Building Services Feasibility Advice

Chatswood Golf Club

128 Beaconsfield Rd, Chatswood NSW 2067

Prepared For:
Watermark

Prepared By:
Building Services Engineers

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BSE
TRUE PARTNERS

Building Services Engineers
Level 2, 121 Walker Street
North Sydney
02 9922 5200
02 9922 5211
mail@bse.com.au

Status

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	V1	29.11.19	SJ
	V2	10.01.20	SJ
Issued To:	Watermark Retirement Living		

Contents

1. Summary

Watermark Retirement Living are currently planning the development of the Chatswood Golf Leisure Resort, a four-level development encompassing independent living units, clubhouse and bar facilities.

To this end, BSE have been engaged to provide advice on the suitability of the existing services infrastructure to accommodate the proposed works. The intent of this report is to summarise the information gathered by BSE and provide advice with respect to the modification/additions anticipated to be required to the existing services infrastructure to accommodate the proposed works. We understand that this information will form part of an overall feasibility study.

We have summarised our finding as follows:

- Water: The existing golf clubhouse is connected to a Ø100mm Cast Iron Cement Lined Pipe (CICL) located within Beaconsfield Road. We anticipate that this will be adequate for the potable water for the proposed development subject to Sydney Water application and approval. However, a pump will be required for potable water and pumps and tanks will be required for fire protection services
- Sewer: The existing golf clubhouse is connected to a Ø150 Polyvinyl Chloride (PVC) sewer main located to the South underneath the golf course. We anticipate that the connection will require amplification to serve the proposed development subject to Sydney Water application and approval
- Gas: There is an existing 50mm Nylon (NY) 210kPa gas main available for connection within Beaconsfield Road. We anticipate that this existing gas main will be adequate for the proposed development subject to Jemena application and approval
- Electrical Power: The maximum demand of the proposed development is approximately 760kVA. We propose that a new 1,000kVA kiosk substation is provided with connection to the existing HV feeder within Colwell Crescent. Final arrangements are subject to Ausgrid application and approval
- Communications: the existing golf clubhouse is provided with connection to the existing Telstra and Optus networks. NBN Co. is available for the proposed development via HFC technology. Final arrangements are subject to NBN Co. application and approval
- We have received the Pressure and Flow statement from Sydney Water which notes slightly less available pressure and flow in comparison to the onsite pressure tests carried out by Fire Compliance and Maintenance to provide this advice (refer to appendix)

Refer to the body of this report for further information.

2. Introduction

2.1. Purpose and scope

The primary objective of this report is to review the existing services infrastructure in conjunction with the proposed works and provide advice on any modifications required to be included as part of an overall feasibility study.

This report contains the findings of BSE's review of the following:

- Review of DialB4UDig information to understand existing inground services

The following services were investigated:

- Water (Sydney Water)
- Sewer (Sydney Water)
- Gas (Jemena)
- Electrical Power (Ausgrid)
- Communications (Telstra, Optus and NBN Co.)

This report does not cover the following:

- Inspection of services on site
- Investigation of structural or civil services
- Measurement of services performance with the exception of the hydrant flow testing
- Review/verification of architectural design with respect to services provisions

2.2. Referenced documentation

2.2.1. General

NCC	National construction code (Building code of Australia)
Survey	*Plan of levels and details at 280-298 Railway Parade, Carlton for Netstrata* drawing 204490-1 completed by W Buxton Pty Ltd on 22.09.15

2.2.2. Hydraulic services

AS3500	Plumbing and drainage
PCA	Plumbing Code of Australia (NCC VOL 3)
Sydney Water	DBYD plans
Jemena	DBYD plans

2.2.3. Electrical services

AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NSW SIR	NSW Service and Installation Rules
AS/CA S009:2013	Communications Alliance Ltd – Installation requirements for customer cabling (Wiring Rules)
Telstra	DBYD plans

Optus	DBYD plans
Ausgrid	DBYD plans and Authority design and construction standards
NBN Co.	NBN Co. website and address enquiry

2.3. Definitions & abbreviations

BCA	Building code of Australia
BSE	Building Services Engineers
DB	Distribution board
DBYD	Dial before you dig
HV	High Voltage (i.e. 11kV+)
LV	Low Voltage (i.e. 400V/230V)
MSB	Main switchboard
NBN	National Broadband Network
NCC	National construction code

3. The Site

The existing site is located at the end of Beaconsfield Road in Chatswood and contains the Golf Clubhouse complete with ring road access and on-grade carparking.

Location of the development Source: Google Maps

The proposed development will include:

- 106 Independent living units
- 1,700 m^2 clubhouse with bar/ bistro area, function and meeting spaces, flexible breakout and activity rooms, swimming pool and gymnasium, golf pro shop and practice area
- 1,100 m^2 of open air carpark
- 4,400 m^2 of basement carpark

The footprint of the proposed development is not encumbered by any existing authority services. However, there is existing sewer mains underneath the golf course to the South of the existing clubhouse.

4. Services Connections

4.1. Water

Potable water is currently supplied by a single water meter connected to the Sydney Water Corporation (SWC) Ø100mm Cast Iron Cement Lined Pipe (CICL) located within Beaconsfield Road. We anticipate that this will be adequate for the potable water for the proposed development subject to Sydney Water application and approval.

We have received the pressure and flow statement from Sydney Water which notes less available pressure and flow compared to the onsite flow test (refer to appendix for results). Based on the Sydney Water statement of available pressure and flow, an onsite pumpset will be required for the domestic potable water supply.

In order to determine the requirements for water supply for fire protection services, we assumed the following:

- The proposed development shall consist of the following building classes; Class 7a – car park, Class 9b – assembly building and Class 2 – residential
- The building has a floor area greater than 500m2
- The car park has greater than 40 spaces
- The residential component of the building is greater than 4 storeys

In summary the proposed development will require the following services.

- Detection & Occupant warning throughout
- Sprinklers throughout
- Hydrants throughout with hose reels to car park and clubhouse only

The Sydney Water statement of available pressure and flow at 128 Beaconsfield road provides max 11 L/s. Allowing for friction losses to the site results in 8 - 10L/s.

The fire protection services demands will be as follows:

- Hydrant 1200 L/min x 60 min x 4 hrs = 288,000 L
- Sprinkler 900 L/min x 60 min x 1.2 hrs = 64,800 L
- Total Demand = 352,800 L
- Less infill at 8 L/s = 115,200 L
- Therefore, minimum tank size = 339,840 L – 115,200 L = 237,600 L
- The hydrant system requires a split tank or two tanks @ 50% = 2 x 118,800 L (effective capacity) tanks

The sprinkler and hydrant system may be combined or separate, but will require two pumps regardless. The hydrant pump duty shall be 1200 L/min @ 750 kPa and the sprinkler pump duty shall be 900 L/min @ 250 kPa.

The spatial requirements for the fire protection services pumps/tanks shall therefore be as follows:

- Pump room with direct external access (or fire isolated stair/corridor) 4000 (W) x 6000 (L)
- Fire booster at or near main entrance
- 2 Fire water tanks each 7000 (W) x 7000 (L) x 2800 (H) - either at same level or higher than the fire booster elevation

4.2. Sewer

The Sydney Water Internal Sewer Diagram shows that the existing building's sewer connection is located to the South of the existing building (refer to appendix). The existing building's sanitary drainage system connects to a

Sydney Water Corporations (SWC) Ø150 Polyvinyl Chloride (PVC) which connects into a Ø300 Vitrified Clay (VC) sewer main which is located within the property boundary.

Based on our preliminary calculations, we anticipate that the existing 150mm site sewer main connection will require amplification to accommodate the proposed development. Subject to Sydney Water advice, a site survey and service protection report may be required for the existing sewer main to assist with any required design amplification.

4.3. Gas

There is an existing Ø50 Nylon (NY) 210kPa gas main available for connection within Beaconsfield Road.

We anticipate that the existing gas main will be adequate for the proposed development subject to Jemena application and approval.

4.4. Electrical power

The existing golf clubhouse is supplied via an aerial low voltage connection from an existing power pole in Beaconsfield Road to a private pole within the site boundary, then underground to the main switchboard.

We have completed a preliminary maximum demand in accordance with AS3000, which resulted in a maximum demand of approximately 760kVA. This will require an upgrade to the existing connection to accommodate the proposed development.

The proposed development shall be able to be accommodated by a single 1,000kVA substation. The nearest HV line to the development is located in Colwell Crescent which we anticipate will have adequate capacity to accommodate the proposed development subject to application and approval by Ausgrid.

Due to the availability of land, we would recommend a kiosk substation be installed. A kiosk substation requires an easement with dimensions of 5300 (W) x 3300 (D). Additionally, a 2000 (W) easement is required from the site boundary to the kiosk substation for HV cabling and 24hr, 7 day a week unimpeded 27 ton truck access with dimensions 4000 (W) x 4000 (H).

The kiosk must not be located within;

- 1:100 flood level or in stormwater paths
- 10000 of an external fire hydrant/fire pumps etc
- 6000 of any ventilation opening
- 3000 of any part of a building unless it is 180/180/180 FRL & 2kPa blast
- 3000 from site boundary unless provided with 180/180/180 FRL & 2kPa blast wall
- 3000 of any glazing and fire exits
- 5000 to water tanks
- 10000 of a Telstra pit (dependant on equipment within pit)
- 20000 of 132kV structures
- Underneath aerial 22kV +

As the proposed development is yet to be finalised, an application for connection has not been submitted to Ausgrid.

4.5. Communications

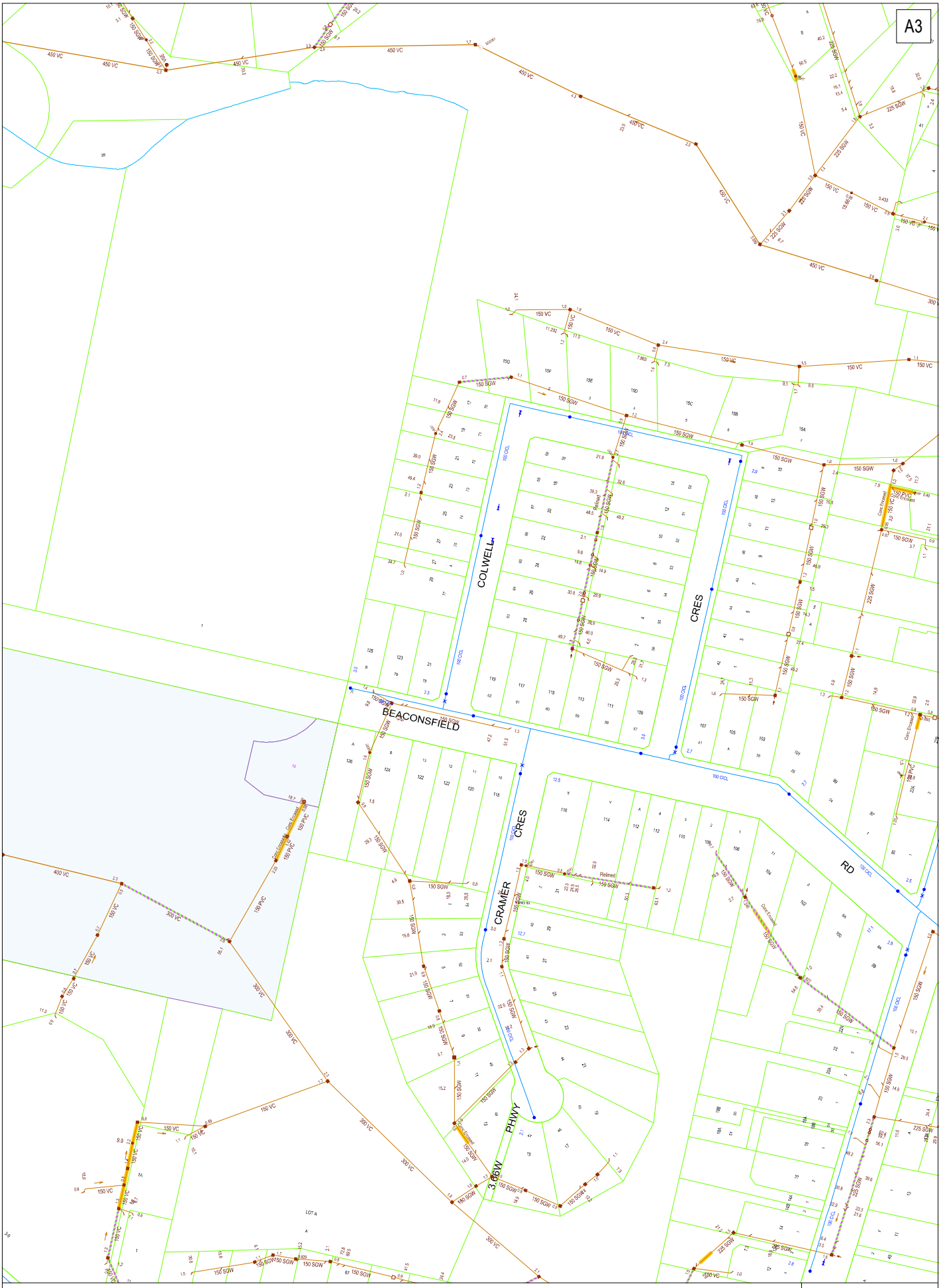
From the DBYD plans, it appears that the existing golf clubhouse is provided with a connection from the existing Telstra Copper and Optus networks.

Following an enquiry on the NBN Co. website, we understand that connection to the National broadband Network (NBN) is currently available via Hybrid Fibre Coaxial (HFC) technology. HFC technology utilises fibre optic cabling to a local fibre node and then the existing 'pay TV' or cable network coaxial cabling to the proposed development. Final connection arrangements will be subject to application and approval by NBN Co.

5. Appendices

The appendices to this report include the following:

Item No.	Document Description	Quantity of Pages
1.	Sydney Water DBYD plans	1
2.	Sydney Water Internal Sewer Diagram	1
3.	Sydney Water Statement of Available Pressure & Flow	1
4.	Hydrant Flow Test	1
5.	Jemena DBYD Plans	1
6.	Ausgrid DBYD Plans	1
7.	Telstra DBYD Plans	2
8.	Optus DBYD Plans	1
9.	NBN Co. DBYD Plans	3



DBYD Address:
128 Beaconsfield Road
Chatswood NSW 2067

DBYD Job No: 18593092

DBYD Sequence No: 92262465

Scale: 1:1500

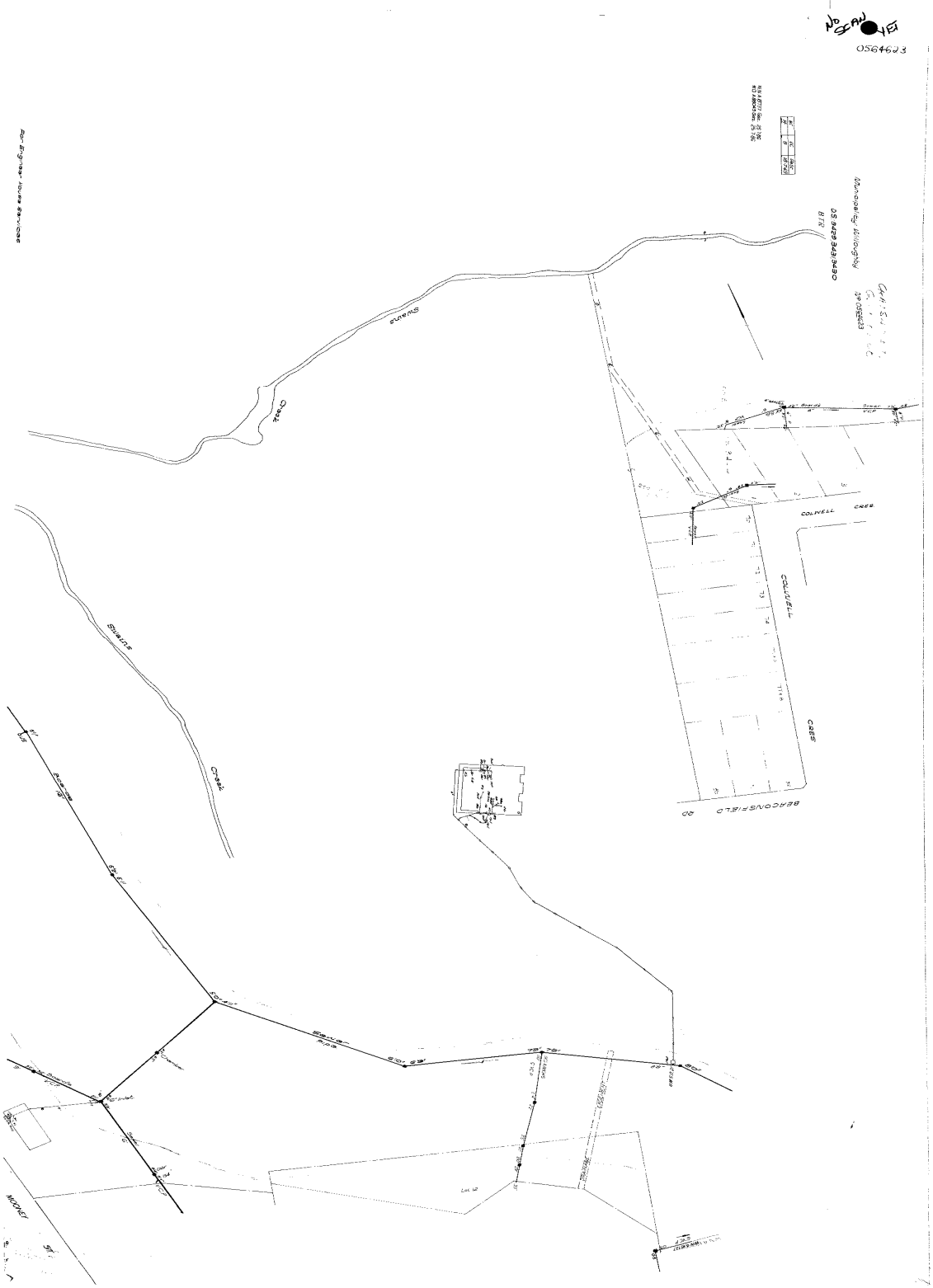
Date of Production: 18/11/2019

Plan 1 of 1

0m 7m 14m 21m 28m

Sewer Service Diagram

Application Number: 773871



Document generated at 28-11-2019 04:01:28 PM

Disclaimer
The information in this diagram shows the private wastewater pipes on this property. It may not be accurate or to scale and may not show our pipes, structures or all property boundaries. If you'd like to see these, please buy a **Service location print**.

Statement of Available Pressure and Flow

Sydney WATER

Philip Li
47-51 Frederick Street
Ashfield, 2131

Attention: Philip Li Date: 30/12/2019

Pressure & Flow Application Number: 768409
Your Pressure Inquiry Dated: 2019-11-20
Property Address: Chatswood Golf Club - Beaconsfield Road Chatswood

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Beaconsfield Road	Side of Street: North
Distance & Direction from Nearest Cross Street	40 metres West from Colwell Crescent
Approximate Ground Level (AHD):	47 metres
Nominal Size of Water Main (DN):	100 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	81 metre head
Minimum Pressure	53 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	51
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5 10 11	46 26 16
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5 10	39 17
Maximum Permissible Flow	11	5

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

swtapin@sydneywater.com.au

General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.

2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.

3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.

4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.

5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system -
Sydney Water Website – www.sydneywater.com.au/tapin/index.htm. Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.

6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.

2. Regular updates of the models are conducted to account for issues such a urban consolidation, demand management or zone change.

3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.

4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.

5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.

6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

PO Box 4679,
Sylvania Waters, 2224

admin@firecompliance.com.au
Phone 1300 576 055
ABN 41 143 535 184

HYDRANT FLOW TEST REPORT

Date: 21.11.19
Time: 7.15am
Site Address: 128 Beaconsfield Rd Chatswood NSW
Client: Building Services Engineers
Test Apparatus: PF1D
Technician: Murray. D

Towns Mains Results

Flow (litres/Sec)	Pressure (kPa)
Closed Head / Static	675
5L/S	525
10L/S	350
13L/S	100
Maximum Flow 14L/S	0

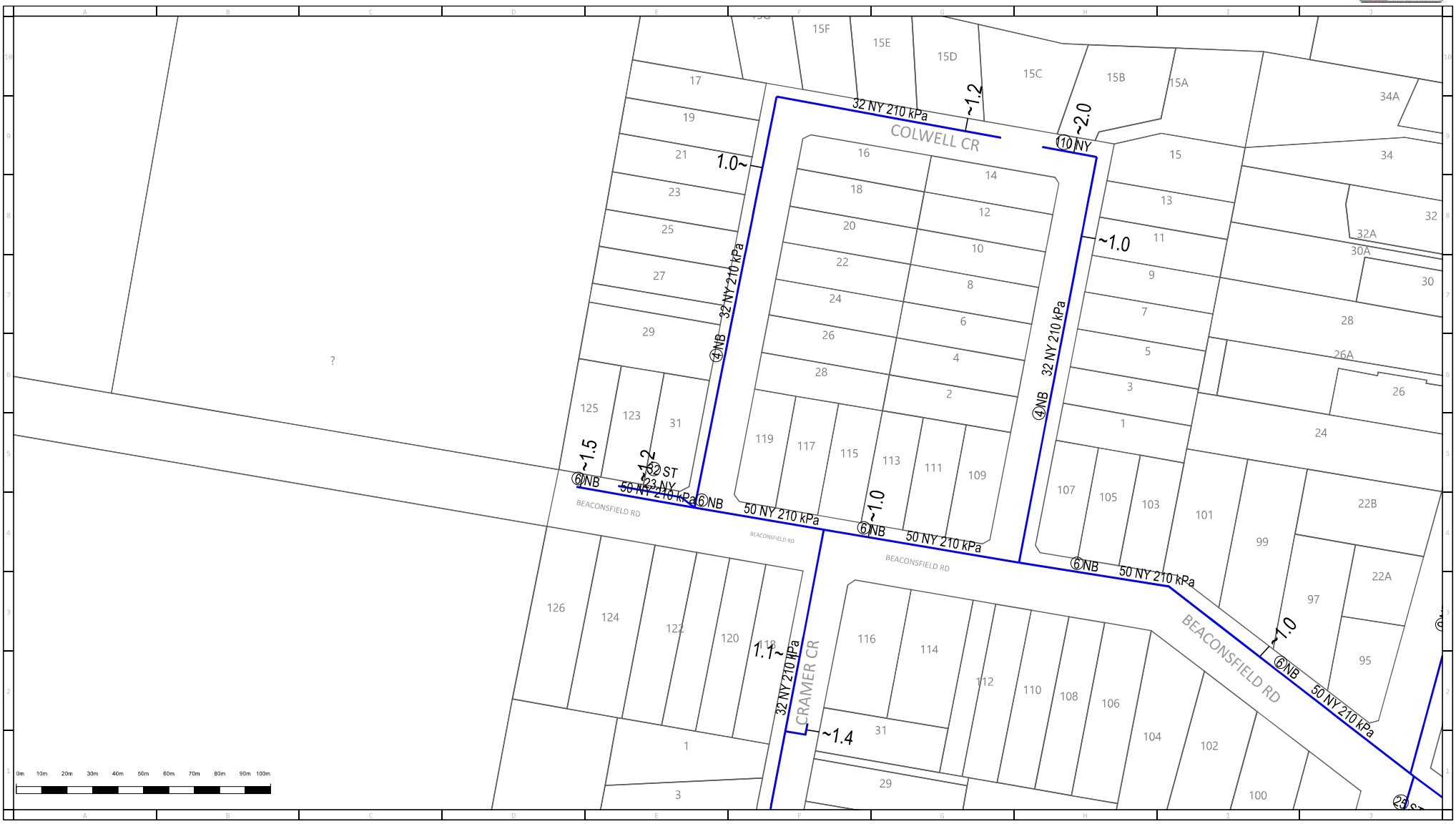
Results:

- There is one sleeve valve within 1 metre which is fully turned on
- The high pressure static reading exists because the test location is at the bottom of a hill

Signed: ARYAN ZAWITY

Disclaimer: Please note the above results are as of today's date and note that these results are not guaranteed in the future due to changes. This may be due to new construction sites in the area or Sydney Water Maintenance Services or any other factor. Fire Compliance and Maintenance does not take any responsibility if the above results cannot be achieved in the future.

DBYD Authority: Jemena Gas Networks (NSW) **DBYD Location:** 128 Beaconsfield Road Chatswood NSW, 2067



Jemena
ABN 87 003 004 322

Main	In Service	Proposed
Unknown Pressure		
Distribution - 2 kPa		
Distribution - 7 kPa		
Distribution - 30 kPa		
Distribution - 100 kPa		
Distribution - 210 kPa		

Main	In Service	Proposed
Distribution - 300 kPa		
Distribution - 400 kPa		
Proposed Isolate (coloured according to kPa)		
Conduit or Casing (Size & Material)		100 PVC

High Pressure Main & Pipeline	In Service	Proposed
Critical Main Treat as High Pressure Main		
Secondary - 1050 kPa		
Secondary Service		
Primary - 3500 kPa		
JGN Trunk - 7000 kPa		
Transmission		

Fittings, Valves & Regulators	
Siphon	Regulator Set
Valve	Regulator Station
Distance in metres of Main from Boundary Line ~1.5	
MBK = Metres Back of Kerb	Automatic Line Break Valve
MFL = Metres from Fence Line	

N W E S

Scale: 1:2000

Issue Date: 18/11/2019
DBYD Seq No: 92262464
DBYD Job No: 18593092

WARNING: This is a representation of Jemena Gas Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. This plan is diagramatic only, and distances scaled from this plan may not be accurate. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the date of issue.

WARNING

Ausgrid's plans show the position of assets at the time of installation and may not account for subsequent changes to road alignments, fences or buildings. The plans show no more than the presence or absence of Ausgrid assets in the street.
Persons working near electricity networks must exercise care and will be held responsible for any damage caused.
You must excavate by hand or use vacuum excavation to establish the location of Ausgrid underground cables and associated assets.
Underground: Working near a cable may result in electric shock even if no contact is made. Any work in the vicinity of any cable should only be performed using safe work methods developed in accordance with the recommendations included in SafeWork NSW Code of Practice for Excavation and SafeWork NSW Guide for Work Near Underground Assets
as well as recommendations of Ausgrid's Network Standard NS156.
Overhead: Do not excavate near poles or towers until the stability of the foundation has been assessed by Ausgrid. Cables or earth conductors may be present close to substations, poles or towers.
Workers must maintain safe approach distances and follow applicable SafeWork NSW Codes of Practice.
NOTE: 1. You must keep Ausgrid plans on site during excavation works. If the people actually performing the excavation works do not know how to read and interpret Ausgrid's plans, then the work must be directed by a person who knows how to read and interpret the plans. 2. This information includes data from the NSW Digital Cadastral Database by Land and Property Information (c) 2016, used under Creative Commons licence version 4.0.

ISG GRID

GL24224	GL33113	GL33114
GL24242	GL33131	GL33132
GL24244	GL33133	GL33134

GRID

195B11	195C11	195D11
195B12	195C12	195D12
195B13	195C13	195D13

GMLA0

Distribution - 92262461

INFORMATION ON THIS PLAN ONLY VALID FOR 30 DAYS FROM ISSUE DATE

19 Nov 2019

Page 1 of 1

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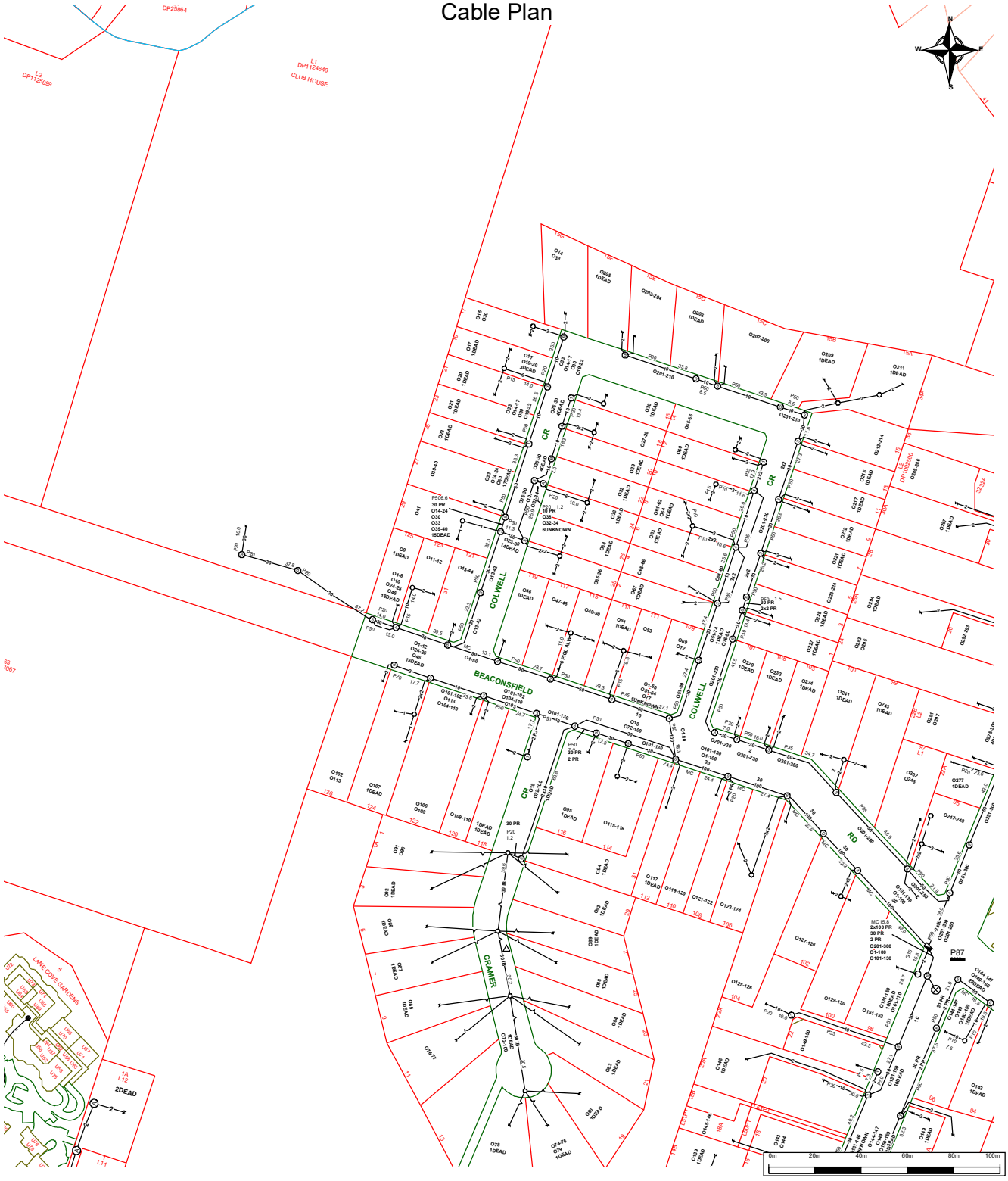
N

0 — 30 metres

Ausgrid

A0 MOCS_std_plot

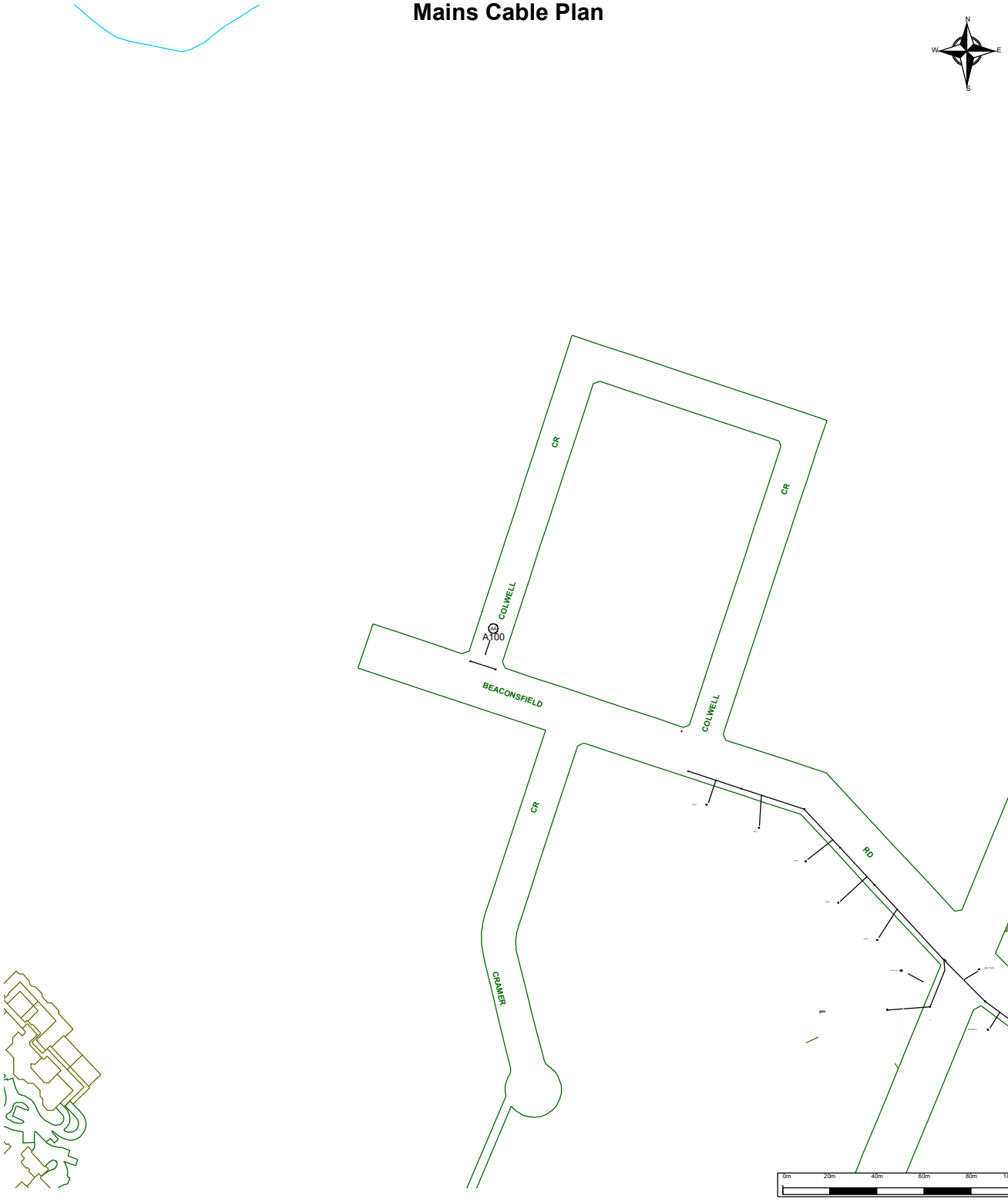
Cable Plan



Telstra	For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556	
Generated On 18/11/2019 16:45:03	Sequence Number: 92262462 Please read Duty of Care prior to any excavating

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

Mains Cable Plan



Telstra For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)	Sequence Number: 92262462
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Sequence Number: 92262463

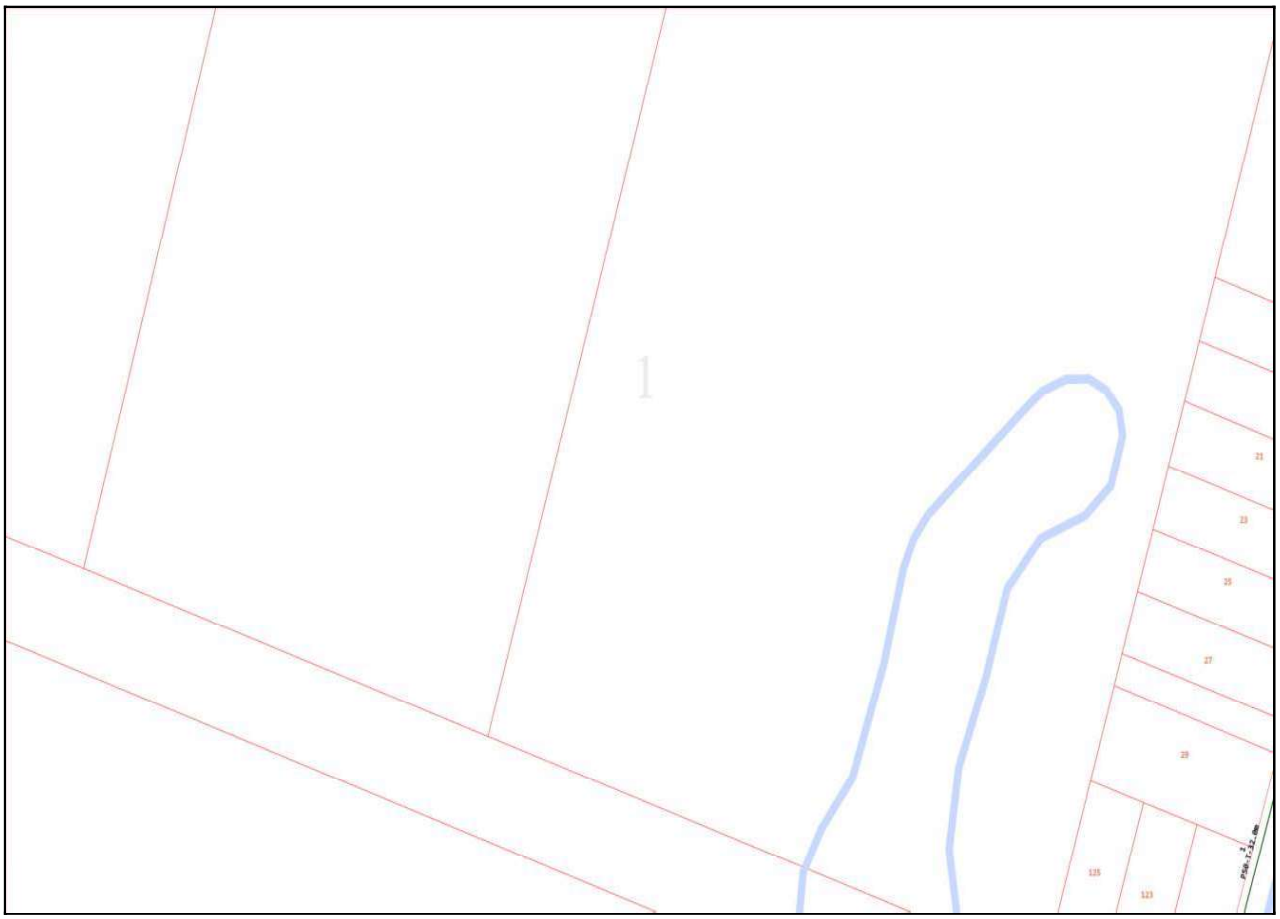
Date Generated: 18/11/2019

For all Optus DBYD plan enquiries –
Email: Fibre.Locations@optus.net.au
For urgent onsite assistance contact 1800 505 777
Optus Limited ACN 052 833 208

LEGEND

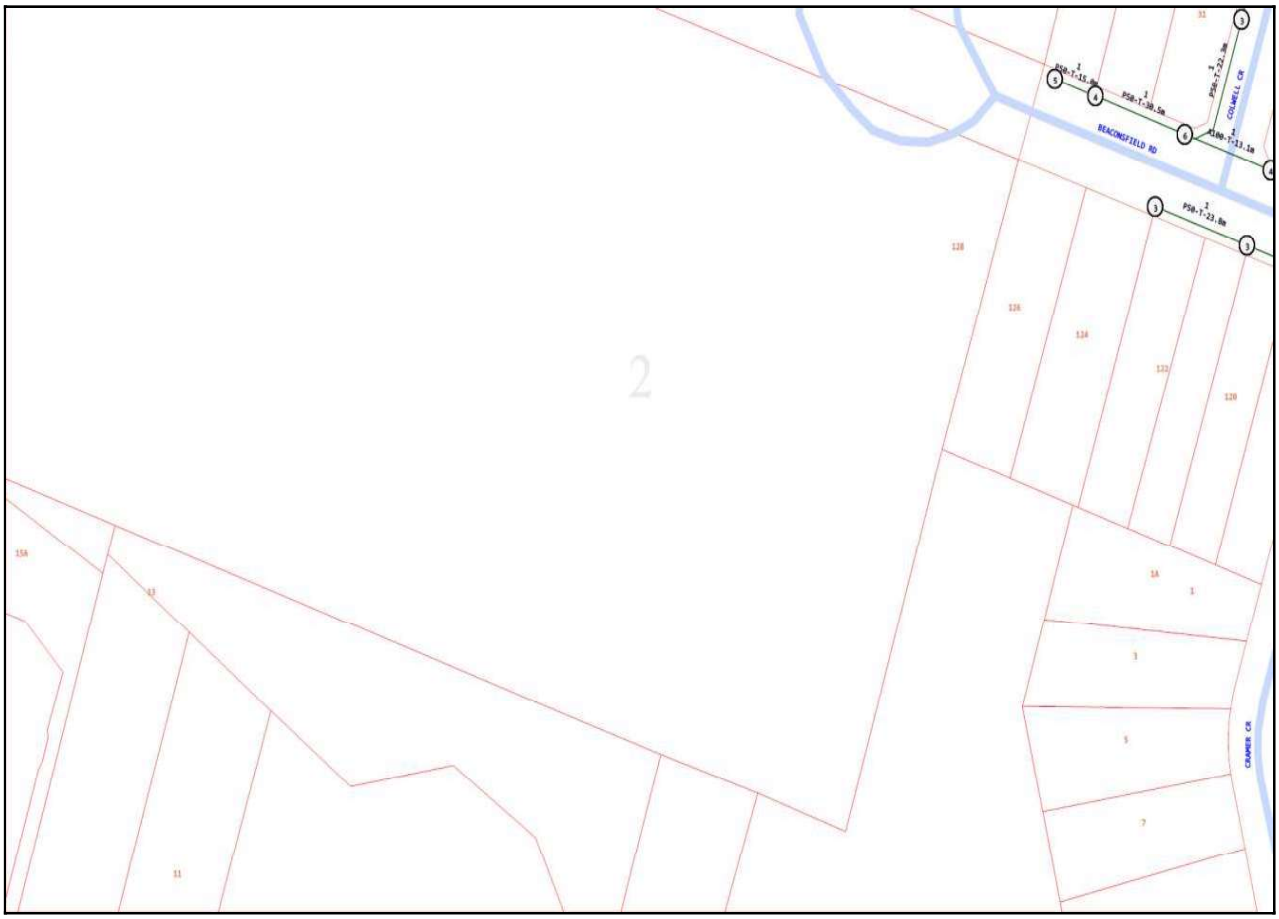
14	Parcel and the location
5	Pit with size "5"
2E	Power Pit with size "2E". Valid PIT Size: e.g. 2E, 5E, 6E, 8E, 9E, E, null.
	Manhole
	Pillar
2 PO – T- 25.0m P40 – 20.0m 5 9	Cable count of trench is 2. One "Other size" PVC conduit (PO) owned by Telstra (-T-), between pits of sizes, "5" and "9" are 25.0m apart. One 40mm PVC conduit (P40) owned by NBN, between pits of sizes, "5" and "9" are 20.0m apart.
2 10.0m 5 9	2 Direct buried cables between pits of sizes ,"5" and "9" are 10.0m apart.
5 9	Trench containing any INSERVICE/CONSTRUCTED (Copper/RF/Fibre) cables.
5 9	Trench containing only DESIGNED/PLANNED (Copper/RF/Fibre/Power) cables.
5 9	Trench containing any INSERVICE/CONSTRUCTED (Power) cables.
BROADWAY ST	Road and the street name "Broadway ST"
Scale	0 20 40 60 Meters 1:2000 1 cm equals 20 m

Email info@nbn.com.au Web nbn.com.au



Level 11, 100 Arthur Street, North Sydney NSW 2060

Email info@nbn.com.au Web nbn.com.au



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