

The engineer in his own way is an artist too - and not just a dead fish with a slide rule.
Jørgen Varming

Mechanical Engineering
Lighting Design
Sustainable Design
Electrical Engineering

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ELECTRICAL ENGINEERING

STEENSEN VARMING



SCS Weigall Sports Complex - Infrastructure Management Plan Electrical and Telecommunications SSDA 10421

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Document Revision and Status

Sydney May 22, 2020
Ref. No. 207016

Date	Rev	Issue	Notes	Checked	Approved
22-05-2020	00	95%	For Comment	BAJ / MH	BAJ
07-09-2020	01	SSDA		BAJ / MH	BAJ

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1.0 Executive Summary

This report has been prepared for the Sydney grammar School – Weigall Sports Complex, in response to the SSDA General Requirement 12 – Utilities (Part B)

This report provides an overview of how the electrical and telecommunications main utilities and site infrastructure are addressed.

Refer to the separate Infrastructure Management Plan for remaining building services such as water and sewerage prepared by others.

Electrical infrastructure:

A new 1000KVA Pad mounted Kiosk substation will be provided to cater the Electrical power demand of the sports complex; an application has been made with the supply authority (Ausgrid) in relation with the proposed development. This project is classified as a contestable works and therefore an Approved Service Provider (ASP) Designer shall be engaged to complete the design in accordance with Ausgrid's requirements.

The new on-site Kiosk substation will be connected from the existing adjacent Ausgrid High Voltage underground cabling network.

Telecommunication Network:

Various options were looked into as described in section-4.3 however with the recurring cost and ease of maintenance the preferred solution is Option -2 which is a feasible and cost effective option via the longer run.

This option involves extending the existing telecommunication network in the Sydney Grammar preparator school via a private duct network to the proposed new Main communication room of the sports complex.

2.0 Project Background

2.1 Scope of Project

The scope of the project is as follows:

1. **Demolition** of the following existing structures and buildings (which are not heritage significant) at the southern edge of the SGS Weigall Sports Ground:
 - a. Multipurpose/tennis courts and associated fencing;
 - b. Barry Pavilion;
 - c. The existing cricket nets off Alma Street; and
 - d. Paved car park near Neild Avenue.
2. **Construction** of the SGS Weigall Sports Complex comprising the following:
 - a. Building 1 - Sports facilities building accommodating the following facilities:
 - i. Ground floor: Main pool, programme pool, terrace/assembly facing Weigall, entry foyer, offices, change rooms, back of house, services and external car parking (5 spaces) and loading;
 - ii. Mezzanine floor: spectator terrace and services;
 - iii. First floor: Multipurpose sports hall 01 – basketball and volleyball, Multipurpose sports hall 02 –cardio, weights, taekwondo, fencing, PDHPE, change rooms, storage and services;
 - iv. Level 2: Multipurpose room 04; Multipurpose sports hall 03 – cardio, weights, taekwondo, fencing, PDHPE, storage and services;
 - v. Driveway entry from Neild Avenue (comprising relocation of the existing driveway southwards with existing driveway potential retained for maintenance access).
 - b. Building 2 – Car park comprising an ancillary car park of one/two split levels accommodating 93 spaces with an additional 4 spaces on grade, accessed from an existing entry from Alma Street (located on the existing cricket nets site). The lower ground level includes the flexibility to be used as an extension of the existing playing fields.
 - c. Parking for a total of 102 cars comprising:
 - i. Building 1: 5 spaces;
 - ii. Building 2: 97 car spaces (93 within the building and four at grade).
 - d. Landscaping of the site including tree removal/retention/replacement, paths, fencing and lighting.
 - e. Building identification signage.
 - f. New kiosk substation.

3. **Use** of the completed building as an educational establishment with external/community use of the proposed facilities that coordinates with the programming of the SGS.

The proposal does not include any of the following:

- General learning areas (**CLA**);
- An increase in the existing student or staff population.

2.2 Site Description

The State Significant Development Application (SSDA) site is part of the Weigall Playing Fields located on Neild Avenue at Rushcutters Bay.

Weigall is bordered by:

- Neild Avenue to the west (Neild Avenue is classified as a collector road and also forms part of the State Road MR625 managed by Roads and Maritime Services);
- State Rail land and the Eastern Suburbs Railway viaduct to the north;
- White City (Hakoah Club and Maccabi Tennis Club), SGS Edgecliff Preparatory School, Vialoux Avenue, Alma Street and residential development to the south;
- Residential development to the south and north-east;
- A Sydney Water stormwater channel which traverses the site;
- A right of way from Alma Street, benefiting the site, which crosses the site formerly known as White City.



Image: Weigall Sports Complex Site Plan

3.0 Introduction

The purpose of this report is to provide a response to the Infrastructure Management Plan requirements specifically in respect to Electrical Power Supply and Telecommunications criteria stated in the project Secretary's Environmental Assessment Requirements (SEARs) for State Significant Development Application (SSDA).

3.1 Response to SEARs

The SGS Weigall sports complex SEARs Report is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSDA. This table identifies the relevant SEARs requirement/s and corresponding reference/s within this report.

Table 1 – SEARs Requirement 14.0 and Relevant Reference

SEARs Items	Project Response
14. Utilities Prepare an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation and easement requirements of the development for the provision of utilities including staging of infrastructure.	<p>In response to relevant sections of SEARS item on Infrastructure the proposed electrical and telecommunications works will include a new external electrical power substation and an internal building telecommunications node.</p> <p>These will be wired from the underground power supply provided by the supply authority (Ausgrid).</p> <p>The telecommunication service shall be an extension of the existing telecommunication network of the Sydney Grammar Preparatory School.</p> <p>This involves providing a new private underground duct from the existing school, via the Council's roadway, to the new development.</p>

4.0 Proposed Infrastructure & Augmentation

4.1 Building Services

The following provides details of the electrical and telecommunications infrastructure proposed to service the development and demonstrates that the site can be suitably serviced from the power supply authority and the National Broadband Network (NBN).

Refer to the separate Infrastructure Management Plan for remaining building services such as water and sewerage prepared by others.

4.2 Electrical Power

The new sports complex is to be serviced by an 11,000/400V service that will terminate into a pad mounted Kiosk substation.

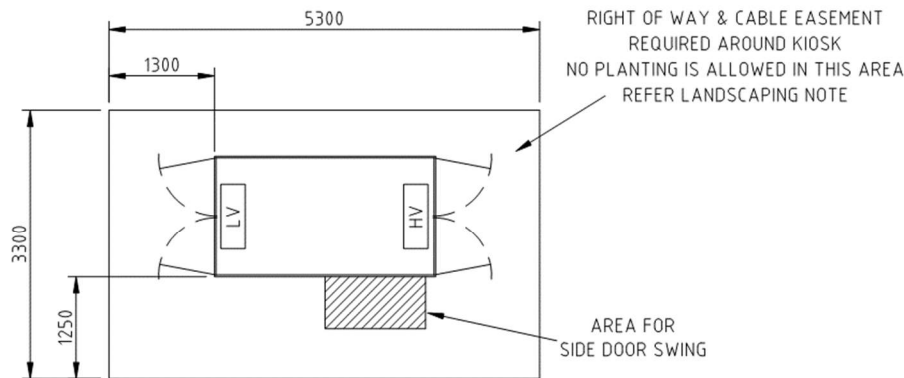
Various options were being investigated with regards to the type of substation and the location.

Due to the demand, functionality and type of project, a pad mounted Kiosk substation as per the local Supply Authority (Ausgrid) requirements is proposed, a 5.3m x 3.3m is footprint required and will be complete with the supply authority high voltage (HV) and low voltage (LV) equipment, per the following image. The capacity of the substation will be 1000KVA. An easement for the substation will need to be arranged with the supply authority.

The LV side of the transformer shall supply a main switchboard, which will be located within a dedicated room at grade level of the sports complex.

Refer to the Appendix Section 5.1 for details of the application send to the supply authority.

Refer to the Appendix Section 5.2 for details on the existing services infrastructure from 'dial before you dig'.



SITE PLAN A
 Scale 1:50

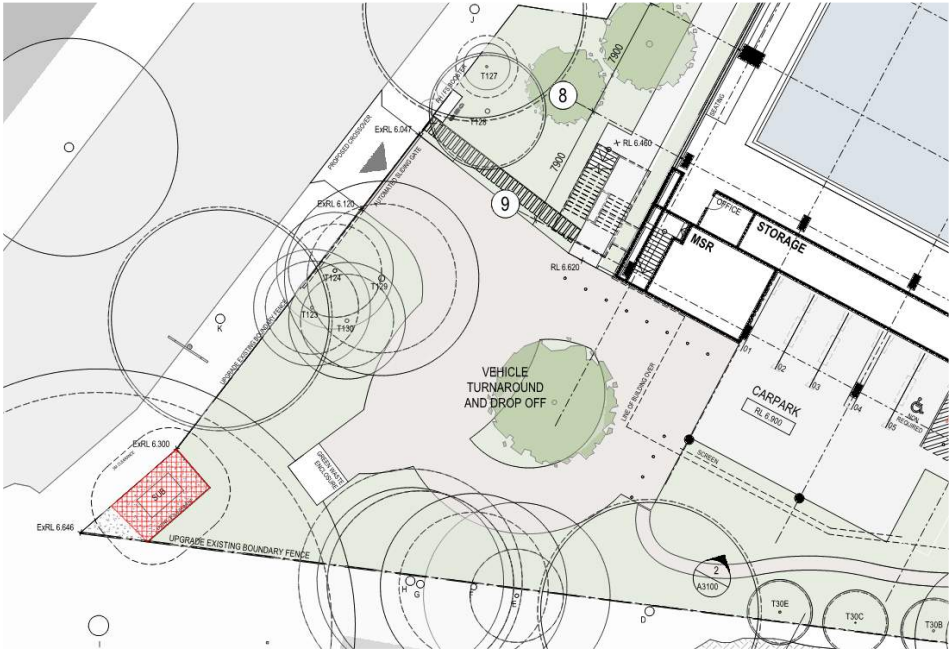
Image: Ausgrid Standard Layout for a Pad mounted Distribution Substation to Suit up to 1000kVA Dry or Oil Filled Transformers

Proposed:

The power for the site can be taken off the existing HV feeds along Neild Avenue, a new Pad mounted 1000KVA substation is proposed for the new development. Several possibilities with respect to the type of substation and locations were looked into before arriving at the proposed method to supply power for the site.

The new infrastructure is achieved by installing 1000 KVA transformer substation on top of a raised plinth arrangement with cables entering the substation from the bottom. This method is preferred since the existing ground RLs are between RL6.15-6.26, therefore the Substation easement would only need to be raised approximately by 250mm max to achieve RL6.40 in order to meet Ausgrid's requirement i.e.: at/greater than 1:100yr flood level.

The substation is located near the project boundary off Neild Avenue shown in red hatch.



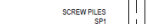
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year flood level

Preliminary Electrical Maximum Demand

Project Name: SGS Weigall sports complex

Instructions

1. Enter room name and VA/m² estimate according to AS3000 according to the rooms function
2. Enter the area for each room and the spread sheet will do the rest
3. To enter more rooms simply add more lines within the table and copy down the formula

Job Number	207016
Date	1/07/2020
Revision	2
Author	BD
Checked	IM

Floor	VA/m ²	Area (m ²)	Total Load (kVA)
Basement Level		1273	67.61
Lower Ground Level		2372	20.08
Ground Level		266	3.37
First Level		3526	164.657
Second Level		855	33.73
Roof		149	616
	TOTALS	8441	905
	Current Per Phase (A)		1286

Image: Preliminary Maximum Demand Calculation

4.3 Telecommunications

The Telecommunications services will be supported from the existing on-site customer's passive cabling network to facilitate the connectivity of various systems such as local data networks, WiFi, audio visual, fire, security and telephones.

Various options were investigated as detailed below however with the recurring cost and ease of maintenance the preferred option is Option -2 which is a feasible and cost effective option in the longer run. This option involves extending the existing telecommunication network in the Sydney Grammar preparator school via a private duct network to the proposed new Main communication room of the sports complex.

A new Lead-in connection will be provided to the site. A new Central distributor shall be located in the new Main Communication room within the proposed new building. The Central distributor shall be served via a fibre lead-in cable from the Sydney Grammar Preparatory School.

Comparison Table :

	Description	Remarks
Option-1	New NBN connection from the nearest available telecommunication network	Pros: Lower capital cost. Cons: Recurring cost associated with new connection
Option-2	Extension of existing telecommunication network of Sydney Grammar preparatory school	Pros: Cost effective in the longer run as recurring charges need not be paid to the supply authority. Cons: Higher capital cost, due to additional in-ground cable ducts and approval from Council is required to run underground ducts in the public space.

Proposed:

The new development can be fed off the nearest available telecommunication network. Conduit network of several providers are available in the vicinity and these networks can be extended to the new development. The new development will comprise of a Main communication room housing the central distributor and space for telecommunication equipment.

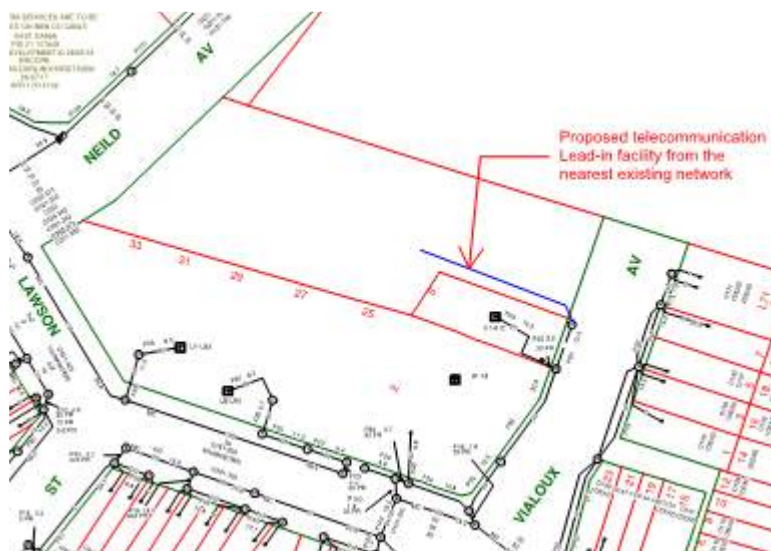


Image: Proposed extension of existing telecommunication network

Refer to the Appendix Section 5.3 for details of the extent of the NBN.
 Refer to the Appendix Section 5.4 for details on the existing services infrastructure from 'dial before you dig'.

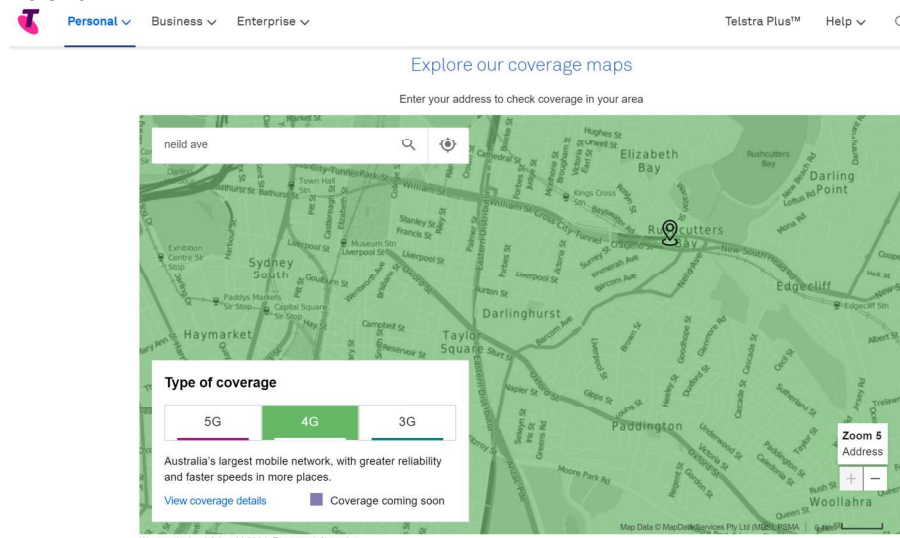
At this stage there is no requirement to provide DAS or Mobile towers for the project.

Mobile network:

No Mobile phone tower or system is planned for the school.

The following information obtained from the webpages of leading mobile network providers and their existing coverage in the area:

Telstra:



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Vodafone:

What's your device

Search an address

Rushcutters Bay, NSW 2011

Type of coverage

Calls & TXT

Voice 4G Indoor
VoLTE Available

Data Coverage

Data 4G Indoor

Coming soon

☐ Planned coverage improvements
Within the next 3 months

Optus:

Enter your address or postcode

COVERAGE LAYERS


Click below to display coverage on map

5G Home 5G Mobile **4G/3G**

5.0 Appendices

5.1 Appendix-A:Ausgrid Application

Ausgrid Application:



New Connection Above 100 AMP

Reference Code : 0071141

New Connection

LOCATION

Land Title Type

Torrens

Lot/DP Number

219/N752011

Nearest Cross Street

Boundary Street

Location Address

Nield Avenue, Rushcutter'S Bay, 2011

Land Zoning

Urban

Location Diagram

File name	Ausgrid filename reference	Size
7237 Site.pdf	LocationAttachmentFilePath_1	0.213 MB

APPLICANT

Applicant Type

Asp On Behalf Of A Retail Customer Or Real Estate Developer

Full Name

Mr Bruce Kennedy

Email Address

bkenedy@shelmerdines.com.au

ABN/ACN

40003331879

Company Name

Shelmerdines Consulting Engineers

Floor Number

1

Street Number/RMB

55

Po Box/Locked Bag

1345

Applicant Address

Hume Street Crows Nest 1585

Phone Number

0294363021

Asp Number

2606

Asp Level

Level 3

CUSTOMER

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Customer Type
Retail Customer
Full Name
Mr Greg Whitbread
Phone Number
0293325800

LOAD DETAILS

Proposed Point Of Common Coupling
Substation
Proposed Asset Identifier
Unknown
Proposed Connection Point
Main Switchboard
Proposed Service Length
40
Proposed Service Type
Underground
Service Voltage
Low Voltage 230/400v
Service Size
1000 Amps
Proposed Maximum Demand
Number Of Phases: 3
Phase A: 765
Phase B: 765
Phase C: 765

Proposed Maximum Demand Calculation

File name	Ausgrid filename reference	Size
7237 Max Demand.pdf	WFAMaxDemandCalc_1	0.011 MB

Are You Intending To Connect Controlled Load At This Premises?
No

ADDITIONAL DEVELOPMENT DETAILS

COMMERCIAL

Number Of Commercial Premises:1

Total Floor Area Without Aircondition In M2:6475

Total Floor Area With Air-Conditioning In M2:3315

Total Number Of Premises:1

I Will Be Installing Equipment At The Premises That May Result In Non Linear / Fluctuating Loads
No

Construction Of The Premises Connection Assets Will Commence
04-Apr-2021
When Do You Wish To Electrify The Premises?
05-Dec-2021
Ausgrid Has Provided A Certified Design Number(Cdn) For A Network Augmentation Project Associated With The Premises
No
Asp 1 Has Been Appointed
No
Do You Have Development Consent (Da) For Your Proposal?
No
Do You Wish To Underground / Relocate Electricity Assets In Conjunction With This Connection Application?
No

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Please attach any documents that are relevant to your connection for example Proposed Design, sketch of the building, Photos etc

File name	Ausgrid filename reference	Size
19086_SGSWeigall_SEARS_Final.pdf	AdditionalAttachment_1	2.197 MB

EXPEDITED CONNECTION

Do you want to expedite your connection offer for all premises?

☐ Yes ☒ No

Ausgrid will send you an offer that meets your supply requirements.

DECLARATION

Applicant Name
Mr Bruce Kennedy

Application Date
16-Jan-2020

Price Description
Above 100 Amps Connection Offer - Technical Assessment required 1 x 452.80

Total Price

Price including GST
AUD \$452.80
AUD \$452.80

[Terms and Conditions:](#)

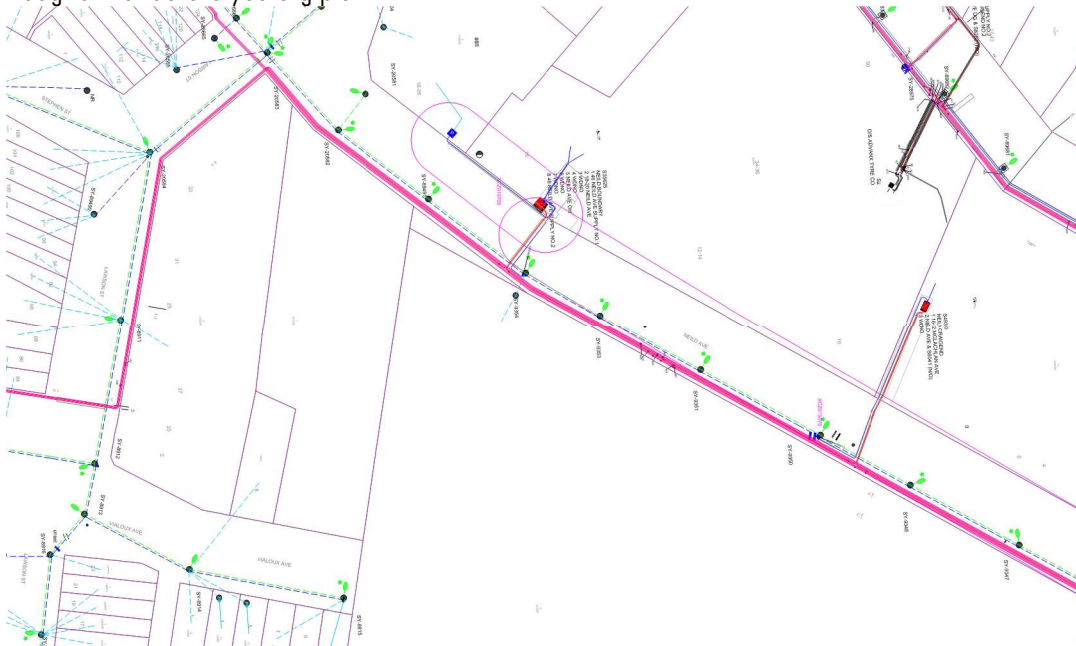
In submitting this application you are engaging Ausgrid to provide you with a connection offer. Once submitted the fee charged is consumed. Ausgrid will aim to provide you with a written response within 10 business days. If additional work and/or fees are required, we will contact you to advise prior to providing the response.

Where this application requests an expedited connection, I declare that I have read and understood the terms and conditions of the connection offer and agree that if the connection is expedited that a contract based on that offer will be formed with Ausgrid on the date that Ausgrid receives the application. Where this application is being made on behalf of a retail customer or real estate developer, I declare that I have obtained the authority of that person to make this application of their behalf, including where applicable, making a request for expedition of the connection application.

*I acknowledge the terms & conditions. ☒

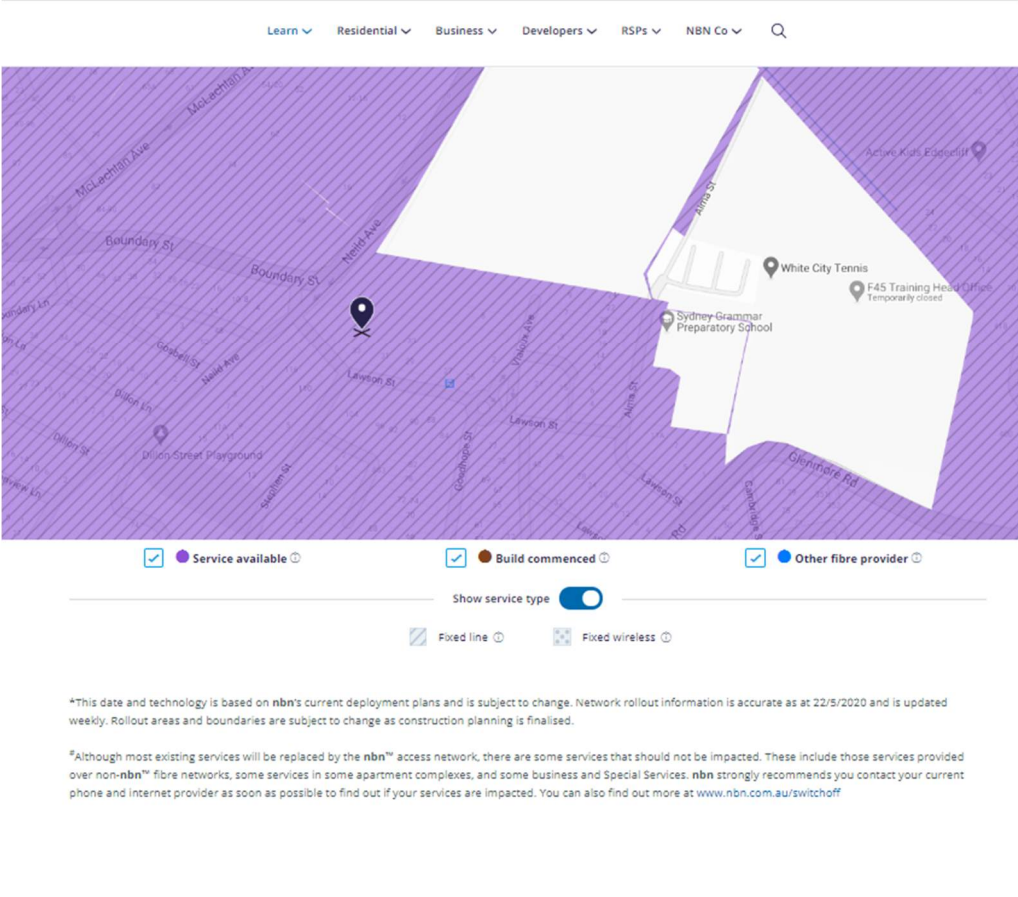
5.2 Appendix-B: DBYD information

Ausgrid Dial before you dig plan:



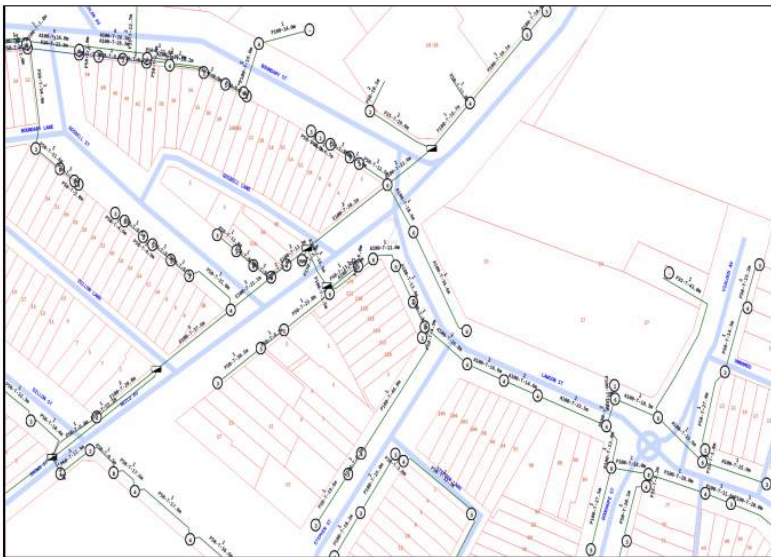
5.3 Appendix-C: Extent of NBN Availability

Based on the Dial before you dig (DBYD) information and information obtained from NBNCo web page, it is inferred that the project has good network connectivity. There is a need to coordinate with the Telecommunication authority to obtain Lead-in facility for the premise.



5.4 Appendix-D: Telecommunication DBYD

NBN Dial before you dig plan:



Telstra Dial before you dig plan:

