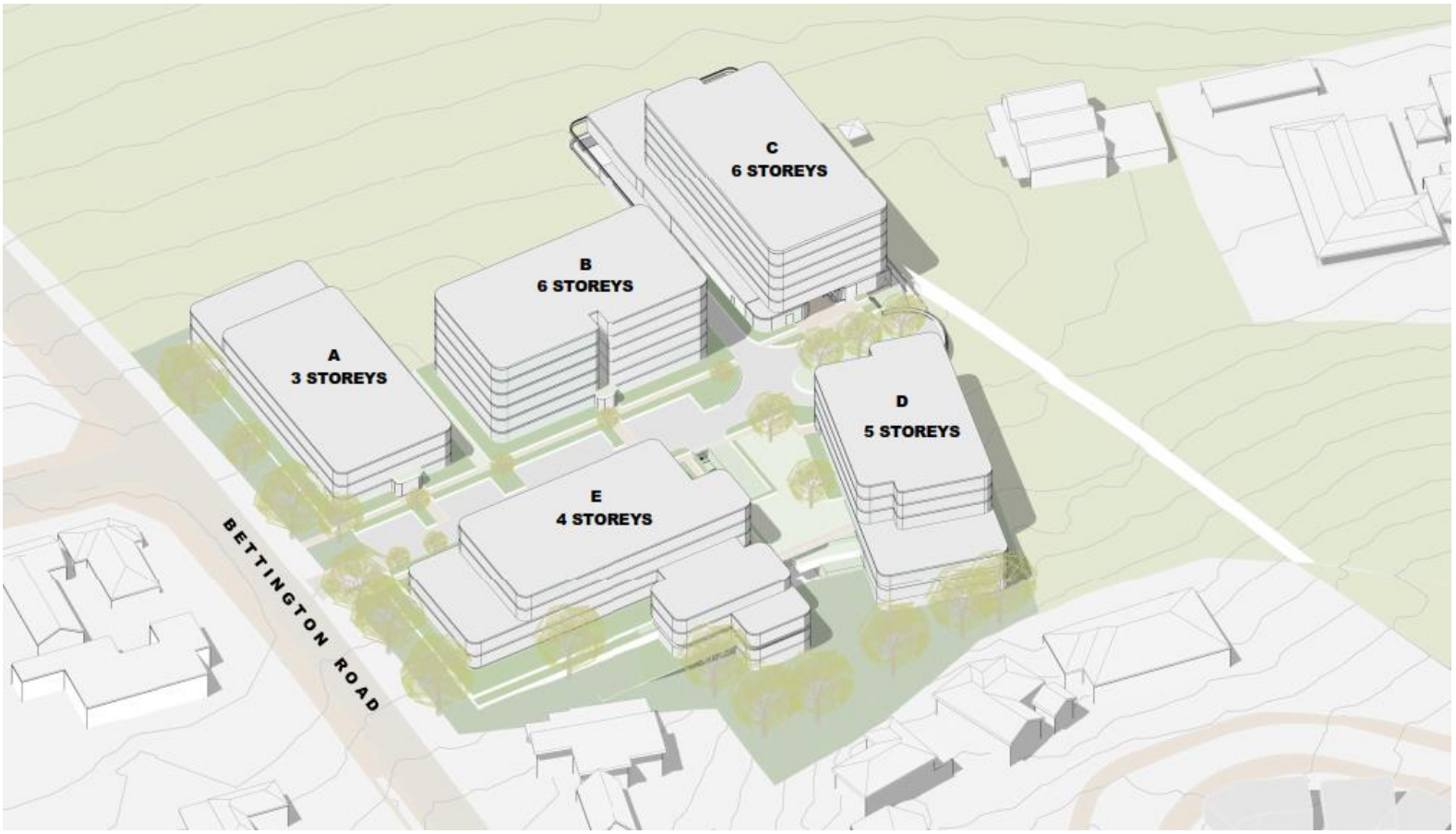
IGS INTEGRATED GROUP SERVICES




# OUTLANDS GOLF COURSE

# Engineering Services
# Desktop Due Diligence Report

**OCTOBER 2021**
**Rev 1.0**

VALUE | INNOVATION | TRUST

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## Document Control

| Version | Date | Author | | Reviewer | |
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| 1.0 | 22nd October 2021 | Oudai Awad | OA | Mays Chalak | MC |
| | | | | | |
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# 1. INTRODUCTION

## 1.1 General

Oatlands Golf Club (OGC) has commissioned IGS to carry out a desktop engineering services due diligence report for the proposed Oatlands Golf Course development.

The proposed development is for a mixed-use residential and club house development consisting of:

- Approximately 17,387m$^2$ of carpark (GBA);
- Approximately 193 residential dwellings;
- Approximately 2,818m$^2$ of Club space (GFA);
- Landscape works;
- Base building services and associated infrastructure.

It is understood that the carpark will be underground and will require carpark ventilation. In accordance with NCC 2019, all Class 2 and 3 buildings that are less than 25m in effective height, and with rise in storeys of 4 or more, are required to be protected by Fire Sprinklers in accordance section E1.5a.

This report presents the findings of a desk study review with respect to:

- Utility infrastructure (electrical, mains water, natural gas, sewer, telecommunications) assessment.

This report has been prepared solely for OGC. No warranty is provided to third parties who rely on this report for any other purpose.

## 1.2 The Site

The site is located at the intersection of Bettington Road and Ellis St and spans approximately 1.6ha. Refer to site plan below (Figure 1).

The site has a total area of approximately 2 hectares located within the Parramatta Council LGA, and current LEP maps denote the site as being zoned RE2, low density residential


**Figure 1 – Proposed Site Plan**

## 1.3 BCA Classification

BCA classification(s) of the development are as follows:

| | | |
|---|---|---|
| **BCA Classification** | Class 2 | Residential/Apartments |
| | Class 5 | N/A |
| | Class 6 | Café / Pro Shop / Club Facilities |
| | Class 7a | Carpark |
| **Rise in Storeys** | 3 - 6 | |
| **Type of Construction** | Type A Construction | |
| **Effective Height** | TBA | |
| **Gross Floor Area** | TBA | |

## 1.4 Mandatory BCA Energy Efficiency Requirements

Mandatory BCA Energy Efficiency requirements are as follows:

- Part J1 – Building Fabric;
- Part J2 – External Glazing;
- Part J3 – Building Sealing;
- Part J5 – Air Conditioning and Ventilation;
- Part J6 – Lighting and Power;
- Part J7 – Hot Water Supply.

Additional Requirements:

- BASIX (residential);
- NaTHERS (residential);
- SEPP65 (residential);
- NCC Section J (commercial)

# 2. UTILITY ENGINEERING SERVICES

## 2.1 Utilities Services Review / Analysis

A utilities review has been carried out in consultation with the relevant local authorities to identify the existing utilities at the site.

Dial Before You Dig (DBYD) requests were submitted on the 29 January 2021 to investigate the presence of existing utilities such as natural gas, water, stormwater, sewer and telecommunications.

The following utilities with interests/assets in the vicinity of the site were notified in this process:

| Seq. No. | Authority Name | Phone | Status |
|---|---|---|---|
| 106002797 | Endeavour Energy | 0298534161 | NOTIFIED |
| 106002799 | Jemena Gas North | 1300880906 | NOTIFIED |
| 106002801 | NBN Co, NswAct | 1800626329 | NOTIFIED |
| 106002800 | Sydney Water | 132092 | NOTIFIED |
| 106002798 | Telstra NSW, Central | 1800653935 | NOTIFIED |

## 2.2 Capacity Calculation Assumptions

The following assumptions have been made in carrying out this assessment:

- Approximately 193 residential dwellings;
- Approximately 2818m$^2$ of Club space (GFA);
- Average population of 2.5 persons per apartment;
- Average population of 1 person per 10m$^2$ for etail;
- Cold Water ~75,000 l/day;
- Sanitary / Sewer Discharge ~70,000 l/day;
- Gas ~3,650 mj/hr diversified load;
- Fire Sprinkler System 18 L/s;
- Fire Hydrant System 20 L/s.

# 3. ELECTRICAL

## 3.1 Electrical Maximum Demand

Based on our preliminary electrical maximum demand calculations, the new development will require 2234 Amps/Phase when After Diversity Maximum Demand (ADMD) has been applied.

This equates to approximately 1564kVA.

The detailed maximum demand calculation is presented below:

**Electrical Maximum Demand Calculation**
**Oatlands Golf Course**
~193 Unit Residential Development
~2818m2 of Club NLA
~17387m2 of Carparking
10 Lifts TBC

**Job No:** EN - N21_017

| Basements | Area (m2) | Quantities | VA/m2 | VA | I (A) | Subdivided I (A) |
|---|---|---|---|---|---|---|
| Carpark (Mechanically Ventilated) | 17387 | | 5 | 86935 | 124.2 | |
| Carpark Lighting | 17387 | | 5 | 86935 | 124.2 | |
| | | | | | | **248.4** |
| **General** | **Area (m2)** | **Quantities** | **VA/m2** | **VA** | **I (A)** | **Subdivided I (A)** |
| Common Space | 10000 | 1 | 5 | 50000 | 71.4 | |
| Evlink 7kW | | 10 | 7000 | 70000 | 101.4 | |
| Lifts | | 10 | | | 240.0 | |
| | | | | | | **412.9** |
| **Apartments** | **Area (m2)** | **Quantities** | **VA/Bed** | **VA** | **I (A)** | **Subdivided I (A)** |
| 2 Bed Apartment (Average) | | 193 | 4000 | 772000 | 1114.3 | |
| Houses | | | 7000 | 0 | 0.0 | |
| | | | | | | **1114.3** |
| **Commercial/Retail** | **Area (m2)** | **Quantities** | **VA/m2** | **VA** | **I (A)** | **Subdivided I (A)** |
| Club | 2818 | | 250 | 704500 | 1016.9 | |
| | | | | | | **1016.9** |
| **Total (without ADMD)** | | | | | | **2792.5** |
| **Total (with 80% ADMD)** | | | | | | **2234.0** |
| **Total Maximum Demand Calculation** | | | | | | **2234.0** |

**The redevelopment of the site will most likely necessitate new onsite substations.**

**To accommodate the new development load 2 x 1,000kVA substations will be required.**

## 3.2 Existing Services

There are existing high voltage feeders on Bettington Road that can be connected into for the new substation required to site.

This is shown below in Figure 2 on the Endeavour Energy DBYD response.

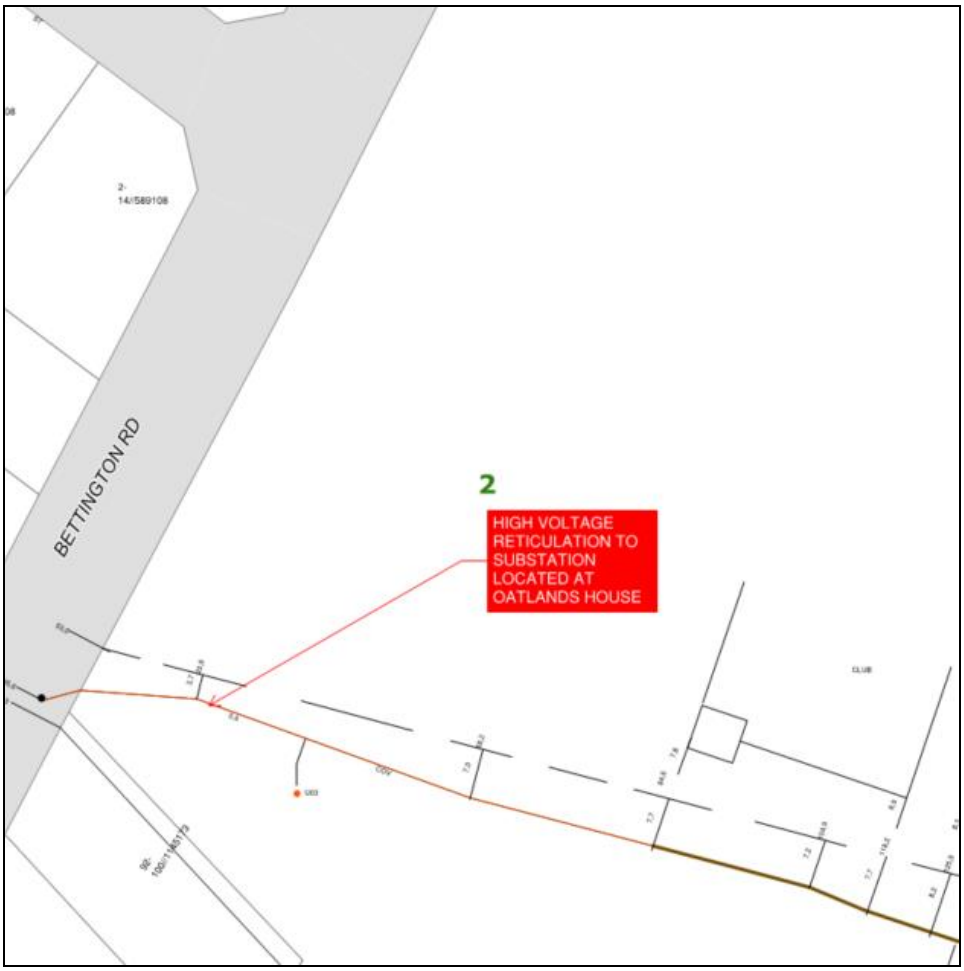


**Figure 2 – Substation Location on the Site**

From the GIS data obtained from Endeavour Energy, there appears to be a HV ductway reticulating through the site which supplies substation 7819 located at the Oatlands House.

The existing route and substation would need to be kept operational as this will be supplying the Oatlands House which at this stage will be operational through construction phase. This HV feeder would need to be diverted through construction and possibly permanently.

This would be subject to further negotiations with Endeavour Energy to ascertain current external customer loads.

## 3.3 Summary & Conclusions

The following items will need to be further considered with respect to the electrical services associated with the site:

- The existing substation would need to be kept operational during construction (TBC);

- The existing HV route will need to be coordinated with future construction works. This will include diversion through construction and possibly permanently to remain supplying Oatlands House;

- Staging and effect of existing substation location (and / or relocation) would need to be further considered.

# 4. NATURAL GAS

## 4.1 Gas Maximum Demand

The gas maximum demand has been estimated at:

- 3,650 mj/hr diversified load.

This is based on the Heating Ventilation and Air Conditioning (HVAC) System being a reverse cycle, split, air cooled, type system. It has been assumed that hot water and cooking appliances in the residential and food retail portions of the development will predominantly be gas.

## 4.2 Existing Services

There are no existing authority gas services on site that will require decommissioning or diversion.

We note that there is an internal / private gas line that runs along the southern car park hedge to the back of the clubhouse which may also be servicing Oatlands House. This internal private line may need adjustment / diversion depending on the final development plans.

## 4.3 Jemena Infrastructure in the Vicinity of the Site

There is 110mm 210 kPa main in Bettington Road which will be suitable and adequate to service the site.

This is shown below in Figure 3.

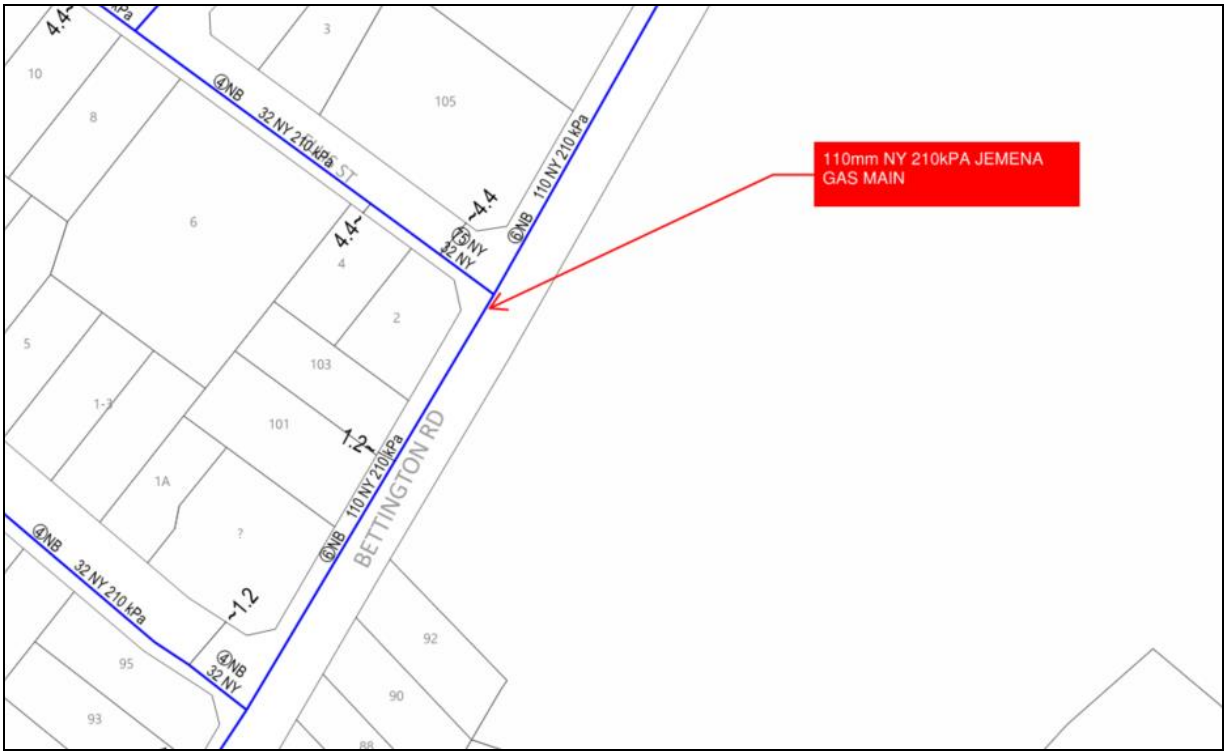


**Figure 3 – Jemena Natural Gas Infrastructure**

## 4.4 Summary and Conclusions

Jemena have extensive infrastructure in the vicinity of the site and can easily cater for the proposed new development.

There may need to be adjustment / diversion of the internal private gas line depending on the final development plans. This can be carried out located with a licenced plumber.

# 5. TELECOMMUNICATIONS

## 5.1 Telecommunications Maximum Demand

Based on current estimate of apartments proposed for the development broadband fibre optic cabling will be required to the site.

## 5.2 Existing Services

There are existing telecommunications services within the site that will need to be coordinated/diverted which potentially supplies the existing Golf Club House. The extent of any telco relocation or removal will be confirmed upon further site investigation.

## 5.3 Telecommunications Infrastructure in the Vicinity of the Site

Response from the respective Telco's shows an existing pit and pipe network in the vicinity of the site fronting Bettington Road.

The telecommunications services identified in the vicinity of the site are expected to have the carrying capacity to suit the needs of the proposed development.

NBN is available in Bettington Road.

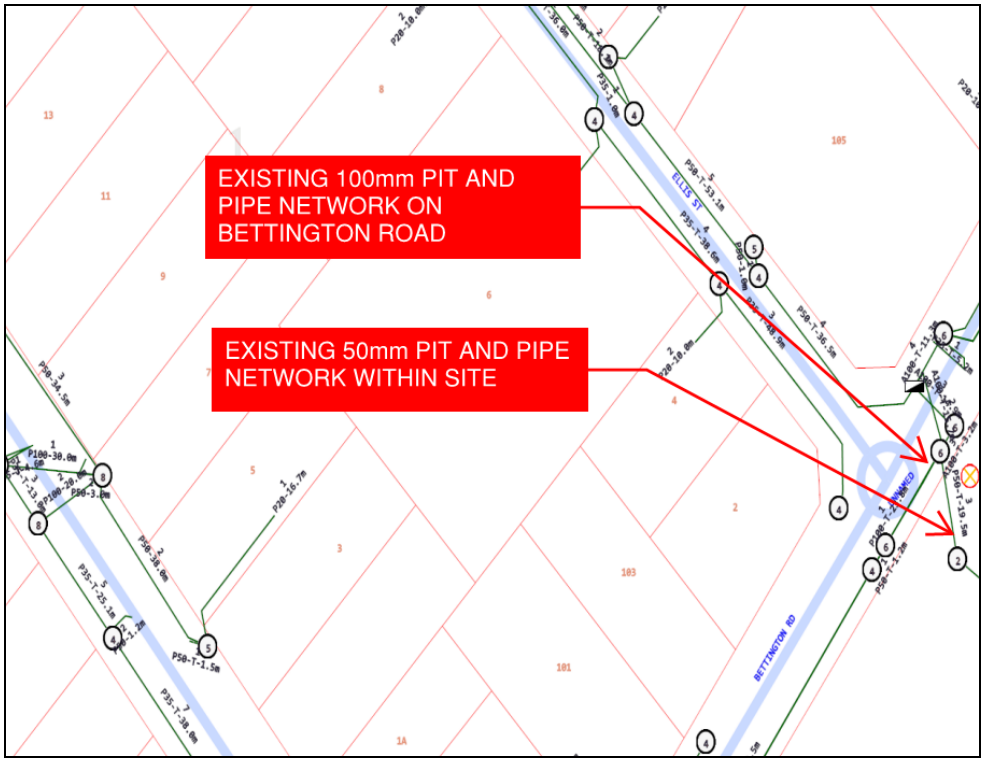


**Figure 4 – NBN Infrastructure in the Vicinity of the Site**

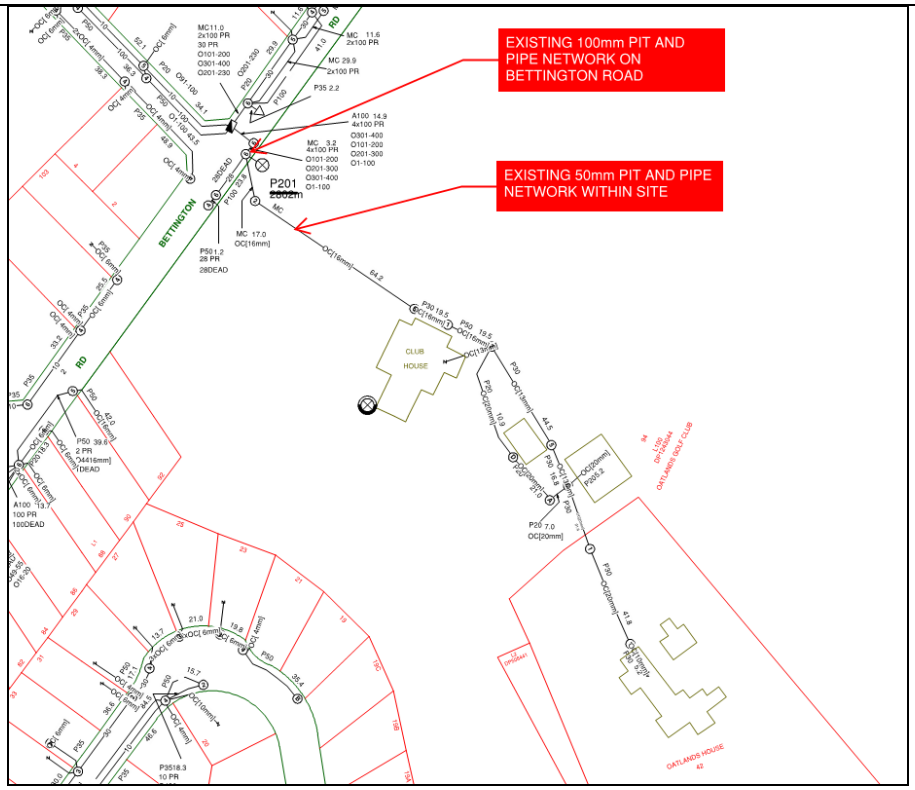


**Figure 5 – Telstra Infrastructure in the Vicinity of the Site**

## 5.4 Summary and Conclusions

The major Telco's all have infrastructure in the vicinity of the site and can easily cater for the proposed new development.

Consultation with Telstra and NBN must be undertaken as to confirm type infrastructure/plant/equipment within the outbuilding and possible options of relocation of decommissioning if required.

# 6. STORMWATER

## 6.1 Stormwater discharge

Parramatta Council stipulate On-site detention must be incorporated to limit discharge flows.

Water sensitive urban design requirements will also need to be implemented as to meet pollution reduction targets via filtration measures.

## 6.2 Existing Services

There are no major existing stormwater services within the site that will need to be decommissioned and/or diverted.

Any minor stormwater services within the site servicing the respective buildings can be readily decommissioned during demolition.

## 6.3 Flooding requirement

Review of the NSW planning portal, the site is not within a flood prone area.
Further consultation is recommended to address any localised overland flow paths that may run through the site..

## 6.4 Stormwater Infrastructure in the Vicinity of the Site

The site is located within Parramatta LGA and must meet the Permissible Site Discharge (PSD) rates as prescribed in the council DCP and Upper Parramatta river catchment trust.

Specifications for the OSD system can be determined through the development of a site specific hydraulic and water quality model.

The maintenance obligations and costs will need to be integrated into the development of the property.

Stormwater discharge point would need to be confirmed based on detailed investigation of the existing infrastructure, a desktop study found the only available kerb inlet pit which is located downstream of the development to be on the south western extents of the site located approximately 100m south of Niblick crescent.

Therefore, we deem the most appropriate discharge point would be directly into the Vineyard Creek traversing the north eastern boundary, subject to council approval.

In addition to this we, understand that the stormwater report recommends discharge to Vineyard Creek via Bettington Road with the permission of the City of Parramatta. This ultimately finds its way into the Club's 30ML storage at the north of the site.

At the present time we understand that a very significant amount of stormwater from the Clubhouse precinct drains directly to the dam through the course drainage network. This should continue as collection of stormwater on site is permissible under the Club's Water Licence.


**Figure 6 – Indicative location of possible discharge point**

**Figure 7 – Stormwater Infrastructure in Bettington Rd**

## 6.5 Summary and Conclusions

There is adequate stormwater infrastructure in the vicinity of the site and can cater for the proposed new development.

Stormwater discharge from the Clubhouse precinct drains directly to the dam through the course drainage network and shall continue as collection of stormwater on site is permissible under the Club's Water Licence.

# 7. MAINS WATER

## 7.1 Water Maximum Demand

Water maximum demand has been estimated as follows:

- Cold Water 75,000 l/day;
- Fire Sprinkler System 18 L/s;
- Fire Hydrant System 20 L/s.

## 7.2 Existing Services

There are no major water services within the site that will need to be decommissioned and/or diverted.

Any minor water services within the site servicing the respective buildings can be readily decommissioned during demolition.

We understand that there may be an internal / private potable service line that reticulates along the southern car park hedge under the practice chipping green that services Oatlands House. This internal private line may need adjustment / diversion depending on the final development plans.

## 7.3 Mains Water Infrastructure in the Vicinity of the Site

Sydney Water is the responsible authority for the provision of potable water to the site.

There is:

1. 450mm diameter water main reticulating along Bettington Road;
2. 180mm diameter water main reticulating along Bettington Road;
3. 150mm diameter water main reticulating along Bettington Road.

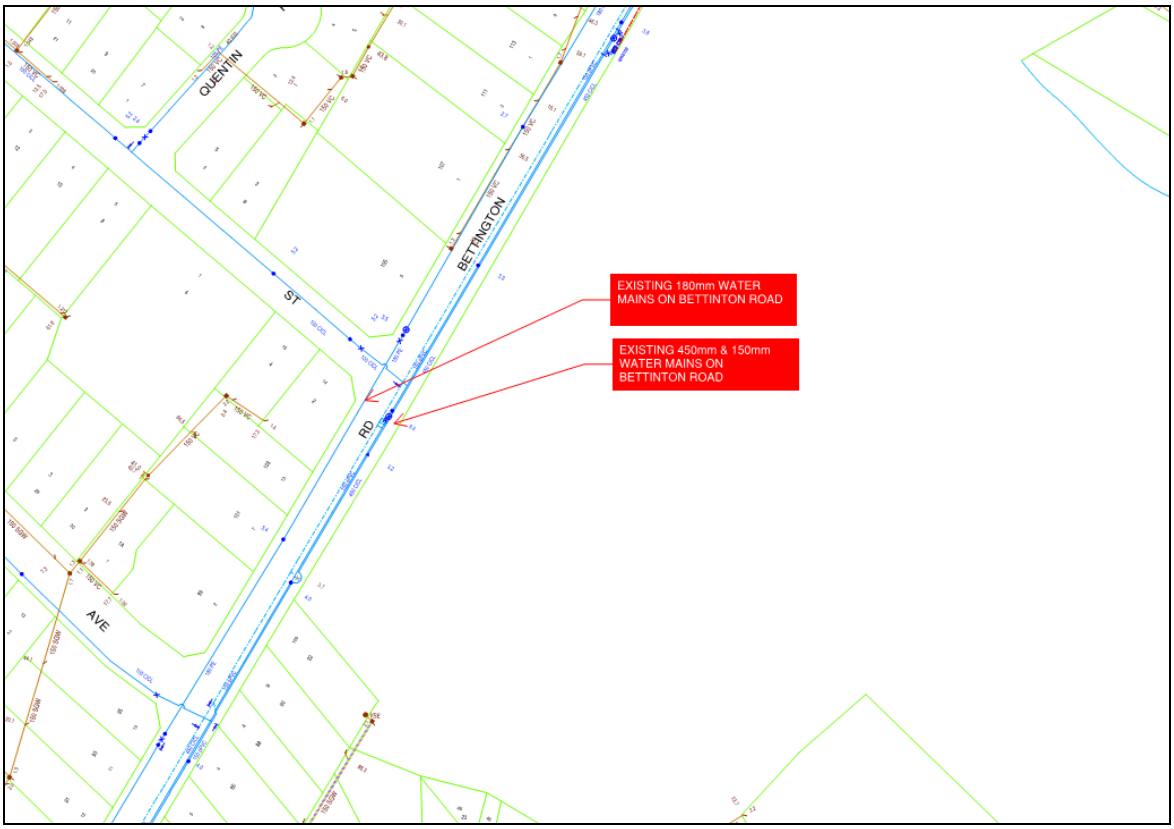


**Figure 8– Sydney Water Sewer/Water Diagram**

## 7.4 Summary and Conclusions

The existing water mains in the vicinity of the will likely be suitable and available for connection to service the sites potable water needs. Subject to Sydney Water NOR.

There may need to be adjustment / diversion of the internal private potable water line depending on the final development plans. This can be carried out located with a licenced plumber.

# 8. SEWER

## 8.1 Sewer Maximum Demand

Sewer maximum demand has been estimated as follows:

- Sanitary / Sewer Discharge 70,000 l/day.

## 8.2 Existing Services

There are multiple existing Sydney water sewer mains traversing the site, which maybe impacted by the development and require diversion or encasement works.

1. 150mm gravity sewer services located at the southern side of the site;
2. 150mm gravity sewer services reticulating east to west at the southern boundary;
3. Vent shaft located at the rear of site connected to the sewer main proposed for disuse.

## 8.3 Sewer Infrastructure in the Vicinity of the Site

Sydney Water is also the responsible authority for the provision of sewer services to and through the site. As mentioned above there are adequate sewer main reticulating the site which can service the sanitary drainage needs.

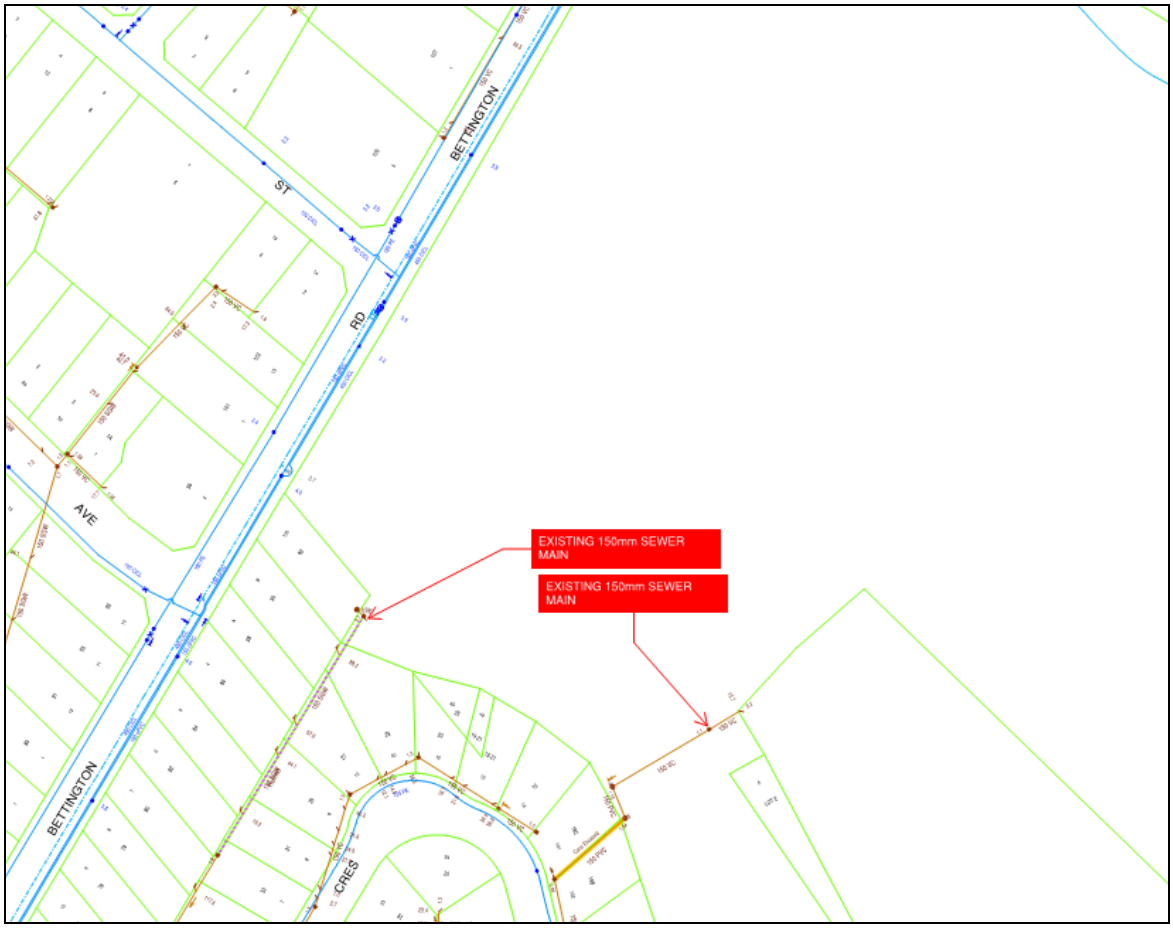


**Figure 9– Sydney Water Sewer/Water Diagram**

**This will be confirmed by the Section 73 that will be lodged with Sydney Water after a Development Application (DA) is obtained.**

## 8.4 Summary & Conclusions

There is adequate sewer infrastructure in the vicinity of the site and can easily cater for the proposed new development.

The quality of the existing sewer mains are not known at this stage however there are multiple options to work from on this site if any of the quality of the mains are deemed unsuitable.