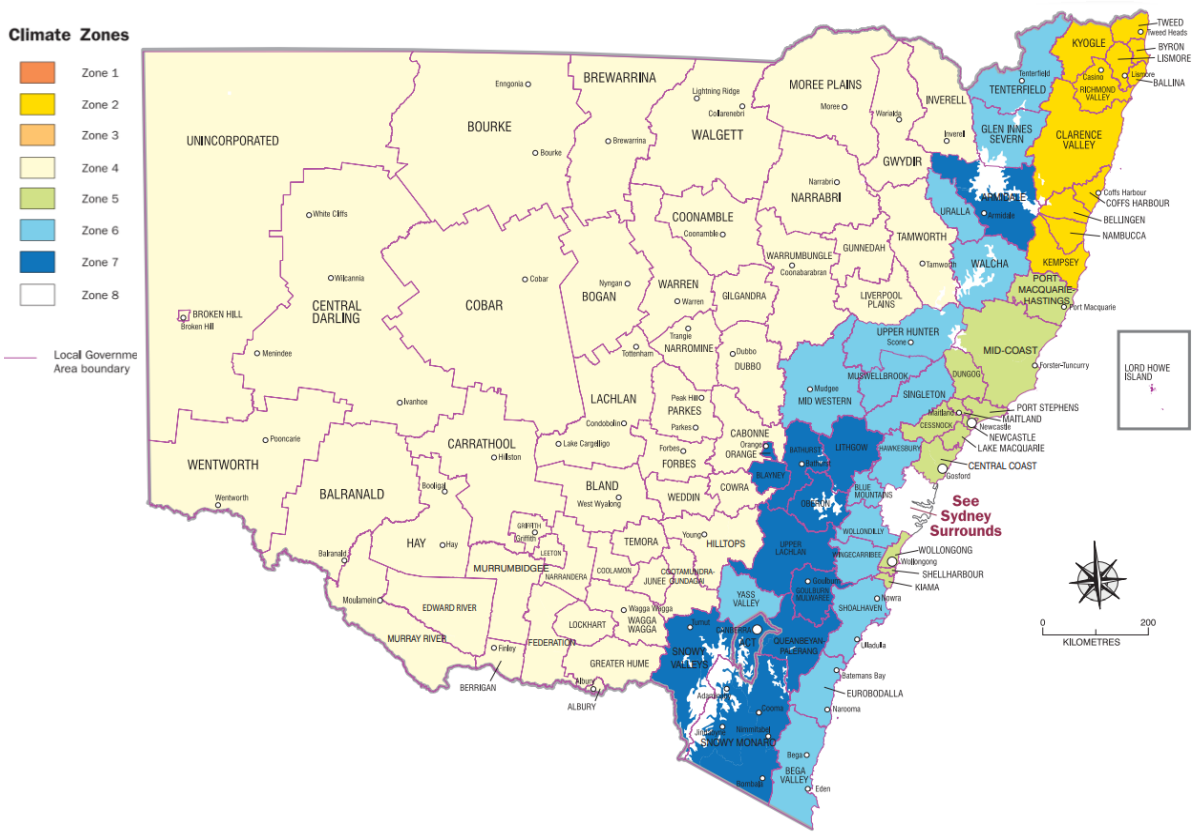


Figure 7: BCA extract: NSW Climate Zone Map

Landscape Architecture

Refer to appendix 7.5 for the landscape design.

A preliminary landscape design for the RAIR Glen Innes site has been developed by Site Image Landscape Architects. The planting design for RAIR Glen Innes embodies a low maintenance and sustainable approach in terms of species choices. Planting has been proposed along the street elevations to supplement the existing trees and soften the elevations.

The planting strategy incorporates trees and low planting at the property entry, while maintaining as many existing trees as possible around other boundaries.

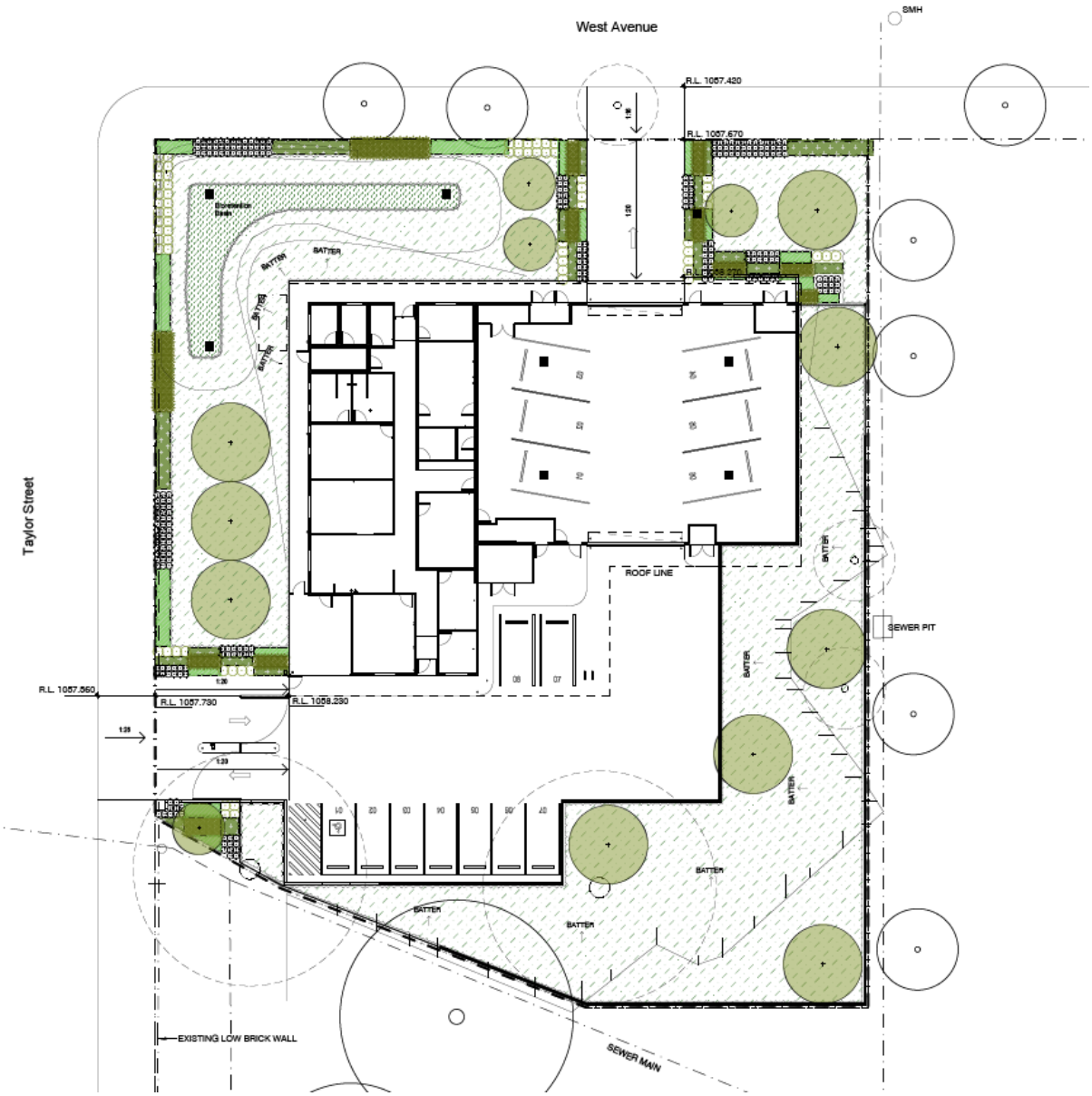


Figure 8 Landscape plan extract

6.4 BCA

Refer to appendix 7.5 for BCA report.

DJRD have engaged BCA Logic to carry out a project specific Building Code of Australia 2019 review of the design drawings for the proposed Glen Innes Ambulance Station located at and to prepare a Building Code of Australia report commenting upon the compliance of the design.
The drawings provided to date have been assessed in respect to the deemed to satisfy provisions of the Building Code of Australia 2019 Parts C, D, E and F. The design is at a point where it can be completed.

General

Building Classification:

Class	Level	Description
3	Ground	Sleeping pod rooms (Sole occupancy units)
5	Ground	Offices, amenities, meeting and communal ancillary areas
7a	Ground	Plant room used for the parking of the ambulances

Rise in Storeys & Effective Height:

The building is single storey and therefore the effective height is not applicable.

Type of Construction:

The building is required to be of Type C Construction.

Exposure to fire source features:

If the external walls of the building are proposed to be located 3m or more from the side and rear boundaries they are not required to be provided with a fire resistance level.

Relief:

The BCA considers a sleep pod to be a sole occupancy unit if the occupier will have exclusive use of the room while they occupy it, see the definition below:

Sole-occupancy unit means a room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes—

(a) a dwelling; or

(b) a room or suite of rooms in a Class 3 building which includes sleeping facilities; or

(c) a room or suite of associated rooms in a Class 5, 6, 7, 8 or 9 building; or

(d) a room or suite of associated rooms in a Class 9c building, which includes sleeping facilities and any area for the exclusive use of a resident.

The sleep pod is considered to be a sole occupancy unit and the walls bounding the relief is required to have an FRL of not less than 60/60/60 and must extend:

- to the underside of the next floor above if that floor has an FRL of at least 30/30/30 or a fire-protective covering on the underside of the floor; or
- to the underside of a ceiling having a resistance to the incipient spread of fire to the space above itself of not less than 60 minutes; or
- to the underside of the roof covering if it is non-combustible, and except for roof battens with dimensions of 75mm x 50mm or less or sarking-type material, must not be crossed by timber or other combustible building elements; or
- 450 mm above the roof covering if it is combustible

Disabled Access

The BCA does not require the Class 3 relief quarters to be accessible however the building is required to be accessible and to comply with the requirements of Part D3 of Building Code of Australia 2019 and the relevant parts of AS1428.1 2009, these include:

- Disabled access is required to be provided from the main points of a pedestrian entry at the allotment boundary to the main entry door.
- Disabled access is required to be provided from the accessible carspace to the main entry doors.
- All accessible doors should be a minimum of 850mm clear width.
- At least one leaf of all double doors must have a clear width of 850mm.
- All doors should have adequate circulation spaces as per the requirements of figure 31 of AS1428.1 2009.
- Both sides of all doorways that are required to be accessible are required to have a luminous contrast of at least 30% to the adjacent surface as per clause 13.1 of AS1428.1 2009 and as stated on the finishes schedule.
- All switches, card readers etc should be placed at a height of between 900-1100mm from floor level and not less than 500mm from any internal corner.
- All floors are required to have a slip resistant surface.
- The accessible carspace is required to be constructed and line marked in accordance with the requirements of AS/NZS 2890.6 2009.
- Braille and tactile signage is required to be provided to the accessible, male and female toilets and to the exit doors as per the requirements of BCA Clause D3.6.

Services

Fire Hydrants

The building is separated with a fire wall, therefore under the provisions of Clause C2.7, the plant and admin parts can be treated as separate compartments. On this basis, each of these buildings will have a floor area less than 500m^2 and consequently no hydrant coverage is required. **Fire Hose Reels**

The proposed floor area is more than 500m^2, therefore the building is required to be protected by fire hose reel coverage in accordance with the Building Code of Australia 2019 and AS2441 2005. Please note that BCA 2019 does not required fire hose reel protection to be provided to Class 5 parts of buildings.

Fire Hose Reels

The building is separated with a fire wall, therefore under the provisions of Clause C2.7, the plant and admin parts can be treated as separate buildings. On this basis, each of these buildings will have a floor area / fire compartment less than 500m^2 and consequently no hose reels are required in the Class 7a plant room.

Section J

Building Fabric:

The envelope of the conditioned space must comply with the building fabric requirements of Part J1 of the Building Code of Australia 2019.

The envelope will include the internal wall as the plant room (vehicle parking bay) is not expected to be conditioned and this internal wall is required to comply with Part J1. Radiant heaters will be provided to the spaces on a timer switch basis.

Glazing:

The glazing in the envelope of the conditioned space must comply with the glazing requirements of Part J2 of the Building Code of Australia 2019.

Building Sealing:

Any openings in the envelope of the conditioned space must have seals specified to the external doors and operable windows and must have self-closing devices specified to the swing doors all as per the requirements of Part J3 of the Building Code of Australia 2019.

The envelope will include the internal wall as the plant room (vehicle parking bay) is not expected to be conditioned and the doors in this internal wall are required to comply with Part J3 ie provided with self-closing devices and seals.

Ventilation Systems, Artificial Lighting, Hot Water Supply

The design stage services consultants design certificates have confirmed that the services comply with the requirements of BCA Section J.

Conclusion

The drawings provided to date have been assessed in respect to the deemed to satisfy provisions of the National Construction Code 2019 Parts C, D, E and F. The design is at a point where it can be completed.

7 APPENDIX

7.1 Return Brief

Glen Innes RAIR Ambulance Station ~ Return Brief

1. Reference Documents

This return brief has been prepared to suit the targeted staffing capacity & outlined for year 2031 based on the following Reference Documents;

a. RAIR Glen Innes Population, Demand and Capacity Assessment
b. RAIR Staff Ratio Appendix - FTE vs Station Requirements

2. Outline of Requirements

Ambulance Station

To be typically based on the Rural Ambulance Station Facilities Design Guidelines / Revision M / Medium Station Template M-01 / 02.1AR1101 - modified to suit required FTE staff levels in accordance with RAIR Staff Ratio Appendices Spreadsheet V5

Staffing			
	Full Time Equivalent Staff	**24**	*As per NSWA Correspondence*
	DOM	**1**	
Provision for Staff			*As per RAIR Staff Ratio Appendix*
	Locker Room – provision for	**30**	Lockers *(24x 1.23 FTE)*
	Common Area Lounge – provision for	**8**	Staff
	Common Area Dining – provision for	**10**	Staff
	Admin Space (Peak by half) – provision for	**3**	staff
Equipment			*As per RAIR Staff Ratio Appendix*
	Computers – provision for	**3**	pcs in admin area
	Basic Printer – provision for	**1**	Basic printer in admin area
Amenities Male			*As per RAIR Staff Ratio Appendix*
	WC	**1**	
	Shower	**1**	
	Change Cubicle	**1**	
Amenities Female			*As per RAIR Staff Ratio Appendix*
	WC	**1**	
	Shower	**1**	
	Change Cubicle	**1**	
Accessible Amenities			*As per RAIR Staff Ratio Appendix*
	Combined Accessible WC + Shower	**1**	*in accordance with AS1428*

Additional Modules		*As per RAIR Design Guidelines*
Zone & Sector Management Module	**1**	Tier 1 – 1 x shared DOM office – 12m2 and 1 x 9m2 S/O office
Fleet Maintenance		Tier 1 as noted in Plant Room below
Sleeping Pod	**2**	Required 1 bed per pod
Education Module	**1**	Tier 2 –30m^2
Gym Space Module	**1**	Approx. 12m2 – may be internal or external protected from the elements

Plant Room

To be typically based on the Rural Ambulance Station Facilities Design Guidelines / Revision M / Medium Station Template M-01 / 02.1AR1101 – modified to suit site as follows;
1. to suit required # of parking bays as outlined on the RAIR Endorsement sheet
2. to suit endorsed schedule of accommodation in approved Return Brief
3. to suit site size & geometry

Internal Vehicles		*As per NSWA Correspondence*
Ambulance	**6**	Internal bays
Fleet Maintenance Bay	**Included**	Tier 1
Wash Bay	**1**	Internal
Total Internal Vehicles	**(6) 6 ambulance bays**	

External Vehicles (Covered)		*As per RAIR Design Guidelines*
DOM Bay	**1**	Operation Frontline Vehicle (Car) – 2.7x5.4m Large Car Park
Relief	**1**	
Total External (Covered) Vehicles	**(2) 1 DOM bay + 1 Relief bay**	

Other Parking (Not Covered)		*Standard Car Parking Bay size: 5.4x2.4m*
Accessible Parking Bay + Circulation Area	**1**	statutory requirement in accordance with AS2890.6
Parking bays	**6**	*As per RAIR Staff Ratio Appendix*
Total	**(7) 1 acc. + 6 parking bays**	

Indicative Schedule of Areas				
Ambulance Station				
1	x	3 staff	Admin	To suit required number of staff
1	x	30 m^2	Combined Medical Equipment Store	*As per RAIR Staff Ratio Appendix*
1	x	> 7m^2	Comms Cupboard	To suit NSWA ITC Reqs
1	x	4m^2	Cleaner's Sink / Store	
1	x	9m^2	Office	
1	x	12m^2	DOM Office	Shared Office
		-	Circulation	
			Amenities	
1	x	8 staff	Common Room	To suit required number of staff
1	x	10 staff	Meals	To suit required number of staff
1	x	7 m^2	Accessible WC with shower	
1	x	14 m^2	Male WC	
1	x	incl	Male Shower	
1	x	incl	Male Change	
1	x	14 m^2	Female WC	
1	x	incl	Female Shower	
1	x	incl	Female Change	
1	x	30 lockers	Locker Room	To suit required number of lockers
1	x	11 m^2	Charge	
1	x	12m2	Gym	
Bolt On Module: Sleeping Pod				
1	x	7m^2	Sleeping Pod	
1	x	7m^2	Sleeping Pod	
1	x	6m^2	WC & Shower	Adjacent to sleep pods
Bolt On Module: T2 Education				
1	x	30m^2	Multi purpose classroom	
Associated External Spaces				
1	x	28m^2	Outdoor Area	Adjacent to common room
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1	x	6m^2	Waste	Confirm if Bolton Modules require this to be larger
Vehicle Plant Room				
1	x	Variable	Plant Room	Drive through configuration to suit 6 SEV
1	x	8m^2	Delivery	
1	x	4m^2	Main Switchboard	
1	x	2m^2	Oil Separator	
1	x		Internal Wash Bay	
Parking Allocation Covered				
1	x		Relief Bay	*2.7x5.4m Large Car Park*
1	x		DOM Bay	*2.7x5.4m Large Car Park TBC*
Parking Allocation Not Covered				
1	x		Accessible Parking Bay + Circulation	*Standard Car Parking Bay size: 5.4x2.4m*
6	x		Parking Bays – Ambulance Station	*Standard Car Parking Bay size: 5.4x2.4m*

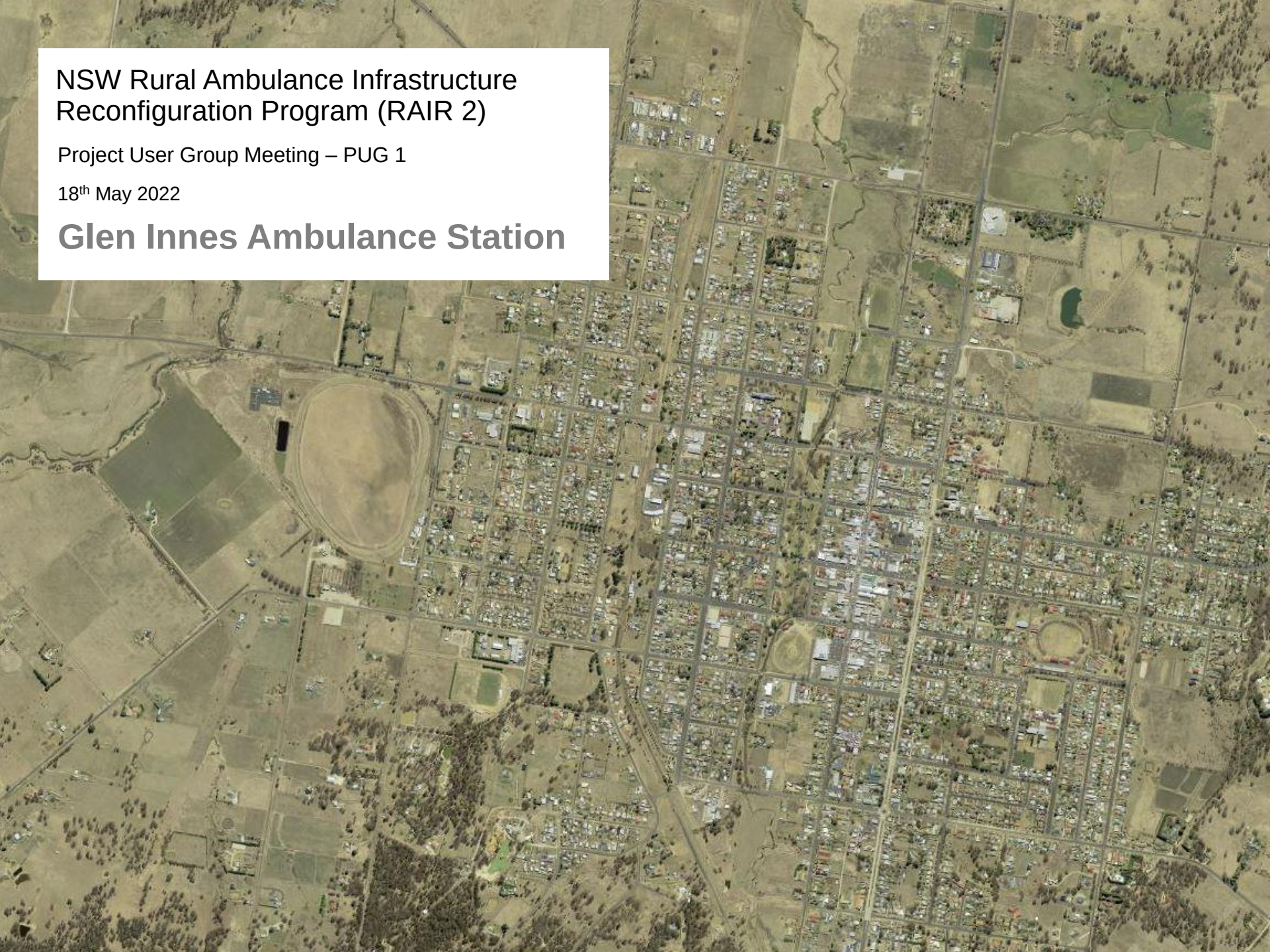
7.2 Architectural PUG Drawings

NSW Rural Ambulance Infrastructure Reconfiguration Program (RAIR 2)

Project User Group Meeting – PUG 1

18th May 2022

Glen Innes Ambulance Station



10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

GLEN INNES CLIMATE

Long Term Averages

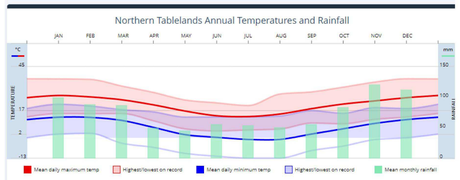
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean Max (°C)	26.7	25.8	24.0	20.8	16.9	13.9	13.4	15.0	18.4	21.3	23.3	25.3	20.4
Mean Min (°C)	13.0	12.9	11.0	6.6	2.0	0.3	-1.0	-1.0	2.4	5.7	9.1	11.5	6.0
Mean Rain (mm)	98.9	87.7	86.3	49.3	44.7	55.2	53.3	49.9	55.0	82.9	120.1	111.7	892.8
Median Rain (mm)	66.6	88.6	54.4	46.4	21.4	37.0	37.4	36.4	45.6	75.5	108.2	102.6	864.4
Mean Rain Days	11.0	11.2	11.8	9.9	12.5	15.7	14.0	11.0	9.0	10.9	11.9	12.4	141.4

Daily Records

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	37.2	36.9	32.7	28.7	23.9	22.1	20.4	27.7	29.0	32.0	35.2	37.3	37.3
Low Max (°C)	15.3	15.2	15.3	10.7	5.6	4.3	4.9	5.5	9.3	8.8	11.6	13.1	4.3
High Min (°C)	21.2	20.1	17.8	16.4	13.1	13.2	13.2	13.8	17.2	15.5	19.1	18.5	21.2
Low Min (°C)	2.3	2.8	-3.4	-6.0	-9.8	-11.6	-12.8	-12.8	-8.0	-5.2	-1.1	0.0	-12.8
High Rain (mm)	98.4	64.0	91.2	88.6	121.4	63.2	83.2	59.4	72.4	96.6	87.4	92.2	121.4

Monthly Records

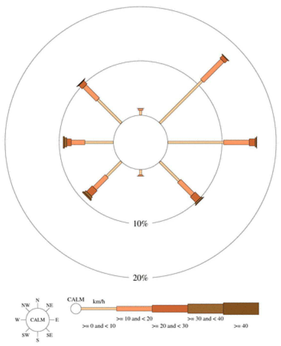
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	30.6	28.3	28.0	23.5	20.1	15.6	15.5	17.8	21.4	24.1	27.6	29.8	22.7
Low Max (°C)	23.8	22.9	22.2	18.2	15.1	11.4	11.7	12.4	15.8	18.1	18.9	21.3	18.9
High Mean (°C)	15.7	14.4	12.7	9.0	4.5	3.4	2.5	3.4	5.6	8.7	11.5	13.2	7.1
Low Mean (°C)	10.9	10.5	7.8	3.6	-1.7	-3.1	-5.7	-3.8	0.5	3.3	6.5	9.6	5.0
High Rain (mm)	233.4	166.8	297.8	221.8	156.0	150.0	211.0	152.0	171.8	203.4	264.8	178.4	1458.4
Low Rain (mm)	27.6	3.0	1.0	1.2	1.6	9.4	3.8	3.0	4.8	16.2	19.6	16.2	369.8

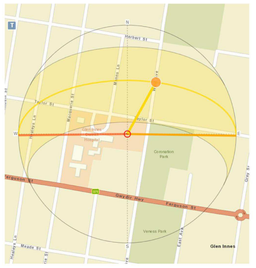


Average Number of Days with Temperatures

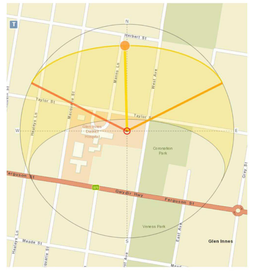
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
≥ 40.0°C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
≥ 35.0°C	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
≥ 30.0°C	6.0	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0	3.0	15.8
≤ 2.0°C	0.0	0.0	0.3	4.1	15.4	19.1	23.1	23.1	14.8	6.3	1.1	0.2	107.4
≤ 0.0°C	0.0	0.0	0.1	1.8	10.4	14.5	18.5	18.6	8.5	2.5	0.3	0.1	75.1

YEARLY WIND ROSE

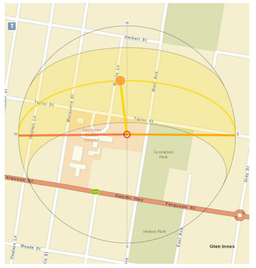




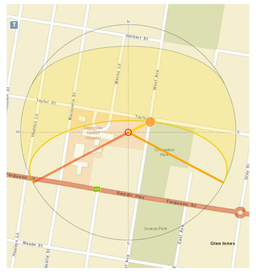
MARCH 20TH- 12PM SUN PATH



JUNE 21TH- 12PM SUN PATH

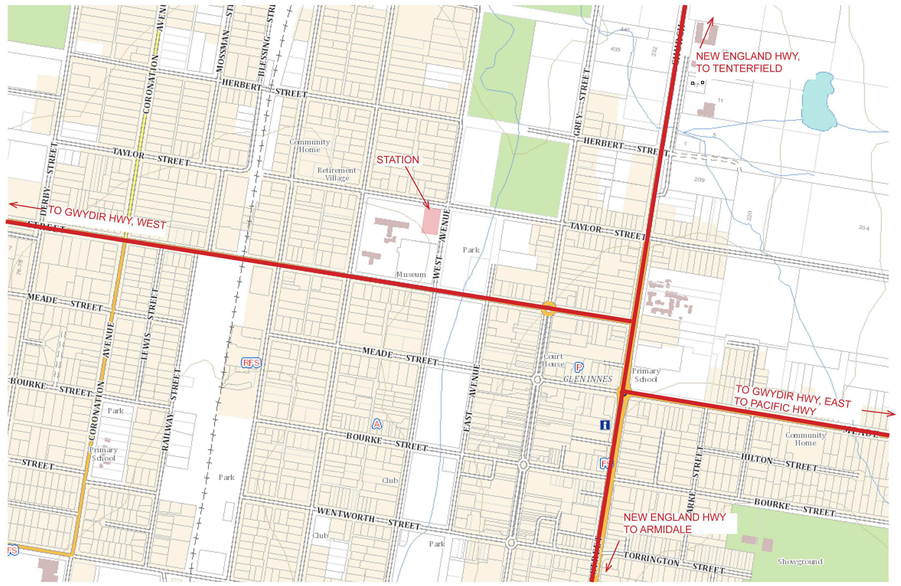


SEPTEMBER 23RD- 12PM SUNPATH



DECEMBER 22ND- 12PM SUNPATH

1:1000 SETBACK, VIEWS, VEGETATION



1:10000 MAJOR ROADS RELATED TO STATION

VIEW 1 - WEST AVENUE , FACING NORTH-WEST

VIEW 2 - WEST AVENUE, FACING SITE

VIEW 3 - TAYLOR STREET, FACING SITE

VIEW 4- TALOR STREET, FACING EAST

DATE PRINTED: 17/05/2022 17:53:35

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

SERVICES: JHA — 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000

STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
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djrd.com.au

DRAWN BY: AF
SCALE AT A1

DESCRIPTION
SITE ANALYSIS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0100	B

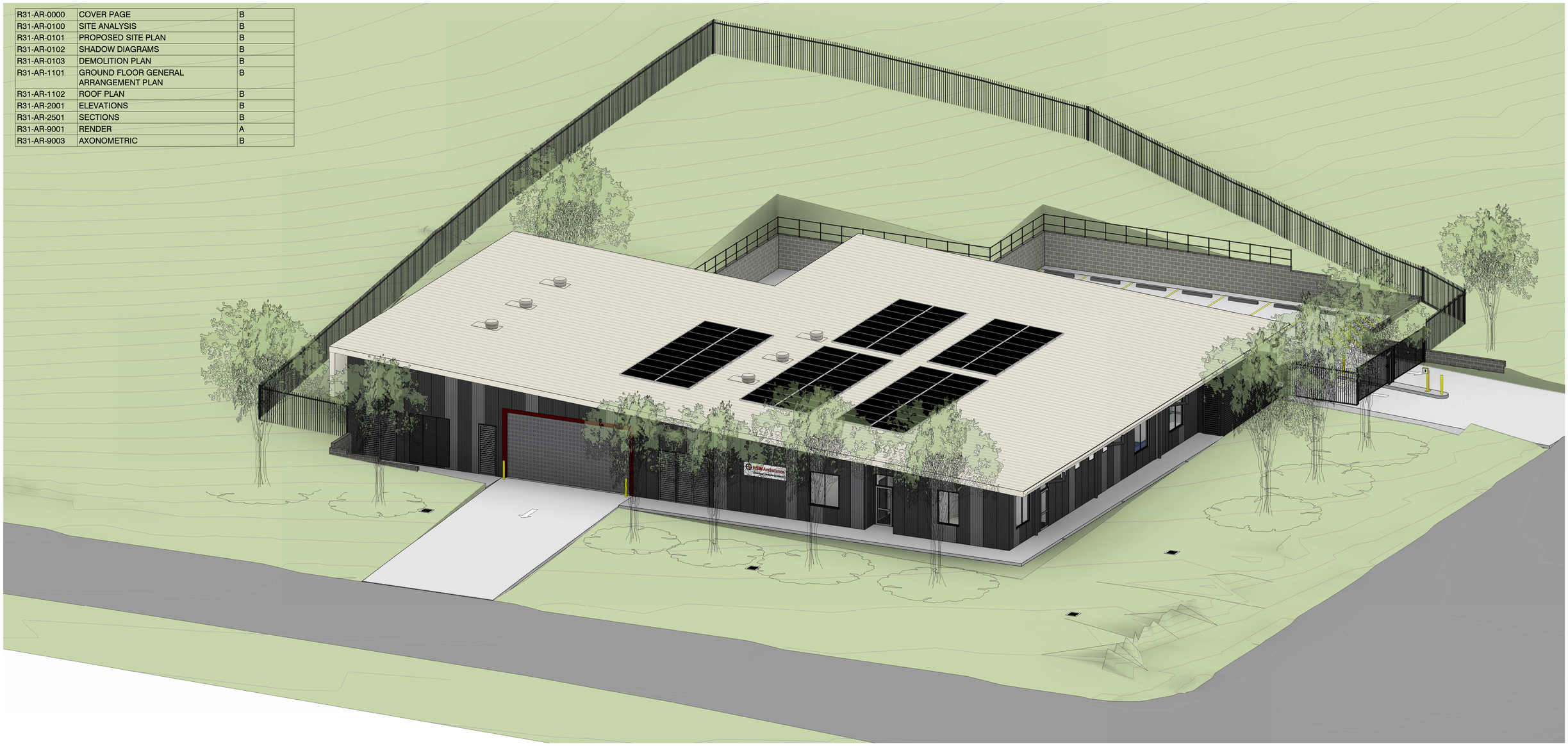
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

RAIR - RURAL AMBULANCE INFRUSTRUCTURE RECONFIGURATION PROGRAM

R31 GLEN INNES - TAYLOR STREET GLEN INNES

SHEET LIST

Sheet Number	Sheet Name	Current Revision
R31-AR-0000	COVER PAGE	B
R31-AR-0100	SITE ANALYSIS	B
R31-AR-0101	PROPOSED SITE PLAN	B
R31-AR-0102	SHADOW DIAGRAMS	B
R31-AR-0103	DEMOLITION PLAN	B
R31-AR-1101	GROUND FLOOR GENERAL ARRANGEMENT PLAN	B
R31-AR-1102	ROOF PLAN	B
R31-AR-2001	ELEVATIONS	B
R31-AR-2501	SECTIONS	B
R31-AR-9001	RENDER	A
R31-AR-9003	AXONOMETRIC	B



DATE PRINTED: 18/05/2022 10:16:25

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR

RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

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STRUCTURE & CIVIL
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T +61 2 8247 8400
BONACCI

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1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

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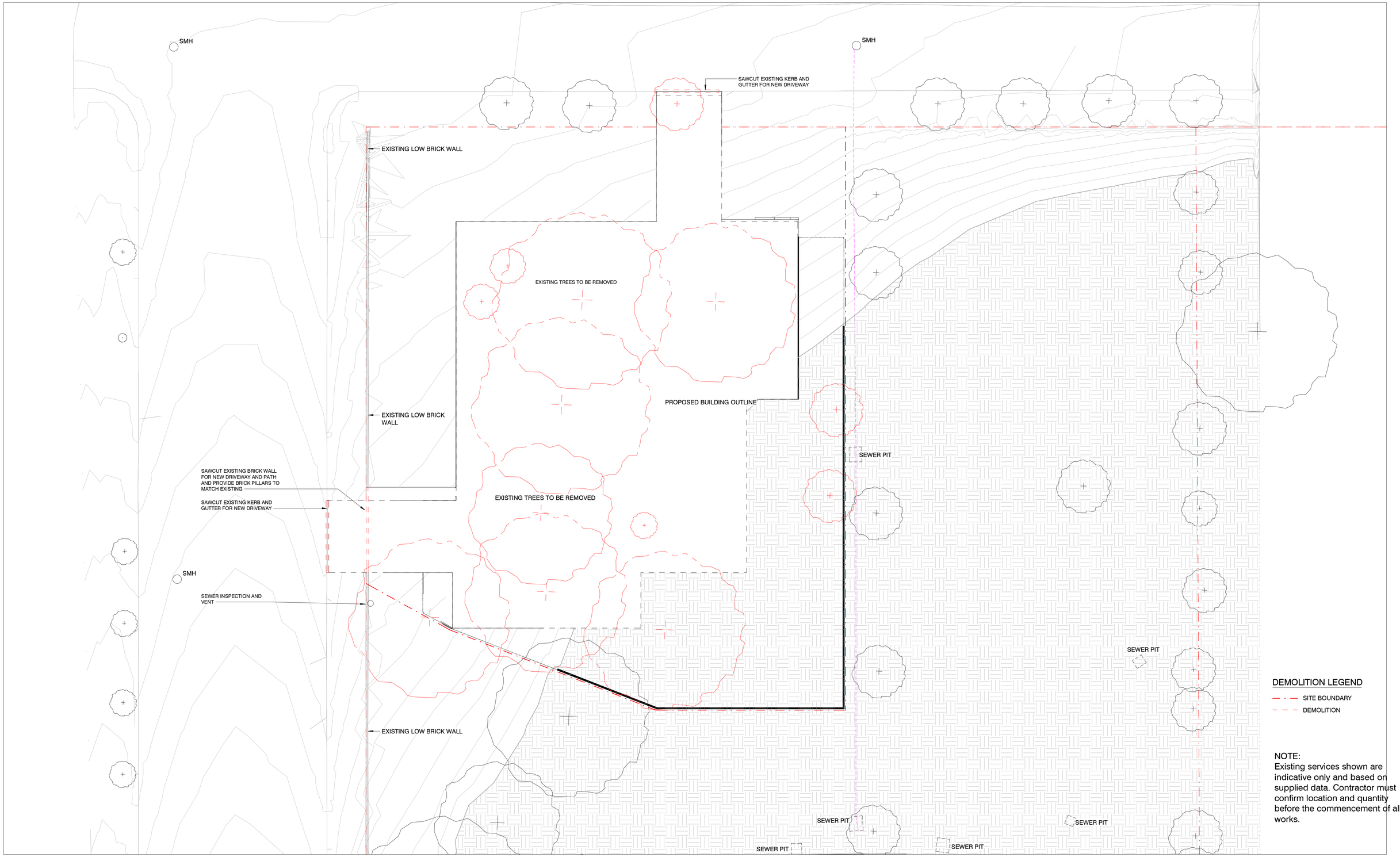
DRAWN BY: AF
SCALE AT A1
DESCRIPTION: COVER PAGE

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0000	B

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1



DEMOLITION LEGEND

SITE BOUNDARY

DEMOLITION

NOTE:
Existing services shown are indicative only and based on supplied data. Contractor must confirm location and quantity before the commencement of all works.

DATE PRINTED: 18/05/2022 10:25:07

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

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STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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TRUE NORTH

1:200 — 0 2 4 6 8 10 20m

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
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ARCHITECT: djrd architects
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Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
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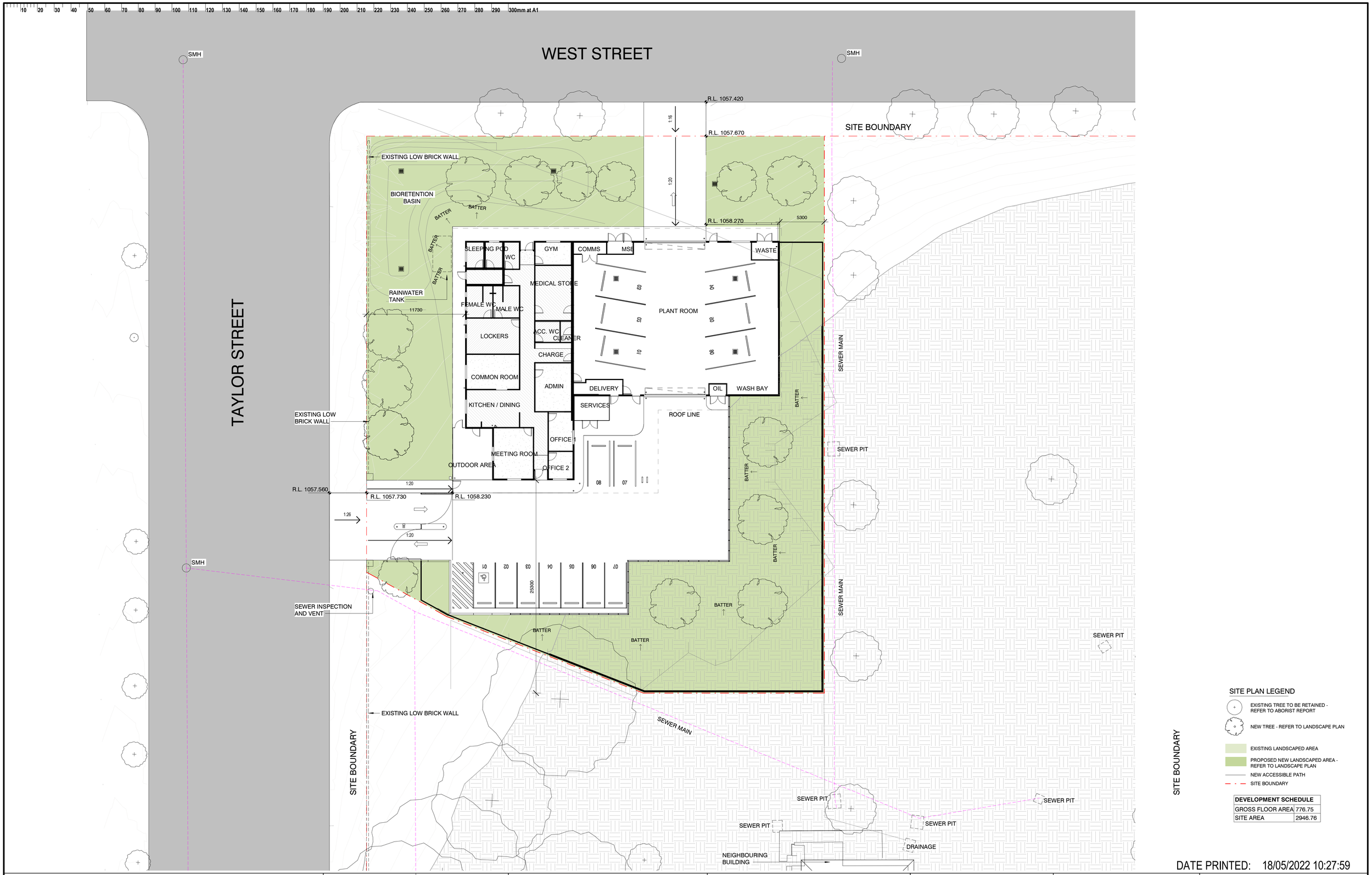
DRAWN BY	SCALE AT A1
AF	1 : 200

DESCRIPTION
DEMOLITION PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0103	B



SITE PLAN LEGEND

- EXISTING TREE TO BE RETAINED - REFER TO ABORIST REPORT
- NEW TREE - REFER TO LANDSCAPE PLAN
- EXISTING LANDSCAPED AREA
- PROPOSED NEW LANDSCAPED AREA - REFER TO LANDSCAPE PLAN
- NEW ACCESSIBLE PATH
- SITE BOUNDARY

DEVELOPMENT SCHEDULE	
GROSS FLOOR AREA	776.75
SITE AREA	2946.76

DATE PRINTED: 18/05/2022 10:27:59

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR

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SERVICES: JHA — 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000

STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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TRUE NORTH

1:100 — 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS: TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

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DRAWN BY: AF
SCALE AT A1: 1 : 200

DESCRIPTION: PROPOSED SITE PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0101	B

DATE PRINTED: 18/05/2022 10:17:05

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

SERVICES: JHA — 23/101 MILLER ST NORTH SYDNEY NSW 2060 T +61 2 9437 1000

PROJECT MANAGER: mace — LEVEL 16 44 MARKET STREET SYDNEY NSW 2000 T +61 2 9299 3555

STRUCTURE & CIVIL: BONACCI — LEVEL 4 66 CLARENCE STREET SYDNEY NSW 2000 T +61 2 8247 8400

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TRUE NORTH

1:100 — 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS
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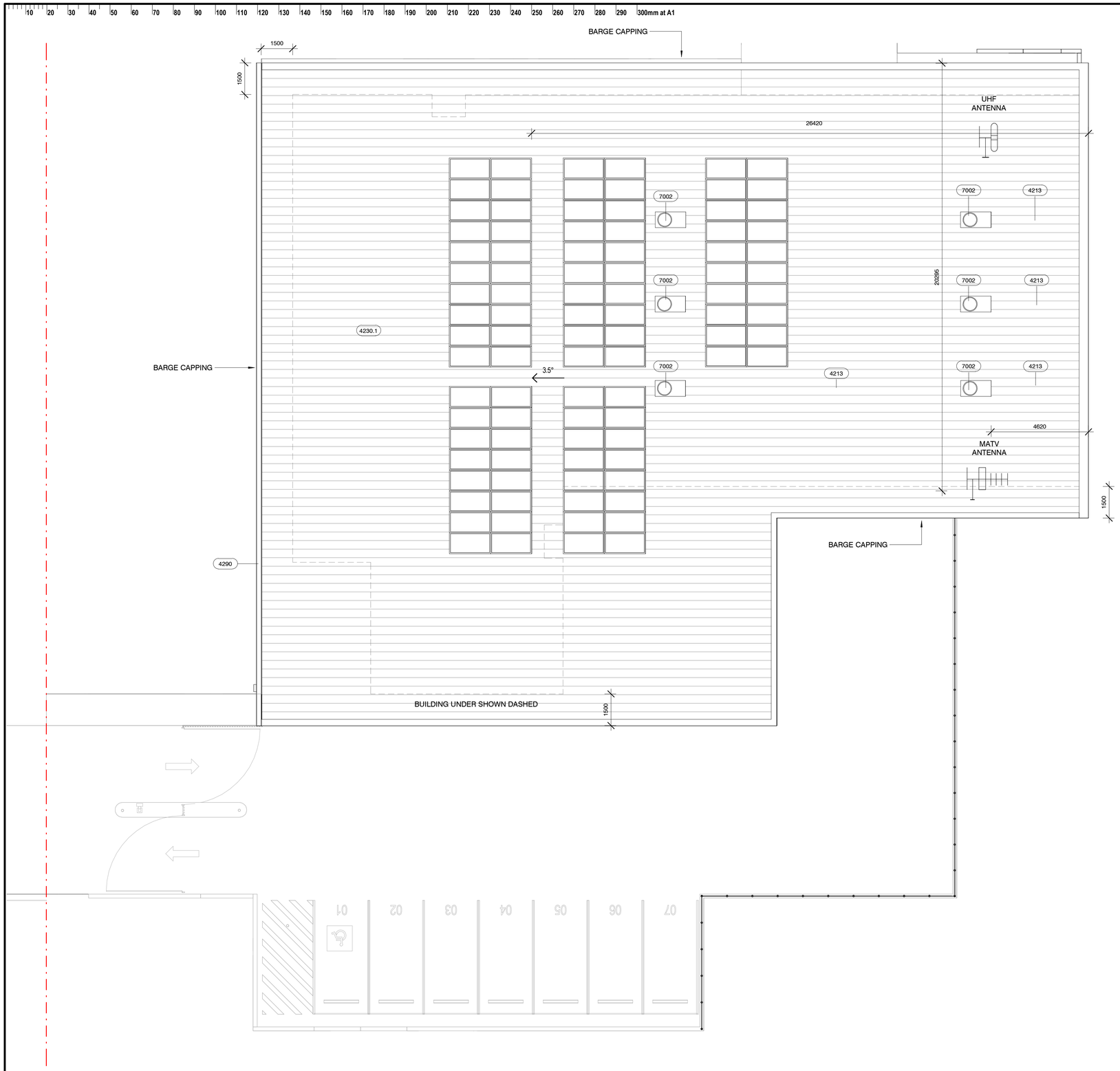
DRAWN BY: AF
SCALE AT A1: 1 : 100

DESCRIPTION
GROUND FLOOR GENERAL ARRANGEMENT PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1101	B



KEYNOTE LEGEND

4213	ROOF BACK FLASHING
4230.1	ROOF SHEETING TYPE 1
4290	HALF ROUND EAVES GUTTER
7002	ROOF VENTILATOR

DATE PRINTED: 17/05/2022 17:56:04

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR

RAIR
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BONACCI

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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE
INFRASTRUCTURE PROGRAM (RAIR)
GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
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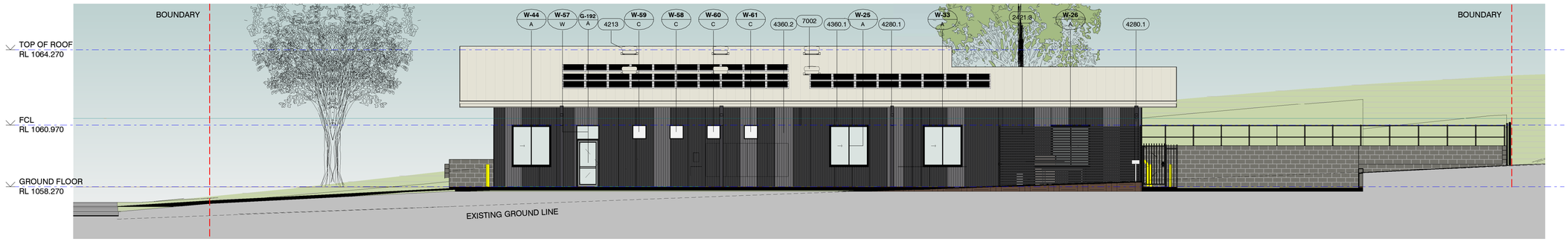
DRAWN BY	SCALE AT A1
AF	1 : 100

DESCRIPTION
ROOF PLAN

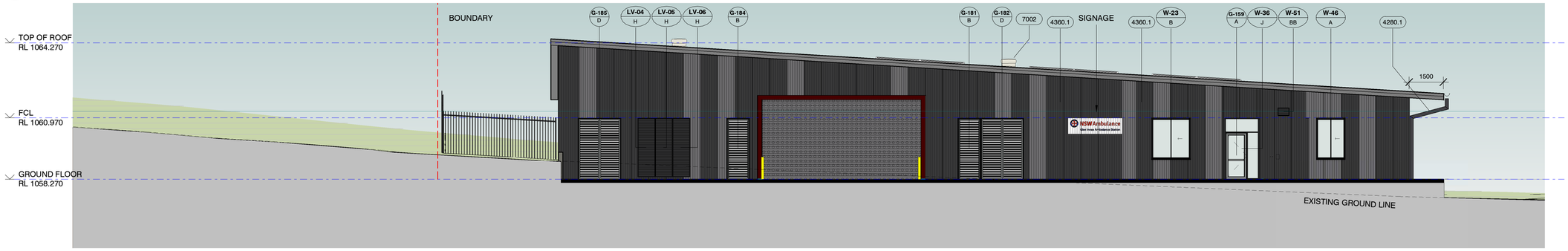
PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1102	B

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

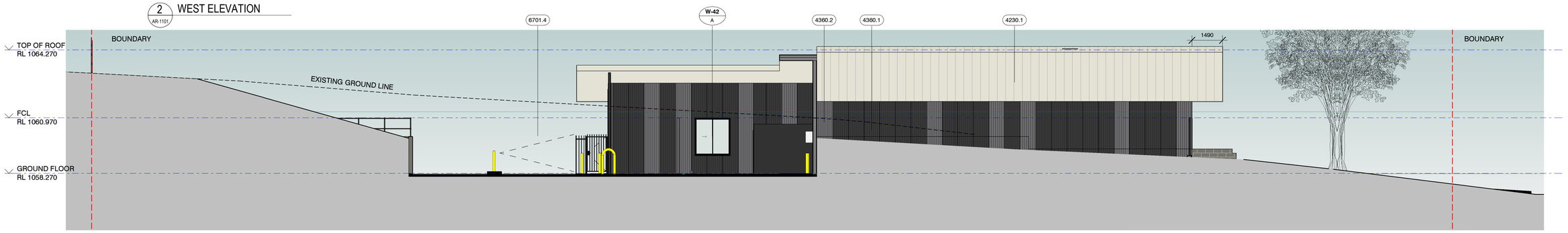
KEYNOTE LEGEND	
2421.3	FENCE TYPE C
4213	ROOF BACK FLASHING
4230.1	ROOF SHEETING TYPE 1
4280.1	DOWNPIPE TYPE 1
4360.1	METAL WALL SHEETING TYPE 1
4360.2	METAL WALL SHEETING TYPE 2
6701.4	PAINT TYPE 4
7002	ROOF VENTILATOR



1 AR-1101 SOUTH ELEVATION



2 AR-1101 WEST ELEVATION



3 AR-1101 NORTH ELEVATION

4 AR-1101 EAST ELEVATION

GENERAL NOTES:

1. Requirements of gates and fences dependent on security desktop review per site

DATE PRINTED: 18/05/2022 10:17:37

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR

RAIR Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

SERVICES
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BONACCI

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1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
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DRAWN BY	SCALE AT A1
SM	1 : 100

DESCRIPTION
ELEVATIONS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-2001	B

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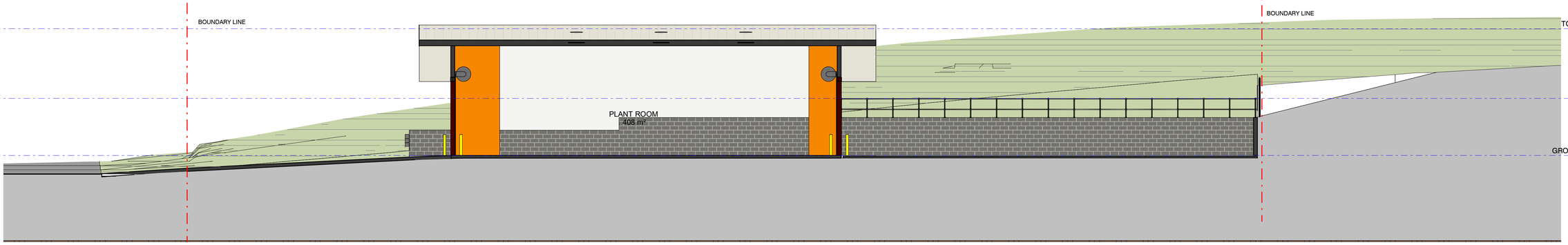
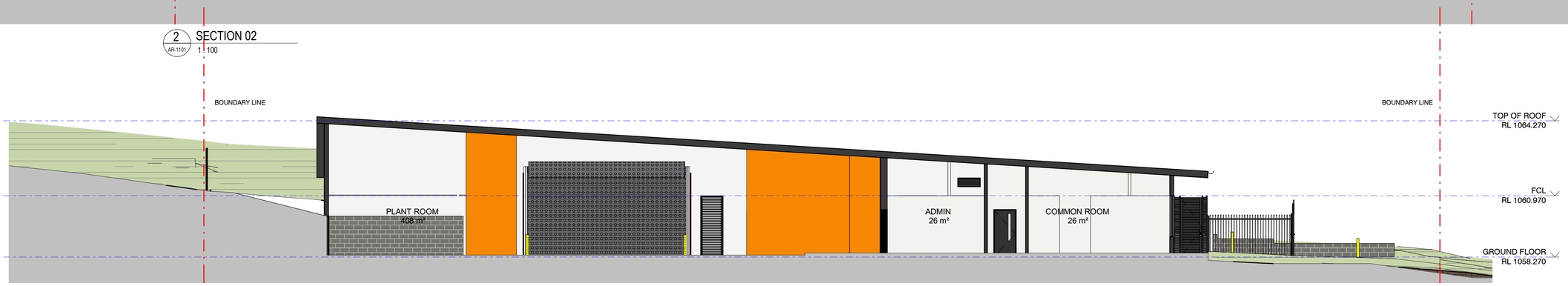
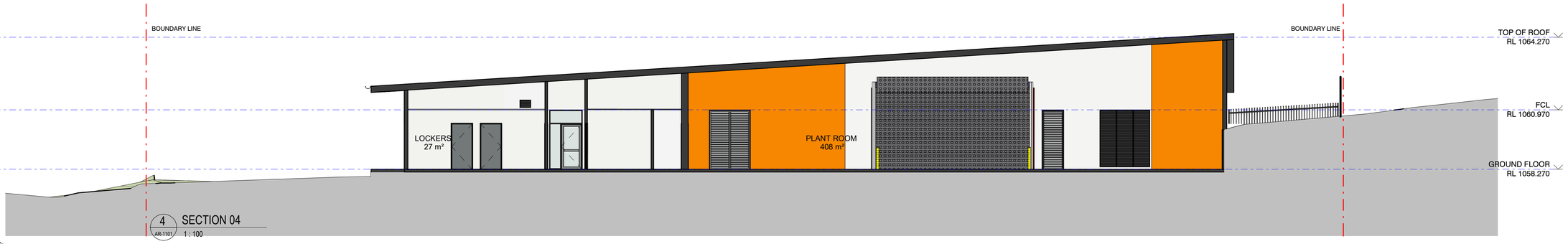


1 AR-1101 SECTION 01
1 : 100

2 AR-1101 SECTION 02
1 : 100



3 AR-1101 SECTION 03
1 : 100



4 AR-1101 SECTION 04
1 : 100

GENERAL NOTES:

1. Requirements of gates and fences dependent on security desktop review per site

DATE PRINTED: 18/05/2022 10:18:03

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future ambulance for our state

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BONACCI

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1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

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DRAWN BY	SCALE AT A1
AF	1 : 100

DESCRIPTION
SECTIONS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-2501	B

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

LYSAGHT CUSTOM ORB METAL CLADDING
- MONUMENT
4360.1

LYSAGHT CUSTOM ORB METAL CLADDING
- BASALT
4360.2

LYSAGHT ROOF SHEETING
- SURFMIST
4230.1

FEATURE TRIM DULUX PAINT FINISH TO MATCH COLORBOND
- MANOR RED
6701.5

DATE PRINTED: 17/05/2022 17:57:11

ISSUE	DATE	SUBJECT	AUTHORISED
A	23.04.22	REF ISSUE	MR

RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

PROJECT MANAGER
LEVEL 16
44 MARKET STREET
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1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR)
GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
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DRAWN BY: AF
SCALE AT A1

DESCRIPTION
RENDER

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-9001	A

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

DATE PRINTED: 18/05/2022 10:18:26

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR
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PROJECT
RURAL AMBULANCE
INFRASTRUCTURE PROGRAM (RAIR)
GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
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DRAWN BY: AF
SCALE AT A1

DESCRIPTION
AXONOMETRIC

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-9003	B

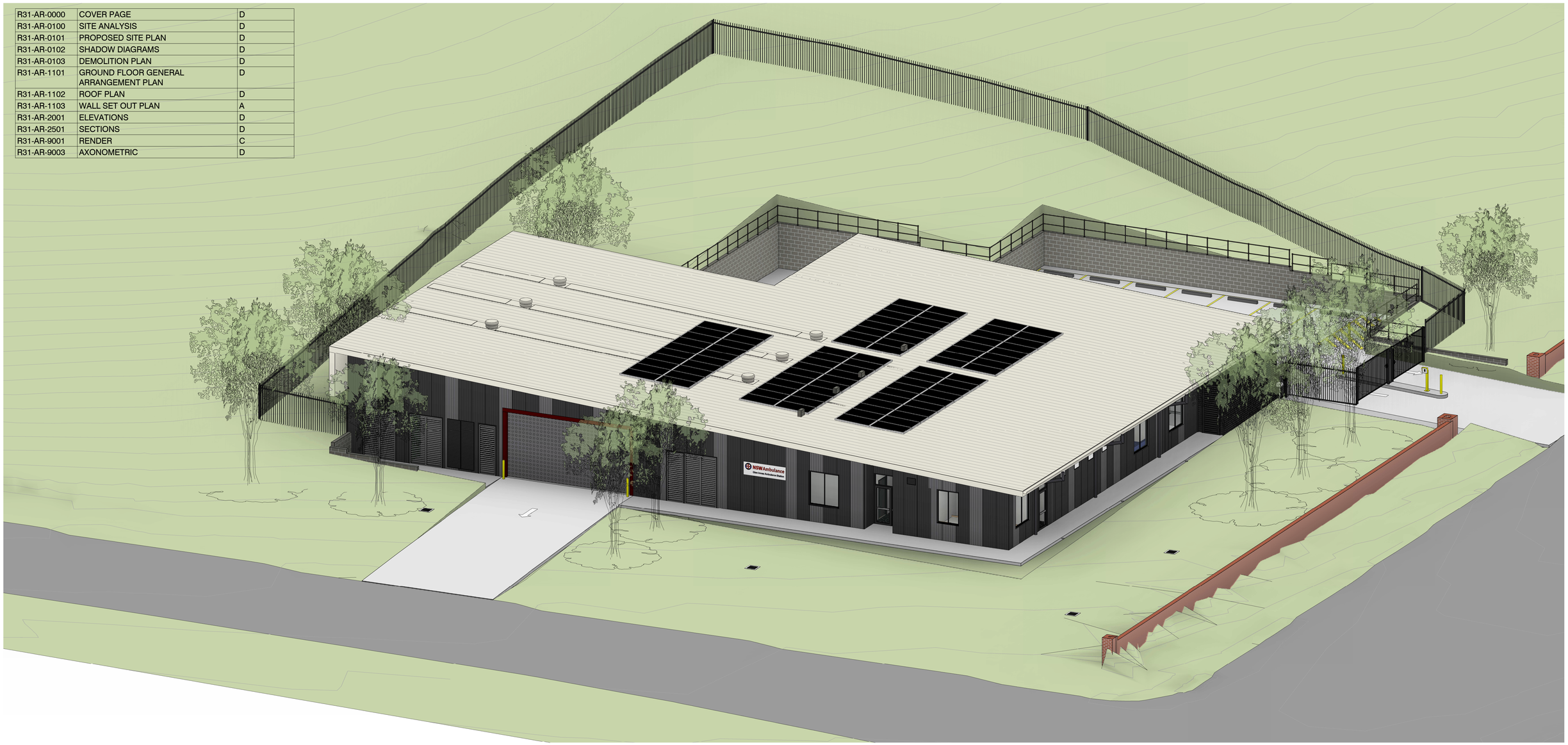
7.3 Architectural Drawings

RAIR - RURAL AMBULANCE INFRUSTRUCTURE RECONFIGURATION PROGRAM

R31 GLEN INNES - TAYLOR STREET GLEN INNES

SHEET LIST

Sheet Number	Sheet Name	Current Revision
R31-AR-0000	COVER PAGE	D
R31-AR-0100	SITE ANALYSIS	D
R31-AR-0101	PROPOSED SITE PLAN	D
R31-AR-0102	SHADOW DIAGRAMS	D
R31-AR-0103	DEMOLITION PLAN	D
R31-AR-1101	GROUND FLOOR GENERAL ARRANGEMENT PLAN	D
R31-AR-1102	ROOF PLAN	D
R31-AR-1103	WALL SET OUT PLAN	A
R31-AR-2001	ELEVATIONS	D
R31-AR-2501	SECTIONS	D
R31-AR-9001	RENDER	C
R31-AR-9003	AXONOMETRIC	D



DATE PRINTED 28/05/2022 12:44:09 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR
D	28.05.22	TENDER	MR

RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

SERVICES
23/101 MILLER ST
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JHA

PROJECT MANAGER
LEVEL 16
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STRUCTURE & CIVIL
LEVEL 4
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SYDNEY NSW 2000
T +61 2 8247 8400
BONACCI

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT
djrd
djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects:
Andrew Hipwell 6562
Daniel Beekwilder 6192
63 Myrtle Street
Chippendale NSW 2008
Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1
DESCRIPTION: COVER PAGE

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0000	D

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

GLEN INNES CLIMATE

Long Term Averages

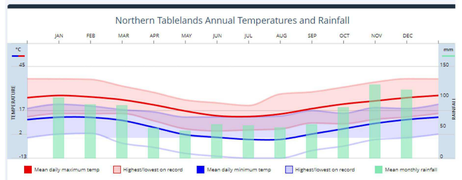
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean Max (°C)	26.7	25.8	24.0	20.8	16.9	13.9	13.4	15.0	18.4	21.3	23.3	25.3	20.4
Mean Min (°C)	13.0	12.9	11.0	6.6	2.0	0.3	-1.0	-1.0	2.4	5.7	9.1	11.5	6.0
Mean Rain (mm)	98.9	87.7	86.3	49.3	44.7	55.2	53.3	49.9	55.0	82.9	120.1	111.7	892.8
Median Rain (mm)	66.6	88.6	54.4	46.4	21.4	37.0	37.4	36.4	45.6	75.5	108.2	102.6	864.4
Mean Rain Days	11.0	11.2	11.8	9.9	12.5	15.7	14.0	11.0	9.0	10.9	11.9	12.4	141.4

Daily Records

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	37.2	36.9	32.7	28.7	23.9	22.1	20.4	27.7	29.0	32.0	35.2	37.3	37.3
Low Max (°C)	15.3	15.2	15.3	10.7	5.6	4.3	4.9	5.5	9.3	8.8	11.6	13.1	4.3
High Min (°C)	21.2	20.1	17.8	16.4	13.1	13.2	13.2	13.8	17.2	15.5	19.1	18.5	21.2
Low Min (°C)	2.3	2.8	-3.4	-6.0	-9.8	-11.6	-12.8	-12.8	-8.0	-5.2	-1.1	0.0	-12.8
High Rain (mm)	98.4	64.0	91.2	88.6	121.4	63.2	83.2	59.4	72.4	96.6	87.4	92.2	121.4

Monthly Records

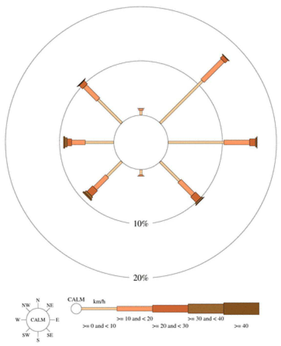
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
High Max (°C)	30.6	28.3	28.0	23.5	20.1	15.6	15.5	17.8	21.4	24.1	27.6	29.8	22.7
Low Max (°C)	23.8	22.9	22.2	18.2	15.1	11.4	11.7	12.4	15.8	18.1	18.9	21.3	18.9
High Mean (°C)	15.7	14.4	12.7	9.0	4.5	3.4	2.5	3.4	5.6	8.7	11.5	13.2	7.1
Low Mean (°C)	10.9	10.5	7.8	3.6	-1.7	-3.1	-5.7	-3.8	0.5	3.3	6.5	9.6	5.0
High Rain (mm)	233.4	166.8	297.8	221.8	156.0	150.0	211.0	152.0	171.8	203.4	264.8	178.4	1458.4
Low Rain (mm)	27.6	3.0	1.0	1.2	1.6	9.4	3.8	3.0	4.8	16.2	19.6	16.2	369.8

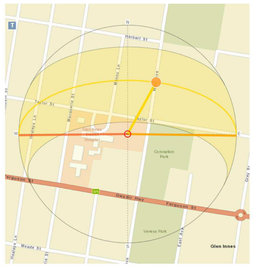


Average Number of Days with Temperatures

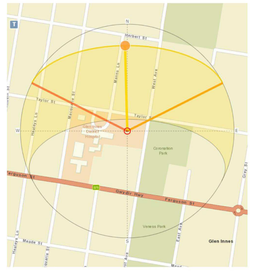
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
≥ 40.0°C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
≥ 35.0°C	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
≥ 30.0°C	6.0	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0	3.0	15.8
≤ 2.0°C	0.0	0.0	0.3	4.1	15.4	19.1	23.1	23.1	14.8	6.3	1.1	0.2	107.4
≤ 0.0°C	0.0	0.0	0.1	1.8	10.4	14.5	18.5	18.6	8.5	2.5	0.3	0.1	75.1

YEARLY WIND ROSE

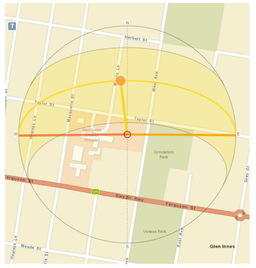




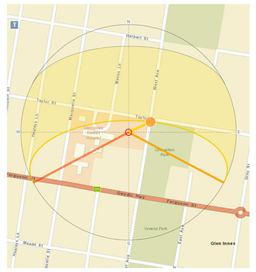
MARCH 20TH- 12PM SUN PATH



JUNE 21TH- 12PM SUN PATH

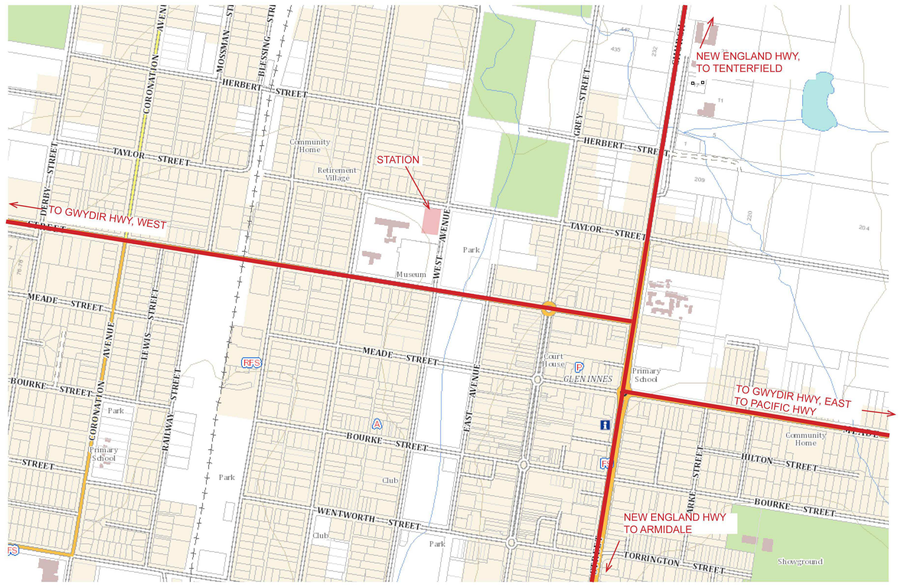


SEPTEMBER 23RD- 12PM SUNPATH



DECEMBER 22ND- 12PM SUNPATH

1:1000 SETBACK, VIEWS, VEGETATION



1:10000 MAJOR ROADS RELATED TO STATION

VIEW 1 - WEST AVENUE , FACING NORTH-WEST

VIEW 2 - WEST AVENUE, FACING SITE

VIEW 3 - TAYLOR STREET, FACING SITE

VIEW 4- TALOR STREET, FACING EAST

DATE PRINTED 28/05/2022 12:45:35 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

SERVICES: 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000 — JHA

PROJECT MANAGER: LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555 — mace

STRUCTURE & CIVIL: LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400 — BONACCI

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

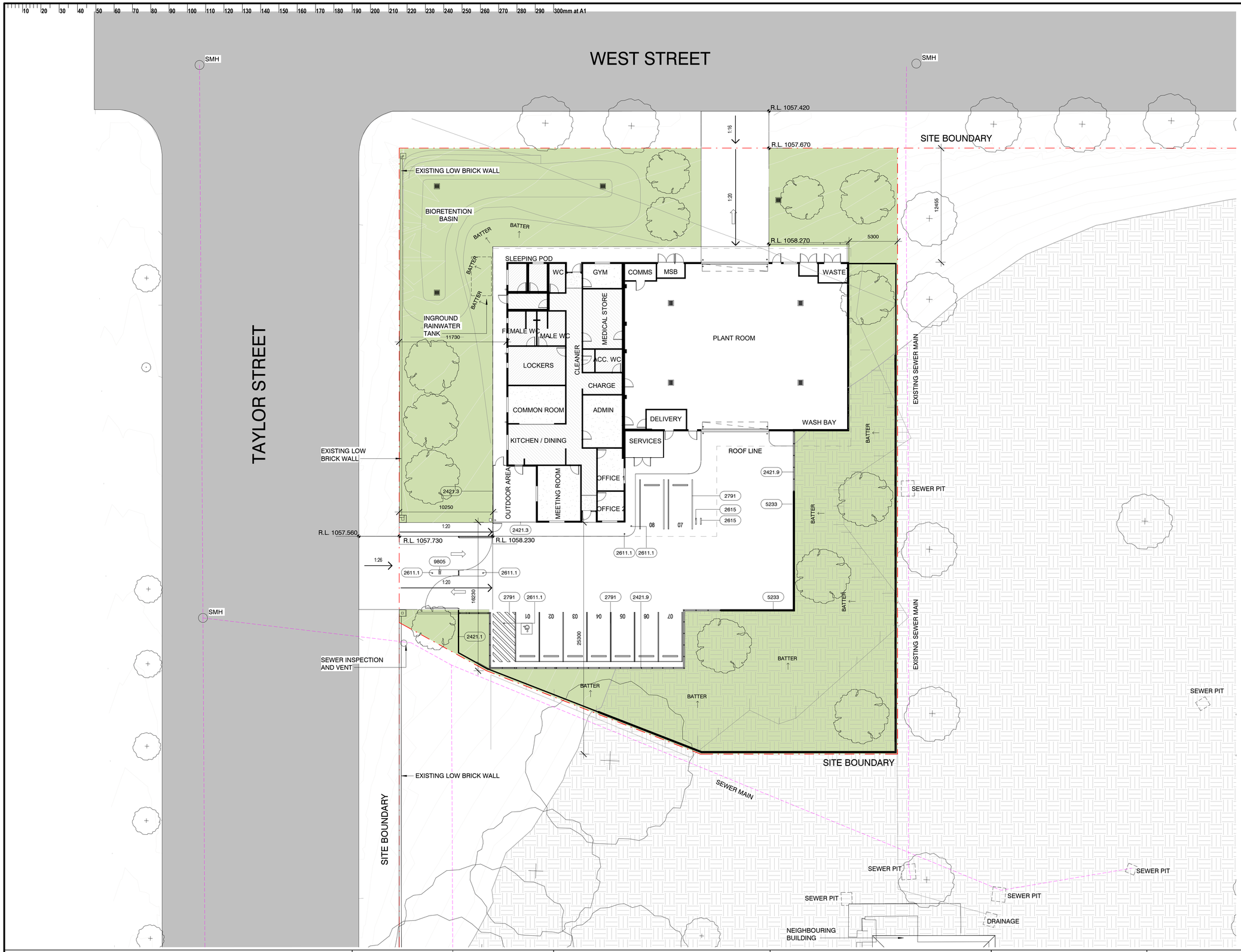
CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS: TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
63 Myrtle Street, Chippendale NSW 2008, Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1
DESCRIPTION: SITE ANALYSIS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0100	D



KEYNOTE LEGEND	
2421.1	FENCE TYPE A
2421.3	FENCE TYPE C
2421.9	FENCE TYPE I
2611.1	POWDERCOATED STEEL BOLLARD
2615	COLUMN GUARD
2791	PAINTED LINE MARKING
5233	BLOCK PARTITION, REFER WALL TYPES LEGEND
9805	KEYPAD CARD ACCESS POINT

SITE PLAN LEGEND

- EXISTING TREE TO BE RETAINED - REFER TO ABORIST REPORT
- NEW TREE - REFER TO LANDSCAPE PLAN
- EXISTING LANDSCAPED AREA
- PROPOSED NEW LANDSCAPED AREA - REFER TO LANDSCAPE PLAN
- NEW ACCESSIBLE PATH
- SITE BOUNDARY

DEVELOPMENT SCHEDULE	
GROSS FLOOR AREA	776.75m²
SITE AREA	3384.15m²

DATE PRINTED 28/05/2022 12:45:58 AM

ISSUE	DATE	SUBJECT	AUTHORISED
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D	28.05.22	TENDER	MR

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

SERVICES: JHA — 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000

STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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TRUE NORTH

1:100 — 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS: TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
63 Myrtle Street, Chippendale NSW 2008, Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1: 1 : 200

DESCRIPTION: PROPOSED SITE PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0101	D

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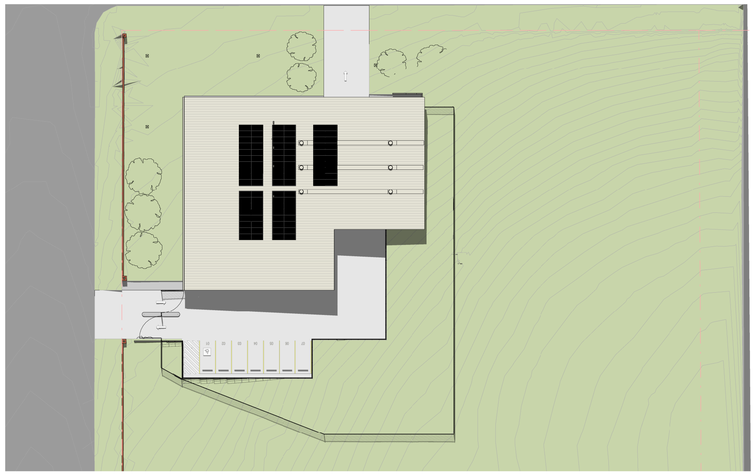

01 AR-2007 9am SUMMER
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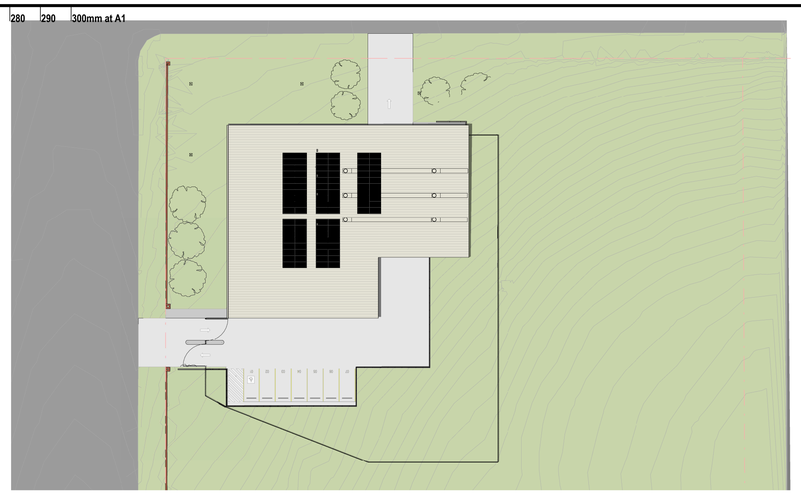

02 AR-2007 12pm SUMMER
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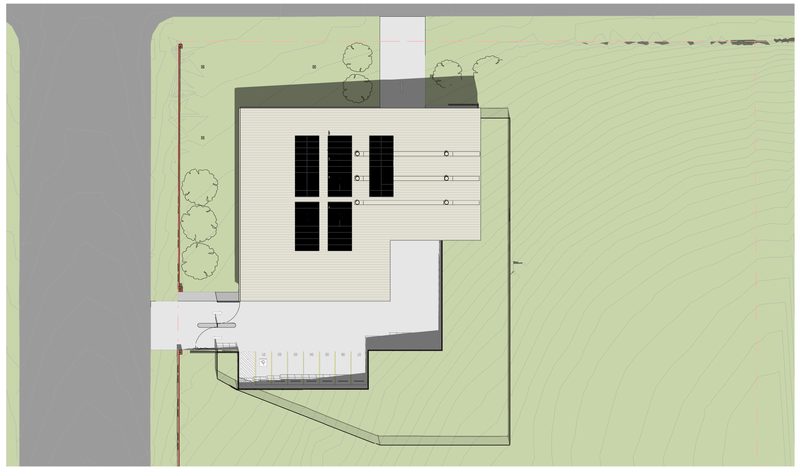

03 AR-2007 3pm SUMMER
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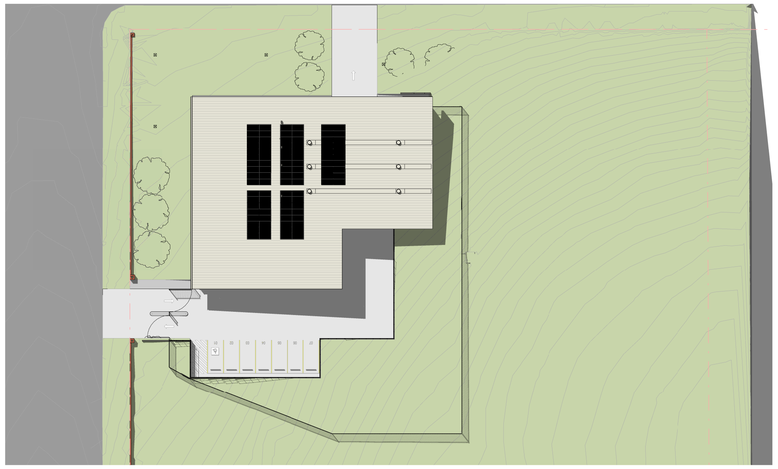

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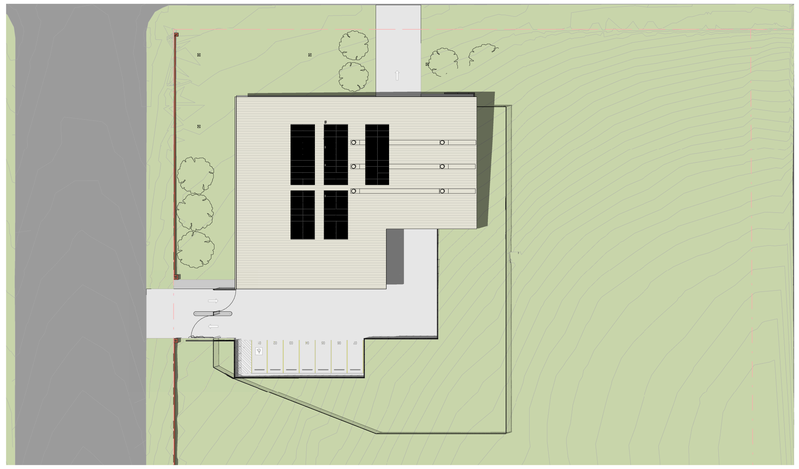

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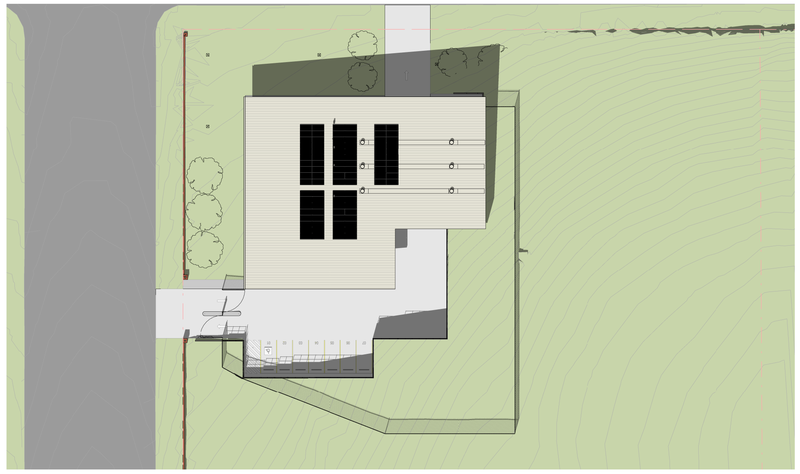
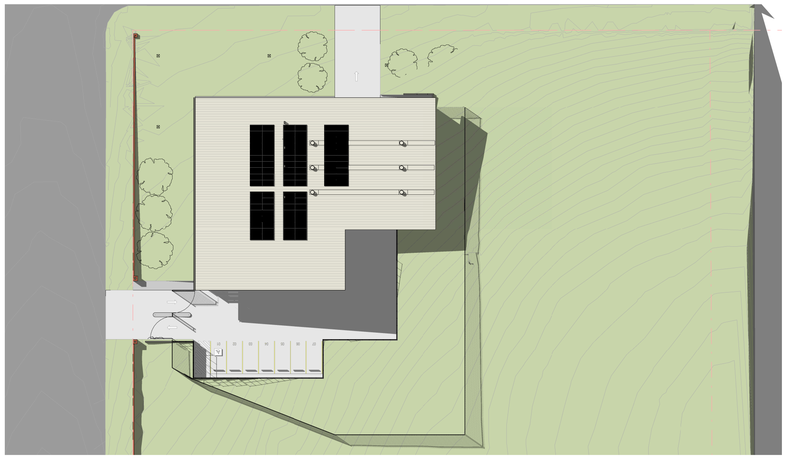


06 AR-2007 3pm EQUINOX
1 : 500



07 AR-2007 9am WINTER
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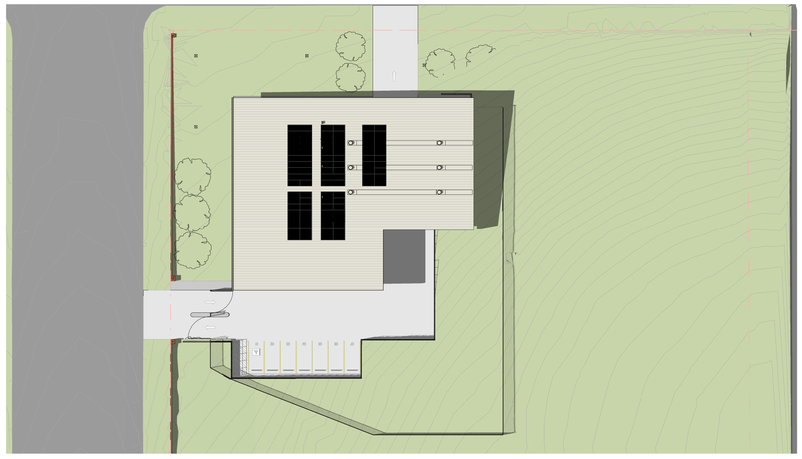
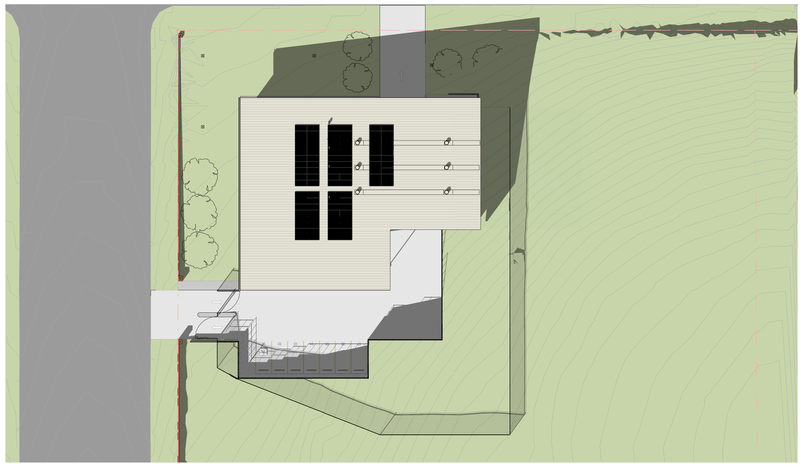


08 AR-2007 12pm WINTER
1 : 500



09 AR-2007 3pm WINTER
1 : 500

DATE PRINTED 28/05/2022 12:48:04 AM

ISSUE	DATE	SUBJECT	AUTHORISED
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RAIR
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Building the future response for our state

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66 CLARENCE STREET
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BONACCI

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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT
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ABN: 48 942 921 969
Nominated Architects:
Andrew Hipwell 6562
Daniel Beekwilder 6192
63 Myrtle Street
Chippendale NSW 2008
Sydney Australia
djrd.com.au

DRAWN BY AF
SCALE AT A1 1 : 500
DESCRIPTION
SHADOW DIAGRAMS

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0102	D

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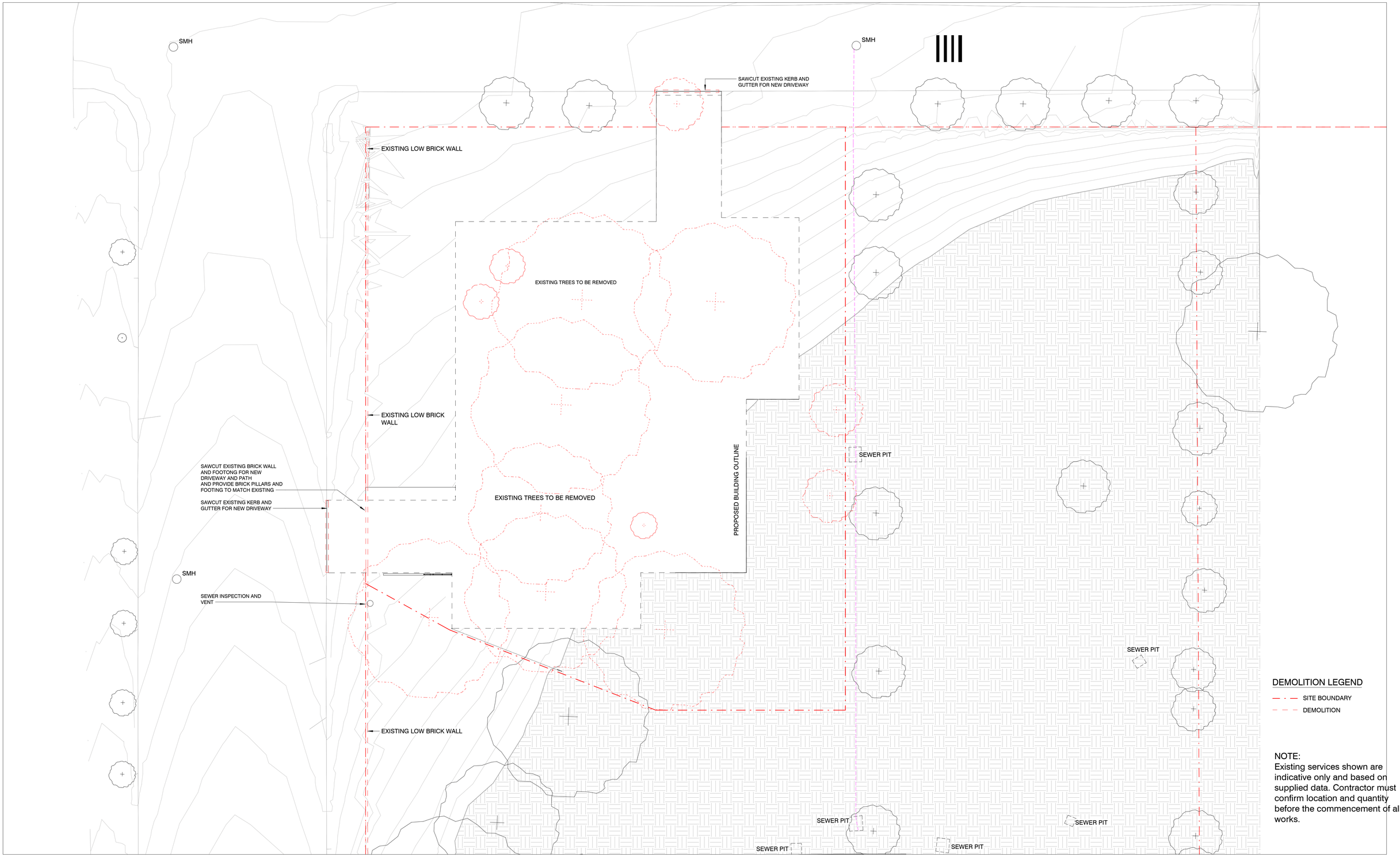

DEMOLITION LEGEND

- SITE BOUNDARY
- DEMOLITION

NOTE:
Existing services shown are indicative only and based on supplied data. Contractor must confirm location and quantity before the commencement of all works.

DRAINAGE

DATE PRINTED 28/05/2022 12:49:34 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
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RAIR
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SERVICES
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JHA

PROJECT MANAGER
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TRUE NORTH

1:200 0 2 4 6 8 10 20m

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT
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T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects:
Andrew Hipwell 6562
Daniel Beekwilder 6192
63 Myrtle Street
Chippendale NSW 2008
Sydney Australia
djrd.com.au

DRAWN BY	SCALE AT A1
AF	1 : 200

DESCRIPTION
DEMOLITION PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0103	D

PROJECT SPECIFIC DOORS

Mark	Room Name	Type	Comments
D-22	MEDICAL STORE	R	FIRE RATED DOOR
D-21	CHARGE	R	FIRE RATED DOOR
D-20	ADMIN	R	FIRE RATED DOOR
D-06	CORRIDOR	F	HELD OPEN WITH MAGNETIC RELEASE
D-18	ADMIN	L	SOLID CORE DOOR WITH SIDE LIGHT

KEYNOTE LEGEND

2421.1	FENCE TYPE A
2611.1	POWDERCOATED STEEL BOLLARD
2615	COLUMN GUARD
2791	PAINTED LINE MARKING
9805	KEYPAD CARD ACCESS POINT

DATE PRINTED 28/05/2022 12:49:45 AM

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RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

SERVICES: JHA — 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000

STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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TRUE NORTH

1:100 — 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

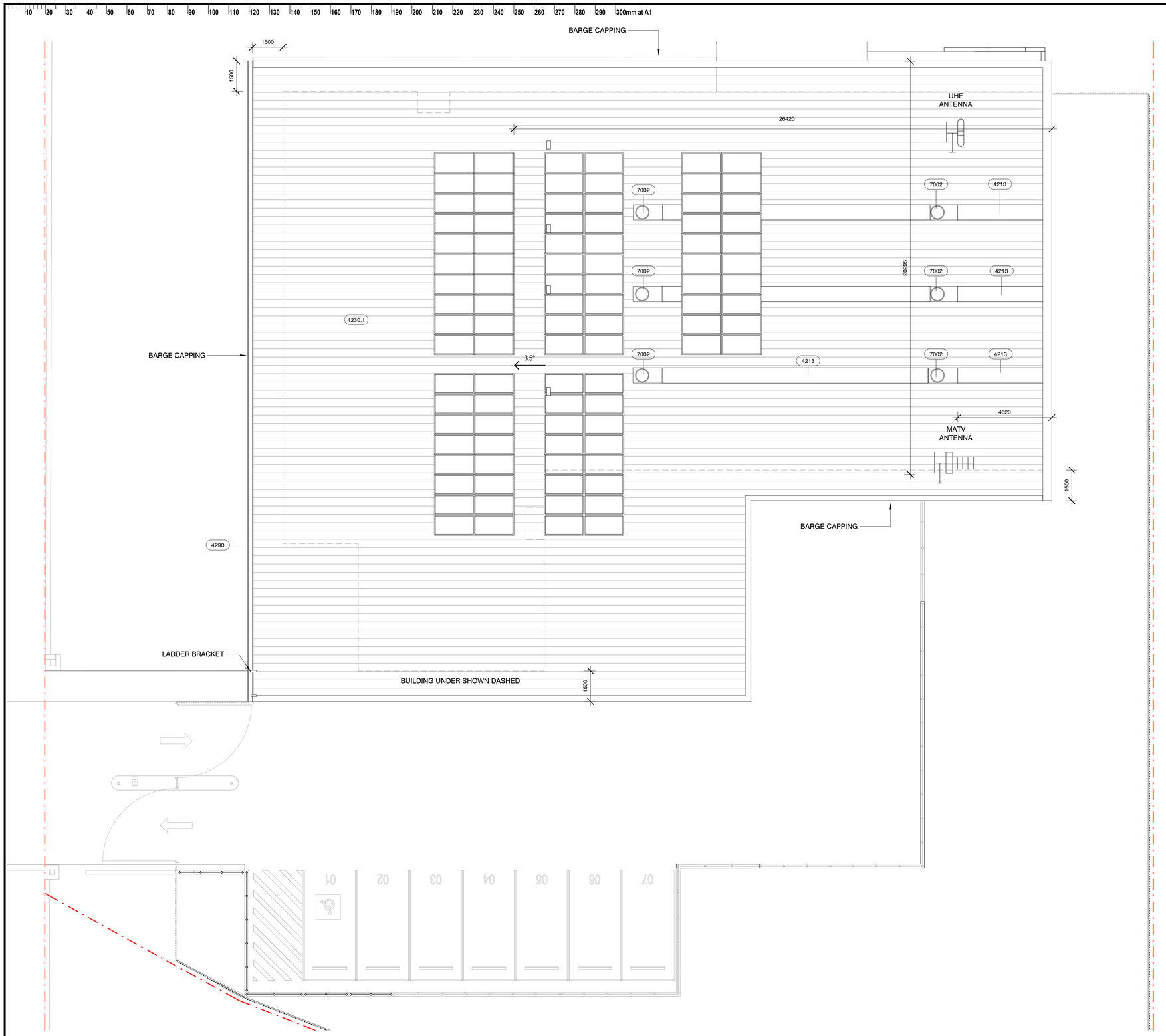
PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
63 Myrtle Street, Chippendale NSW 2008, Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1: 1 : 100

DESCRIPTION
GROUND FLOOR GENERAL ARRANGEMENT PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1101	D



KEYNOTE LEGEND

4213	ROOF BACK FLASHING
4230.1	ROOF SHEETING TYPE 1
4290	HALF ROUND EAVES GUTTER
7002	ROOF VENTILATOR

DATE PRINTED 28/05/2022 12:49:57 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR
D	28.05.22	TENDER	MR

RAIR
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Building the future response for our state

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T +61 2 8247 8400
BONACCI

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TRUE NORTH

1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

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djrd architects
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Nominated Architects:
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Daniel Beekwilder 6192
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Chippendale NSW 2008
Sydney Australia
djrd.com.au

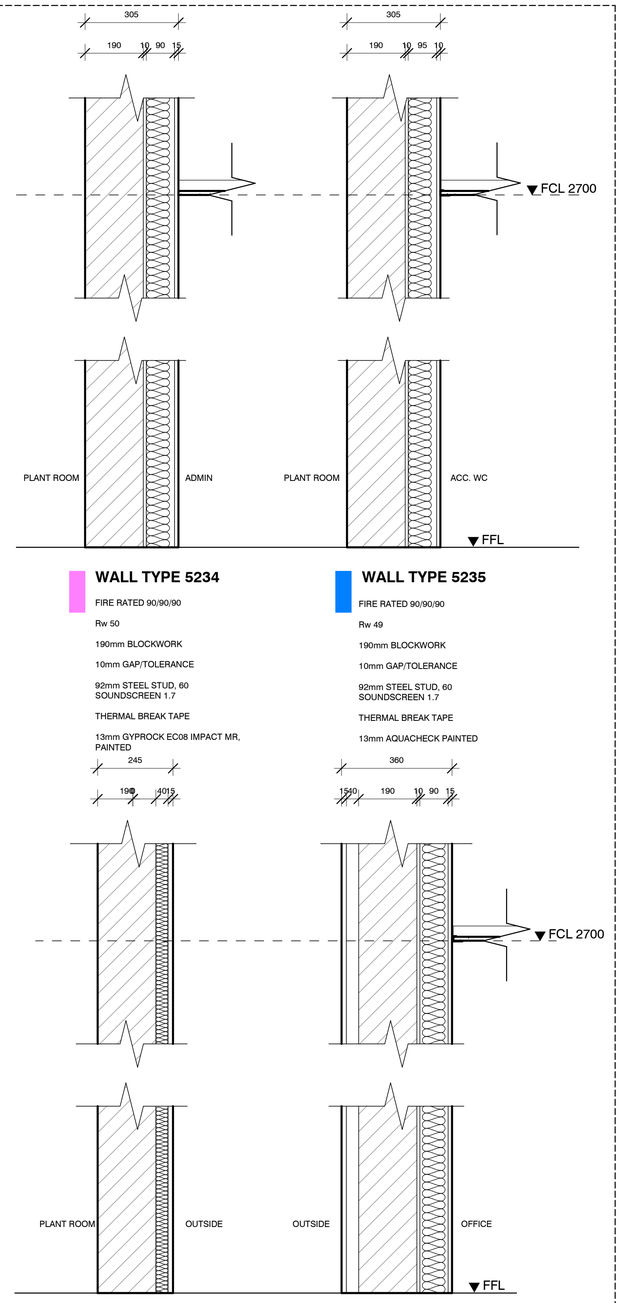
DRAWN BY	SCALE AT A1
AF	1 : 100

DESCRIPTION
ROOF PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1102	D

KEYNOTE LEGEND

2421.1	FENCE TYPE A
2421.3	FENCE TYPE C
5201	EXTERIOR WALL TYPE 1, REFER WALL TYPES LEGEND
5202	EXTERIOR WALL TYPE 2, REFER WALL TYPES LEGEND
5203	EXTERIOR WALL TYPE 3, REFER WALL TYPES LEGEND
5220	INTERIOR WALL TYPE 1, REFER WALL TYPES LEGEND
5222	INTERIOR WALL TYPE 3, REFER WALL TYPES LEGEND
5223	INTERIOR WALL TYPE 4, REFER WALL TYPES LEGEND
5224	INTERIOR WALL TYPE 5, REFER WALL TYPES LEGEND
5233	BLOCK PARTITION, REFER WALL TYPES LEGEND
5234	BLOCK PARTITION, REFER WALL TYPES LEGEND
5235	BLOCK PARTITION, REFER WALL TYPES LEGEND
5236	BLOCK PARTITION, REFER WALL TYPES LEGEND
5237	BLOCK PARTITION, REFER WALL TYPES LEGEND



WALL TYPE 5234

FIRE RATED 90/90/90

Rw 50

190mm BLOCKWORK

10mm GAP/TOLERANCE

92mm STEEL STUD, 60 SOUNDSCREEN 1.7

THERMAL BREAK TAPE

13mm GYPROCK EC08 IMPACT MR, PAINTED

WALL TYPE 5235

FIRE RATED 90/90/90

Rw 49

190mm BLOCKWORK

10mm GAP/TOLERANCE

92mm STEEL STUD, 60 SOUNDSCREEN 1.7

THERMAL BREAK TAPE

13mm AQUACHECK PAINTED

WALL TYPE 5236

FIRE RATED 60/60/60

VERTICAL CUSTOM ORD CLADDING REFER TO CONSTRUCTION DETAILS

VAPOUR BARRIER

TOP HAT FURRING

190mm BLOCKWORK

WALL TYPE 5237

FIRE RATED 90/90/90

Rw 50

VERTICAL CUSTOM ORD CLADDING REFER TO CONSTRUCTION DETAILS

THERMAL BREAK TAPE

TOP HAT FURRING

190mm BLOCKWORK

10mm GAP/TOLERANCE

92mm STEEL STUD, 60 SOUNDSCREEN 1.7

13mm GYPROCK EC08 IMPACT MR, PAINTED

DATE PRINTED 28/05/2022 12:50:04 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	28.05.22	TENDER	MR

GENERAL NOTES:
1. Refer to SK_20, SK_21 & SK_22 for wall type details

RAIR — Rural Ambulance Infrastructure Reconfiguration — Building the future response for our state

PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

SERVICES: JHA — 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000

STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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TRUE NORTH

1:100 — 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
LOT2 : DP1208729

ARCHITECT: djrd architects
T +612 9319 2955
ABN: 48 942 921 969
Nominated Architects: Andrew Hipwell 6562, Daniel Beekwilder 6192
63 Myrtle Street, Chippendale NSW 2008, Sydney Australia
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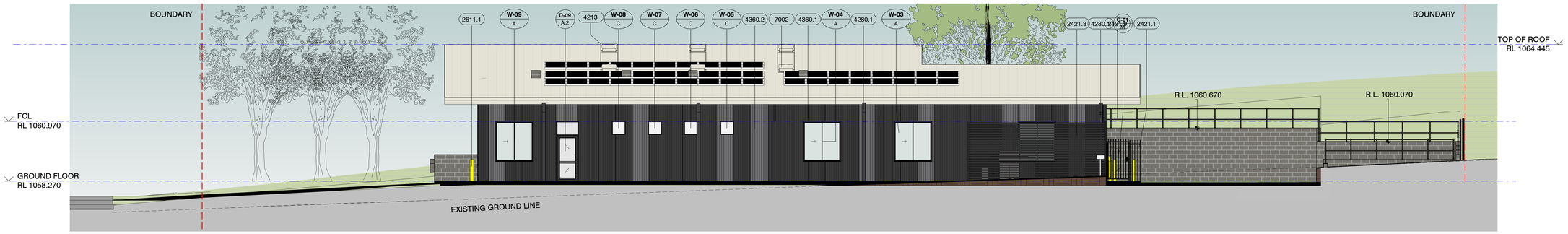
DRAWN BY	SCALE AT A1
AF	As indicated

DESCRIPTION
WALL SET OUT PLAN

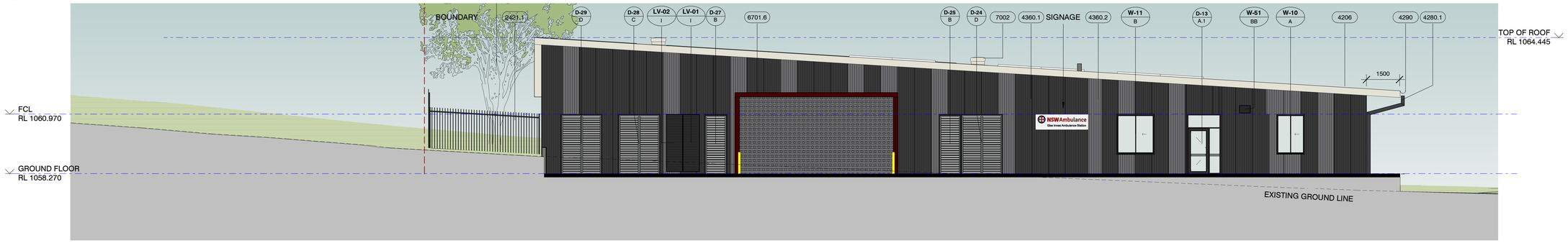
PROJECT No	DRAWING No	REVISION
22 417	R31- AR-1103	A

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

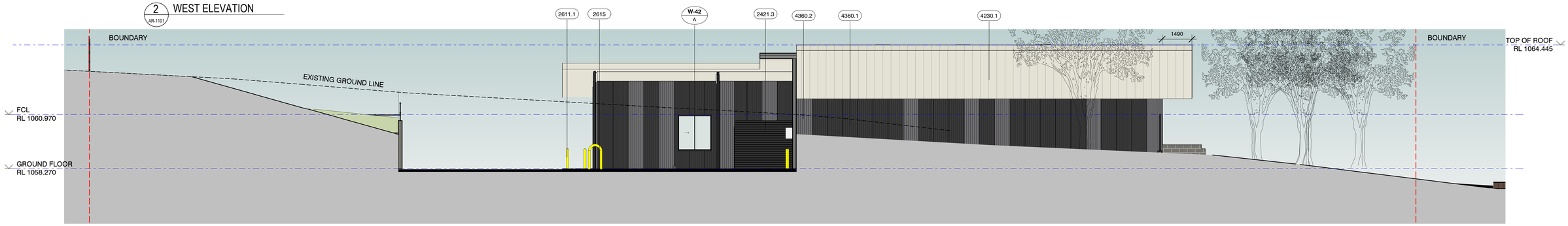
KEYNOTE LEGEND	
2421.1	FENCE TYPE A
2421.3	FENCE TYPE C
2421.9	FENCE TYPE I
2611.1	POWDERCOATED STEEL BOLLARD
2615	COLUMN GUARD
4206	COLORBOND FASCIA
4213	ROOF BACK FLASHING
4230.1	ROOF SHEETING TYPE 1
4280.1	DOWNPIPE TYPE 1
4290	HALF ROUND EAVES GUTTER
4360.1	METAL WALL SHEETING TYPE 1
4360.2	METAL WALL SHEETING TYPE 2
6701.4	PAINT TYPE 4
6701.6	PAINT TYPE 6
7002	ROOF VENTILATOR



1 AR-1101 SOUTH ELEVATION



2 AR-1101 WEST ELEVATION



3 AR-1101 NORTH ELEVATION

4 AR-1101 EAST ELEVATION

GENERAL NOTES:

1. Requirements of gates and fences dependent on security desktop review per site

DATE PRINTED 28/05/2022 12:50:28 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR
D	28.05.22	TENDER	MR

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PROJECT MANAGER: mace — LEVEL 16, 44 MARKET STREET, SYDNEY NSW 2000, T +61 2 9299 3555

SERVICES: JHA — 23/101 MILLER ST, NORTH SYDNEY NSW 2060, T +61 2 9437 1000

STRUCTURE & CIVIL: BONACCI — LEVEL 4, 66 CLARENCE STREET, SYDNEY NSW 2000, T +61 2 8247 8400

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1:100 — 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT: NSW GOVERNMENT Health Infrastructure — NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
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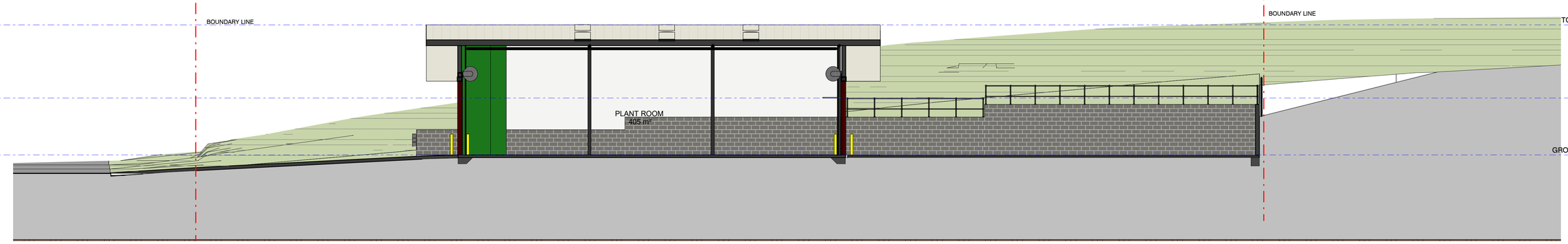
DRAWN BY: SM
SCALE AT A1: 1 : 100

DESCRIPTION
ELEVATIONS

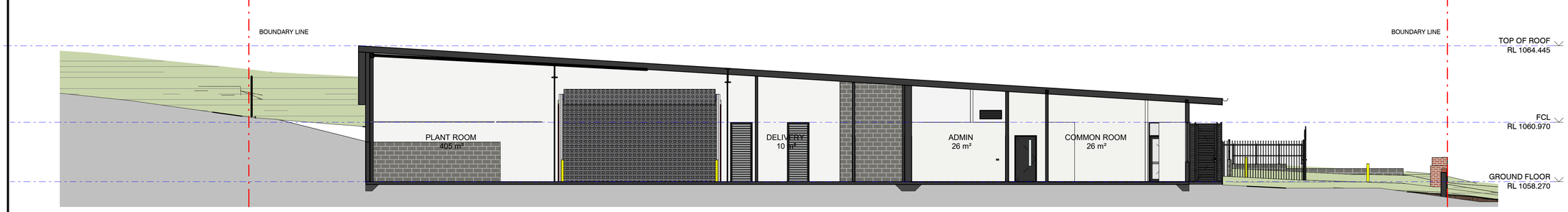
PROJECT No	DRAWING No	REVISION
22 417	R31- AR-2001	D

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

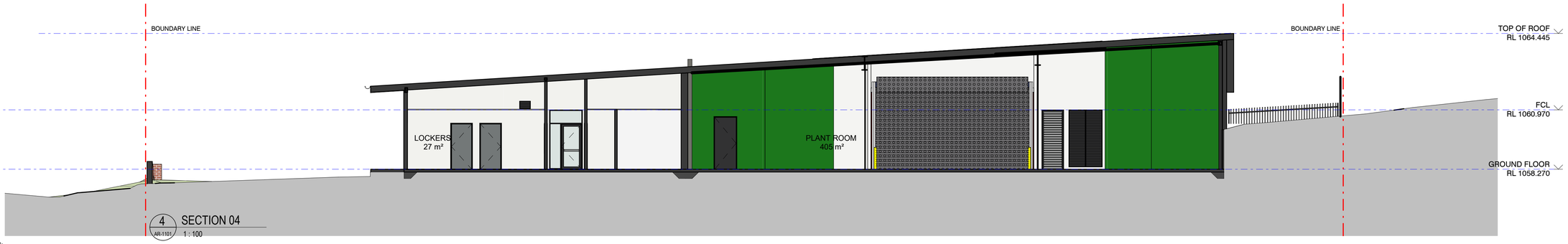


1 AR-1101 SECTION 01
1 : 100

2 AR-1101 SECTION 02
1 : 100



3 AR-1101 SECTION 03
1 : 100



4 AR-1101 SECTION 04
1 : 100

GENERAL NOTES:

1. Requirements of gates and fences dependent on security desktop review per site

DATE PRINTED 28/05/2022 12:51:52 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR
D	28.05.22	TENDER	MR

RAIR
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1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
TAYLOR STREET, GLEN INNES, NSW, 2370
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DRAWN BY: AF
SCALE AT A1: 1 : 100
DESCRIPTION: SECTIONS
PROJECT No: 22 417
DRAWING No: R31- AR-2501
REVISION: D

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1

LYSAGHT CUSTOM ORB METAL CLADDING
- MONUMENT
4360.1

LYSAGHT CUSTOM ORB METAL CLADDING
- BASALT
4360.2

LYSAGHT ROOF SHEETING
- SURFMIST
4230.1

FEATURE TRIM DULUX PAINT FINISH TO MATCH COLORBOND
- MANOR RED
6701.5

DATE PRINTED 28/05/2022 12:51:59 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	23.04.22	REF ISSUE	MR
B	18.05.22	UPDATED REF	MR
C	26.05.22	TENDER	MR

RAIR
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1:100 0 1 2 3 4 5 10

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR)
GLEN INNES

CLIENT
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NSW Ambulance

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DRAWN BY: AF
SCALE AT A1

DESCRIPTION
RENDER

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-9001	C

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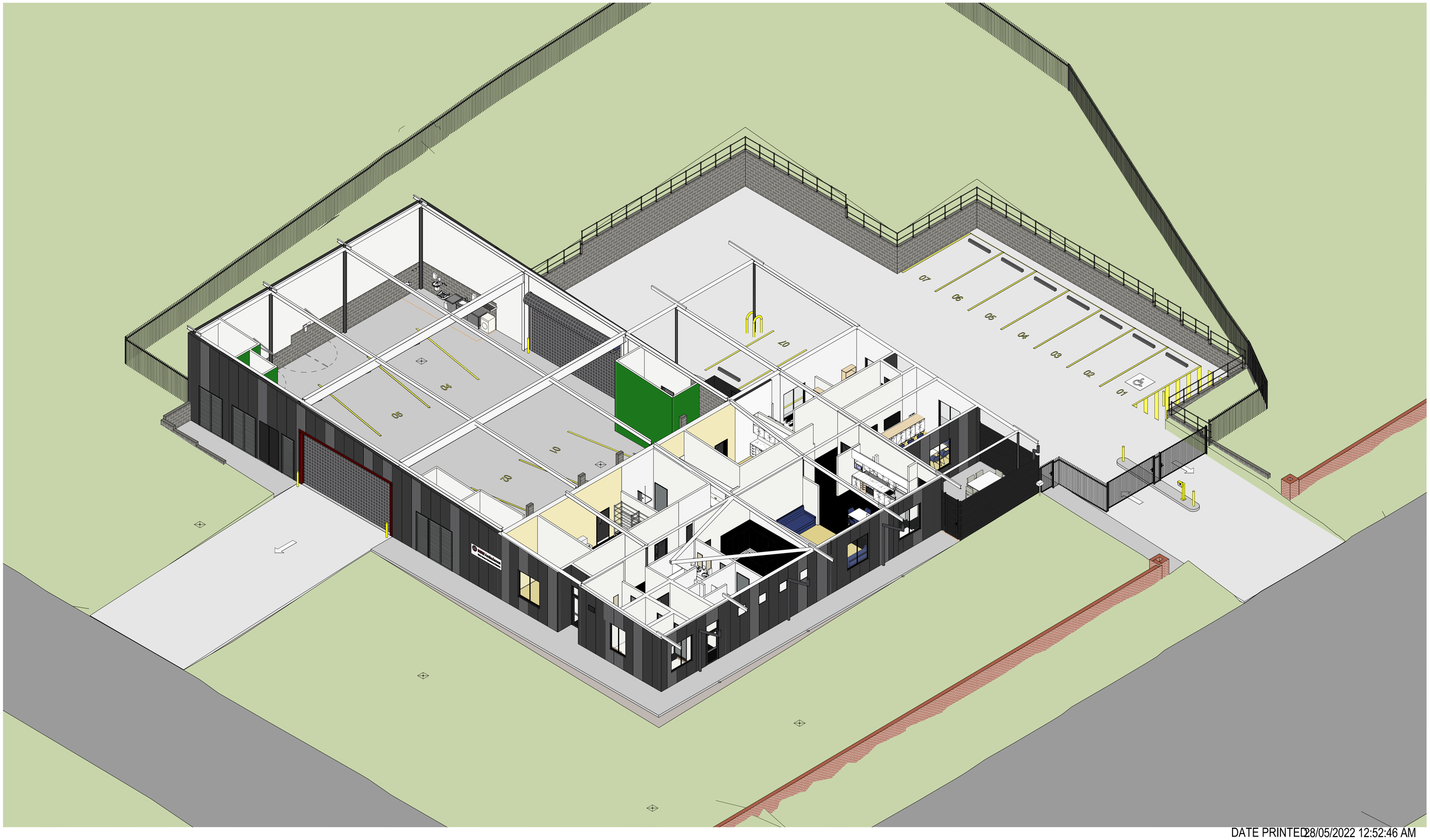

DATE PRINTED 28/05/2022 12:52:46 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR
D	28.05.22	TENDER	MR

RAIR
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BONACCI

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PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
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DRAWN BY: AF
SCALE AT A1

DESCRIPTION
AXONOMETRIC

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-9003	D

7.4 Landscape Architecture Drawings

RAIR Glen Innes R31

Taylor Street, Glen Innes, NSW 2370

Landscape REF Documentation

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The contractor shall check and verify all work on site (including work by others) before commencing the landscape installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred to the Landscape Architect for confirmation.

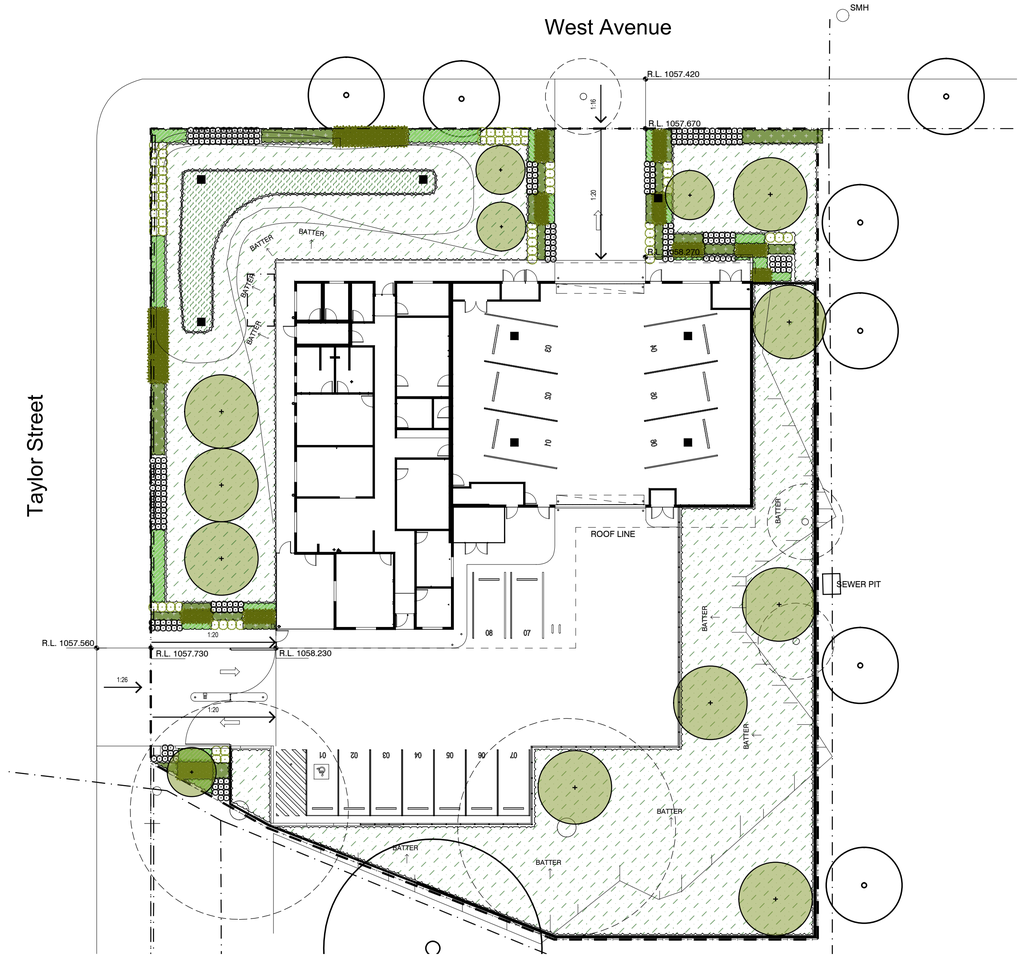
Issue	Revision Description	Drawn	Check	Date
C	Architectural Coordination	LW	NM	19.05.2022
B	Architectural Coordination	LW	NM	27.04.2022
A	Development Application	LW	NM	26.04.2022

Drawing Schedule

Drawing Number	Drawing Title	Scale
000	Landscape Coversheet	N/A
101	Landscape Plan	1:150
501	Landscape Details	As Shown

Plant Schedule

	Botanic Name	Common Name	Mature Size (h x w) (m)	Spacing	Pot Size
	TREES				
Ca	*Cupaniopsis anacardioides*	Turkeroo	15 x 5	As Shown	100L
	SHRUBS				
Ad	*Austromyrtus dulcis*	Midgen Berry	1 x .8	As Shown	200mm
LPP	*Loropetalum 'Purple Pixie'*	Purple Pixie	.3 x 1.2	As Shown	300mm
WAB	*Westringia fruticosa 'Aussie Box'*	Native Rosemary	0.6 x 0.6	As Shown	300mm
	GRASSES AND GROUNDCOVERS				
Cg	*Carpobrotus glaucescens*	Pigface	.1 x 2	5/sqm	150mm
Dc	*Dianella caerulea*	Flax Lily	.4 x .4	5/sqm	150mm
Dr	*Dianella revoluta*	Blueberry Lily	1 x 2	5/sqm	150mm
GBR	*Grevillea* Bronze Rambler	Grevillea Bronze Rambler	.3 x 3	5/sqm	150mm
Hs	*Hibbertia scandens*	Snake Vine	.1 x 1	5/sqm	150mm
Hv	*Hardenbergia violacea*	False Sarsaparilla	3 x 2	5/sqm	150mm
Ll	*Lomandra longifolia*	Matt Rush	1 x 1	4/sqm	150mm
	Matrix Planting				
		Total Area			
					/25sqm
Ad	*Austromyrtus dulcis*	Midgen Berry	1	8	5
CLJ	*Callistemon 'Little John'*	Bottlebrush	1	1	8
WAB	*Westringia fruticosa 'Aussie Box'*	Native Rosemary	0.6	0.6	14
Hs	*Hibbertia scandens*	Trailing Guidea Flower	0.2	1	7
Ll	*Lomandra longifolia*	Matt Rush	1	1	8
Dc	*Dianella caerulea*	Flax Lily	0.4	0.4	23
Hv	*Hardenbergia violacea*	False Sarsaparilla	3	2	12
	Bioretention Basin Mix Planting				
Ca	*Carex appressa*	Tall Sedge	1 x 1	10/m2	150mm
Fn	*Ficinia nodosa*	Club Rush	1 x 1	10/m2	150mm
Ju	*Juncus usitatus*	Common Rush	1.2 x 1.5	10/m2	150mm
Ll	*Lomandra longifolia*	Mat-rush	1 x 0.8	10/m2	150mm
Jp	*Juncus prismatocarpus*	Branching Rush	0.6 x 0.3	10/m2	150mm



Site Plan | Scale 1:250

Legend

Key Plan

Client

Project

RAIR Glen Innes
Taylor Street, Glen Innes,
NSW 2370

SITE IMAGE

Level 1, 3-5 Baptist Street
Redfern NSW 2016
Australia

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Site Image (NSW) Pty Ltd
ABN 44 801 262 380

Landscape Architects

REF

Drawing Name

Landscape Coversheet

Scale

Job Number	Drawing Number	Issue
SS22-4920	R31-LA-000	C

NOT FOR CONSTRUCTION

A1

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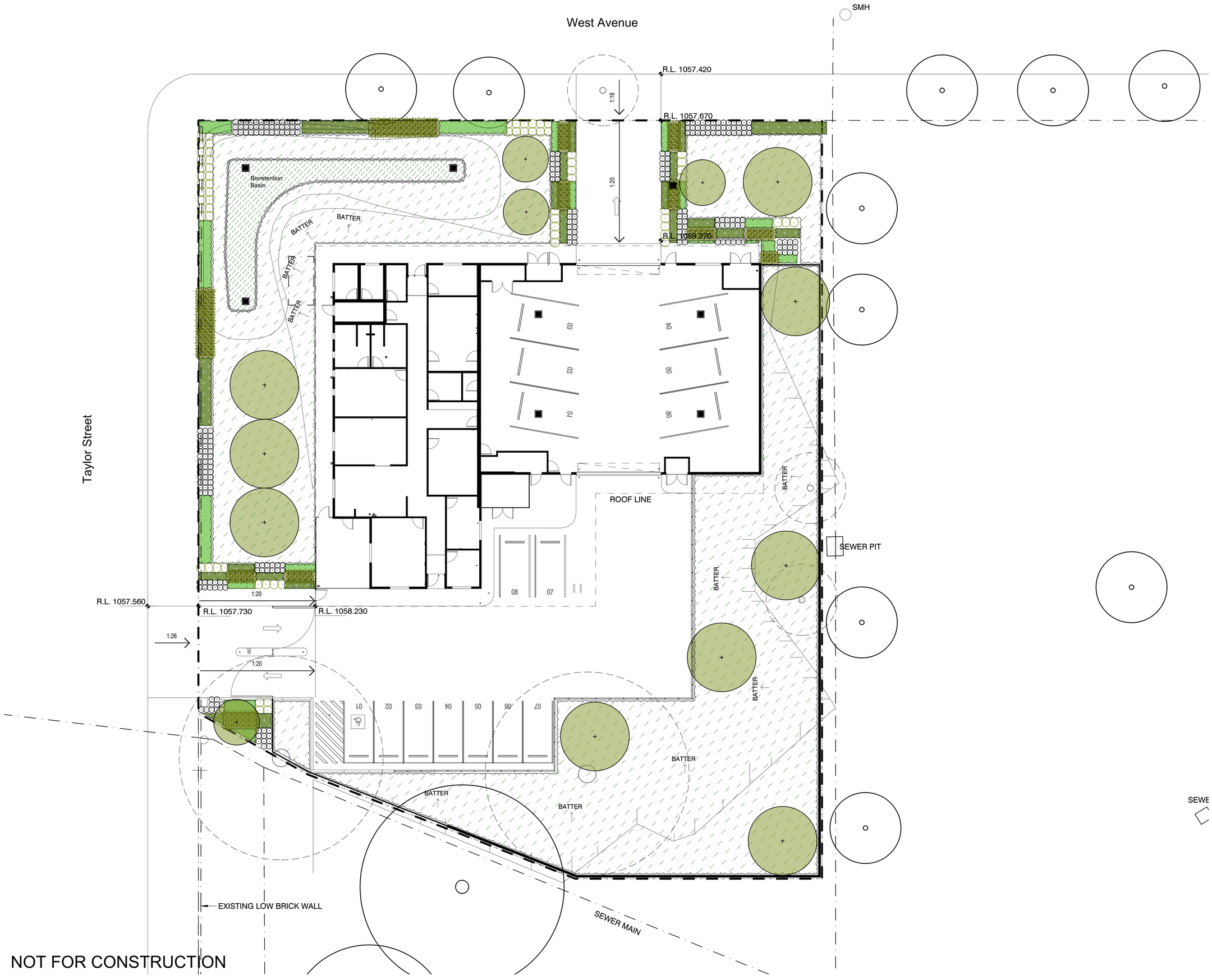
The contractor shall check and verify all work on site (including work by others) before commencing the landscape installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred to the Landscape Architect for confirmation.



Issue	Revision Description	Drawn	Check	Date
C	Architectural Coordination	LW	NM	19.05.2022
B	Architectural Coordination	LW	NM	27.04.2022
A	Development Application	LW	NM	26.04.2022

Legend

- Boundary
- Tree to be Retained
- Tree to Removed
- Proposed Tree — Refer Schedule and Detail
- Grasses and Groundcovers — Refer Schedule and Detail
- Shrubs and Accents — Refer Schedule and Detail
- Planting Matrix — (Refer Schedule and Detail)
- Bioretention Planting — (Refer Schedule and Detail)

Key Plan

Client

NSW GOVERNMENT Health Infrastructure

NSW Ambulance

Project

RAIR Glen Innes
Taylor Street, Glen Innes,
NSW 2370

SITE IMAGE

Level 1, 3-5 Baptist Street
Redfern NSW 2016
Australia

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www.siteimage.com.au

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Landscape Architects

REF

Drawing Name

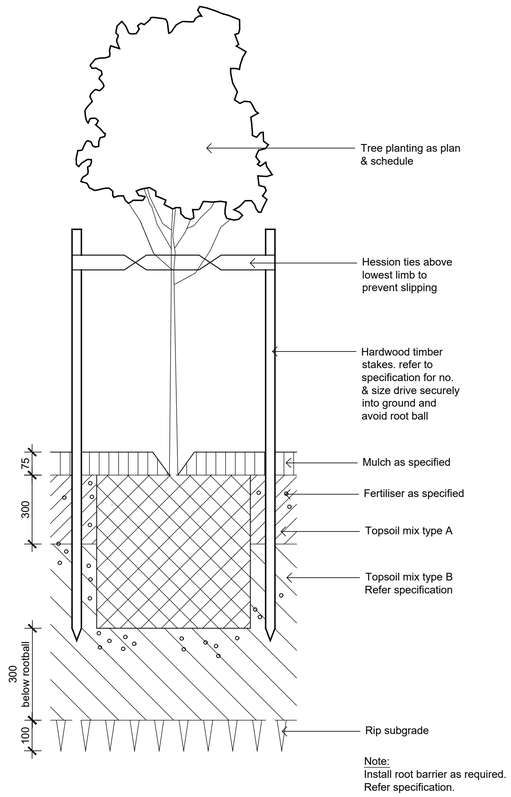
Landscape Plan

Scale 1:150 @ A1 (0 1 2 3 4 5m)

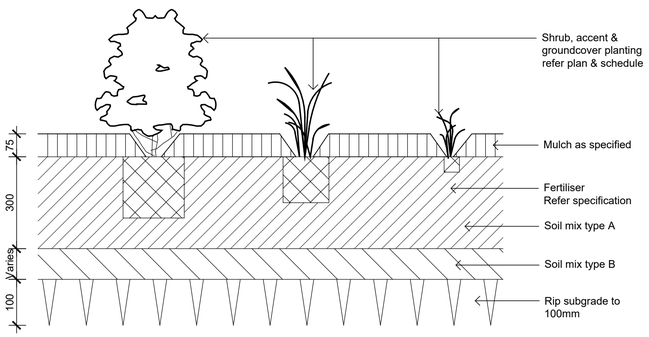
Job Number	Drawing Number	Issue
SS22-4920	R31-LA-101	C

NOT FOR CONSTRUCTION

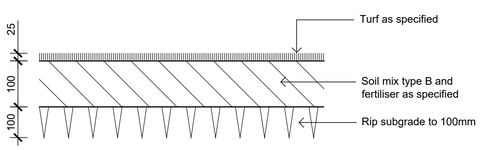
A1



01 501 Detail 75-200L Tree Planting on Grade
1:10



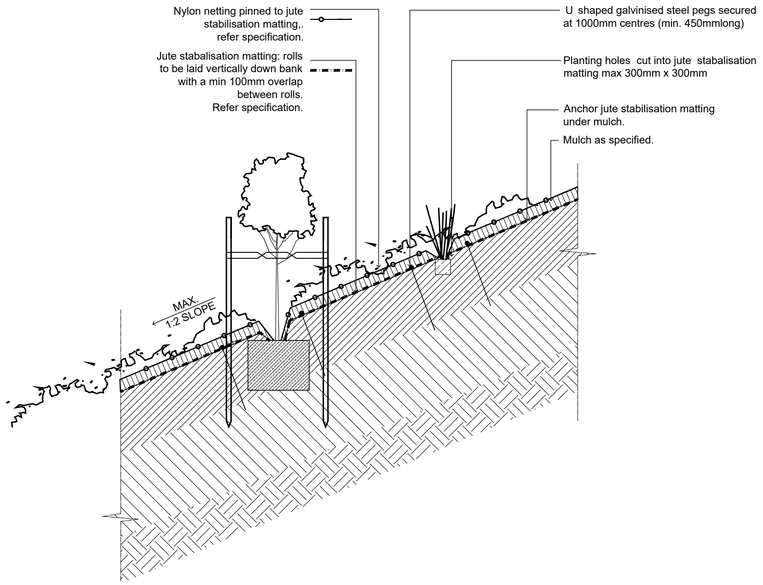
02 501 Detail Shrub Accent & Groundcover Planting on Grade
1:10



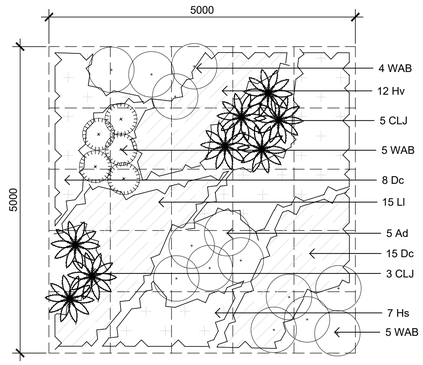
03 501 Detail Turf on Even Grade
1:10

NOT FOR CONSTRUCTION

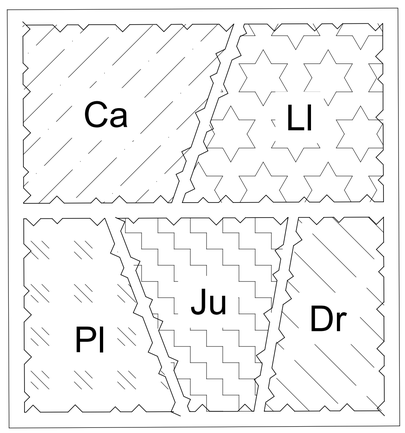
A1



03 501 Typical Embankment Planting
1:20



04 501 Planting Matrix
1:50



05 501 Bio-Retention Basin Mix Planting
1:30

2021 Site Image (NSW) Pty Ltd ABN 44 801 262 380 as agent for Site Image NSW Partnership. All rights reserved. This drawing is copyright and shall not be reproduced or copied in any form or by any means (graphic, electronic or mechanical including photocopy) without the written permission of Site Image (NSW) Pty Ltd Any license, expressed or implied, to use this document for any purpose what so ever is restricted to the terms of the written agreement between Site Image (NSW) Pty Ltd and the instructing party.

The contractor shall check and verify all work on site (including work by others) before commencing the landscape installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred to the Landscape Architect for confirmation.

Issue	Revision Description	Drawn	Check	Date
B	Architectural Coordination	LW	NM	19.05.2022
A	Development Application	LW	NM	26.04.2022

Legend

Key Plan

Client

NSW GOVERNMENT Health Infrastructure
NSW Ambulance

Project

RAIR Glen Innes
Taylor Street, Glen Innes,
NSW 2370

SITE IMAGE
Level 1, 3-5 Baptist Street
Redfern NSW 2016
Australia

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www.siteimage.com.au

Site Image (NSW) Pty Ltd
ABN 44 801 262 380

Landscape Architects

REF

Drawing Name

Landscape Details

Scale As Shown

Job Number	Drawing Number	Issue
SS22-4920	R31-LA-501	B

7.5 BCA Report

BCA Assessment Report

Lot 2: DP 1208729 Taylor Street, Glen Innes

Project:	Lot 2: DP 1208729 Taylor Street, Glen Innes
Reference No:	113737:12a-BCA-r3
Date:	23 May 2022
Client:	DJRD Architects
Email:	DBeekwilder@djrd.com.au
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Suite 302, Level 3, 151 Castlereagh Street Sydney NSW 2000| **Postal Address** PO Box Q1440, Queen Victoria Building NSW 1230

Document Control

Revision	Date	Description	
113737:12a-BCA-r1	21 April 2022	REF Stage BCA Assessment Report	
113737:12a-BCA-r2	26 April 2022	Fire wall added	
113737:12a-BCA-r3	23 May 2022	Fire Wall Location Updated	
		Prepared by	Verified by
		Jarryd Beckman	Matthew Kemp
		Accredited Certifier Grade A1, No. BDC 3126 Building Regulations Consultant	Accredited Certifier Grade A1, No. BDC 0208 Senior Building Regulations Consultant

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BASIS OF ASSESSMENT

1.1. Location and Description

The building development, the subject of this report, is located at Lot 2: DP 1208729 Taylor Street, Glen Innes. The proposed development is located on the Glen Innes District Hospital site and comprises the construction of a new single storey Ambulance station which will include an enclosed plant room used for ambulance parking, external public parking, amenities, sleeping pods and general office / communal areas.

The main pedestrian access into the building is from the northern boundary via the 1:20 walkway, while the main vehicular access is from the northern and eastern driveway entrances.

Photo sourced from DJRD Architectural Plans

1.2. Purpose

The purpose of this report is to assess the current design proposal against the Deemed-to-Satisfy Provisions of BCA 2019 Volume One Amendment 1, and to clearly outline those areas (if any) where compliance is not achieved, where areas may warrant redesign to achieve strict BCA compliance or where areas may be able to be assessed against the relevant performance criteria of BCA 2019.

1.3. Building Code of Australia

This report is based on the Deemed-to-Satisfy Provisions of the National Construction Code Series Volume One – Building Code of Australia, 2019 Edition (BCA) Amendment 1 incorporating the State variations where applicable. Please note that the version of the BCA applicable to new building works is the version applicable at the time of the lodgement of the Construction Certificate (CC) application to the Accredited Certifying Authority. The BCA is updated generally on a three-yearly cycle, starting from the 1st of May 2016.

1.4. Limitations

This report does not include nor imply any detailed assessment for design, compliance or upgrading for:

(a) the structural adequacy or design of the building;

(b) the inherent derived fire-resistance ratings of any proposed structural elements of the building (unless specifically referred to); and

(c) the design basis and/or operating capabilities of any proposed electrical, mechanical or hydraulic fire protection services.

This report does not include, or imply compliance with:

(a) the National Construction Code – Plumbing Code of Australia Volume 3;

(b) the Disability Discrimination Act 1992;

(c) The deemed-to-satisfy provisions of Part D3 and Clause F2.4 of the BCA (refer to separate Access Report)

(d) Demolition Standards not referred to by the BCA;

(e) Work Health and Safety Act 2011;

(f) Requirements of Australian Standards unless specifically referred to;

(g) Requirements of other Regulatory Authorities including, but not limited to, Telstra, Telecommunications Supply Authority, Water Supply Authority, Electricity Supply Authority, Work Cover, Roads and Maritime Services (RMS), Local Council, ARTC, Department of Planning and the like; and

1.5. Design Documentation

This report has been based on the Design plans and Specifications listed in Annexure A of this Report.

2 BUILDING DESCRIPTION

For the purposes of the Building Code of Australia (BCA) the development may be described as follows.

2.1. Rise in Storeys (Clause C1.2)

The building has a rise in storeys of one (1).

2.2. Classification (Clause A6.0)

The building has been classified as follows.

Table 1. Building Classification

Class	Level	Description
3	Ground	Sleeping pods
5	Ground	Offices, amenities, meeting and communal ancillary areas
7a	Ground	Plant room used for the parking of the ambulances

2.3. Effective Height (Clause A1.0)

The building is single storey and therefore the effective height is not applicable.

2.4. Type of Construction Required (Table C1.1)

The building is required to be of Type C Construction.

2.5. Floor Area and Volume Limitations (Table C2.2)

The building does not exceed the maximum floor area and volume limits of:-

Class 5	Maximum Floor Area	3 000m^2
	Maximum Volume	18 000m^3
Class 7a	Maximum Floor Area	2 000m^2
	Maximum Volume	12 000m^3

Note: There are no maximum floor area or volume limitations for Class 3 parts as these classifications are required to have fire rated bounding construction under Specification C1.1.

2.6. Fire Compartments

The building has the following fire compartments:

1. The plant room; and
2. The admin portion of the building (separated by a fire wall).

2.7. Exits

The following points in the building have been considered as the exits:

(a) The entrance door which is located adjacent to the gym.

(b) The main entrance door which is located adjacent to the office and admin rooms.

(c) Both external doorways in the plant room / covered parking area.

2.8. Location of Fire-source features

The fire source features for the subject development are:

North: The far side of Taylor Street.

South: The external wall of the Glen Innes District Hospital.

East: The far side of West Avenue.

West: The external wall of the Glen Innes District Hospital.

3 BCA ASSESSMENT

3.1. General

An assessment of the Architectural design documentation against the Deemed-to Satisfy Provisions of the Building Code of Australia, 2019 Amendment One (BCA) has been undertaken. It is important to note that only those items which are considered to be critical to the compliance of the proposed works have been discussed below. Any parts of the BCA2019 which have not been discussed are considered to be satisfied to an appropriate level and would readily be able to achieve compliance at Construction Certificate (CC) stage or are not applicable to the proposed development.

3.2. Dimensions and Tolerances

The BCA contains the minimum standards for building construction and safety, and therefore generally stipulates minimum dimensions which must be met. BCA Logic's assessment of the plans and specifications has been undertaken to ensure the minimum dimensions have been met.

The designer and builder should ensure that the minimum dimensions are met onsite and consideration needs to be given to construction tolerances for wall set outs, applied finishes and skirtings to corridors and bathrooms for example, tiling bed thicknesses and the like which can adversely impact on critical maters such as access for people with disabilities, stair and corridor widths and balustrade heights.

3.3. Section C – Fire Resistance

Clause C1.8 – Lightweight construction

Where lightweight construction is used for the fire rated walls, then the lightweight construction must comply with Clause C1.8 and Specification C1.8.

Clause C1.10 – Fire Hazard Properties

The fire hazard properties for the proposed internal linings throughout the building shall be further assessed at CC stage to determine compliance with Specification C1.10.

Clause C2.2 – Fire compartment limitations

The floor area and volume of the proposed building does not exceed the maximum limitations as specified for a Type C building with Class 3, 5 and 7a parts.

Clause C2.7 – Separation by Fire Walls

The building has a fire wall construction between the plant and admin portions of the building to separate the building for the purposes of Part E, therefore removing the need for a hydrant as the floor area of each building is less than 500m^2. The fire wall will be required to extend to the underside of the non-combustible roof covering as per the provisions of this clause.

Clause C2.8 – Separation of classifications in the same storey

The building is Type C Construction, therefore the FRL's for Class 3, 5 and 7a parts are generally the same, albeit the Class 3 sleeping pods will require FRL 60/60/60 bounding walls. Compliance is readily achievable, subject to fire compartment plans being provided at CC stage.

Clause C2.13 – Electrical supply systems

The building contains a main switch board, however it is assumed that the emergency equipment will have battery back-up and therefore no fire separation is required.

Clause C2.14 – Public corridors in Class 2 and 3 buildings

The Class 3 sleeping pods discharge onto a common corridor, however the corridor is less than 40 metres long, therefore no additional smoke separation is required.

Clause C3.3 – Separation of external walls and associated openings in different fire compartments

The external walls and any openings located within 4 metres of the fire wall must achieve an FRL of 60/60/60 and have any openings protected in accordance with Clause C3.4. Compliance is readily achievable at CC stage.

Clause C3.5 – Doorways in fire walls

The internal doorways that are located within the fire door must have self-closing -/90/30 fire doors installed. Compliance is readily achievable at CC stage.

Clause C3.11 – Bounding construction: Class 3 buildings

The building is Type C Construction, therefore the doorways from the Class 3 sleeping pods which open into the corridor must be protected with a self-closing, tight fitting, solid core door, not less than 35 mm thick.

Clause C3.15 – Openings for service installations:

Where services pass through fire rated elements, they must be protected in accordance with Specification C3.15.

Specification C1.1 – Fire Resisting Construction:

To satisfy the fire rating provisions of Type C Construction, the only elements required to achieve an FRL are the fire wall and bounding walls of the sleeping pods (including the common corridor). With regards to the fire wall, it will have to achieve an FRL of 90/90/90 whilst the bounding walls and adjacent corridor will have to achieve an FRL of 60/60/60 and extend to the underside of the non-combustible roof covering.

3.4. Section D1 & D2 – Provision for Escape & Construction of Exits

Clause D1.4 – Exit travel distances:

With reference to the designated exits outlined in section 2.7 of this report and Clause D1.4, all points throughout the Class 5 and 7a parts are located within 20 metres (Class 7a parts) or 30 metres (Class 5 parts) of an exit, or within 20 metres of a point from which travel in different directions to 2 exits is available, in which case the maximum distance to one of those exits does not exceed 40 metres. With regards to the travel distances from the Class 3 sleeping pods, the entry doors are located no further than 20 metres from a point of open space located along the northern pathway, therefore compliance with Clause D1.4 throughout the entire building is achieved.

Clause D1.5 – Distance between alternative exits:

Where alternative exits are relied upon throughout the Class 5 and 7a parts, the distance between the alternate exits does not exceed 60 metres, nor are they located within 9 metres of each other.

Clause D1.6 – Dimensions of exits and paths of travel to exits:

The unobstructed height throughout all exits and paths of travel to exits must be no less than 2 metres, except for a doorway where a height of 1980mm is permitted. Furthermore, all egress widths must maintain a clear distance of 1 metre, except doorways are permitted to have a reduced width of 750 mm (when the doorway is deemed non-accessible).

Clause D1.10 – Discharge from exits:

The exits throughout the building discharge to a point where occupants will be required to egress along a maximum 1:20 walkway to get to the street. Compliance is readily achievable, subject to further details being provided at CC stage. The exits that serve as alternate exits are considered to be located far enough apart as practical.

Clause D2.7 – Installations in exits and paths of travel:

Where there are electricity meters, distribution boards, central telecommunications distribution boards or equipment located in a required exit or along a path of travel to a required exit or corridor, then the services and/or equipment must be enclosed by non-combustible construction or a fire-protective covering with the doorways and other openings suitably smoke sealed in accordance with Clause D2.7.

Clause D2.15 – Thresholds:

The threshold of all doorways must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless the door opens to open space and the threshold is provided with a threshold ramp or step ramp in accordance with AS 1428.1-2009.

Clause D2.20 – Swinging doors:

All doorways that serve as required exits swing in the direction of egress and would comply with the provisions of this clause.

Clause D2.21 – Operation of latch:

All doorways that serve as a required exit or are located along a path of travel to a required exit, must be readily opened without a key from the side that faces a person seeking egress and be -

(i) a single hand downward action lever on a single device which is located between 900 mm and 1.1 metres from the floor and have a clearance between the handle and the back plate or door face of not less than 35 mm and not more than 45mm; or

(ii) a single hand pushing action on a single device which is located between 900 mm and 1.2 metres from the floor surface.

3.5. Section E – Services and equipment

Clause E1.3 – Fire Hydrants:

The building is separated with a fire wall, therefore under the provisions of Clause C2.7, the plant and admin parts can be treated as separate buildings. On this basis, each of these buildings will have a floor area less than 500m^2 and consequently no hydrant coverage is required.

Clause E1.4 – Fire hose reels:

The building is separated with a fire wall, therefore under the provisions of Clause C2.7, the plant and admin parts can be treated as separate buildings. On this basis, each of these buildings will have a floor area / fire compartment less than 500m^2 and consequently no hose reels are required in the Class 7a plant room.

Clause E1.6 – Portable fire extinguishers:

The building will be required to be protected with portable fire extinguishers in accordance with Clause E1.6 and AS 2444-2001. Further details to be provided at CC stage.

Clause E2.2 – General requirements (smoke detection):

The building contains a Class 3 part, therefore the building requires a smoke detection system in accordance with Clause E2.2a. To satisfy the provisions of Clause E2.2a and Specification E2.2a, the building will require either of the following detection systems:

(ii) A Clause 3 smoke alarm system throughout which is hardwired and powered from consumers main source and is in accordance with AS 3786 – 2014 and Clause 3 of Specification E2.2a; or

(iii) A Clause 4 smoke detection system throughout which has a Fire Indictor Panel (FIP) installed which alerts a building occupant warning system in accordance with Clause 7 of Specification E2.2a. The smoke detection system must be installed in accordance with Clause 4 of Specification E2.2a and AS 1670.1-2015. Note: Where a Clause 4 smoke detection is installed, then the fire rating of the main switch board may be required if the switch board sustains power to the FIP and there is no battery backup.

Clause E4.2 – Emergency lighting and exit sign requirements:

The building will require emergency lighting and illuminate exits and/or directional signs in accordance with BCA Clauses E4.2, E4.4, E4.5, E4.6 and E4.8 and AS 2293.1-2005.

3.6. Section F – Health and Amenity

Clause F1.0 Deemed-to-satisfy provisions (weatherproofing)

Performance Requirement FP1.4, for the prevention of the penetration of water through external walls, must be complied with. There are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls, therefore a performance solution will be required at CC stage.

Clause F1.1 – Stormwater drainage:

Stormwater drainage to comply with AS/NZS 3500.3:2018.

Clause F1.4 – External above ground membranes:

Waterproofing membranes for external above ground use to comply with AS 4654 Parts 1 and 2:2012.

Clause F1.5 – Roof coverings:

The plans show metal sheeting roofing. The metal sheet roofing must comply with AS 1562.1.

Clause F1.6 – Sarking:

Sarking-type materials used for weatherproofing must comply with AS/NZS 4200 Part 1 and 2:2017.

Clause F1.7 – Waterproofing of wet areas in buildings:

Wet areas must be constructed in accordance with AS 3740:2010 and Clause F1.7 of the BCA.

Clause F1.9 – Damp-proofing:

Moisture is to be prevented from reaching the walls above a damp-proof course, and the underside of the suspended floors. Where a damp-proof course is provided, it must consist of –

(i) a material that complies with AS/NZS 2904; or

(ii) impervious sheet material in accordance with AS 3660.1

Clause F1.10 – Damp-proofing of floors on the ground:

If a floor of a room is laid on the ground or on fill, moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870:2011.

Clause F1.13 – Glazed assemblies:

The following glazed assemblies in the external walls, must comply with AS 2047-2014 requirements for resistance to water penetration:

(i) Windows

(ii) Swinging glazed doors

(iii) Adjustable louvres

(iv) Window walls with one piece framing

Clause F1.1 Facilities in residential buildings:

The Class 3 sleeping pods will have access to the common area sanitary facilities.

Clause F2.3 – Facilities in Class 3 to 9 buildings:

The Class 5 and 7a parts have a proposed accessible sanitary compartment, as well as separate male and female bathrooms. The male and female bathrooms both contain one WC and two wash basins. In accordance with Table F2.3, these sanitary facilities will accommodate a total of 20 females and 20 males. It is noted that there is also a WC and shower provided adjacent to the sleeping pods, however this compartment is treated as a non-required compartment as the building does not have more than 40 staff members, therefore it is not included in the required occupancy calculations under Table F2.3.

Clause F3.1 – Height of rooms and other spaces:

The sections drawings show ceiling heights of 2.7 metres throughout which will achieve compliance with the provisions of this clause.

Clause F4.1 and F4.2 – Natural light:

Natural light is required to the Class 3 sleeping pods. The windows located in the eastern and northern elevations have an aggregate area greater than 10% of the floor area of the bedroom, therefore sufficient natural light is provided in accordance with Clause F4.2.

Clause F4.4 – Artificial lighting:

Artificial Lighting must be provided to all areas / rooms and be installed in accordance with AS/NZS 1680.0:2009.

Clause F4.5 – Ventilation of rooms:

All rooms must be provided with Clause F4.6 compliant natural ventilation **OR** a mechanical ventilation or air-conditioning system complying with AS 1668.2:2012. The plant room is considered to be an enclosed carpark, therefore this part of the building must be provided with mechanical ventilation complying with AS 1668.2; or a system of natural ventilation complying with Section 4 of AS 1668.4.

Part F5 – Sound Transmission and Insulation

The bounding walls of the Class 3 sleeping pods that are adjacent to corridor and WC will require an Rw (airborne) not less than 50 and the wall which separates the two sleeping pods will require an Rw + Ctr (airborne) not less than 50. The doorway in the sleeping pods which opens into the public corridor must achieve an Rw rating no less than 30.

3.7. Section J – Energy Efficiency

The separating wall between the plantroom and the conditioned spaces must comply with the building fabric provisions of J1 of the BCA2019. Where openings are constructed within the envelope of the conditioned part of the building, suitable seals shall be installed around the operable windows and external doors in accordance with the provisions of J3 of the BCA2019.

4 STATEMENT OF COMPLIANCE

The architectural design documentation as referred to in this report have been assessed against the applicable provisions of the Building Code of Australia, (BCA) and it is considered that such documentation either complies or is capable of complying with the relevant provisions of the BCA, for the purposes of a Review of Environmental Factors (REF).

ANNEXURE A DESIGN DOCUMENTATION

Annexure A – Design Documentation

This report has been based on the following design documentation.

Table 2. Architectural Plans

Architectural Plans Prepared by djrd architects			
Drawing Number	**Revision**	**Date**	**Title**
R31-AR-0000	C	18.05.2022	Cover Sheet
R31-AR-0100	C	18.05.2022	Site Analysis
R31-AR-0101	C	18.05.2022	Proposed Site Plan
R31-AR-0103	C	18.05.2022	Proposed Demolition Plan
R31-AR-1101	C	18.05.2022	Ground Floor General Arrangement Plan
R31-AR-1102	C	18.05.2022	Roof Plan
R31-AR-2001	C	18.05.2022	Elevations
R31-AR-2501	C	18.05.2022	Sections
R31-AR-9001	B	18.05.2022	Render
R31-AR-9003	C	18.05.2022	Axonometric

ANNEXURE B ESSENTIAL SERVICES

Annexure B - Essential Services

The following fire safety measures are required to be installed in the building. The following table may be required to be updated as the design develops and options for compliance are confirmed.

Item	Essential Fire and Other Safety Measures	Standard of Performance
Fire Resistance (Floors – Walls – Doors – Shafts)		
1.	Fire seals protecting openings in fire resisting components of the building	**BCA2019 C3.15** (Openings for service installations) **BCA2019 Spec C3.15** AS1530.4:2014 & AS4072.1-2005
2.	Lightweight construction > FRL 60/60/60 fire rated bounding walls around the sleeping pods and adjacent corridor extended to the underside of the non-combustible roof covering > FRL 90/90/90 Fire Wall (if lightweight).	**BCA2019 C1.1, Spec. C1.1** **BCA2019 C1.8, Spec C1.8** **BCA2019 C2.7** (Fire Walls) **BCA2019 C3.11** (Bounding Construction) AS1530.4:2014
3.	Solid core doors Type 'C' Construction	**BCA2019 Spec. C3.4** C3.11 (Bounding Construction)
4.	Doorways and windows > FRL -/90/30 internal fire doors within the fire wall	**BCA2019 Clause C3.5**
General		
5.	Portable fire extinguishers	**BCA2019 E1.6** AS 2444–2001
General Egress		
6.	Warning & operational signs	**BCA2019 D3.6** (Braille Exit Signs) (Note: E4.5 (Exit Signs))
Electrical Services		
7.	Automatic fire detection & alarm: > Clause 3 – AS 3786:2014 Smoke Alarm systems powered from consumer mains in accordance with AS 3786-2014; or > Clause 4 – AS 1670.1:2018 system throughout the building/part connected to a Clause 7 building occupant warning system.	**BCA2019 E2.2**, NSW Table E2.2a, **Spec E2.2a** **Spec E2.2a** - Clause 3 (Smoke alarm system) **Spec E2.2a** - Clause 4 (Smoke detection system)
8.	Emergency lighting	**BCA2019 E4.2, E4.4** AS/NZS 2293.1:2018
9.	Exit signs	**BCA2019 E4.5** (Exit Signs)

Item	Essential Fire and Other Safety Measures	Standard of Performance
		BCA2019 E4.6 (Direction Signs) **BCA2019 E4.8** (Design and Operation - Exits) AS/NZS 2293.1:2018
Mechanical Services		
10.	1. Mechanical ventilation to carpark (if natural ventilation cannot be achieved)	**BCA2019 E2.2, Table E2.2a** **Spec E2.2a**

7.6 DDA Report

Access Assessment Report

Lot 2: DP 1208729 Taylor Street, Glen Innes

Project:	Lot 2: DP 1208729 Taylor Street, Glen Innes
Reference No:	113737:12b-Access-r2
Date:	26 April 2022
Client:	DJRD Architects
Client Contact:	DBeekwilder@djrd.com.au
BCA Logic Contact:	Jarryd Beckman
Direct:	8484 4094
Email:	jbeckman@bcalogic.com.au

Suite 302, Level 3, 151 Castlereagh St, Sydney NSW 2000 | **Postal Address** PO Box Q1440, Queen Victoria Building NSW 1230

Document Control

Revision	Date	Description	
113737:12b-Access-r1	21 April 2022	REF Stage Access Assessment Report	
113737:12b-Access-r2	26 April 2022	Fire wall added	
		Prepared by	Verified by
		Jarryd Beckman	Matthew Kemp
		Registered Certifier Grade A1, No. BDC 3126 Building Regulations Consultant	Registered Certifier Grade A1, No. BDC 0208 Senior Building Regulations Consultant Access Institute Qualified Access Consultant

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1 BASIS OF ASSESSMENT

1.1. Location

The building development, the subject of this report, is located at Lot 2: DP 1208729 Taylor Street, Glen Innes. The proposed development is located on the Glen Innes District Hospital site and comprises the construction of a new single storey Ambulance station which will include an enclosed plant room used for ambulance parking, external public parking, amenities, sleeping pods and general office / communal areas.

The main pedestrian access into the building is from the northern boundary via the 1:20 walkway, while the main vehicular access is from the northern and eastern driveway entrances.

Photo sourced from DJRD Architectural Plans

1.2. Purpose

The purpose of this report is to assess the proposed building against the documents and their relevant Deemed to Satisfy requirements. The report is intended to clearly outline those areas where compliance is not achieved and provide recommendations to achieve compliance:

- Disability Discrimination Act 1992 (DDA);
- Disability Access to Premises Standards 2010 (Premises Standards);
- Building Code of Australia 2019 (BCA2019) Volume 1 Amendment 1 – Part D3 and F2.4; and
- Applicable Australian Standards AS1428.1:2009, and AS2890.6:2009.

1.3. Limitations

This report is limited to an assessment of the access and amenity provisions for people with a disability against the documents as outlined in 1.2 above. It is not an assessment of the proposal against all provisions of the BCA2019 and if this is required, a separate report will be necessary.

This report does not include nor imply any detailed assessment for design, compliance or upgrading for:

- The structural adequacy or design of the building;
- The inherent derived fire-resistance ratings of any existing or proposed structural elements of the building (unless specifically referred to); and
- The design basis and/or operating capabilities of any existing or proposed electrical, mechanical or hydraulic fire protection services.

This report does not include, or imply compliance with:

- The Disability Discrimination Act (it cannot be guaranteed that that a complaint under the DDA will not be made, however should the building comply with BCA2019 and the Premises Standard then those responsible for the building cannot be subject to a successful complaint);
- BCA2019 Sections B, C, E, F, G, H, I, J, Parts D1 and D2;
- Demolition Standards not referred to by the BCA2019;
- Work Health and Safety Act;
- Construction Safety Act;
- Requirements of other Regulatory Authorities including, but not limited to, Telecommunications Supply Authority, Water Supply Authority, Electricity Supply Authority, Work Cover, Roads and Maritime Services (RMS), Local Council, ARTC, Department of Planning and the like; and
- This report does not assess the safety of the particular aspects of the building but merely the minimum standards called up by the documents outlined in Part 1.2 of this report.

1.4. Federal Disability Discrimination Act (DDA)

Disability is broadly defined and includes disabilities which are physical, intellectual, psychiatric, neurological, cognitive or sensory (a hearing or vision impairment), learning difficulties, physical disfigurement and the presence in the body of disease causing organisms.

All organisations have a responsibility, under the DDA, to provide equitable, dignified access to goods and services and to premises used by the public. Premises are broadly defined and would include all areas included within the subject development.

The DDA applies nationally and is complaint based. While the Disability (Access to Premises – Buildings) Standards 2010 and the BC2019 are recognised as a design standard to satisfy certain aspects of the DDA, compliance with the BCA2019 and the referenced standards does not guarantee that a complaint will not be lodged.

1.5. Disability Access to Premises Standards (Premises Standards)

The Premises Standards intend to provide certainty for the building industry in relation to meeting the requirements for access in new and upgraded buildings. They only apply to elements addressed within the Standards. All other elements related to premises will still be subject to the existing provisions of the DDA.

The Premises Standards generally align with the BCA2019 and reference a range of Australian Standards relating to access and other associated matters.

They do not apply to existing buildings that are not undergoing upgrade, however they introduce the concept of the "Affected Part". This means that new works need to be connected to the building's Principal Pedestrian Entrance by an accessible path of travel. This can mean that upgrade to the building may be necessary even where none is proposed.

1.6. Design Documentation

This report has been based on the Design plans and Specifications listed in Annexure A of this Report.

1.7. Definitions

Accessible

Having features to enable use by people with a disability.

Accessway

A continuous accessible path of travel (as defined in AS 1428.1) to, into or within a building.

Continuous Accessible Path of Travel

An uninterrupted path of travel to, into or within a building providing access to all access facilities.

Luminance Contrast

The light reflected from one surface or component, compared to the light reflected from another surface or component.

Ramp

An inclined surface on a continuous accessible path of travel between two landings with a gradient steeper than 1 in 20 but not steeper than 1 in 14.

2 KEY COMPLIANCE CONSIDERATION

2.1. General

The following is a summary of all the individual elements that relate directly to the ability of a person with a disability to access all the portions of the building required to be accessible.

Accessibility has been assessed against the documents outlined in Part 1.2 of this Report. The Annexure of this report provides a detailed assessment of the proposal against ALL relevant Deemed-to-Satisfy Provisions and prescriptive requirements.

Note: It is important that the Annexure is to be read in conjunction with the items below, as some matters may not have had sufficient information provided to allow a detailed assessment to be undertaken.

The abbreviations outlined below have been used in the following tables.

2.2. Classification

Under the provisions of Parts A6 of BCA2019 and Part A4 of the Access Code, the building has been classified as follows:

Table 1. Building Classification

Class	Level	Description
3	Ground	Sleeping pods (sole occupancy unit)
5	Ground	Offices, amenities, meeting and communal ancillary areas
7a	Ground	Plant room used for the parking of ambulances

Note: The Sleeping pods have been classified as a Class 3 part, on the basis that the rooms will be a common place of transient living for a number of unrelated occupants i.e. operational ambulance staff.

2.3. Dimensions and Tolerances

The Premises Standards and BCA contains the minimum standards for building construction and safety, and therefore generally stipulates minimum dimensions which must be met. BCA Logic's assessment of the plans and specifications has been undertaken to ensure the minimal dimensions have been met.

The designer and builder should ensure that the minimum dimensions are met onsite and consideration needs to be given to construction tolerances for wall set outs, applied finishes and skirtings to corridors and bathrooms for example, tiling bed thicknesses and the like which can adversely impact on critical maters such as access for people with disabilities, stair and corridor widths and balustrade heights.

2.4. Areas Required to be Accessible

The following areas of the building are required to be accessible:

Table 2. Areas Required to be Accessible

Area / Room	Description
Class 3 Sleeping pods	An exemption under Clause D3.4 has been assumed, on the basis that the occupants of the sleeping pods will be operational ambulance employees. It is readily assumed that the operational ambulance workers will be able-bodied persons who will not require the room to have accessible features.
Class 5 Offices, amenities, meeting and communal ancillary areas	To and within all areas normally used by the occupants
Class 7a Plant room used for the parking of the ambulances	There are no accessible carparking spaces in the plantroom, however there is an accessible sanitary compartment provided in the plant room and therefore an accessway shall be provided to this compartment. Furthermore, there is an accessible carparking space located in the external public parking area, therefore access from this space to the building must be provided.

Note: The limitations and exemptions of Clauses D3.2, D3.3 and D3.4 of the BCA2019 and Access Code been considered where applicable in the process of developing the above table.

3 STATEMENT OF COMPLIANCE

The design documentation as referred to in this report has been assessed against the applicable provisions for Accessibility as outlined in Part 1.2 of this report. It is considered that such documentation complies or is capable of complying (as outlined in Part 2 of this Report) with those documents, for the purposes of a Review of Environmental Factors (REF).

Annexure A – Design Documentation

This report has been based on the following design documentation.

Table 3. Architectural Plans

Architectural Plans Prepared by djrd architects			
Drawing Number	**Revision**	**Date**	**Title**
R31-AR-0000	B	23.04.2022	Cover Sheet
R31-AR-0100	B	23.04.2022	Site Analysis
R31-AR-0101	B	23.04.2022	Proposed Site Plan
R31-AR-0103	B	23.04.2022	Proposed Demolition Plan
R31-AR-1101	B	23.04.2022	Ground Floor General Arrangement Plan
R31-AR-1102	B	23.04.2022	Roof Plan
R31-AR-2001	B	23.04.2022	Elevations
R31-AR-2501	B	23.04.2022	Sections
R31-AR-9003	B	23.04.2022	Axonometric

Annexure B - Premises Standards & BCA Assessment

N/A	Not Applicable. The Deemed-to-Satisfy clause is not applicable to the proposed design.
Complies	The relevant provisions of the Deemed-to-Satisfy clause have been satisfied by the proposed design.
CRA – Refer Annexure C	'COMPLIANCE READILY ACHIEVABLE'. It is considered that there is not enough information included in the documentation to accurately determine strict compliance with the individual clause requirements. However, with further design development, compliance can readily be achievable. This item is to be read in conjunction with the BCA Specification included within Annexure C of this report.
FI	Further Information is necessary to determine the compliance potential of the building design.
PS	Performance Solution with respect to this Deemed-to-Satisfy Provision is necessary to satisfy the relevant Performance Requirements.
DNC	Does Not Comply.
Noted	BCA Clause simply provides a statement not requiring specific design comment or confirmation.

Building Code of Australia 2019 Assessment Summary (BCA2019) / Premises Standards (Access Code)

Table 4. BCA 2019 Summary

Clause	Clause Requirements	Comment	Status
Section D: Access and Egress			
Part D3 – Access for People with a Disability			
D3.0: Deemed-to-Satisfy Provisions	Informational	Informational	Noted
D3.1: General Building Access Requirements	The building or parts are required to be accessible. Accessible meaning having the features necessary to permit its use by persons with a disability. **Class 3 –** From a pedestrian entrance to at least 1 floor containing SOU's, to the entrance doorway of each SOU located on that level, and any other level served by a passenger lift or an accessible ramp. To and within not less than 1 of each type of room or space for use in common by the residents To and within at least 1 SOU's **Class 5 –** To and within all areas normally used by the occupants. **Class 7 –** To and within any level containing accessible carparking spaces.	**Class 3 parts –** An exemption under Clause D3.4 has been assumed, on the basis that the occupants of the sleeping pods will be operational ambulance employees. It is readily assumed that the operational ambulance workers will be able-bodied persons who will not require the room to have accessible features. **Class 5 parts –** Disabled access is capable of being achieved to and within the Class 5 parts of the building. Dimensioned details shall be provided at CC stage to confirm the door widths and circulation zones. **Class 7a –** Access is provided throughout the plantroom to the accessible sanitary compartment. Access from the external disabled carparking space to and within the building is capable of achieving compliance.	CRA – Refer Annexure C CRA – Refer Annexure C CRA – Refer Annexure C
D3.2: Access to Buildings	(a) An accessway must be provided to a building required to accessible – (i) from the main points of a pedestrian entry at the allotment boundary; and	The accessway from the street to the principle pedestrian entrance will utilise a walkway which is no steeper than 1:20, enabling occupants to travel from Taylor street to the main entrance door. The accessway is capable of	CRA – Refer Annexure C

Section D: Access and Egress			
	(ii) from any required accessible carparking space on the allotment. (b) In a building required to be accessible, an accessway must be provided through the principal pedestrian entrance, and – (i) through not less than 50% of all pedestrian entrances including the principal pedestrian entrance; and (ii) in a building with a total floor area more than 500 m2, a pedestrian entrance which is not accessible must not be located more than 50 m from an accessible pedestrian entrance, except for pedestrian entrances serving only areas exempted by D3.4. (c) For the purposes of (c)— (i) an accessible pedestrian entrance with multiple doorways is considered to be one pedestrian entrance where— (A) all doorways serve the same part or parts of the building; and (B) the distance between each doorway is not more than the width of the widest doorway at that pedestrian entrance (see Figure D3.2); and a doorway is considered to be the clear, unobstructed opening created by the opening of one or more door leaves (see Figure D3.2).	achieving compliance with the relevant provisions of AS 1428.1-2009. The accessway from the external accessible carparking space will utilise the driveway and pathways that provide access to the principal pedestrian entrance. The accessway is capable of achieving compliance with AS 1428.1-2009. The entrance doors will readily achieve the required unobstructed clearance of 850mm and wheelchair circulation clearances of AS 1428.1.	CRA – Refer Annexure C Complies
D3.3: Parts of Buildings to be Accessible	> Walkways and ramps must comply with clause 10 of AS 1428.1-2009. > Non-fire-isolated stairways must comply with Clause 11 of AS 1428.1-2009.	<u>Walkways and ramps</u> The building has a walkway that is no steeper than 1:20 located in the front setback of the site. This walkway is capable of achieving compliance with AS 1428.1-2009.	CRA – Refer Annexure C

Section D: Access and Egress			
	> Fire-isolated stairways must comply with clause 11 (f) & (g) of AS 1428.1-2009. The accessways must be provided with: > Passing spaces (1800x2000mm) complying with AS1428.1 at 20m max. intervals where direct line of sight is not available. > Turning spaces (1540x2070mm) complying with AS1428.1 within 2m of the end of accessways (including corridors or the like); and at 20m max. intervals along an accessway. > An intersection of accessways satisfies the spatial requirements for a passing and turning space.	Non-fire-isolated stairs The building does not have any non-fire-isolated stairs. Fire-isolated stairways The building does not have any fire-isolated stairs. Turning spaces The internal corridors throughout the building allow sufficient space for a wheelchair to make a 180- degree turn by achieving a minimum space of 1540mm x 2070mm.	N/A N/A Complies
D3.4: Exemptions	Certain areas can be exempted under this clause if pose a health and safety risk for people with disability and /or access would be inappropriate because the particular purpose for which this area is used (e.g. plant rooms, service areas, heavy / toxic item storage, etc.)	The following areas within this development have been identified as potential excepted areas, subject to certifier's approval: > The Class 3 sleeping pods are considered to receive a concession, on the basis that the occupants of the sleeping pods will be operational ambulance employees and it is readily assumed that the operational ambulance workers will be able-bodied persons who will not require the room to have accessible features. > The Delivery room.	Noted
D3.4: Accessible Car Parking	Accessible carparking spaces to be in compliance with this Clause and AS2890.6 in the proportion required by BCA2019.	There is an accessible carparking space provided in the external public parking area. The space will require an adjacent shared zone with bollard as per the requirements of AS 2890.6. Compliance is readily achievable at CC stage.	CRA – Refer Annexure C
D3.6: Signage	> Braille and tactile signage complying with Specification D3.6 and incorporating the international symbol of access, or deafness as appropriate, must identify each:	Signage details are to be provided at CC stage for the accessible sanitary compartment and the ambulant compartment. Compliance is readily achievable.	CRA – Refer Annexure C

Section D: Access and Egress			
	○ sanitary facility; and ○ identify each door required by E4.5 to be provided with an exit sign and state "Exit" and "Level" and either: (aa) the floor level number; or (bb) a floor level descriptor; or (cc) a combination of (aa) and (bb) > Signage to accessible sanitary facilities must identify if the facility is suitable for left or right handed use; and > Signage to identify an ambulant accessible facility in accordance with AS 1428.1 must be located on the door of the facility. Where a bank of facilities is not provided with an accessible unisex sanitary facility, directional signage incorporating the international symbol of access in accordance with AS 1428.1 must be places at the location of the sanitary facilities that are not accessible, to direct a person to the location of the nearest accessible unisex facility.		
D3.7: Hearing Augmentation	N/A	N/A	N/A
D3.8: Tactile Indicators	N/A	The building does not have any ramps, stairways or head height clearances less than 2 m which would require tactiles.	N/A
D3.9: Wheelchair seating spaces in Class 9b Assembly Buildings	N/A	N/A	N/A
D3.10: Swimming Pools	N/A	N/A	N/A

Section D: Access and Egress			
D3.11: Ramps	On an accessway a series of connected ramps must not have a combined vertical rise of 3.6m and a landing for a step ramp must no overlap a landing for another step ramp or ramp.	The building does not have any ramps with a combined rise more than 3.6 m.	Complies
D3.12: Glazing on an Accessway	On an accessway, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.	Compliance is readily achievable, subject to a detailed window/door schedule being provided at CC stage to confirm the colour and location of the glazing strips on the fully glazed doorways and sidelights located along an accessway. The glazing strips shall achieve a minimum 30% luminance contrast to the floor surface on the adjoining side of the doorway.	CRA – Refer Annexure C

Section F: Healthy and Amenity			
Part F2 – Sanitary and Other Facilities			
F2.0: Deemed-to-Satisfy Provisions	Informational	Informational	Noted
F2.4: Accessible Sanitary Facilities (including Table F2.4)	In a building required to be accessible— (a) accessible unisex sanitary compartments must be provided in accessible parts of the building in accordance with Table F2.4(a); and (b) accessible unisex showers must be provided in accordance with Table F2.4(b); and (c) at each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment at that bank of toilets, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1 must be provided for use by males and females; and (d) an accessible unisex sanitary compartment must contain a closet pan, washbasin, shelf or bench	There is an accessible sanitary compartment proposed in the building which is accessed from the admin area. Based off scaled measurements, the compartment is capable of achieving a clear floor area of 2300mm x 2630mm which will allow sufficient space for a compliant WC, wash basin, shower and other fixtures and fittings to be installed in accordance with AS 1428.1-2009. In addition, both of the single WC's in the male and female bathrooms are shown as ambulant compartments with grabrails and circulation spaces in front of the pans. Compliance with AS 1428.1-2009 at CC stage is readily achievable. Note: there is also a WC and shower provided adjacent to the sleeping pods, however this compartment is treated as a non-required compartment as the building does not have more than 40 staff members, therefore it	CRA – Refer Annexure C CRA – Refer Annexure C Noted

Section F: Healthy and Amenity			
	top and adequate means of disposal of sanitary towels; and (e) the circulation spaces, fixtures and fittings of all accessible sanitary facilities provided in accordance with Table F2.4(a) and Table F2.4(b) must comply with the requirements of AS 1428.1; and (f) an accessible unisex sanitary facility must be located so that it can be entered without crossing an area reserved for one sex only; and (g) where male sanitary facilities are provided at a separate location to female sanitary facilities, accessible unisex sanitary facilities are only required at one of those locations.	is not included in the required occupancy calculations under Table F2.3.	
F2.9: Accessible adult change facilities	N/A	N/A	N/A

Annexure C - Compliance Specification

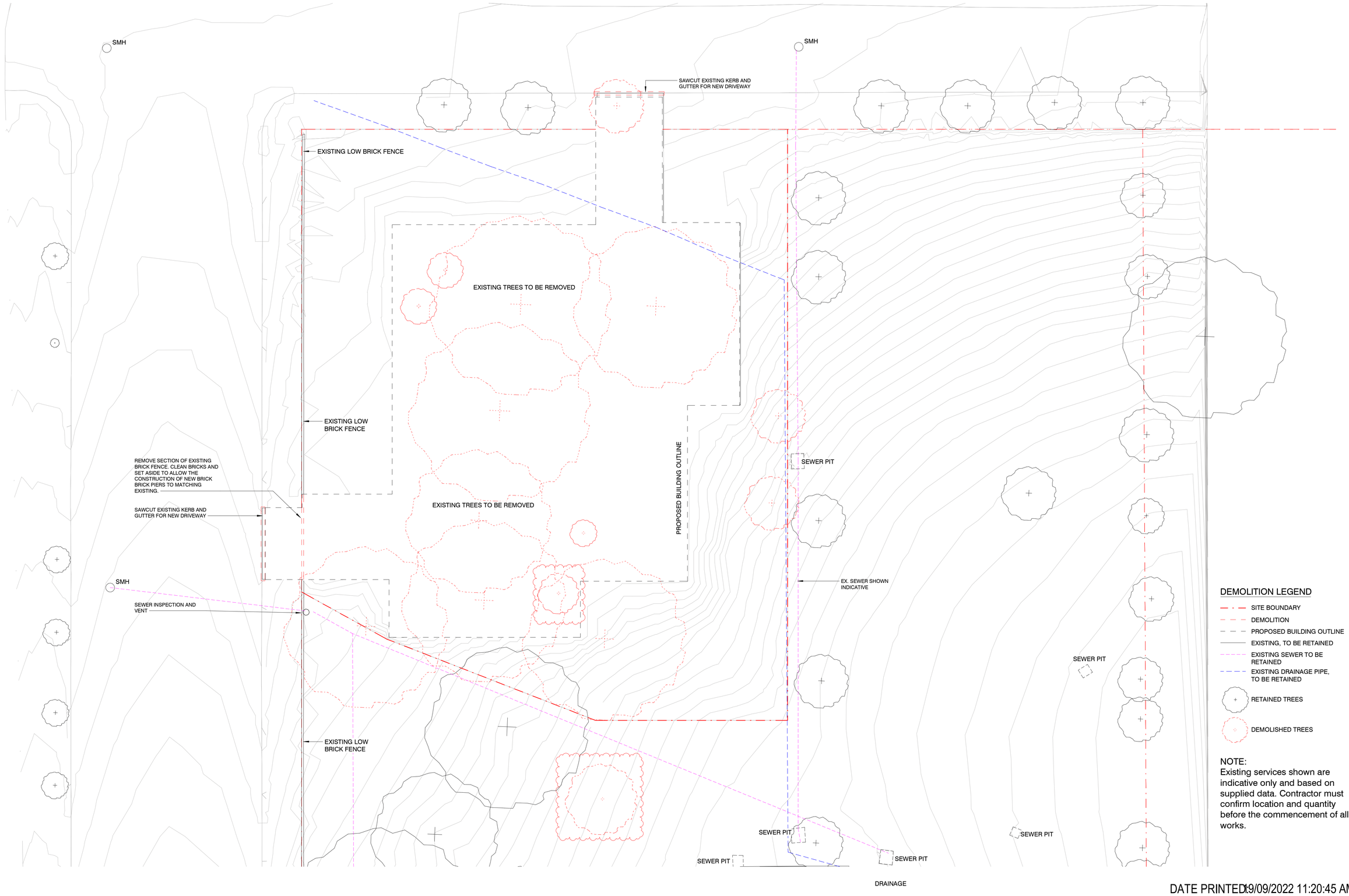
Design Certification

Further due to the level of detail provided at this stage the following items are to form part of a design statement or specification:

General

1. On an accessway where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights or glazing capable of being mistaken for a doorway or opening will be clearly marked and comply with Clause 6.6 of AS1428.1-2009. A solid non-transparent contrasting line not less than 75mm wide is to extend across the full width of the glazing panel. The lower edge of the contrasting line is to be located between 900-1000mm above the plane of the finished floor level. The contrasting line is to provide a minimum of 30% luminance contrast when viewed against the floor surface or surfaces within 2 metres of the glazing on the opposite side.
2. All doorways will have a minimum luminance contrast of 30% in accordance with Clause 13.1 of AS1428.1-2009.
3. Fixtures and fittings in accessible sanitary facilities will be provided and installed in accordance Clause 15 of AS1428.1-2009.
4. Fixtures and fittings in ambulant facilities will be provided and installed in accordance Clause 16 of AS1428.1-2009.
5. Walkways will comply with Clause 10 of AS1428.1-2009.
6. For the walkways, the floor or ground surface abutting the sides of the walkway will be firm and level of a different material to that of the walkway at the same level and follow the grade of the walkway and extend horizontally for a minimum of 600mm, or be provided with a kerb or kerb rail in accordance with Clause 10.2 of AS1428.1-2009.
7. Grabrails will comply with Clause 17 of AS1428.1-2009.
8. Accessible car spaces will achieve compliant headroom clearances in accordance with Clause 2.4 of AS2890.6-2009.
9. Demarcation will be provided in the accessible car space and adjacent shared zone in accordance with Clause 3.1 and 3.2 of AS2890.6. Refer to Annexure B1 for a diagrammatic explanation.
10. Bollards will be provided in the shared disabled car space area in accordance with Clause 2.2.1(e) of AS2890.6-2009. Refer to Annexure B1 for a diagrammatic explanation.
11. Switches and power points will comply with Clause 14 of AS1428.1-2009.
12. Floor and ground floor surfaces on accessible paths and circulation spaces including the external areas will comply with Clause 7 of AS1428.1-2009. Any level difference over 3mm must be ramped according AS1428.1 Clause 10.5.
13. Braille and tactile signage will comply with BCA2019 Clause D3.6.
14. Signage will have to comply with Clause 8 of AS1428.1-2009.
15. Door handles and the like, will be in accordance with Clause 13.5 of AS1428.1-2009.

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1



DEMOLITION LEGEND

- SITE BOUNDARY
- DEMOLITION
- PROPOSED BUILDING OUTLINE
- EXISTING, TO BE RETAINED
- EXISTING SEWER TO BE RETAINED
- EXISTING DRAINAGE PIPE, TO BE RETAINED
- RETAINED TREES
- DEMOLISHED TREES

NOTE:
Existing services shown are indicative only and based on supplied data. Contractor must confirm location and quantity before the commencement of all works.

DATE PRINTED: 19/09/2022 11:20:45 AM

ISSUE	DATE	SUBJECT	AUTHORISED
A	08.04.22	BASE ARCHITECTURE SET	MR
B	23.04.22	REF ISSUE	MR
C	18.05.22	UPDATED REF	MR
D	28.05.22	TENDER	MR
E	06.07.22	DRAFT CONTRACT ISSUE	MR
F	18.07.22	FOR COORDINATION	MR
G	23.07.22	CONTRACT ISSUE	MR
H	19.09.22	REF UPDATE	MR

RAIR
Rural Ambulance Infrastructure Reconfiguration
Building the future response for our state

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This drawing should be read in conjunction with all relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.

TRUE NORTH

1:200 0 2 4 6 8 10 20m

PROJECT
RURAL AMBULANCE INFRASTRUCTURE PROGRAM (RAIR) GLEN INNES

CLIENT
NSW GOVERNMENT Health Infrastructure
NSW Ambulance

PROJECT ADDRESS
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LOT2 : DP1208729

ARCHITECT
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Nominated Architects:
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Daniel Beekwilder 6192
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Chippendale NSW 2008
Sydney Australia
djrd.com.au

DRAWN BY: AF
SCALE AT A1: 1 : 200

DESCRIPTION
TREE REMOVAL PLAN

PROJECT No	DRAWING No	REVISION
22 417	R31- AR-0103	H

HEALTH INFRASTRUCTURE
Statement of Compliance

Review of Environmental Factors – Glenn Innes Ambulance Station

Project Details	
Project Name	Glenn Innes Ambulance Station
Project Location	Glenn Innes
REF Prepared by	GeoLINK 23/9/2022
Activity Description	The proposed development relates to the construction of a new ambulance station at the Glen Innes District Hospital to improve the delivery of emergency services within the region. The new single storey ambulance station will include: • Operations rooms including amenities, administration and office space, outdoor areas, lockers, common room, medical store and a gymnasium. • Plant room providing six (6) ambulance parking bays, wash bay, oil separation, delivery area and waste storage area. • External hardstand areas including walkways, six (6) light vehicle parking bays, one (1) relief parking space, one (1) PWD parking space, one (1) DOM covered parking bay, one (1) service bay. • Access via Taylor Street and West Avenue. The Activity involves tree removal and excavation works, and landscaping at the completion of construction works

NSW Health Infrastructure is proposing the construction of a new ambulance station at Glenn Innes District Hospital under the provisions of *State Environmental Planning Policy (Transport & Infrastructure) 2021* (T&I SEPP) which requires determination under Part 5 of the *Environmental Planning & Assessment Act 1979* (EP&A Act). This Statement of Compliance demonstrates that the Review of Environmental Factors (REF) for the proposed activity has met the requirements of Part 5 of the EP&A Act and the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulations).

The REF has identified and considered the following matters:

1. The activity is "development without consent" under the T&I SEPP

The activity:

- Is being undertaken by, or on behalf of a public authority within the boundaries of an existing health services facility
- Is for development for the purposes of patient transport facilities, including helipads and ambulance facilities
- Does not result in a building exceeding 15 metres in height or is located closer than 5 metres to any property boundary (or an addition to a building resulting in the building exceeding that height or being closer than that distance to any property boundary)

2. The notification requirements of the T&I SEPP have been met in accordance with Chapter 2, Division 1, and Division 10

- Written notification of the intention to undertake the activity was given to Glenn Innes Severn Council and to occupiers of adjoining land on 8 June 2022.

- The proposal was also notified to Council in relation to potential impacts on Council services and heritage items, pursuant to Section 2.10 & 2.11 of T&I SEPP. It is noted that the submitted Heritage Impact Statement found that the proposed works will have a minimal and acceptable impact on heritage items within the vicinity and accordingly did not require notification to Council on these grounds. Notwithstanding, Council was still notified and provided an opportunity to comment.
- During this period, no submissions were received.

3. Consideration of other environmental planning instruments

- Consideration of the applicable instruments is provided at Section 4.5 in the REF.

4. The requirements of Section 5.5 of the EP&A Act and Section 171 of the EP&A Regulations have been met:

- Pursuant to Section 5.5(1) of the EP&A Act, the REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.
- The factors to be taken into account under Section 171 of the EP&A Regulation 2021 have been fully considered in the REF in determining the likely impact of the proposed activity on the environment and measures to mitigate potential singular and cumulative impacts associated with the proposed activity have been identified.
- As demonstrated in the completed Section 5.5 checklist (Section 4.3 of the REF) and Section 171 checklist (Section 6 of the REF), the proposed activity will not have significant effects on the environment or threatened species and as a result, an Environmental Impact Statement is not required before a decision is made whether or not the proposed activity can proceed.

5. Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

- The activity will not have any impacts on matters of national significance including impacts on Commonwealth land, listed threatened species, migratory species protected under international agreements, national heritage places, world heritage properties/areas, or Ramsar wetlands of international importance. An approval under the EPBC Act is therefore not required.

6. Approvals, authorisations and notifications under other Acts

- As detailed in the REF, any approvals, authorisations or notifications that are required under other Acts before the activity can proceed have been obtained, or where applicable, have been included in the identified requirements.

Certification

I certify that I have reviewed and endorsed the contents of this REF document, and, to the best of my knowledge, it is in accordance with the *Environmental Planning & Assessment Act 1979* (EP&A Act), the *Environmental Planning & Assessment Regulation 2021* (EP&A Regulation) and the Guidelines approved under Section 170 of the EP&A Regulation, and the information it contains is neither false nor misleading.

Author and endorsements

Author	Position	Date
Nicholas Dowman	Senior Planning Advisor	7 December 2022
Endorsed by	**Position**	**Date**
Rachel Mitchell	Manager, Town Planning	7 December 2022

HEALTH INFRASTRUCTURE

RAIR 2 – Glenn Innes Ambulance Station

Ngoorabul/Ngarabal Country

Assessment of Review of Environmental Factors - GeoLINK

3/11/2022

Version Number 1

NSW GOVERNMENT | Health Infrastructure

DETERMINED – APPROVAL

REF Approval No: 26/2022

Date: 18/11/2022

Signed by:

NSW GOVERNMENT

Overview

This report has been prepared by Health Infrastructure (HI) as the Determining Authority in accordance with Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* for the RAIR 2 Glen Innes Ambulance Station at 85 Taylor Street, Glen Innes. This review has considered the Review of Environmental Factors (REF) prepared by GeoLINK dated 23/9/2022 including Appendices A to U.

The relevant legislation applied in determining the assessment of the REF includes:

a) *Environmental Protection and Biodiversity Conservation Act 1999 (Cwth)*

b) *Environmental Planning and Assessment Act 1979, particularly Section 1.3*
- the objects of the Act, and Part 5, Section 5.5 duty to consider environmental impact

c) *Environmental Planning and Assessment Regulation 2021,* Section 171

d) *Biodiversity Conservation Act 2016*

e) *Heritage Act 1977*

f) *National Parks and Wildlife Act 1974*

g) *Protection of the Environment Operations Act 1997*

h) *Water Management Act 2000*

i) *State Environmental Planning Policy (Transport & Infrastructure) 2021 (TI SEPP)*

j) *State Environmental Planning Policy (Resilience and Hazards) 2021*

k) *Glen Innes Severn Local Environmental Plan 2012* (GISLEP 2012)

l) *Guidelines for Division 5.1 Assessments (Feb 2022),* prepared by the NSW Department of Planning.

Site Description and Proposed Works

Site

This site is located within the grounds of the Glen Innes District Hospital Campus at 85 Taylor Street, Glen Innes. The site is described in real property terms as Lot 2 DP1208729 and has an area of approximately 3 hectares. It is within the Glen Innes Severn Local Government Area (LGA).

The ambulance station will be located in the north-eastern corner of the site, with dual access off Taylor Street and West Avenue. The new station will front Taylor Street. It is proposed to excise a portion of the site for the ambulance station, with a site area of 3384.15m^2.

The Traditional Custodians for the Glen Innes region are the Ngoorabul/Ngarabal people.

Scope of Work

The proposed activity relates to the construction of a new ambulance station at the Glen Innes District Hospital. The new single storey ambulance station will include:

- Operations rooms including amenities, administration and office space, outdoor areas, lockers, common room, medical store and a gymnasium.
- Plant room providing six (6) ambulance parking bays, wash bay, oil separation, delivery area and waste storage area.

- External hardstand areas including walkways, six (6) light vehicle parking bays, one (1) relief parking space, one (1) PWD parking space, one (1) DOM covered parking bay, one (1) service bay.
- Access via Taylor Street and West Avenue.

The Activity involves tree removal (15 trees) and excavation works, and landscaping at the completion of construction works. It is proposed to excise a portion of the site for the ambulance station development, in accordance with the exempt development provisions in the TISEPP.

The station is expected to be staffed at a rate of 24 full time equivalent (FTE) staff by the year 2031, with emergency vehicle crews on 12 hour shifts and shifts being allocated according to expected callouts and staff fatigue management policies. The expected maximum number of people on-site at one time will be six people.

Planning Pathway

Division 10 of TI SEPP outlines the approval requirements for health service facilities. Pursuant to section 2.61(1)(d) *"development for the purposes of patient transport facilities, including helipads and ambulance facilities"*, may be carried out by or on behalf of a public authority without consent on any land if the development is carried out within the boundaries of an existing health services facility.

The proposal involves the construction of a new ambulance facility by HI and NSW Ambulance within the boundaries of the Glen Innes District Hospital, which is classified as development without consent as the proposed activity is consistent with clause 2.61(1)(d) of TI SEPP. Furthermore, the proposed station will not exceed 15 m in height and will be greater than 5m from the nearest property boundary.

Therefore, the proposal is considered an 'activity' for the purposes of Part 5 of the EP&A Act and is subject to an environmental assessment (REF). The proposal is considered an 'activity' in accordance with section 5.1 of the EP&A Act.

Review of Environmental Factors

Specific environmental factors identified by GeoLINK as requiring consideration as a result of the proposed activity are:

- Aboriginal Heritage
- Heritage and Archaeology
- Soil and Geology
- Hydrology, Flooding and Water Quality
- Ecology
- Bushfire
- Noise and vibration
- Air quality and Energy
- Visual Amenity
- Traffic, Access and Parking
- Hazardous Materials and Contamination
- Waste Generation

- Land Use & Services
- Community Impact/ Social Impact
- Cumulative Impacts

Consultation

Pursuant to the requirements of Clause 2.62 of the TI SEPP, the proposed activity was notified to both the Glen Innes Severn Shire Council and adjoining residents during the period 8 June 2022 to 29 June 2022.

The proposal was also notified to Council in relation to potential impacts on Council services and heritage items, pursuant to Section 2.10 & 2.11 of TI SEPP. It is noted that the submitted Heritage Impact Statement by Weir Phillips dated May 2022 found that the proposed works will have a minimal and acceptable impact on heritage items within the vicinity and accordingly did not require notification to Council on these grounds. Notwithstanding, Council was still notified and provided an opportunity to comment.

During this period, no submissions were received.

Other Considerations

Tree removal

The Assessment recommended that fifteen (15) trees in total would require removal to allow the proposed development. The Demolition Plan also identifies 15 trees to be removed. The trees include:

- Fraxinus excelsior - European Ash
- Cercis siliquastrum - Judas Tree x2
- Hesperocyparis macrocarpa ‘Brunniana’ - Brunning Golden Cypress
- Ulmus parvifolia - Chinese Elm Tree x4
- Eucalyptus deanei - Mountain Blue Gum
- Prunus Serrulata - Japanese Flowering Cherry
- Liquidambar styraciflua - Sweet Gum
- Crataegus sp. - Hawthorn
- Unnamed dead tree
- Aesculus indica - Indian horse chestnut
- Prunus cerasifera ‘Nigra’ - Purple leaved cherry plum x2.

Nine (9) of these are affected by direct footprint conflict and/ or major TPZ encroachment to the point they would be non-viable following the completion of the development works. Of these nine (9) trees, five (5) are of low retention value, three (3) are of moderate retention value and one (1) tree is of high retention value (Tree 7). Despite their varied retention values, the Arborist Report recommends their removal and sufficient offset replacement due to direct conflict with the proposed works. Significant redesign or relocation of the proposal would be required for retention of these trees.

Six (6) additional trees are to be removed in the context of the development due to poor health and/or structure and very limited useful life expectancy.

The trees proposed to be removed are considered to have been planted as landscaping within the site and are not native, with the exception of Tree 7 (Mountain Blue Gum). The REF concludes that the species proposed to be removed do not provide important habitat for any threatened fauna or represent threatened flora or communities.

To compensate for tree loss and complement the development, Landscaping Plans have been prepared for the Activity by Site Image Landscape Architects. The plans show 15 replacement trees (1:1 replacement ratio) of suitable species and mature size, as well as a mix of mainly native shrubs and grasses to be planted at the completion of construction works. Mitigation measures have been incorporated regarding tree protection and replacement.

Heritage

The broader hospital site is listed as a heritage item, as identified by the Glen Innes Severn LEP 2012. While the entire site is mapped as a Heritage item, the submitted Heritage Impact Statement by Weir Phillips dated May 2022 (HIS) at Appendix G to the REF clarifies that the heritage significance and relevant items is restricted to the “Land of the Beardies Museum (former hospital complex)”, located to the south of the proposed ambulance station, on the adjoining Lot 1 DP1208729.

There are also several heritage items within the vicinity of the hospital site. The HIS supports that the proposed works will have a minimal and acceptable impact on the heritage items within the vicinity of the site.

It is noted that Council was also provided the opportunity to comment on the proposal and no submission was received.

The proposed works are to be located away from the historically significant buildings within the hospital grounds and the site's topography ensures that the proposed structure will be mostly obscured from the former Glen Innes Hospital site.

The REF conclude that the proposal has a satisfactory heritage impact.

Conclusion and Recommendation

The review of the REF and recommendations against the relevant legislation and the Best Practice Guidelines concurs with the finding that, subject to the mitigation measures shown below, the proposal will not have a significant impact on the environment. On that basis, an Environmental Impact Statement is not required.

Below are the final mitigation measures which must be implemented as part of this approval.

Mitigation measures

The following Mitigation Measures have been imposed to ensure that any development activity is carried out in accordance with the plans/documentation and any amendment approved under Part 5 of the *Environmental Planning and Assessment Act 1979*.

General measures

1. Development in Accordance with Plans and Documentation

The proposal must be carried out generally in accordance with the Review of Environmental Factors dated 23/09/2022 and prepared by GeoLINK on behalf of NSW Health Infrastructure (including accompanying appendices A - U) and generally in accordance with the following plans/documentation as modified below and by any of the under-mentioned measures:

Drawing Title	Drawing Ref	Revision	Date	Prepared by
Cover Page	R31-AR-0000	C	18.05.2022	DJRD

Site Analysis	R31-AR-0100	C	18.05.2022	DJRD
Proposed Site Plan	R31-AR-0101	C	18.05.2022	DJRD
Shadow Diagrams	R31-AR-0102	C	18.05.2022	DJRD
Tree Removal Plan	R31-AR-0103	H	19.09.2022	DJRD
Ground Floor General Arrangement Plan	R31-AR-1101	C	18.05.2022	DJRD
Roof Plan	R31-AR-1102	C	18.05.2022	DJRD
Elevations	R31-AR-2001	C	18.05.2022	DJRD
Sections	R31-AR-2501	C	18.05.2022	DJRD
Render	R31-AR-9001	B	18.05.2022	DJRD
Axonometric	R31-AR-9003	C	18.05.2022	DJRD
Landscape Coversheet	000	G	19.09.2022	Site Image
Landscape Plan	101	G	19.09.2022	Site Image
Landscape Details	501	C	1.06.2022	Site Image

2. Crown Certificate

A Certificate under Section 6.28 of the *Environmental Planning and Assessment Act 1979* is to be obtained prior to any work commencing.

3. Building Code of Australia

All building work is to be undertaken in accordance with the Building Code of Australia and referenced Australian Standards, including the requirements of AS 1428.1 General Requirements for Access.

4. Approvals

The applicant is to obtain all other necessary approvals required by State and Commonwealth legislation and relevant Council policies. A copy of all approvals is to be kept on site.

5. Long Service Levy

For work costing $25,000 or more, a Long Service Leave Levy shall be paid. For further information contact the Long Service Payments Corporation on their Helpline 131441.

6. Tree Management and Landscape

6.1 Trees not proposed to be removed are to be protected in accordance with AS 4970 - 2009 Protection of Trees on Development Sites.

6.2 No building materials, builder sheds and the like are permitted to be stored under the canopy of existing trees.

6.3 Trees removed are to be replaced at a replacement ratio of at least 1:1 as indicated by the Landscape Plans and Planting Schedule (pot size 100L) prepared by Site Image and dated 19/9/2022.

Prior to commencement of works

Note: The following Measures are to be complied with prior to the commencement of works on the subject site, and at other stages where stated.

7. Community Notification

7.1 Prior to commencement of work, the proponent must notify in writing Council and the occupier of any land within 40 metres of the boundary of the site works. The notification should outline the project, the expected timing for commencement and completion of construction works.

7.2 Where practicable, work programs for noisy work should be coordinated with the hospital, at least two (2) weeks prior to commencement to minimise impacts on their operations.

7.3 Complaints received prior to and during the undertaking of works shall be recorded and attended to promptly. On receiving a complaint, works shall be reviewed to determine whether issues relating to the complaint can be avoided or minimised. Feedback shall be provided to the complainant explaining what remedial actions were taken.

7.4 The proponent shall develop a complaints management system and record details of all complaints received and the means of resolution of those complaints. The Complaints Register shall be made available on request.

7.5 A site notice board must be located at the entrance or other appropriate location on the site in a prominent position and must including the following:

a. 24-hour contact person for the site;
b. Telephone, facsimile numbers and email addresses;
c. Site activities and time frames.

7.6 The site notice must be erected no less than 2 days prior to the commencement of works.

8. Hazardous Materials

8.1 All asbestos handling shall be carried out consistent with the recommendations of Contamination Report prepared by JK Environments dated 25 May 2022.

8.2 An Asbestos Management Plan is to be prepared to provide a procedure to control the risk of exposure from asbestos and lead impacted topsoil during the work.

8.3 An unexpected finds procedure is to be included in an overarching Construction Management Plan (CMP) for the work, in the event that other contamination is encountered which have not been identified during this assessment.

8.4 Waste must be transported by an appropriately licensed transporter, and disposed to a facility that is licensed to receive that class of waste. It is recommended that this report is sent to the proposed receiving facility to confirm their acceptance of the material prior to off-site disposal. If the description of the soil differ from that described within, then further assessment for waste classification purposes may be required prior to off-site disposal.

8.5 SafeWork NSW is to be notified in accordance with the relevant policy prior to work involving asbestos material being undertaken.

8.6 Air monitoring devices shall be put in place, around the site, during the demolition. A qualified environmental hygienist shall be on site to supervise the work to ensure the safety of workers and the public are not compromised in anyway. Daily monitoring and results will be taken and analysed to ensure safe air quality levels ensue.

8.7 A Lead Removal Control Plan will be developed and implemented by the contractor. Lead based paint is defined as paint containing more than 1% lead by weight, and is classified as hazardous waste according to EPA NSW ‘Waste Classification Guidelines. Part 1: Classifying Waste’.

9. Dilapidation Report

Prior to construction, a dilapidation report is to be prepared for hospital, Council, or other assets within the zone of influence of the work.

10. Construction Management

A detailed Construction Management Plan is to be prepared prior to the commencement of works and implemented during the undertaking of works. The Construction Management Plan is to include, but not be limited to:

a. How compliance with the environmental controls and mitigation measures detailed in this REF is to be achieved.

b. Construction noise management measures.

c. Vibration management measures.

d. Sediment and erosion control measures.

e. Construction site management measures.

f. Construction traffic management measures.

g. Air quality and dust management measures.

h. Restrictions on hours during construction.

i. Unexpected finds protocols

j. Training of responsibilities under National Parks and Wildlife Act 1975, Heritage Act 1977 and any other relevant legislation.

11. Demolition/Construction Waste Management Plan

11.1 A Demolition/Construction Waste Management Plan shall be prepared by an appropriately qualified contractor prior to the commencement of works. The Waste Management Plan should be prepared in accordance with DECCW's "Waste Classification Guidelines (2008)" and the Protection of the Environment Operations Act 1997.

11.2 The Demolition/Construction Waste Management Plan is to include the following requirements and details:

a. The type and volume of all waste materials (e.g. excavation material, green waste, bricks, concrete, timbers, plasterboard and metals) is to be estimated prior to the commencement of works, with the destination for each waste identified. Waste should be re-used or recycled as much as practicable. Where not practicable, the location of a suitable waste disposal facility is to be identified.

b. Cleaning out of batched concrete mixing plant is not permitted within any construction compound.

c. Non-recyclable waste and containers are to be regularly collected and disposed of at a licensed disposal site. Frequency of collection should be identified.

d. No burning or burying of waste is permitted on the site.

e. Any bulk garbage bins delivered by authorised waste contractors are to be placed and kept within the property boundary.

11.3 The following mitigation measures will be implemented in order to prevent adverse impacts in relation to waste generated by the proposed works:

a. No materials will be used in a manner that will pose a risk to public safety and waste generated from the proposed works will be recycled where possible.

b. Unnecessary resource consumption will be avoided.

c. Non-recyclable wastes will be collected and disposed of or recycled in accordance with Office of Environment and Heritage (OEH) guidelines.

12. Noise Management Measures

12.1 During preparation of the construction program, consult with the hospital to determine what areas (if any) of the hospital is particularly noise sensitive, and at what time (ward rooms, operating theatres, etc.).

12.2 Identify feasible acoustic controls or management techniques (use of screens, scheduling of noisy works, notification of adjoining land users, respite periods) when excessive levels may occur.

12.3 For activities where acoustic controls and management techniques still cannot guarantee compliant noise levels, implement a notification process whereby nearby development is made aware of the time and duration of noise intensive construction processes.

13. Erosion and Sediment Control

13.1 Erosion and sediment controls will be implemented in accordance with the Landcom/ Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) and ensure any water diversion or control outlets associated with the works do not result in scouring.

13.2 Works will only commence once all erosion and sediment controls have been established. The controls will be maintained in place until the works are complete and all exposed erodible materials are stable.

13.3 Erosion and sedimentation controls will be checked and maintained (including clearing of sediment from behind barriers) on a regular basis (including after any precipitation events) and records kept and provided on request.

14. Services and Utilities

Prior to the commencement of works, any services and utilities that may be impacted by the works are to be appropriately relocated.

15. Construction Traffic Management

A Construction Traffic Management shall be prepared in consultation with Council prior to commencement of works.

During construction/undertaking of work

Note: The following Conditions are to be complied with during the approved construction/the undertaking of works.

16. Construction Site Management

16.1 Construction site fencing is to be installed around the construction site. Vehicle and workforce access points and roads to the construction compounds are to be clearly designated and controlled for authorised access only. Vegetation clearance is to be minimised.

16.2 The worksite should be left tidy and rubbish free each day prior to leaving the site and at the completion of works.

16.3 The use and storage of hazardous materials and dangerous goods, including petroleum, distillate and other chemicals, shall be in accordance with the relevant legislation including, but not limited to:

- Protection of the Environment Operations Act 1997
- Work Health and Safety Regulation 2017
- AS 1940 The storage and handling of flammable and combustible liquids
- Safe Work NSW Code of Practice – Managing Risks of Hazardous Chemicals in the Workplace.

16.4 All materials on-site or being delivered to the site must be wholly contained within the site. The requirements of the Protection of the Environment Operations Act 1997 are to be complied with when placing/stockpiling loose material or when disposing of waste products or during any other activities likely to pollute drains or watercourses.

16.5 The public way must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.

16.6 All equipment and machinery should be secured against vandalism outside of working hours.

16.7 No batching plant is permitted on the site.

16.8 A copy of the approved and certified plans, specifications and documentation shall be kept on site at all times and shall be available for perusal by any officer of Council.

16.9 Any contractor(s) must meet all workplace safety legislation and requirements.

16.10 No vehicle maintenance is permitted in the demolition and construction areas except in emergencies.

16.11 Any loose material stockpiles are to be stored within the temporary construction compound(s) and are to be protected from possible erosion.

17. Erosion and Sediment Control

17.1 Disturbance of sediment during the construction phase of the development and the design management and implementation of pollution controls must be consistent with “Managing Urban Stormwater: Soils and Construction” (NSW Landcom, 2004), (Blue Book), and “approved Methods for the Modelling and Assessment of air pollutants in NSW (EPA)”.to ensure containment of sediment to the immediate work site.

17.2 All sediment control measures must be regularly inspected and cleaned out and/or repaired as necessary, and all collected silt disposed of appropriately. Stockpiles should also have adequate sediment control measures in place.

17.3 Erosion and control measures are not to be removed until disturbed areas have stabilised.

18. Air Quality and Dust Management

18.1 Spraying of paint and other materials with the potential to become air borne particulates is only to be undertaken on days with still or light wind conditions.

18.2 No burning of materials is permitted.

18.3 Dust generated during construction activities is to be controlled to avoid impact on surrounding properties

18.4 All necessary maintenance for construction vehicles and equipment is to be undertaken during the construction period.

18.5 Excessive use of vehicles and powered construction equipment is to be avoided.

18.6 Exposed areas are to be progressively revegetated as soon as practical.

18.7 Vehicle wash down areas are to be established to ensure all mud and soil from construction vehicles is not carried onto public roads.

18.8 All vehicles involved in any excavation and/or demolition and departing the site with demolition materials, spoil or loose matter must have their loads fully covered before entering the public roadway.

18.9 Vehicles, machinery and equipment will be maintained in accordance with manufacturer's specifications in order to meet the requirements of the Protection of the Environment Operations Act 1997 and associated regulations.

19. Construction

19.1 No blasting shall be permitted during construction.

19.2 The use of any rock excavation machinery or any mechanical pile drivers or the like is restricted to the hours of 7.00am to 5.00pm (maximum) on Monday to Friday only, to minimise the noise levels during construction and loss of amenity to the surrounding area.

20. Services

20.1 All services and utilities in the area of construction must be appropriately disconnected and reconnected as required. The contractor is required (if necessary) to consult with the various service authorities regarding their requirements for the disconnection of services.

20.2 Where services are found not to be adequate to support the development they shall be appropriately augmented.

21. Traffic Management

Existing traffic access and arrangements should be maintained during construction as much as practicable.

22. Contamination (Unexpected Finds)

22.1 Should any new soil contamination information or contaminants be identified during the undertaking of works which have the potential to alter previous conclusions about site contamination, then the Managing Contractor and HI must be immediately notified and works must cease in the location of the contamination.

22.2 Works must not recommence until a suitably qualified contaminated land specialist (i.e. a Certified Environmental Practitioner) has investigated and assessed the category of the contamination in accordance with SEPP (Resilience and Hazards) 2021 and if required prepared a Remediation Action Plan (RAP) which details the necessary remedial work or management required to render the site suitable for the proposed development.

22.3 Following completion of the remediation, a Site Remediation & Validation Report (SRVR) which documents the completeness of the remedial work is to be submitted to HI and the EPA, if required.

22.4 Any contaminated materials or hazardous substances that need to be removed from site are to be classified first and then stored, transported and disposed of in accordance with EPA requirements at an EPA licensed waste facility.

22.5 Asbestos removal and management in NSW is regulated under the Work Health and Safety Act 2011 and Work Health and Safety Regulation 2017. The handling of asbestos work must be carried out in accordance with Safework Australia Code of Practice "How to Manage and Control Asbestos in the Workplace" February 2016, including being undertaken by contractors who hold a current Safework Asbestos or Demolition Licence and any other current Safework Licence required

22.6 If soils are to be disposed offsite during construction, they are required to be disposed in accordance with the waste classification, subject to additional sampling and analysis.

22.7 Construction works should not result in the contamination of the site.

22.8 A spill containment kit will be available at all times. All personnel will be made aware of the location of the kit and trained in its effective deployment.

22.9 The contractor shall develop a procedure for the management of acid sulfate material (ASM) including identification, testing and treatment of ASM encountered during the works and opportunities for reuse of treated ASM within the site.

22.10 Materials will be sourced from licensed quarries and operators. All materials will be certified uncontaminated and environmentally safe.

23. Noise and Vibration Management

23.1 All works will be in accordance with AS2436-1981: Guide to Noise Control on Construction, Maintenance and Demolition Sites.

23.2 Building contractors are to implement the requirements of the Office of Environment “Interim Construction Noise Guideline (July 2009)” as far as practicable.

23.3 Construction is to be carried out in accordance with the Building Code of Australia deemed-to-satisfy provisions with respect to noise transmission.

23.4 All reasonable, practicable steps are to be undertaken to reduce noise and vibration from the site.

23.5 Plant and equipment is to be maintained, checked and calibrated in accordance with the appropriate design requirements and to ensure that maximum sound power levels are not exceeded.

23.6 Plant and equipment (where possible) is to be strategically positioned on site to reduce the emission of noise from the site to the surrounding area, users of the site and on-site personnel.

23.7 Unnecessary noise is to be avoided when carrying out manual operations and operating plant.

23.8 Any equipment not used for extended periods is to be switched off.

24. Non Aboriginal Heritage

24.1 All personnel working on site will receive training in their responsibilities under the Heritage Act 1977.

24.2 If any item of European heritage is discovered during works, work shall cease immediately and the project heritage consultant, the relevant Council and/or Office of Environment and Heritage notified.

24.3 Work shall not recommence until the significance of the find is established.

25. Aboriginal Heritage

25.1 If suspected Aboriginal material has been uncovered as a result of development activities within the Project Area:

- work in the surrounding area is to stop immediately
- a temporary fence is to be erected around the site, with a buffer zone of at least 10 metres around the known edge of the site
- an appropriately qualified archaeological consultant is to be engaged to identify the material, and
- if the material is found to be of Aboriginal origin, the Aboriginal community is to be consulted in a manner as outlined in the OEH guidelines: Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010).

25.2 Should Human Remains will be located at any stage during earthworks within the Project Area, all works must halt in the immediate area to prevent any further impacts to the remains. The Site should be cordoned off and the remains themselves should be left untouched. The nearest police station, the relevant Local Aboriginal Land Council and the OEH Regional Office are all to be notified as soon as possible.

25.3 If Aboriginal cultural materials are uncovered as a result of development activities within the Project Area, they are to be registered as Sites in the Aboriginal Heritage Information Management System (AHIMS) managed by the OEH. Any management outcomes for the site will be included in the information provided to the AHIMS.

25.4 All effort must be taken to avoid any impacts on Aboriginal Cultural Heritage values at all stages during the development works. If impacts are unavoidable, mitigation measures should be negotiated between the Proponent, OEH and the Aboriginal community.

26. Restriction on Hours during Construction

26.1 The undertaking of any construction activity on the subject site is to be limited to the following hours:

- Monday to Friday inclusive: 7.00am to 6.00pm
- Saturdays: 8.00am to 1.00pm
- Sundays and Public Holidays: No work permitted.

26.2 Entry and departure of vehicles from the site will be restricted to the imposed work hours.

26.3 Activities may be undertaken outside of hours in condition 26.1 and 26.2 if required

- By the police or a public authority for the delivery of vehicles, plant or materials; or
- in an emergency to avoid the loss of life, damage to property or to prevent environmental harm.
- Where the works are inaudible at the nearest external sensitive receiver, a disruption notice has been issued by the relevant LHD or Hospital and a letter of support has been provided from the relevant LHD or Hospital for the Out of Hours Works.

26.4 Consideration will be given to extending these hours to allow for specific work tasks on a case by case basis, subject to approval from Health Infrastructure being sought prior to this occurring and the assessment of any impact of this extension.

27. Access and pedestrian movements

27.1 Safe pedestrian access and movement to the hospital and surrounding buildings shall remain unimpeded at all times.

27.2 Appropriate signage and directional information shall be provided.

Prior to commencement of operation

Note: *The following Conditions are to be complied with prior to commencement of operation of the facility.*

28. Works as Executed

Prior to use of the facility, “Works as Executed” drawings are to be submitted to HI.

Operational measures

29. Operational Noise and Amenity

29.1 Whenever possible, the pressure washer and other power tools shall be operated between 7am to 8pm during Monday and Friday and between 8am to 8pm on Saturdays, Sundays and Public Holidays.

29.2 Use of ambulance sirens within the Ambulance Station lot and surroundings should be minimised whenever possible and their operation addressed in the Management Plan.

29.3 To minimise impact on the surrounding amenity, Waste Collection movements are recommended to occur during the day-time.

Advisory Notes

AN1 Project Compliance – DGN 40

Health Infrastructure (HI) is responsible for ensuring that the conditions of consent are complied with during the course of the delivery of the project. To ensure that HI is complying with its legal obligations, compliance with the requirements of DGN 40 – Compliance with Planning Approval Conditions is required.

AN2 Greening our Facilities – Tree Planting Reporting

Prior to the operation of the facility, report on the number of trees planted as required under this approval by logging the relevant information with HI Planning.

Determination

Acting as a delegate of the Health Administration Corporation, and, in accordance with Section 5.5 of the *Environmental Planning and Assessment Act 1979*, having taken into account to the fullest extent possible all matters likely to affect the environment as a result of the proposed activity, I hereby determine the Review of Environmental Factors by granting approval subject to the Mitigation Measures above.

..... 18 November 2022 .....

Emma Skulander Date

A/Chief Executive Health Infrastructure