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CIVIL ENGINEERING REPORT

Tweed Coast Homes Pty Ltd
Lots 1, 2 and 3 DP 29748 & Lot 4 DP 31209
Tweed Coast Road & Cypress Crescent, Cabarita Beach

Prepared by:

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Director
Cozens Regan Williams Prove Pty Ltd

Date:

March 2010

Tweed Coast Homes Pty Ltd
Lots 1, 2 and 3 DP 29748 & Lot 4 DP 31209
Tweed Coast Road & Cypress Crescent, Cabarita Beach
Civil Engineering Report

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**MIXED USE RESIDENTIAL & TOURIST DEVELOPMENT
TWEED COAST ROAD & CYPRESS CRESCENT, CABARITA BEACH
LOTS 1, 2 AND 3 DP 29748 & LOT 4 DP 31209**

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1.0 INTRODUCTION

This report has been prepared in support of a Development Application on behalf of Tweed Coast Homes Pty Ltd. The subject site is a 0.2802ha title which will be referred to herein as Lot 1 and is described as part of Lot 1, 2, and 3, Section 1 DP 29748 and Lot 4 section 1 DP 31209, Parish of Cudgen and County of Rous.

This Civil Engineering Report summarises our various preliminary investigations and designs into the existing services. The Report addresses the existing engineering constraints and proposes solutions which are tailored to enable practical and cost effective development of the project.

2.0 THE SITE

2.1 LOCATION

The site is located on the corner of Tweed Coast Road and Cypress Crescent, Cabarita Beach. The proposed works involve demolition and redevelopment of an existing tourist park. The site is surrounded by existing residential and vacant space. Currently access to the site is off Cypress Crescent.

2.2 DESCRIPTION OF DEVELOPMENT

It is proposed to construct a mixed use residential and tourist facility on the site. The footprint of the proposed building is occupied by existing structures and on ground car parking associated with the site current usage.

The proposed multi level building will consist of eighteen (18) residential units and six (6) associated dual use residential and tourist accommodation units..

The site grades to the east. A detail survey of the site has been carried out, a copy of which is contained in Appendix A. The site will require excavation for the basement and removal of the spoil material.

3.0 TRAFFIC

3.1 SITE LOCATION

The site is located on the corner of Tweed Coast Road and Cypress Crescent, Cabarita Beach. And is shown on the site plans and documents prepared by Pat Twohill Designs as part of this application

3.2 SITE ACCESS

The site currently has in the order of twenty five (25) tourist park sites. The traffic generated from the site currently enters and exist via Cypress Crescent and then on to the Tweed Coast Road. Upon completion of this proposed development access and egress would remain unchanged.

3.3 EXISTING TRAFFIC CONDITIONS

The site currently has in the order of twenty five (25) tourist park sites. The traffic generated from the site currently enters and exist via Cypress Crescent and then on to the Coast Road. Cypress Crescent is an existing access street with a standard pavement width of seven and one half meters (7.5m), where Tweed Coast Road is considered a sub arterial road.

A protected right turn and left turn entry into Cypress Crescent, from Tweed Coast Road already exists.

Public transport exists along Tweed Coast Road in the form of a serviced bus route.

3.4 TRIP GENERATION AND DISTRIBUTION

The site currently has in the order of twenty five (25) tourist park sites. The traffic generated from the site currently enters and exist via Cypress Crescent and then on to the Tweed Coast Road. From the RTA *Guide to Traffic Generating Developments* the following was determined:

Existing Traffic Generation:

	Unit	Daily	Peak Hour
Permanent Park Residence	Dwelling	3	0.4

Proposed Traffic Generation

Residence Unit	Dwelling	6	0.6
Residential and Tourist Unit	Dwelling	6	0.6

The trip generation is predicted as:

	Unit	Trip Rate	Peak Hour (Total trips)
<u>Existing Traffic Generation</u>	25	3	10
<u>Proposed Traffic Generation</u>	24	6	14.5

The distribution of the movements is expected to be all towards the north along Tweed Coast Road for the am peak and from the north for the pm peak.

3.5 RECOMMENDATION

The development will generate in the order of fourteen and one half (14.5) movements during the peak hour. It s estimated that all of these movements will use Tweed Coast Road. This will potentially add an additional four and one half (4.5) vehicle movements during the peak hour onto Tweed Coast Road. This is less than one car every 10minutes. It is recommended that the proposed development be approved based on this traffic impact assessment.

4.0 EARTHWORKS

The earthworks proposed for the development will require cut to spoil earthworks. The earthworks are expected to be in the order of 6,000 m³ for the total development.

All earthworks will be done to Level 1 Geotechnical Supervision and in accordance with the Erosion and Sediment Control Plan requirements outlined in the plan prepared by Cozens Regan Williams Prove Pty Ltd.

Adherence to Local Authority approved working hours (approx. 7.00am - 7.00pm, Mon-Sat) and contractually required careful attention to muffler condition/repair for all plant and machinery will minimise noise impact during bulk earthworks and general civil works construction on the site. The plant numbers and duration of operation will be dependant on the particular stage sector and the modus-operandi of the particular selected Contractor.

5.0 EROSION AND SEDIMENT CONTROL

The Local Authority By-Law and Statutory Authority provisions related to Workplace Health & Safety, Dust and Smoke Nuisance, Environment and Occupational Noise Suppression will be rigidly enforced as part of the general site works contractual arrangements.

The area to be disturbed is approximately 0.2802ha (the whole site). The sediment expected to be generated will be minor. During construction the installation of sediment control devices such as, the basement excavation acting as a basin, sediment fences and traps is considered adequate, however a sperate Erosion and Sediment Control Plan has been documented.

Erosion and Sediment Control requirements outlined in the Erosion and Sediment control Plan prepared by Cozens Regan Williams Prove Pty Ltd. details all the requirements for maintenance of the structures during the construction phase and required methods of reporting.

6.0 FLOODING

The site has been assessed and has been determined as unaffected by regional flooding. Localised flooding will also not affect the site as it is at the head of the catchment. The street system provides the major storm event flow paths and discharges directly to the beach dunes at the end of Cypress Crescent. The minor drainage system within the road reserve also discharges to the dunes.

7.0 ACID SULPHATE SOILS

Acid Sulphate Soils investigations and an associated management plan have been undertaken and are to be submitted as part of this application. All works on the subject site will be carried out in accordance with the management plan prepared by Border – Tech.

8.0 STORMWATER

The site is not affected by runoff from external sites, as it is at the head of the local catchment. Tweed Shire Council records indicate that a stormwater line in Cypress Crescent collects the minor storm runoff. It is envisaged a new piped stormwater system will be installed to extending from the existing street system to the site. This will be used to collect the concentrated flow collected in the building hydraulic system provided as a result of the proposed development.

The post development impervious area is greater than the predevelopment case, but in keeping with previous development in the area no mitigation of the peak discharge is proposed. Extension of the street drainage system means that a reduced flow is delivered to the street flow system making the stormwater pipe system more efficient.

Overland flow paths will remain the same and unchanged.

The proposed stormwater and services layout is contained in the figure A0621/SK3.

8.1 STORMWATER MANAGEMENT

Stormwater collected from the site is to be treated prior to discharge. Roof water is required to be collected and discharged to the existing system. The hard stand areas are to be collected and treated by an oil and grit separator, prior to discharging to the existing drainage system. For specific details regarding stormwater treatment and reuse refer to the Stormwater Management Plan prepared by Cozens Regan Williams Prove Pty Ltd.

8.2 WATER CYCLE MANAGEMENT

Stormwater collected from the site is to be treated prior to discharge. Roof water is required to be collected, stored and reused where possible. Discharge from the storage area will be to the existing system. The hard stand areas are to be treated for oils and grits prior to discharge to the existing drainage system.

9.0 SEWERAGE RETICULATION

The site as it exists is serviced by an existing Council sewer. It is proposed to connect discharge from the development to the existing internal sewer that discharges to the council system. The existing site currently services twenty five tourist caravan sites, giving an existing design discharge for 60 equivalent persons and a flow of 1.06 l/s.

The total site area for the full development is 0.282 ha and is to comprise of twenty four (24) residential/tourist units with an estimated equivalent persons of 75 EP. Based on these EP values and calculated in accordance with WSA02 – 2002 the peak flow will be and a flow of 1.55 l/s. This equates to an increase in flow of 0.48 l/s.

An assessment of the additional load on Council's sewer system is being undertaken by Tweed Shire Council. Refer to Appendix B for layouts of council's existing sewer system.

10.0 WATER RETICULATION

The site is currently supplied by existing services within Cypress Crescent. The proposed development can be serviced from this existing one hundred millimetre (100mm) diameter connection or alternatively the two hundred and fifty millimetre (250mm) diameter connection in Tweed Coast Road.

An assessment of the additional demand on Council's water reticulation system has been undertaken. Discussions and subsequent verbal advice from Tweed Shire Council indicate that the existing Council system is capable of meeting the additional demand proposed by the development.

The flow requirements for the development have been assessed in accordance with WSA03 – 2002.

The calculations below determine the estimated demand the proposed development will have on the existing system. These calculations were to aid Council in determining whether there is any requirement to upgrade any portion of the system.

The current site usage has been determined to have the following demands.

On Demand Services – Existing

AD	21,000	Litres per Day
MDMM	31,500	Litres per Day
PD	52,500	Litres per Day
PH	4,375	Litres per Hour

The ultimate development of the site requires:-

On Demand Services – Ultimate development

AD	26,880	Litres per Day
MDMM	40,320	Litres per Day
PD	67,200	Litres per Day
PH	5,600	Litres per Hour

The internal main is the subject of independent assessment and is required to meet the standards of the Plumbing and Drainage Codes AS3500. A booster pump for fire services may need to be considered; however this will require a pressure and flow test on the existing main and is best determined during the Building Application stage.

11.0 OTHER SERVICES

Country Energy and Telecom domestic services are underground reticulation which run in front of the site and can be used to service the proposed development.

The existing services are sufficient to provide services to the existing twenty five (25) powered sites and amenity buildings. This will be replaced by twenty four (24) units and it is expected that the demand will be of the same magnitude.

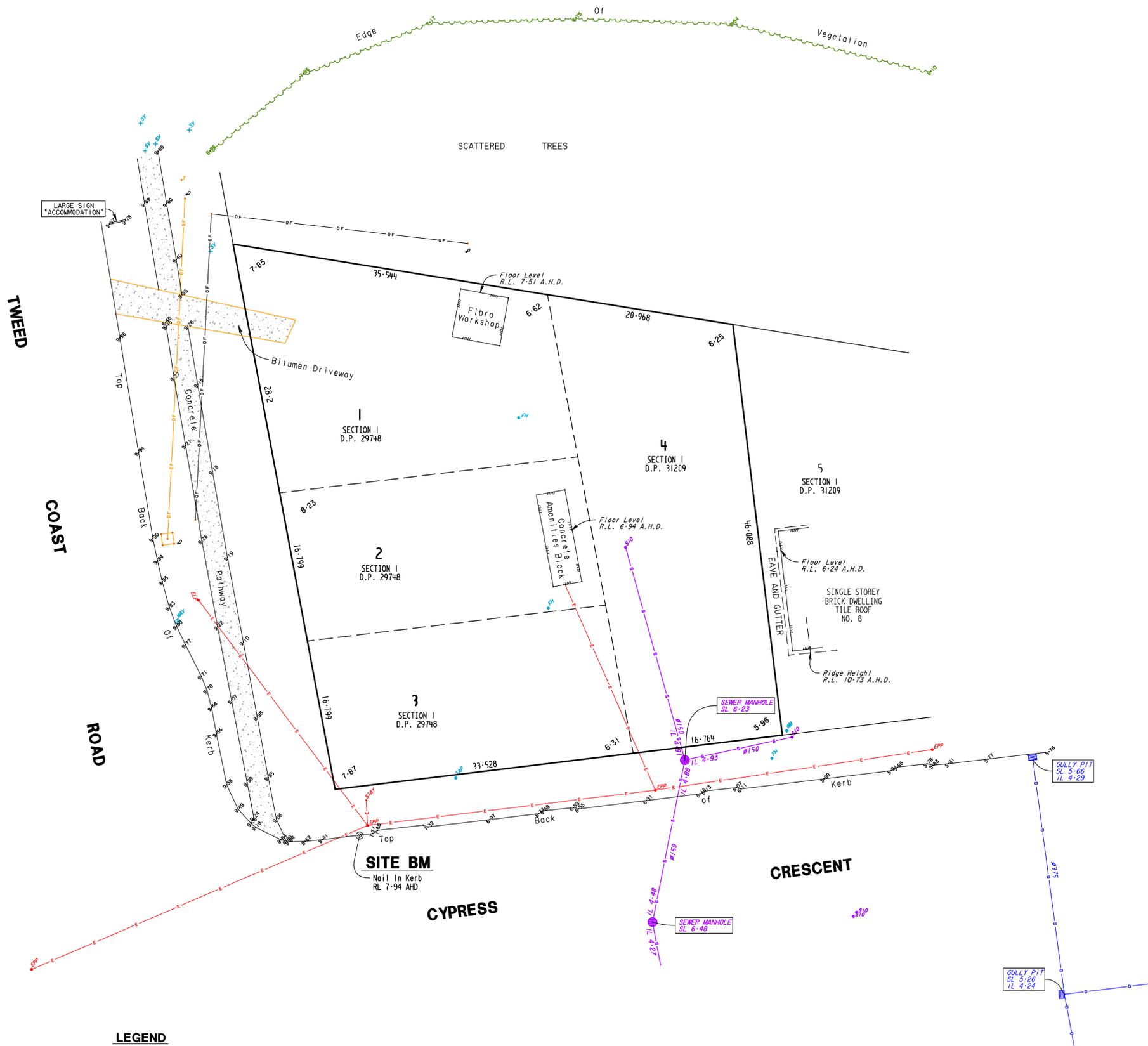
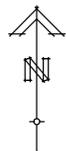
12.0 CONCLUSION

This civil engineering report has shown that the proposed Lots 1, 2 and 3 DP 29748 & Lot 4 DP 31209 for this site can be serviced and constructed using suitable engineering solutions to council's requirements. All preliminary comments and assumptions are subject to confirmation by detail design.

Tweed Coast Homes Pty Ltd
Lots 1, 2 and 3 DP 29748 & Lot 4 DP 31209
Tweed Coast Road & Cypress Crescent, Cabarita Beach
Civil Engineering Report

APPENDIX A

Survey Plan



LEGEND

- OF- DENOTES UNDERGROUND OPTUS OPTIC FIBRE CABLE (APPROXIMATE LOCATION ONLY)
- OF- DENOTES UNDERGROUND TELSTRA OPTIC FIBRE CABLE (APPROXIMATE LOCATION ONLY)
- E- DENOTES OVERHEAD POWER LINES
- FH DENOTES FIRE HYDRANT
- XSV DENOTES STOP VALVE
- WAV DENOTES WATER AIR VALVE
- ELP DENOTES ELECTRICITY POWER POLE
- ELP DENOTES ELECTRICITY LIGHT POLE
- STAY DENOTES STAY POLE
- TAP DENOTES TAP
- SIO DENOTES SEWER INSPECTION OPENING
- WM DENOTES WATER METER
- T DENOTES TELSTRA OPTIC FIBRE MARKER
- O DENOTES OPTUS OPTIC FIBRE MARKER

IMPORTANT NOTE:



ALL UNDERGROUND SERVICES SHOULD BE LOCATED ONSITE BY RELEVANT AUTHORITIES BEFORE ANY WORK IS COMMENCED.

Revision Client: KEN HANSEN		Important Notes: (THIS NOTE IS AN INTEGRAL PART OF THIS PLAN) DATE OF SURVEY: 23/02/2009 LEVEL DATUM: VIDE PM 41442 RL 9.597 AHD ONLY VISIBLE SURFACE FEATURES OF UNDERGROUND SERVICES HAVE BEEN SHOWN. NO REPORT IS MADE ON ANY UNDERGROUND SERVICES ON OR ADJACENT TO THE SITE. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITIES SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATION OF ALL SERVICES. THE TITLE BOUNDARIES AS SHOWN HEREON WERE NOT MARKED AT THE TIME OF SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY & NOT BY FIELD SURVEY.		LEVEL & DETAIL SURVEY on Lots 1, 2, 3 SECTION 1 in DP29748 and Lot 4 SECTION 1 in DP31209 Tweed Coast Road, Cabarita Parish of CUDGEN County of ROUS		B & P SURVEYS CONSULTING SURVEYORS 30 Beryl Street Tweed Heads, NSW, 2485, Australia Telephone: (07) 5536 3611 Fax: (07) 5536 3701 Email: tweed@bpsurveys.com.au Website: www.bpsurveys.com.au Offices Also At: Surfers Paradise Murwillumbah Ph: (07) 55390499 Ph: (02) 66721924	
Scale: 1 : 250 @A1		Level Datum: VIDE PM 41442 RL 9.597 AHD		F.Bk: L/L L.Bk: - Drawn: BJC Chk'd:		Ref. No: T15510 Date: 24.02.2009 Drawing No./Size: 17486 B	

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APPENDIX B
Service Authority Information

Basemap

- Abc Lot Section Plan Number
- Abc Cadastral Notes
- Surrounding Local Government Areas
- Abc Street Names (Zoomed In)
- Parcels
 - Deposited Plan
 - Neighbourhood Property Plan
 - Other
 - Strata Plan
- Road Reserve

Water Reticulation

Water Node Text

Water Service Connection

Water Valve Status

- SVC

Water Node

- Air Release Valve
- Butterfly Valve
- Check Valve
- End Cap
- Gate Valve
- Single Hydrant
- Junction
- Pressure Reducing Valve
- Pressure Sustaining Valve
- Pump
- Reducer
- Reservoir
- Scour Valve

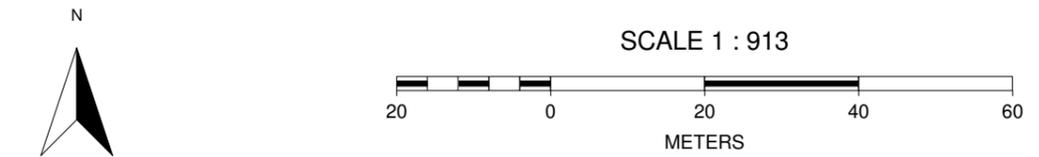
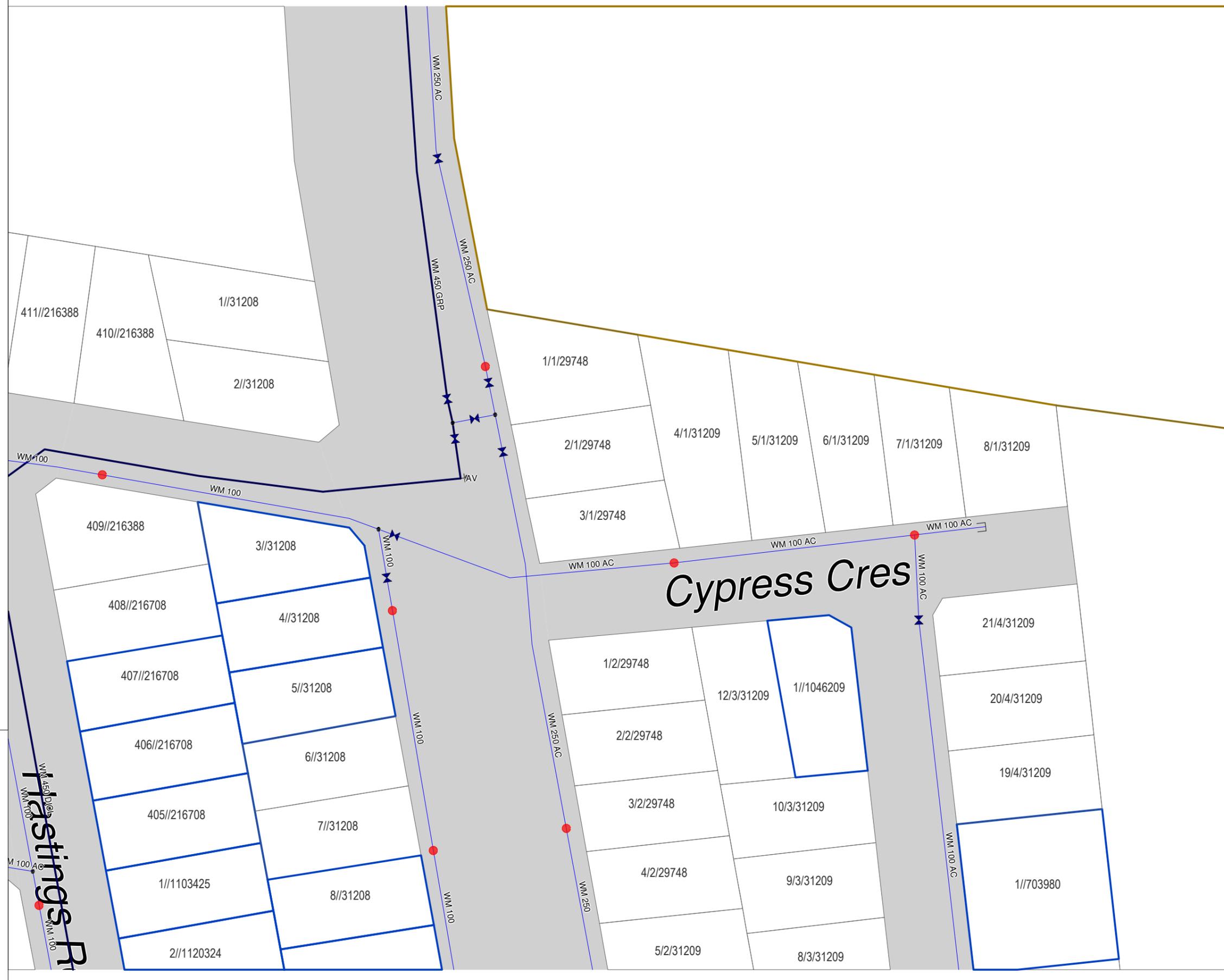
Water Symbol

- Cross Over
- Extraction Point
- Sample Point
- Water Treatment Plant

Water Pipe Location

- 0 - 250
- 300 - 1000

Engineer_Redline



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Basemap

- Abc Lot Section Plan Number
- Abc Cadastral Notes
- Surrounding Local Government Areas
- Abc Street Names (Zoomed In)

Parcels

- Deposited Plan
- Neighbourhood Property Plan
- Other
- Strata Plan

Road Reserve

Stormwater

Stormwater Node

- Manhole
- Wingwall
- Drop Inlet
- Kerb Inlet

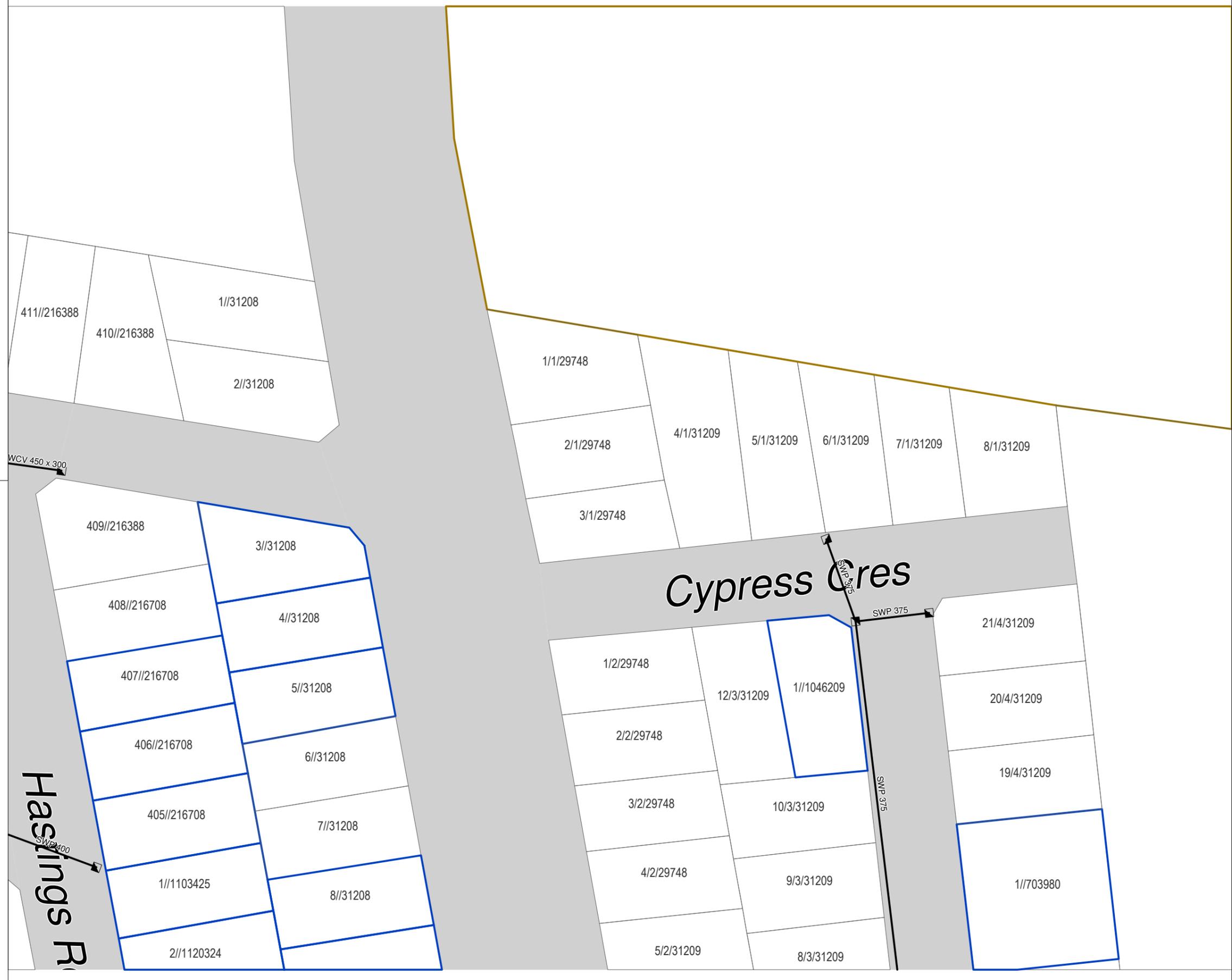
Private SWP

Stormwater Culverts

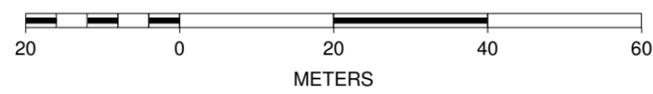
Stormwater Channel

Stormwater Pipe Location

- 0 - 975
- 1,000 - 2100
- Other



SCALE 1 : 913



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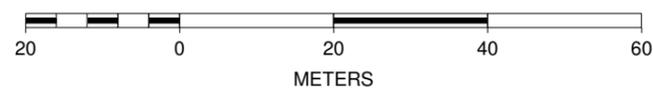
- Abc Lot Section Plan Number
- Abc Cadastral Notes
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- Abc Street Names (Zoomed In)
- Parcels
 - Deposited Plan
 - Neighbourhood Property Plan
 - Other
 - Strata Plan
- Road Reserve

Sewer Reticulation

- Sewer Node Text
- Sewer Service Connection
- Sewer Valve Status
 - Closed
 - Not Found
- Sewer Symbol
 - SC Low Point
 - STP
 - STP Outfall
- Sewer Sub Node
 - CV BALL
 - CV SSC
 - CV SSC CW
 - CV SSFC
 - OV BALL_TU
- Sewer Node
 - Air Vac Release
 - End Cap
 - Public Manhole
 - Open Valve
 - Public Property Pump
 - Pump Station Public
 - Reducer
 - Scour Valve
 - Vacuum Chamber
 - Vent Stack
- Sewer Vacuum Mains
 - Pipe Diameter 0 - 100mm
 - Pipe Diameter 110 - 160mm
- Sewer Rising Mains Location
- Sewer Gravity Overflow
- Sewer Gravity Mains Location
 - 0 - 200
 - 225 - 600
 - 700 - 900



SCALE 1 : 913



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