



Infrastructure Management Plan New Public School in Wagga Wagga Estella Road, Wagga Wagga NSW 2678

REPORT

PREPARED FOR

Hansen Yunken

PREPARED BY

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INFRASTRUCTURE MANAGEMENT PLAN

Activity Schedule

Date	Revision	Issue	Prepared By	Approved By
18.10.2019	A	Draft Issue	N. Sutherland	J. Gilligan
18.12.2019	B	Updated Hydraulic Sketch	N. Sutherland	J. Gilligan

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1. EXECUTIVE SUMMARY

This Infrastructure Management Plan (IMP) has been prepared by Northrop Consulting Engineers Pty Ltd (Northrop) on behalf of Hansen Yunken for the New Public School in Wagga Wagga.

This IMP outlines the existing infrastructure, detailing information on the existing capacity and any augmentation to the aforementioned services required for the proposed development. The information contained within this IMP are preliminary and are based on currently available information and correspondence undertaken at the time of writing.

This IMP is a working document and Northrop welcomes comments and/or queries regarding the content of this document from all project stakeholders so that all specific project requirements are captured. Please note that some information is subject to change following the issue of a Building Certifier's Report, Arborist's Report, Geotechnical Report, Fire Engineering Report and the like.

2. INTRODUCTION

2.1 Intent

The intent of this report is to detail the investigations and findings associated with the existing building services (mechanical, electrical, and hydraulic) currently servicing the site, and advise what upgrade works are required for these services for future works planned.

The investigations for this Infrastructure Management Plan primarily focuses on the following objectives:

- Identify potential opportunities and site constraints;
- Identify the location, size and capacity of all existing services within the vicinity of the proposed site;
- Identify utility confirmation for the subject site;
- Identify options to service the site to support the proposed development.

2.2 Proposed Development

The proposed works are understood to comprise the following:

2.2.1 New Primary School

- 16 future focus learning designed teaching spaces;
- All Core Facilities to be constructed to Core 21 EFSG;
- Site designed and master-planned to allow for the possible future expansion of the school to 24 teaching spaces if required;
- Designed and oriented to connect with nearby land uses, including proposed Council formal and informal recreation spaces to the east and the Charles Sturt University Campus to the north.

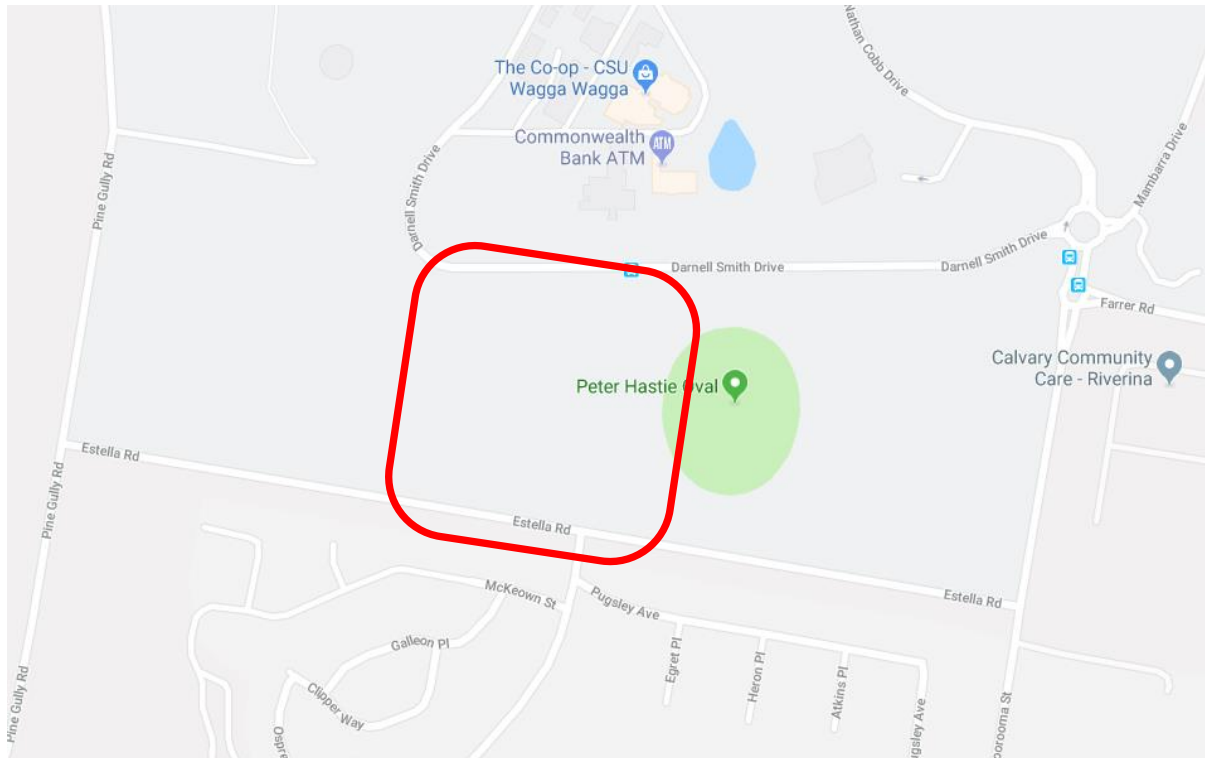
2.2.2 Joint Use Facilities

- Joint Use Agreement with Wagga Council for use of school hall and meeting/community rooms. As such, school hall to be designed and sited to allow community use/access and additional meeting/community rooms, commercial kitchen to be appropriately incorporated into hall space/reception area. Enlarged hall if joint use funding possible;
- Integrated facilities with open space and Council's sports fields, links to indigenous heritage (Wiradjuri design creative layer), agricultural plot/community garden, public toilets with accessible change room facilities for the school and community;
- Sustainable design per EFSG standards.

3. SITE INFORMATION AND LOCATION

3.1 Site Information & Location

Site Name:	New Public School in Wagga Wagga
Site Address:	Estella Road, Estella NSW 2678



Site Plan (Source: Google Maps 2018)

4. EXISTING AUTHORITY INFRASTRUCTURE

Northrop has performed non-invasive investigations in regard to the existing site conditions and additional loading from the proposed building onto the existing utility infrastructure available for connection to the site.

Our assessment has been based on the information provided by the relevant water, sewer, and natural gas utility authorities, and information provided by the project representatives.

4.1 Wagga Wagga City Council Sewer Infrastructure

The development has access to the following Wagga Wagga City Council sewer mains:

- DN 200 Class 12 Vinyl Iron pressure sewer main located within Estella Road;
- Private Charles Sturt University sewer main located within Darnell Smith Drive.

4.1.1 Sewage Generation

Preliminary sewage generation rates have been estimated in accordance with the Sewerage Code of Australia - WSA-02-2002 (2009). A number of assumptions have been made in estimating sewer generation rates:

- 552 student yield;
- 0.2 Equivalent Persons (EP) / student has been adopted for the study area.

Table 3.1.1 Equivalent Populations for Synchronous Discharges

Classification	Unit	EP per Unit	Remarks
Commercial/ Special Cases			
Education Institutions	Student	0.2	Includes teaching staff.

Table 3.1.2 Sewage Generation Estimates for Study Area

Student Yield	EP ¹	ADWF (kL/d) ²	ADWF (L/s) ³	PDWF 'd' Factor ⁴	PDWF (L/s) ⁵
552	110	19.80	0.23	2	0.46

Notes:

1. Based on 0.2 EP / Student.
2. Average Dry Weather Flow (ADWF) based on 180 L/EP/day.
3. Based on 0.0021 L/s / EP.
4. Peak Dry Weather Flow (PDWF) from Figure B.1 of WSA 02-2002-2.2.
5. ADWF x d Factor.

4.1.2 EP Capacity Limitations for Reticulation Sewers

Pipe Size (DN)	Maximum Allowable EP
150	600
225	1,600
300	3,200

4.2 Riverina Water County Council Water Infrastructure

The development has access to the following Wagga Wagga City Council water mains:

- DN 450 Asbestos Cement water main located within Estella Road;
- Private Charles Sturt University water main located within Darnell Smith Drive.

4.2.1 Potable Water Demand

Preliminary potable water demand estimates for the proposed development based on a preliminary student yield estimate of 552 students.

Table 3.2.1 Area Based Default Demand Rates for Planning Water Supply Systems			
Zoning	Max Day Demand Rate	Ratio Max hour / Max Day	Ratio Max Day / Average Day
Special Uses			
School (1,000 Students)	180 kL / Net Ha / Day	2.0	2.0

Table 3.2.2 Potable Water Demand Estimates for Study Area					
Student Yield	Total Area (ha)	Average Day Demand (kL/d)	Average Day Demand (L/s)	Peak Day Demand (kL/d)	Peak Day Demand (L/s)
552	3	270	3.15	540	6.25

4.3 APA Group Natural Gas Infrastructure

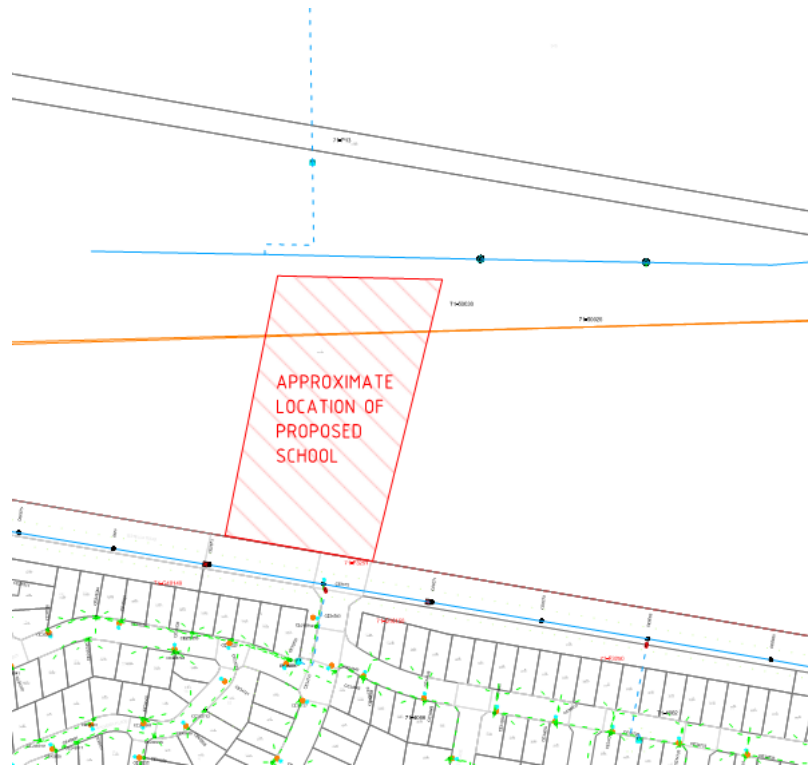
The development has access to the following APA Group natural gas mains:

- DN 63 high pressure natural gas main located at the intersection of Estella Road and Gunn Street.

4.4 High Voltage Infrastructure

The Energy Authority serving the site is Essential Energy.

The site appears to be well serviced with high voltage (HV) infrastructure with one HV feeder on Estella (the blue line indicates the underground HV feeder). The site does not appear to be fed by any electricity supply at the moment.



Essential Energy HV Infrastructure

Based on the preliminary Maximum Demand calculation in Section 3.1 of this report, the development will be serviced by on-site 750 kVA Kiosk Substation. We have corresponded with Essential Energy and this has been confirmed. Please see appendix F for the Essential Energy Design Information Pack (DIP).

4.5 Low Voltage Infrastructure

There is no low voltage power available on Estella Road.

4.6 Lighting

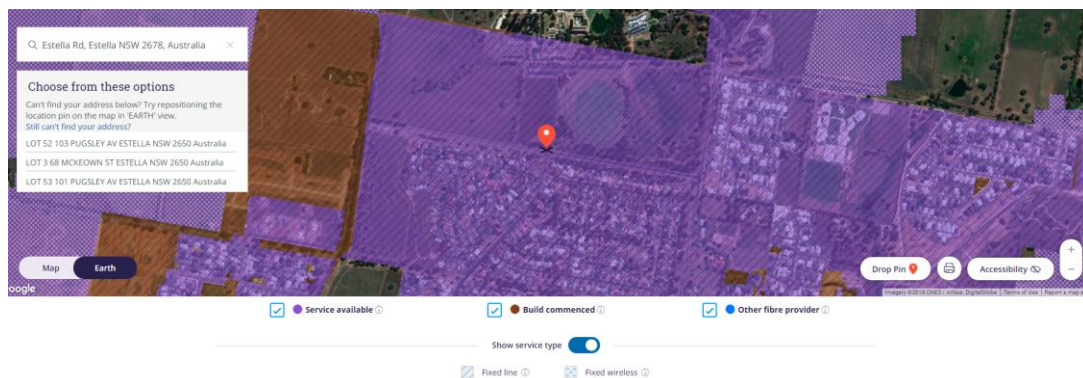
There is no street lighting available on the Estella road except on the pole which is located on the intersection of Estella road and Gunn Drive.



Street Light on Estella Road

4.7 Communications

The area in which the new school will be located has nbn services available close by.



nbn™ Availability

An assessment of the DBYD documents show that nbn have services which come from the intersection of Estella road and Gunn Drive.

It should be noted that due to the operation of the school, Charles Sturt University (CSU) has requested a connection from its campus (located directly north of the new school) to the new development. The new connection will be a fibre connection.

5. ELECTRICAL SERVICES

5.1 Maximum Demand

Based on the architectural drawings available at the time of preparing this report, we have conducted a maximum demand calculation, as follows:

Dist. Group	Load Description	Area (m ²)	Load per m ² (VA)	Load for whole area (kVA)	Load (A/Phase)
Block A	Cleaning Supplies	7.7	15	0.1155	0.2
Block A	Kiln	7.9	300	2.37	3.4
Block A	Office	94.4	85	8.024	11.6
Block A	Storage	33.6	15	0.504	0.7
Block A	Toilets	11.8	15	0.177	0.3
Block A	Communications	19.4	300	5.82	8.4
Block A	MSB	11.4	15	0.171	0.2
Block A	Security Store	17.6	15	0.264	0.4
Block A	Sick Bay	13.3	85	1.1305	1.6
Block A	Entry Vestibule	27.5	85	2.3375	3.4
Block A	Reception	26.8	85	2.278	3.3
Block A	Clerical/Printing	35.6	250	8.9	12.8
Block A	Corridor	51	80	4.08	5.9
Block B&C	Comms	9.6	90	0.864	1.2
Block B&C	Cleaners	5.8	15	0.087	0.1
Block B&C	Meeting Room	17.4	85	1.479	2.1
Block B&C	Toilet	52.8	15	0.792	1.1
Block B&C	Community Room	124.1	85	10.5485	15.2
Block B&C	Kitchen	5.2	300	1.56	2.3
Block B&C	Store	4.3	15	0.0645	0.1
Block B&C	Office	15.3	85	1.3005	1.9
Block B&C	Kitchen	19.4	300	5.82	8.4
Block B&C	Store	85.6	15	1.284	1.9
Block B&C	Sound Room	3.2	85	0.272	0.4
Block B&C	Corridor	96	80	7.68	11.1
Block B&C	Community Hall	305.7	85	25.9845	37.5
Block B&C	Community Court (Outdoor)	83	15	1.245	1.8
Block B&C	Staff Room	71.4	85	6.069	8.8
Block B&C	Comms	9	90	0.81	1.2
Block B&C	Store	5.2	15	0.078	0.1
Block B&C	Toilets	12.1	15	0.1815	0.3
Block B&C	CDS	2.9	15	0.0435	0.1
Block B&C	Meeting Room	21.8	85	1.853	2.7
Block B&C	Kitchen	23.7	300	7.11	10.3
Block B&C	Professional Learning Space	77.4	85	6.579	9.5
Block B&C	Staff Court (Outdoors)	80.2	15	1.203	1.7
Block B&C	Hall	141.6	90	12.744	18.4
Block D	Library Hall	143.2	85	12.172	17.6
Block D	Comms	11.6	90	1.044	1.5
Block D	Store	20.5	15	0.3075	0.4
Block D	Toilets / Changeroom	61.2	15	0.918	1.3
Block D	Office Workroom	27.5	85	2.3375	3.4
Block D	Laundry	7.6	250	1.9	2.7

Block D	CDS	4.4	15	0.066	0.1
Block D	Canteen Office	11.4	80	0.912	1.3
Block D	Canteen	48.3	150	7.245	10.5
Block D	Special Programs Terrace	167.2	15	2.508	3.6
Block D	Special Program (Rooms)	90.2	85	7.667	11.1
Block D	Comms	14.8	90	1.332	1.9
Block D	Store	15.8	15	0.237	0.3
Block D	Library	64.1	85	5.4485	7.9
Block E & F	Toilets	43.2	15	0.648	0.9
Block E & F	Outdoor Learning	176.6	15	2.649	3.8
Block E & F	Open Learning	124	85	10.54	15.2
Block E & F	Learning Studio	745.6	85	63.376	91.5
Block E & F	Practical Activities Area (Classroom)	410	85	34.85	50.3
Block E & F	Staff Room	101.6	85	8.636	12.5
Block E & F	Learning Common	75.4	85	6.409	9.3
Block E & F	Presentation Area	153.8	85	13.073	18.9
Block E & F	Comms	26	90	2.34	3.4
Block E & F	Cola	191.8	15	2.877	4.2
Carpark	Outdoor	1079	5	5.395	7.8
	Lifts (32A)				40.0
	Future Homebase				80.0
	Totals	6321.1		376.4	591.8
				Spare Capacity	10%
				AS3000 Maximum Demand (Non-Domestic, Design Spare Capacity)	650.98
					Amps/ Phase

We have included a 10% spare capacity to account for any variability which may occur during the detailed design process. The proposed school carries a maximum demand of **650.98 Amps per Phase**. It should be noted that Wagga Wagga's population is expected to grow by 1.9% per annum (according to City of Wagga Wagga). Providing extra capacity in the system will allow for the natural expansion and growth of the school in future years without major upgrades being required.

6. WATER MANAGEMENT

6.1 Cold Water Service

6.1.1 Standards

General: The NCC, AS/NZS 3500.1, and Riverina Water County Council requirements.

Water Supply: To AS/NZS 3500.1.

Backflow Prevention: To AS/NZS 2845.1 and AS 2845.2.

Copper Pipe: To AS 1432 and AS 4809.

Microbial Control: To AS/NZS 3666.1 and AS/NZS 3666.2 and the recommendations of SAA/SNZ HB 32.

6.1.2 System Performance Requirements

- Pipe Velocity Below ground: 2.4 m/sec
- Pipe Velocity Above Ground: 1.6 m/sec
- Maximum Pipe Velocity: 3 m/sec
- Design Water Pressure at Fixtures or Outlets: 250 kPa
- Minimum Water Pressure at Fixtures or Outlets: 50 kPa
- Maximum Water Pressure at Fixtures or Outlets: 500 kPa

The cold-water service will be designed in such a manner as to:

- Avoid the likelihood of contamination of drinking water within both the water service and the Riverina Water County Council supply;
- Provide water to fixtures and appliances at flow rates and pressures which are adequate for the correct functioning of those fixtures and appliances under normal conditions and in a manner that does not create undue noise;
- Avoid the likelihood of leakage or failure including uncontrolled discharges;
- Facilitate the efficient use of drinking water;
- Allow adequate access for maintenance of mechanical components and operational controls
- Allow the system, appliances, and backflow prevention devices to be isolated for testing and maintenance, where required.

6.1.3 System Description

The cold-water service will be designed in accordance with the NCC, AS3500.1, and Riverina Water County Council requirements.

The cold-water service shall make connection to the DN 450 water main located within Estella Road and reticulate to a water meter assembly located at the property boundary. Potable water will be reticulated to the following points of use:

- Amenity fixtures;
- Laundry fixtures;
- Canteen fixtures;
- Administration area fixtures (e.g. sink bay basins);
- Back of house fixtures (e.g. cleaner's sinks).

6.2 Non-potable Cold-Water Service

6.2.1 Standards

General: The NCC, AS/NZS 3500.1, Wagga Wagga City Council, and Riverina Water County Council requirements.

Stormwater Drainage: To AS/NZS 3500.3.

Rainwater Supply: To AS/NZS 3500.1.

Metal Tanks and Rainwater Goods: To AS/NZS 2179.1.

Design and Installation: To the recommendations of SAA HB 230.

6.2.2 System Performance Requirements

- Pipe Velocity Below ground: 2.4 m/sec
- Pipe Velocity Above Ground: 1.6 m/sec
- Maximum Pipe Velocity: 3 m/sec
- Design Water Pressure at Fixtures or Outlets: 250 kPa
- Minimum Water Pressure at Fixtures or Outlets: 50 kPa
- Maximum Water Pressure at Fixtures or Outlets: 500 kPa

The rainwater re-use water service must be designed in such a manner as to:

- Avoid the likelihood of contamination of drinking water;
- Provide nondrinking water to fixtures and appliances at flow rates and pressures which are adequate for the correct functioning of those fixtures and appliances under normal conditions and in a manner that does not create undue noise;
- Avoid the likelihood of leakage or failure including uncontrolled discharges;
- Allow adequate access for maintenance of mechanical components and operational controls;

- Allow the system, appliances, and backflow prevention devices to be isolated for testing and maintenance, where required.

6.2.3 System Description

A rainwater harvesting system will be installed per sustainability development and council requirements. The system will collect non-trafficable roof areas and drain to above ground rainwater storage tanks for storage and re-use to non-potable fixtures.

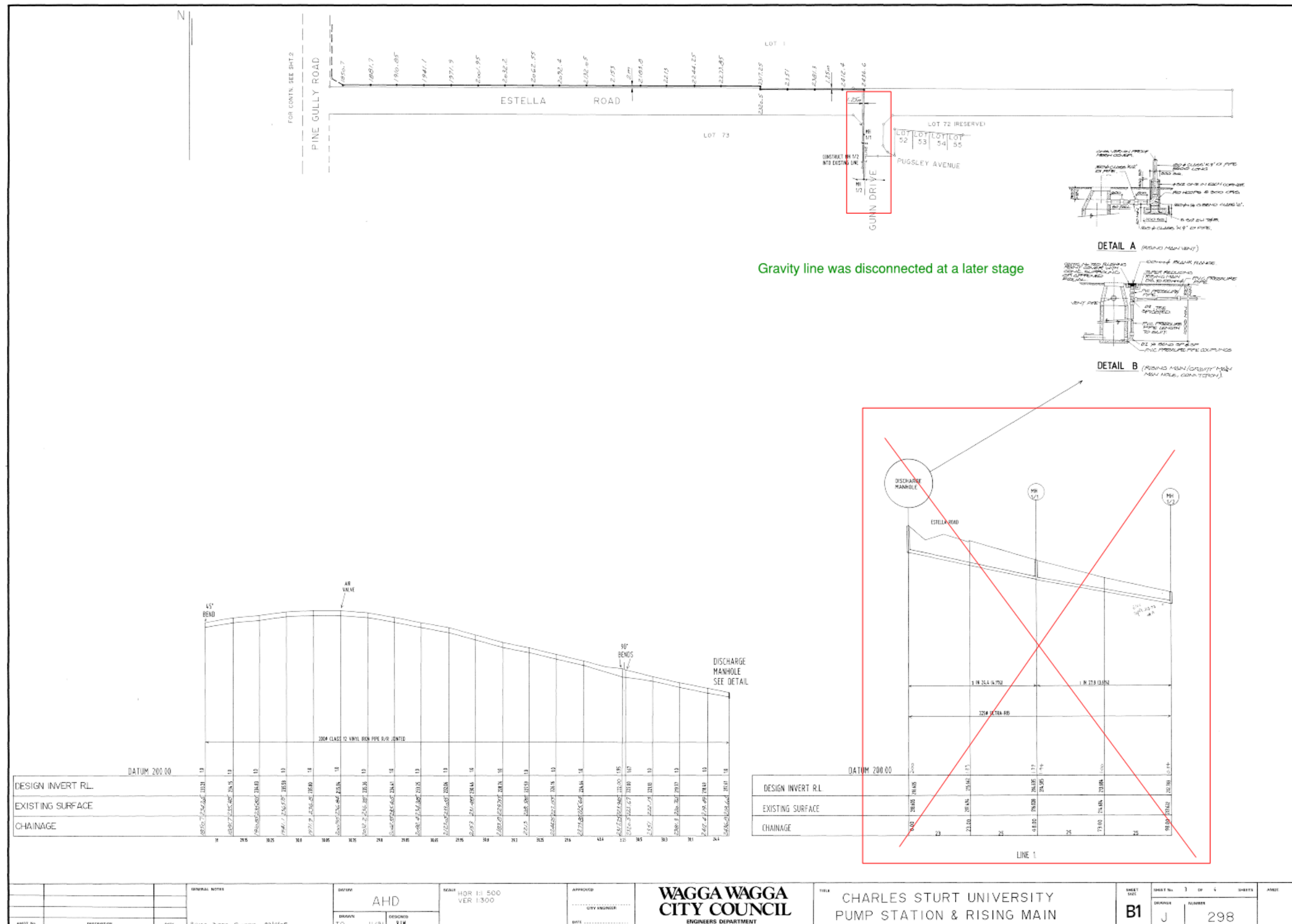
The rainwater re-use system shall be complete with a dual submersible booster pumpset, UV lamps, filters, and associated valves and pipework in accordance with Volume 3 of the NCC - The Plumbing Code of Australia and AS/NZS 3500 requirements. The rainwater re-use water service shall be utilised for irrigation purposes (via external hose taps) with the pumpset and associated equipment capable of delivering water supply to the proposed points of connection at the required pressures and on demand.

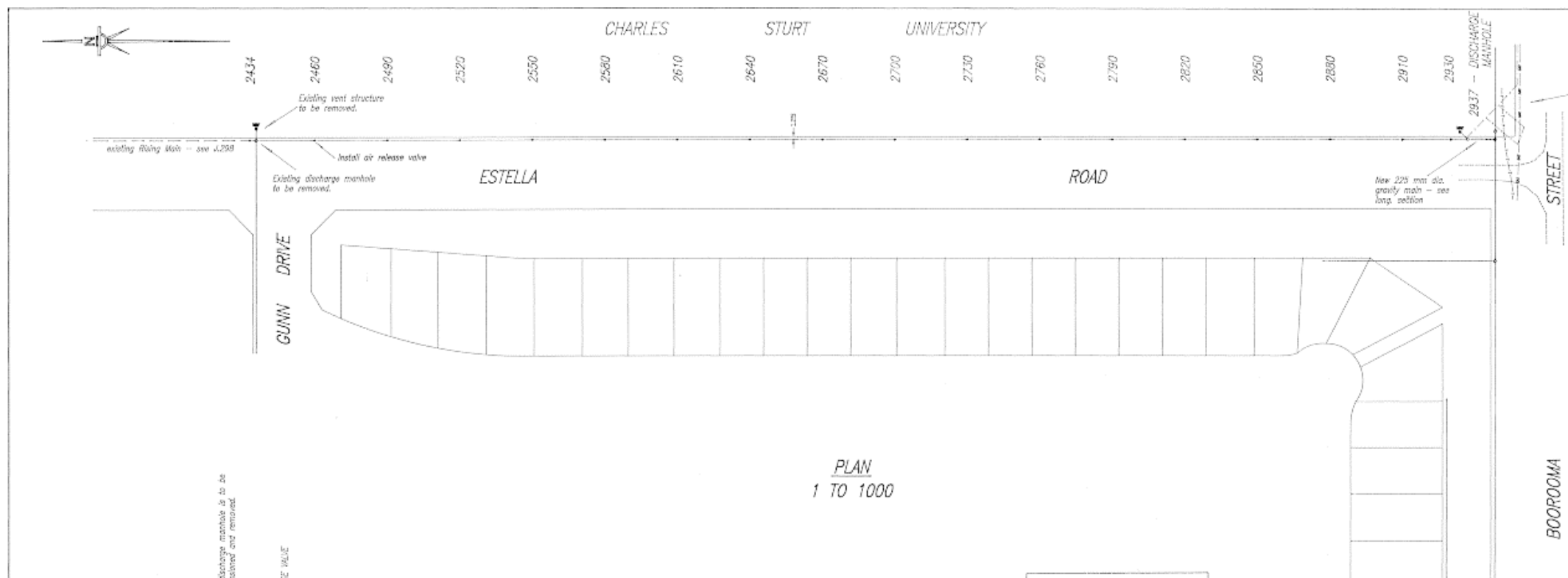
The rainwater harvesting system shall be provided with a potable cold-water make-up supply backflow prevention device to prevent the collected rainwater from entering the potable water system.

The filtration system shall comprise the following:

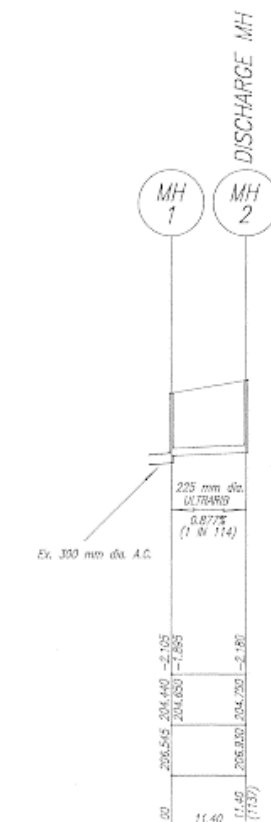
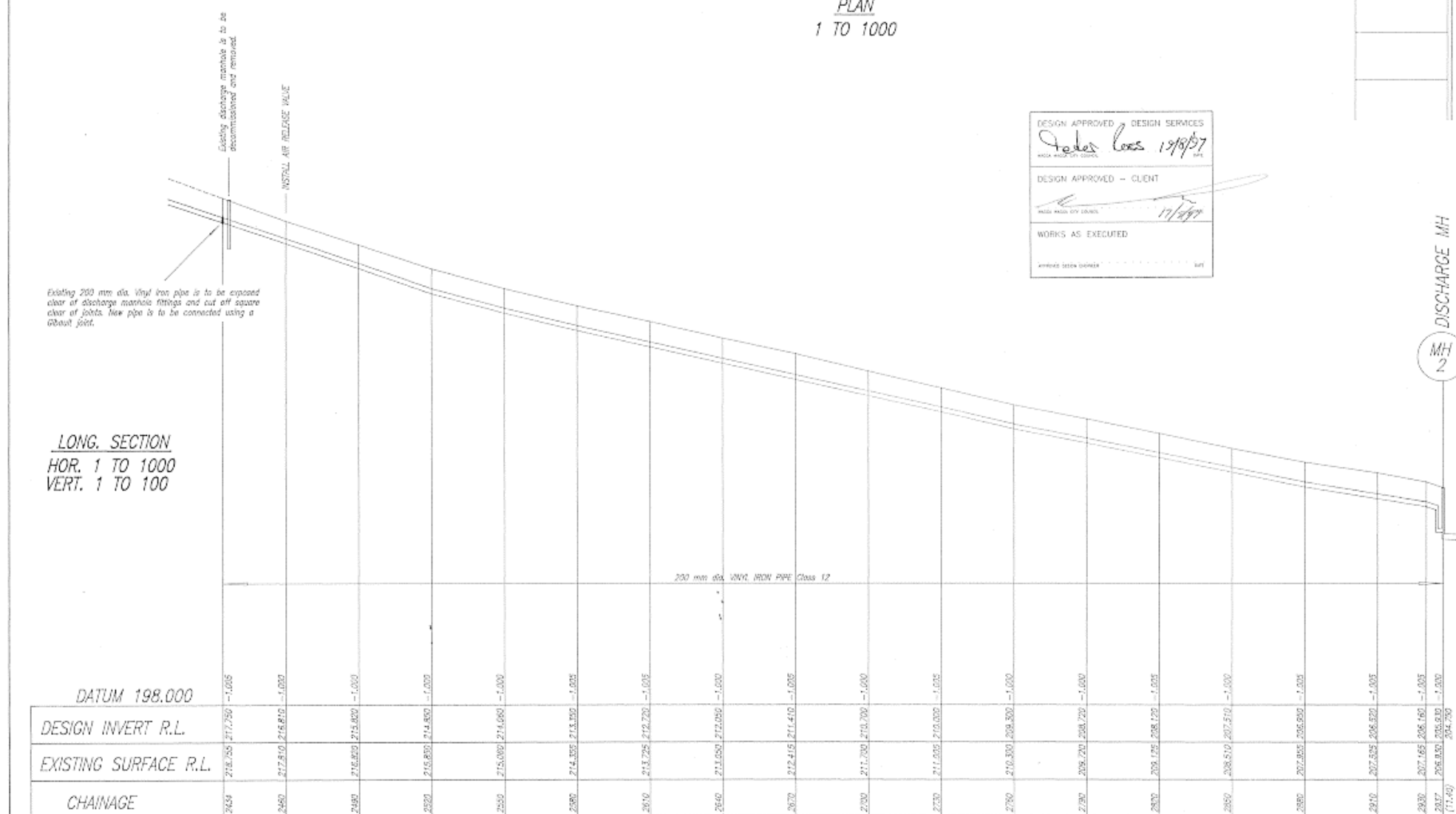
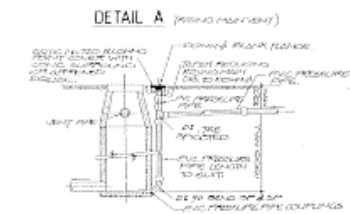
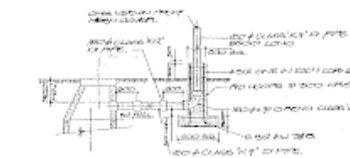
- 1 x automatic backwash filter;
- 2 x needlefelt bag filters (1 x 20 micron and 1 x 5 micron).

APPENDIX A – EXISTING WAGGA WAGGA CITY COUNCIL SEWER INFRASTRUCTURE

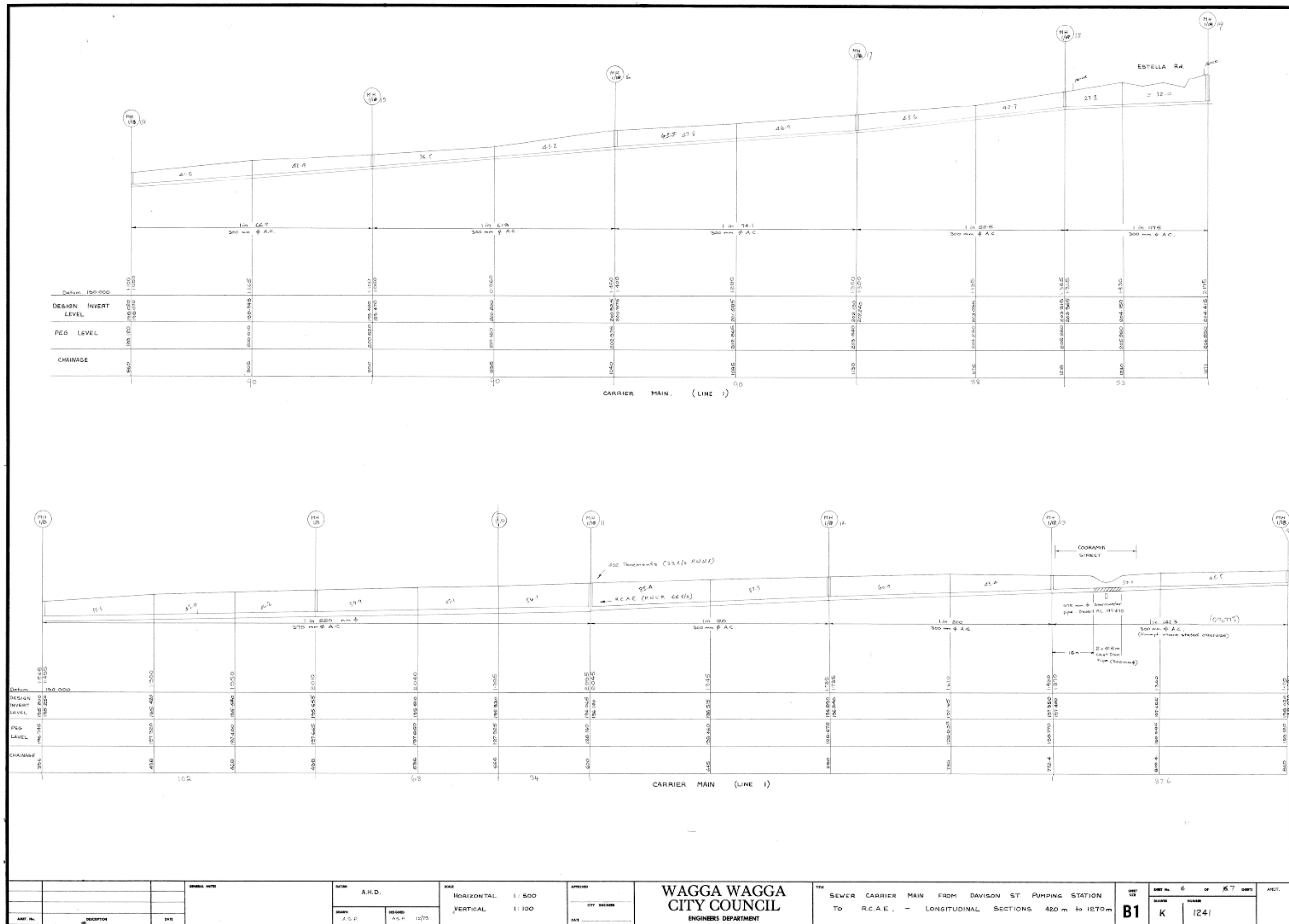


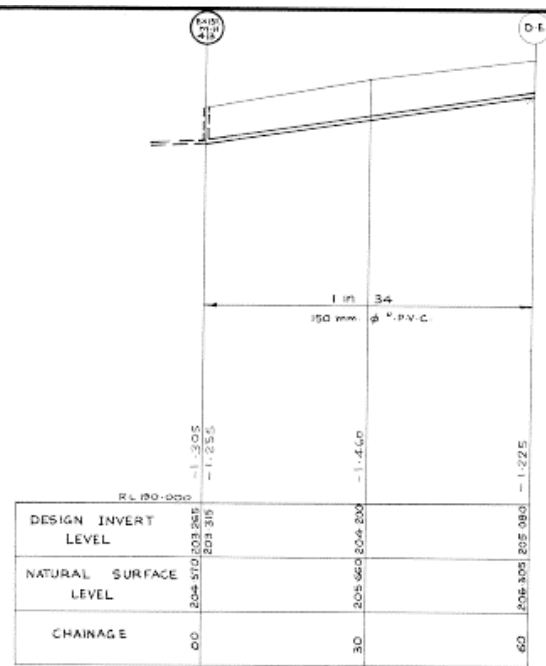


NOTE
63 P.E. GAS LINE ON WESTERN SIDE OF BOOROOMA STREET WAS NOT ABLE TO BE LOCATED. INDICATIONS ARE THAT IT IS LOCATED CLEAR OF THE PROPOSED WORKS, HOWEVER, SHOULD WARNING TAPE BE UNCOVERED CONTACT;
LED DISCOOL
GREAT SOUTHERN ENERGY
MOB. 018-693377

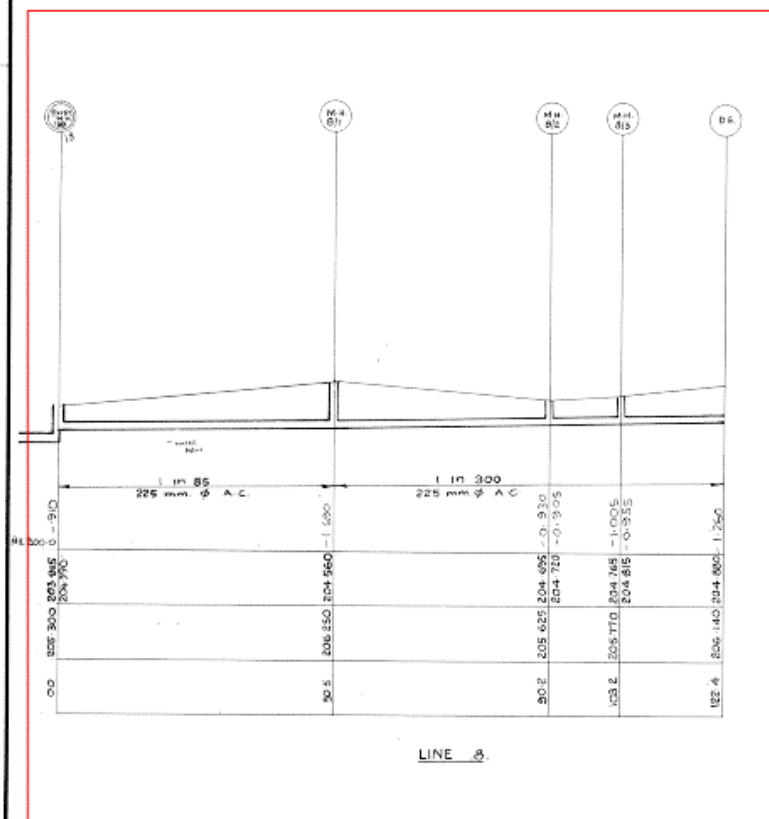


ADWT. No.	DESCRIPTION	DATE	GENERAL NOTES	DRAWN	SCALE	APPROVED	TITLE	SHEET SIZE	SHEET No.	OF	SHETS	ADMT.
				R/JL	AS SHOWN		SEWER RISING MAIN EXTENSION	A1	1	1		
				DESIGNED	DATUM	MANAGER OF DESIGN SERVICES	C.S.U. RISING MAIN - ESTELLA ROAD		NUMBER	COMPUTER FILE NAME		
				JULY '97	A.H.D.				298A	CSU		





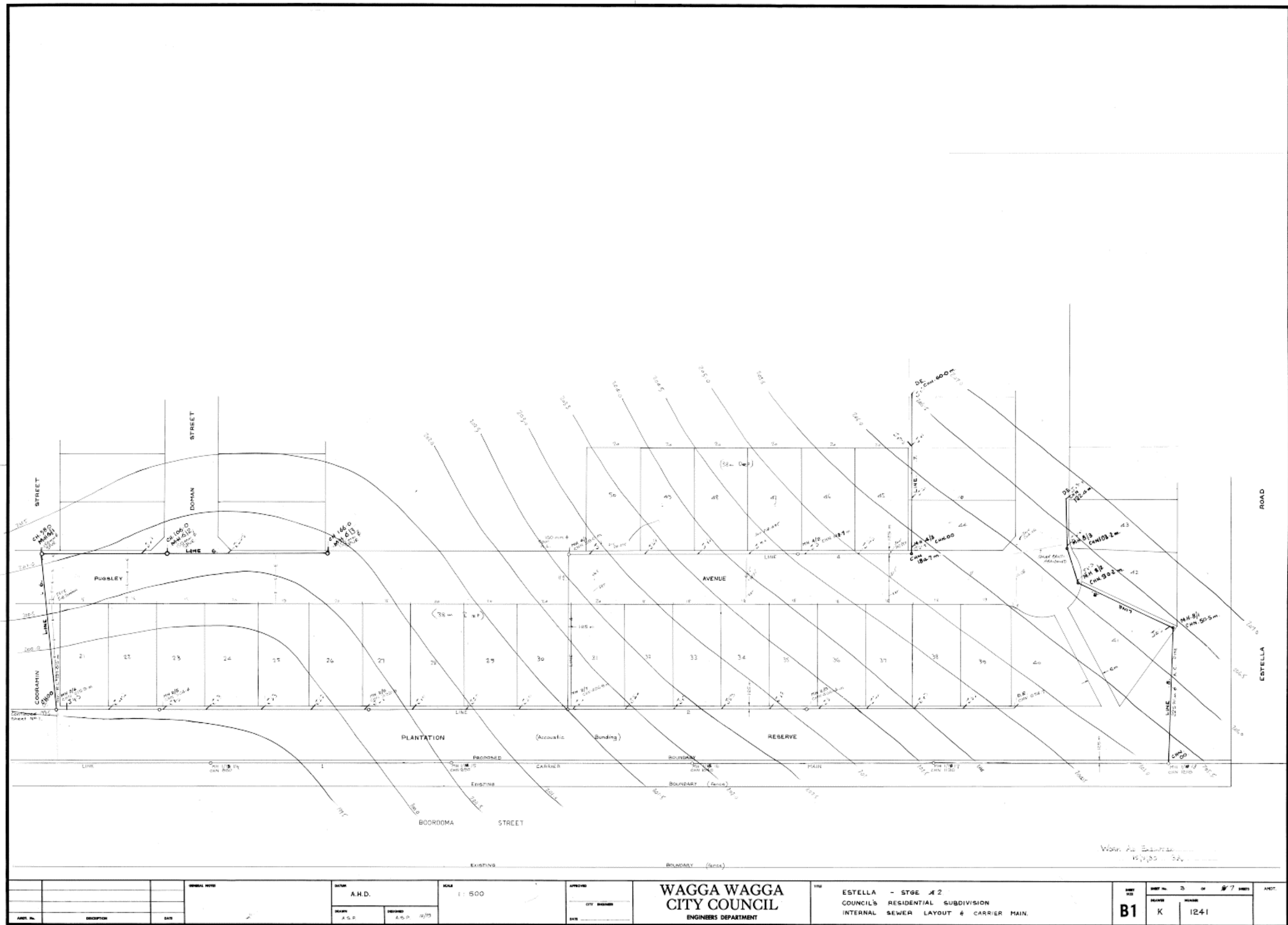
LINE 7



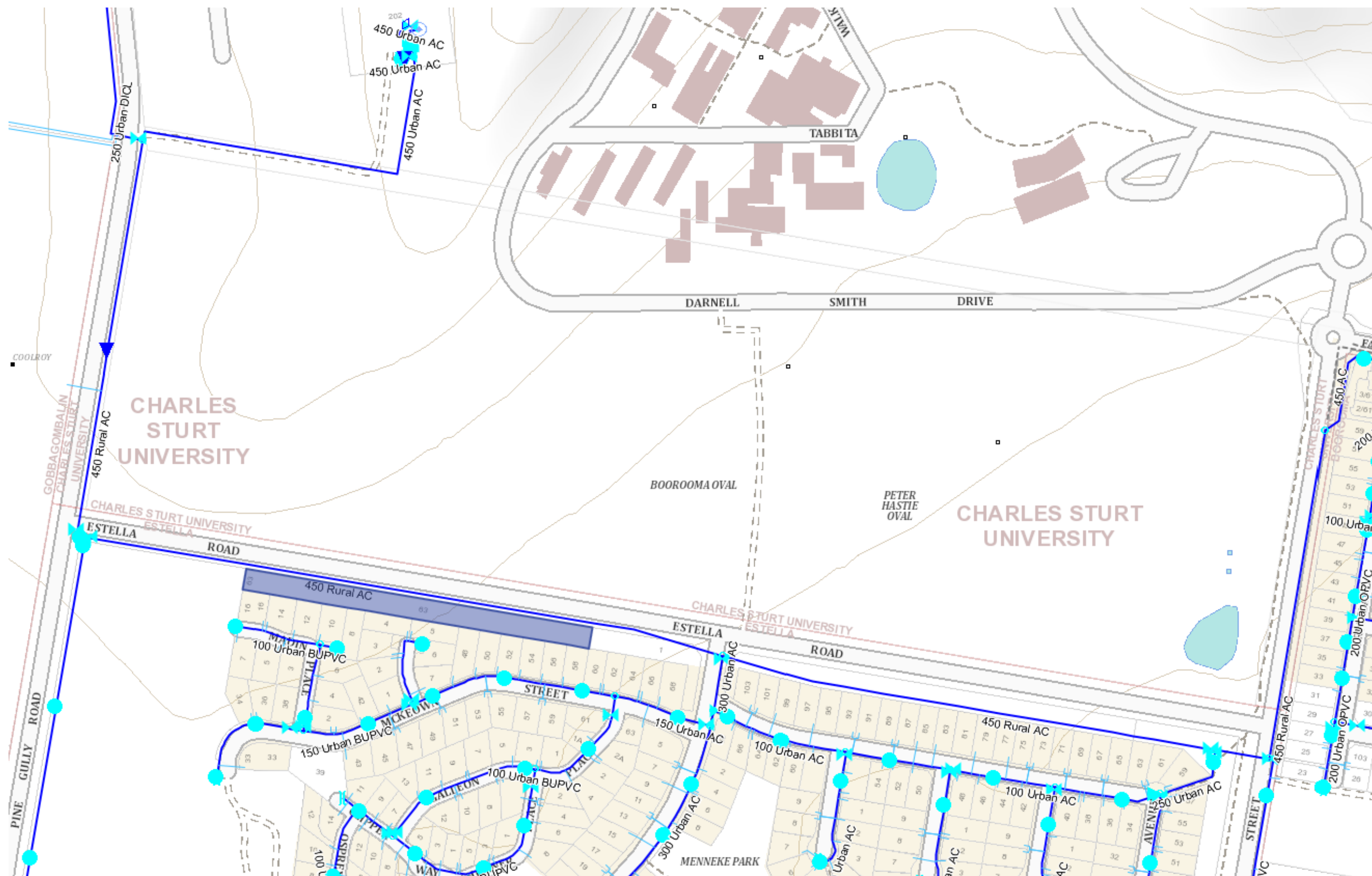
LINE 8

GENERAL NOTES			D.A.T.U.M. A.H.D.		SCALE H: 1:500 V: 1:100		APPROVED CITY ENGINEER		WAGGA WAGGA CITY COUNCIL ENGINEERS DEPARTMENT		TITLE ESTELLA - STAGE 2 & 3 COUNCIL'S RESIDENTIAL SUBDIVISION INTERNAL SEWER LAYOUT LONG SECTION		SHEET SIZE B1		SHEET No. 7 OF 7		DRAWER K		NUMBER 124.1		AMDT.	
AMDT. No.	DESCRIPTION	DATE	DRAWN J.M.C.	DESIGNED J.M.C.	DATE 14-8-1980																	

Work As Executed
15/10/80 G.A.



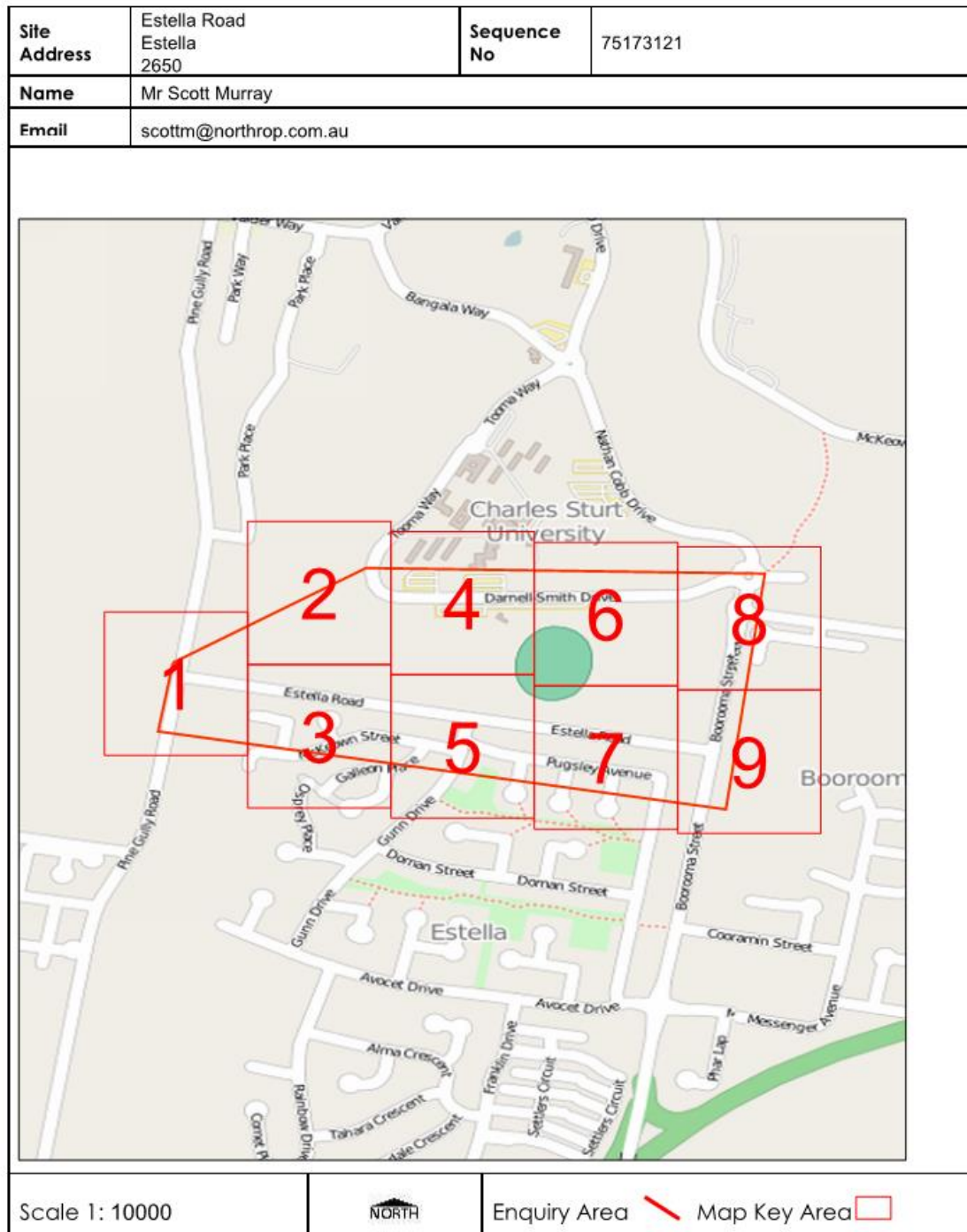
APPENDIX B – EXISTING RIVERINA WATER COUNTY COUNCIL WATER INFRASTRUCTURE



APPENDIX C – EXISTING APA GROUP INFRASTRUCTURE



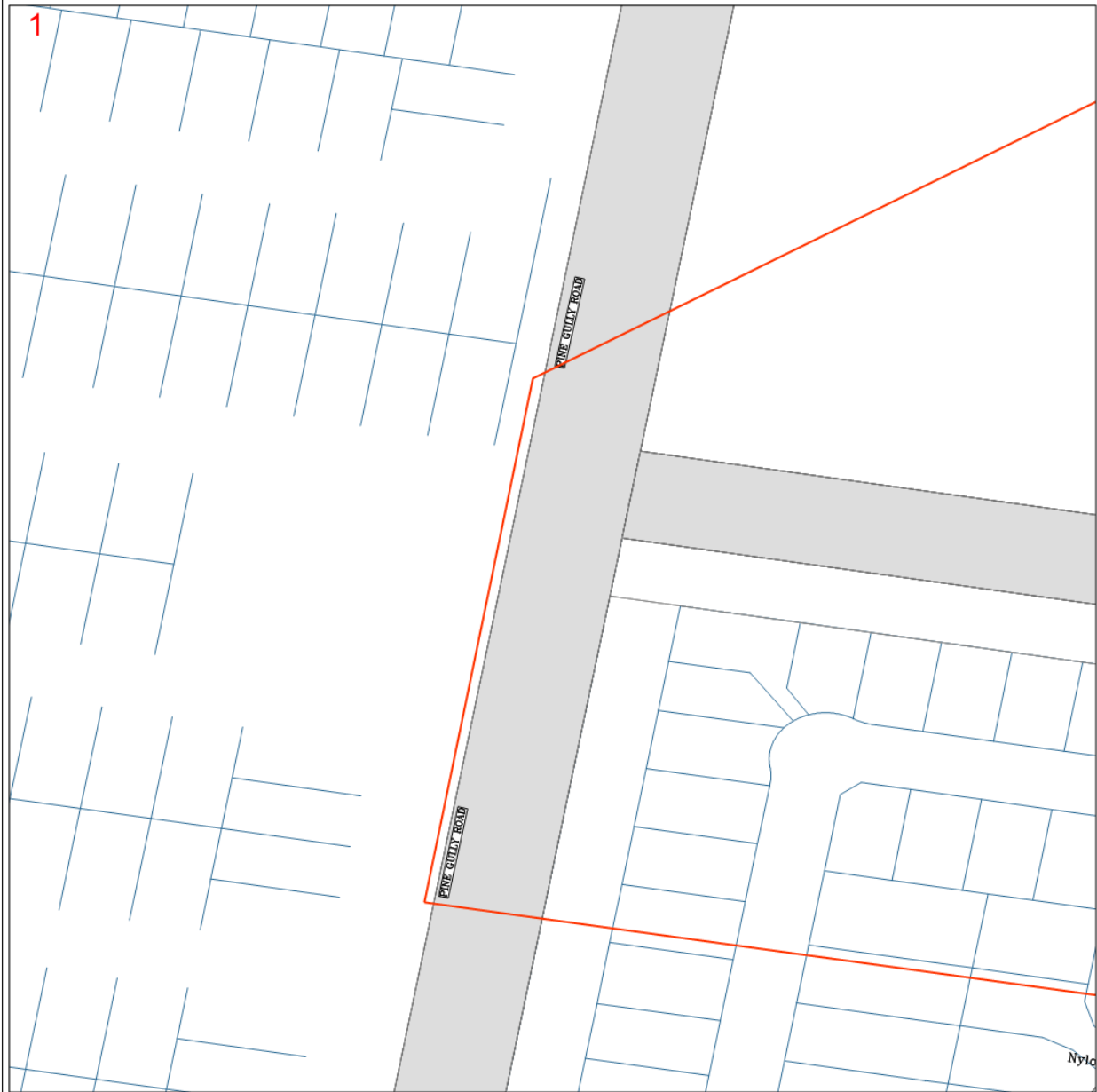
operated by





Site Address	Estella Road Estella 2650	Sequence No	75173121
Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

Before you commence any works you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA asap



LEGEND					
	Service Pipe		Field Valve		Delivery Point
	Distribution Pipe		Anode Bed		Gas Regulator Site
	Critical Pipe		CP Test Point Site		Depth
	Transmission Pipe				

Map Key:

1	2	4	6	8
3	5	7	9	

Scale 1:1000

0 0.01km

NORTH



Site Address	Estella Road Estella 2650	Sequence No	75173121
Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

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asap



LEGEND		
	Service Pipe	Field Valve
	Distribution Pipe	Anode Bed
	Critical Pipe	CP Test Point Site
	Transmission Pipe	Delivery Point
		Gas Regulator Site
		Depth

Map Key:

1	2	4	6	8
3	5	7	9	

Scale 1:1000

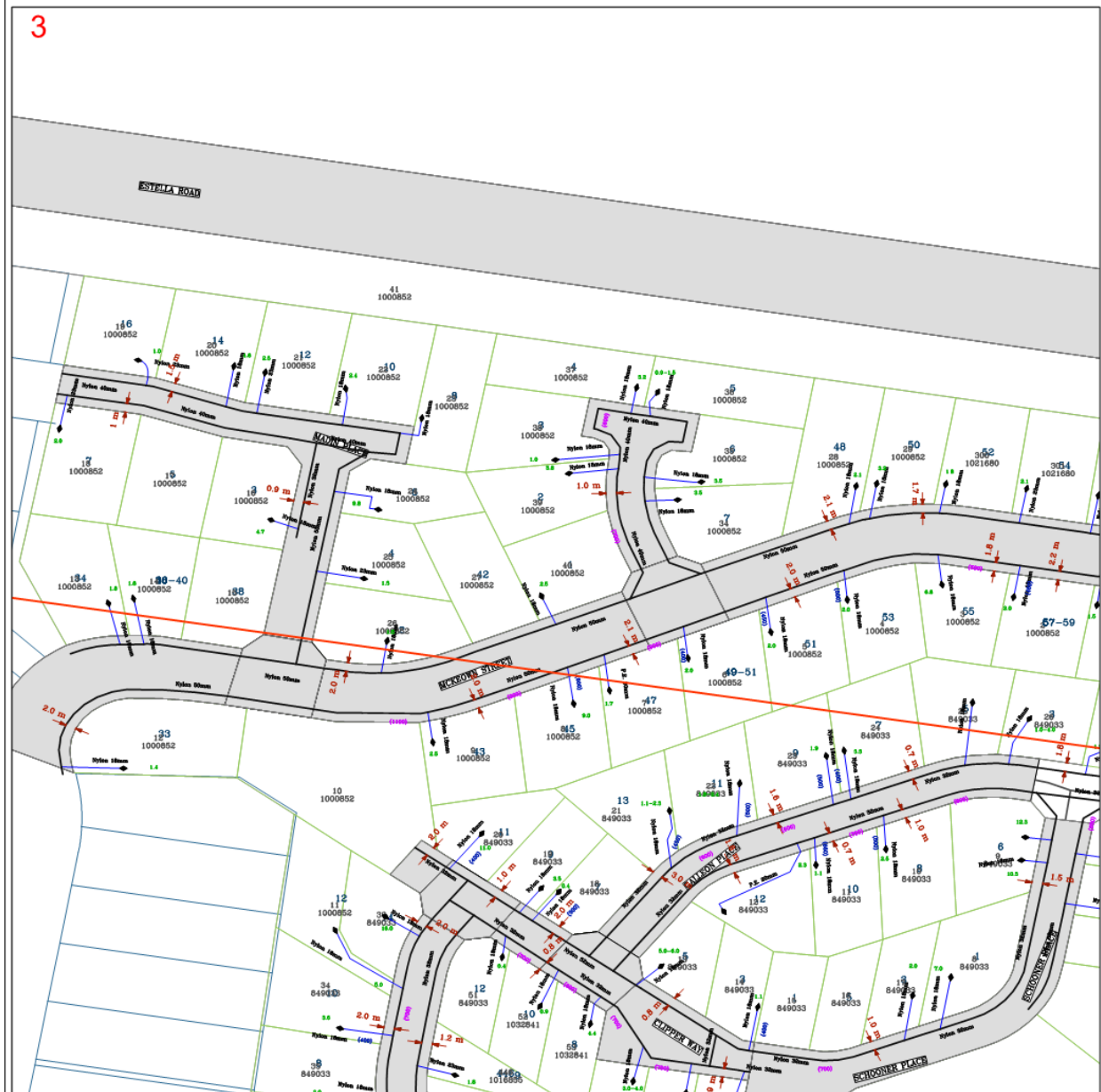
0 0.01km

NORTH



Site Address	Estella Road Estella 2650	Sequence No	75173121
Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

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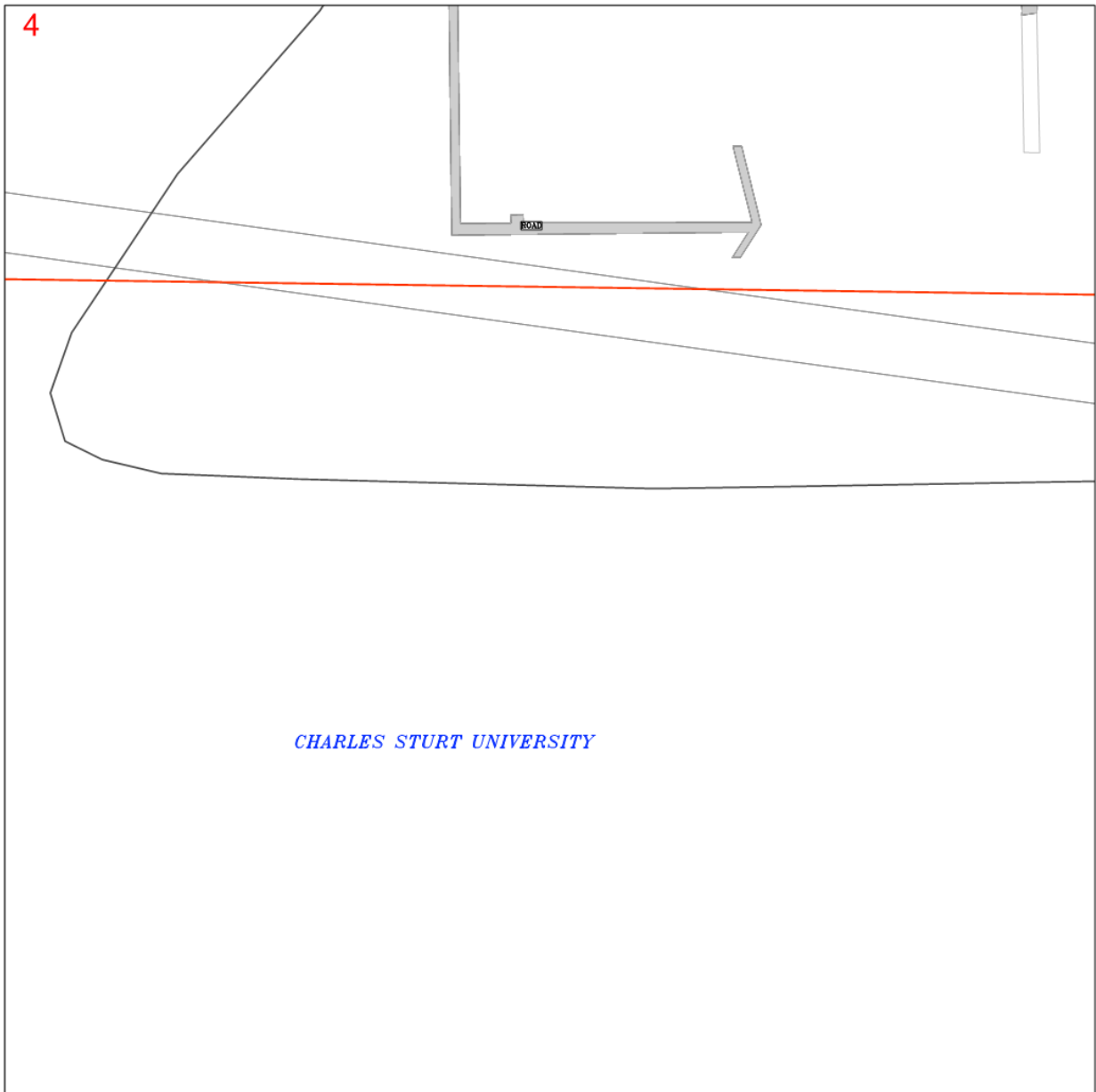


 LEGEND  Service Pipe  Distribution Pipe Critical Pipe Transmission Pipe  Field Valve  Anode Bed  CP Test Point Site  Delivery Point  Gas Regulator Site  Depth Map Key: <table><tr><td></td><td>2</td><td>4</td><td>6</td><td>8</td></tr><tr><td>1</td><td>3</td><td>5</td><td>7</td><td>9</td></tr></table>			2	4	6	8	1	3	5	7	9	Scale 1:1000		0 0.01km	 NORTH
	2	4	6	8											
1	3	5	7	9											
Scale 1:1000		0 0.01km	 NORTH												



Site Address	Estella Road Estella 2650	Sequence No	75173121
Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

Before you commence any works you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA asap





LEGEND

Service Pipe

Distribution Pipe

Critical Pipe

Transmission Pipe



Field Valve



Anode Bed



CP Test Point Site



Delivery Point



Gas Regulator Site



Depth

Map Key:



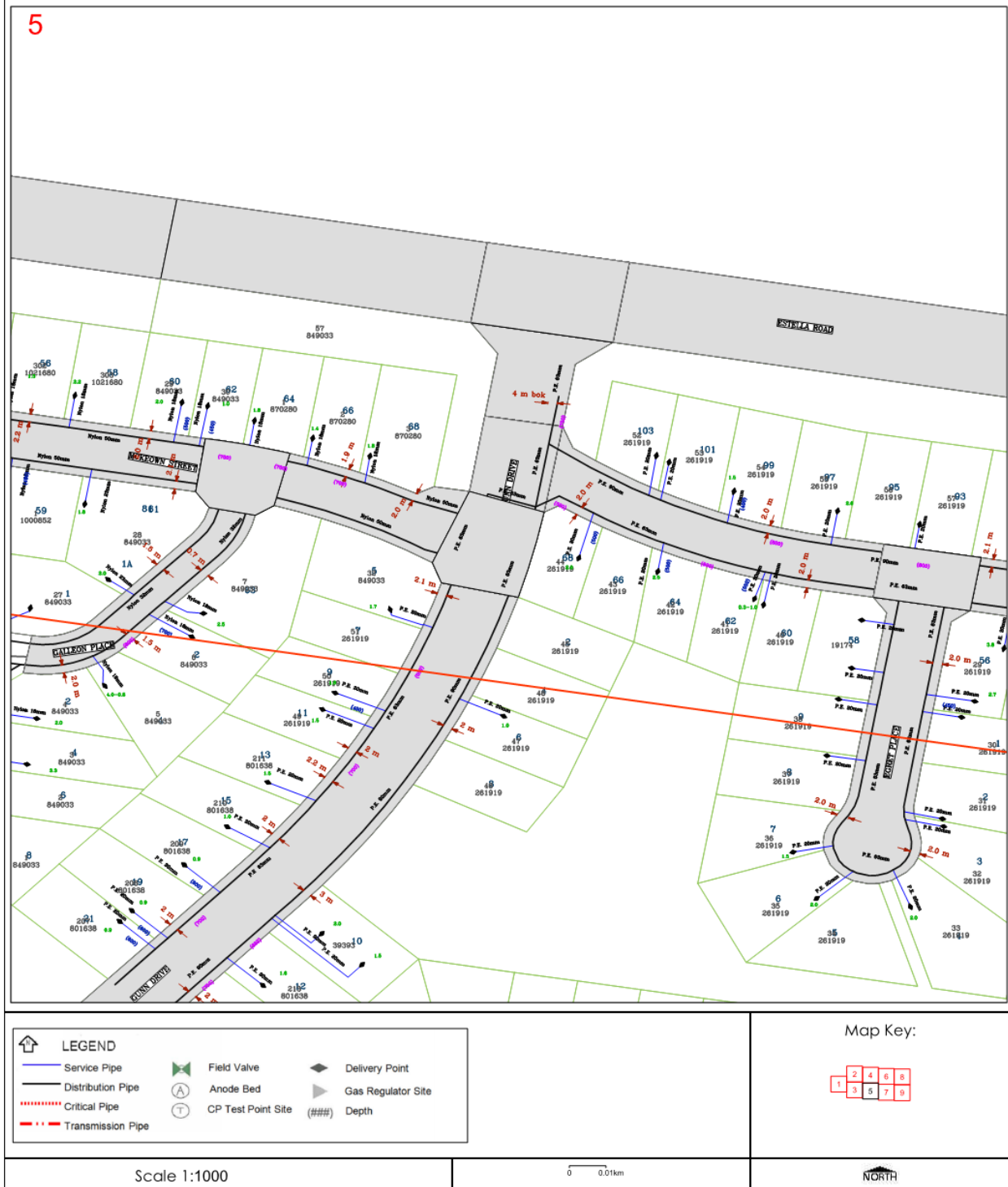
Scale 1:1000

0 0.01km



Site Address	Estella Road Estella 2650	Sequence No	75173121
Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

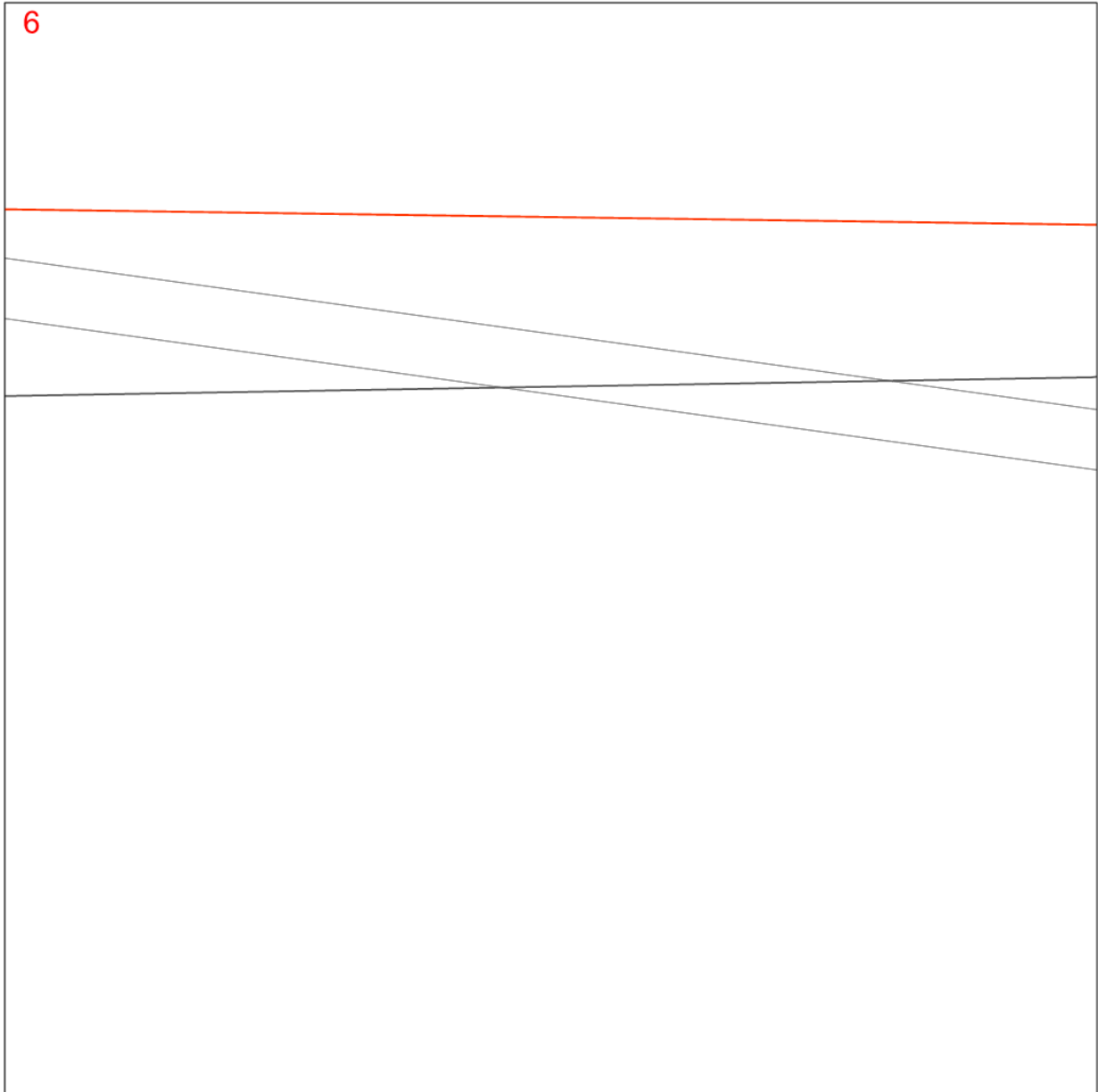
Before you commence any works you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA asap





Site Address	Estella Road Estella 2650	Sequence No	75173121
Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

Before you commence any works you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA asap



LEGEND		
	Service Pipe	Field Valve
	Distribution Pipe	Anode Bed
	Critical Pipe	CP Test Point Site
	Transmission Pipe	Delivery Point
		Gas Regulator Site
		Depth

Map Key:



Scale 1:1000

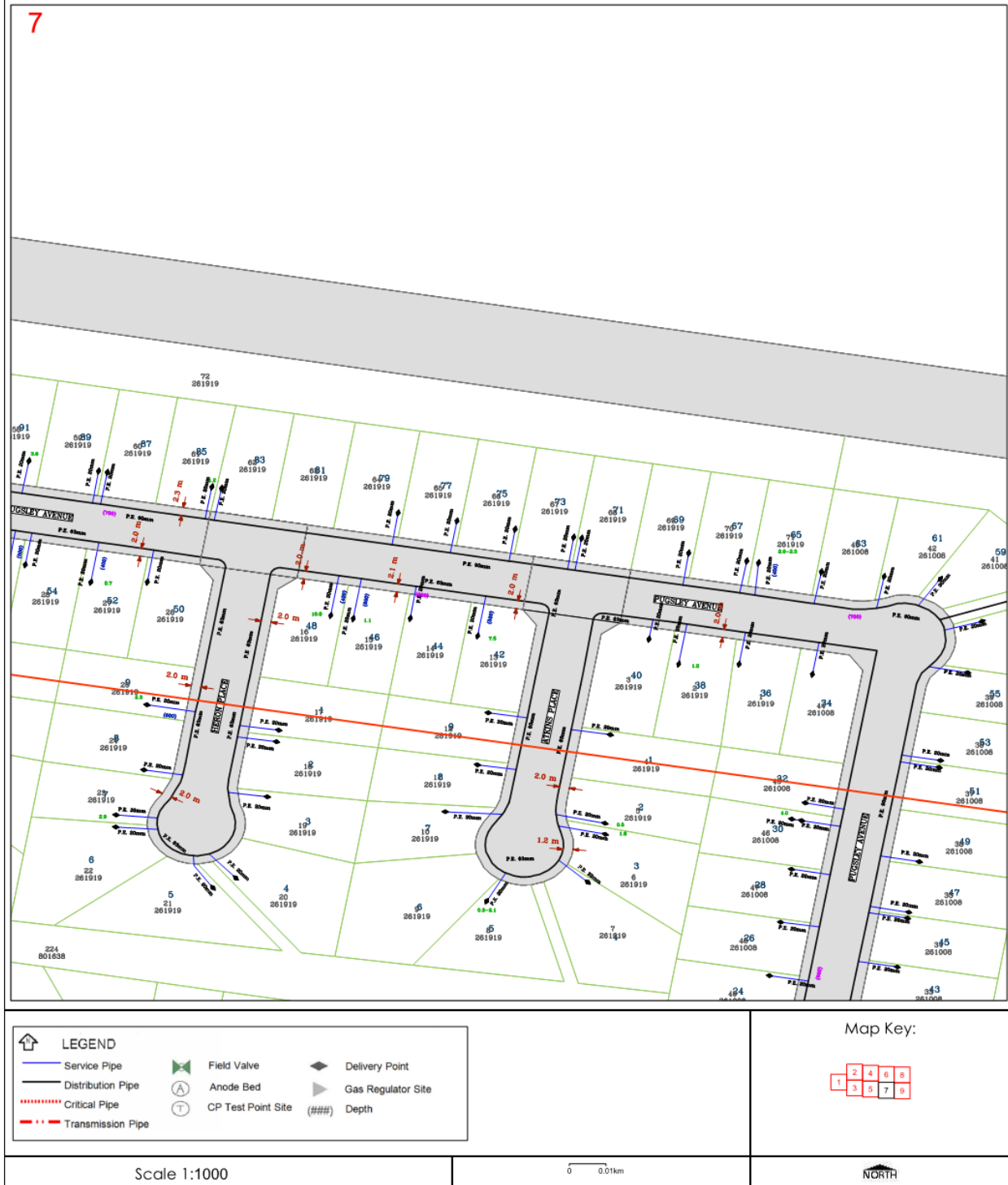
0 0.01km





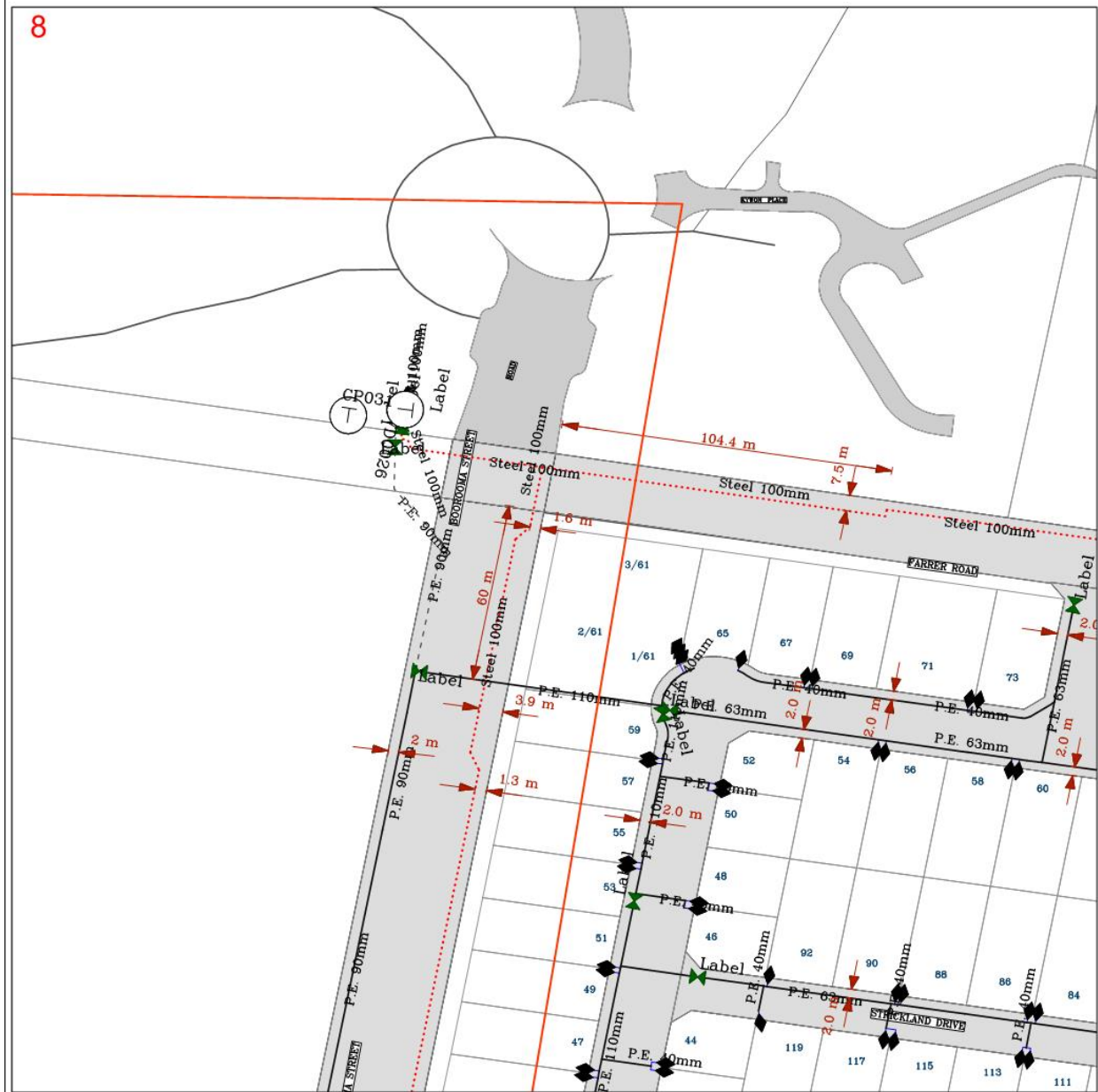
Site Address	Estella Road Estella 2650	Sequence No	75173121
Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

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Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

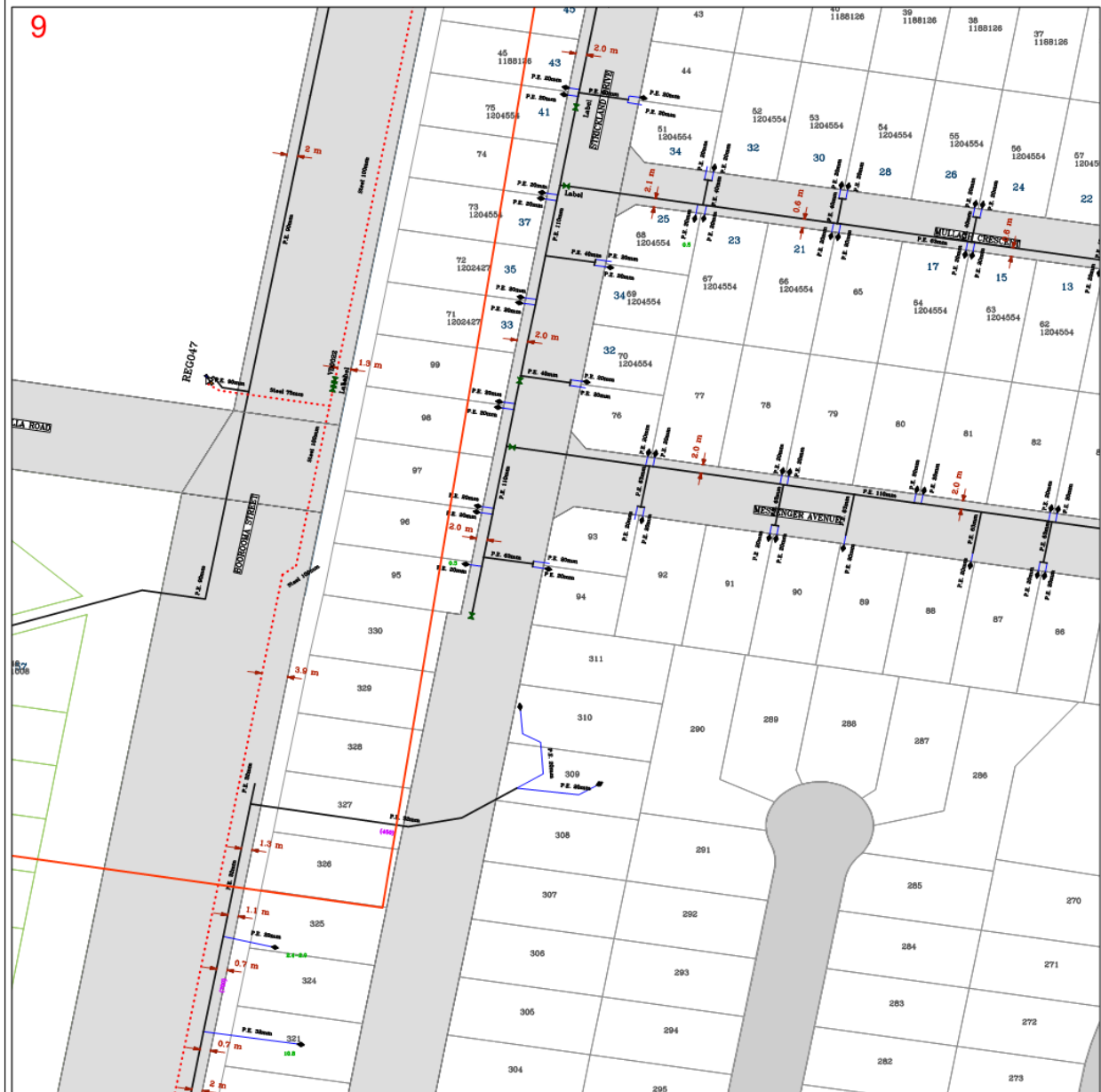
Before you commence any works you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA asap



LEGEND - Service Pipe - Distribution Pipe - Critical Pipe - Transmission Pipe - Field Valve - Anode Bed - CP Test Point Site - Delivery Point - Gas Regulator Site - Depth		Map Key:
Scale 1:1000		0 0.01km NORTH

Site Address	Estella Road Estella 2650	Sequence No	75173121
Email	scottm@northrop.com.au	Map Reference	Penguin 170G2.170H2

Before you commence any works you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA asap

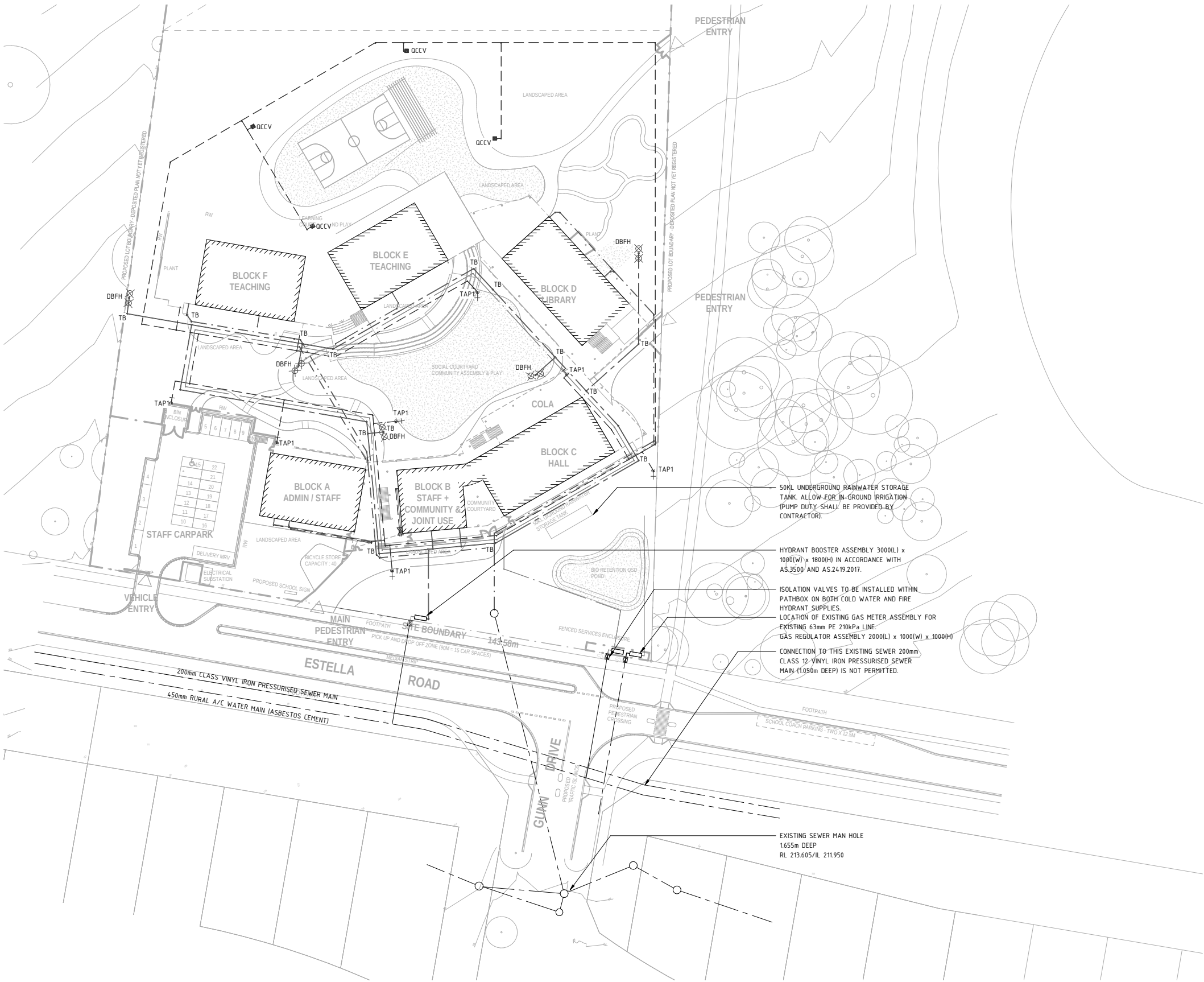


LEGEND - Service Pipe - Distribution Pipe - Critical Pipe - Transmission Pipe - Field Valve - Anode Bed - CP Test Point Site - Delivery Point - Gas Regulator Site - Depth		Map Key:
Scale 1:1000		0 0.01km NORTH

APPENDIX D – CIVIL SITE SERVICING CONCEPT



APPENDIX E – HYDRAULIC SITE SERVICING CONCEPT



50kL UNDERGROUND RAINWATER STORAGE TANK. ALLOW FOR IN-GROUND IRRIGATION (PUMP DUTY SHALL BE PROVIDED BY CONTRACTOR).

HYDRANT BOOSTER ASSEMBLY 3000(L) x 1000(W) x 1800(H) IN ACCORDANCE WITH AS 3500 AND AS 2419.2017.

ISOLATION VALVES TO BE INSTALLED WITHIN PATHBOX ON BOTH COLD WATER AND FIRE HYDRANT SUPPLIES.

LOCATION OF EXISTING GAS METER ASSEMBLY FOR EXISTING 63mm PE 210kPa LINE.

GAS REGULATOR ASSEMBLY 2000(L) x 1000(W) x 1000(H)

CONNECTION TO THIS EXISTING SEWER 200mm CLASS 12 VINYL IRON PRESSURISED SEWER MAIN (1.050m DEEP) IS NOT PERMITTED.

EXISTING SEWER MAN HOLE
1.655m DEEP
RL 213.605/IL 211.950

AMENDMENTS				DESCRIPTION
REV	BY	DATE		
P1		19.11.19	50% SCHEMATIC DESIGN	
P2		03.12.19	75% SCHEMATIC DESIGN	

LEGEND

Woolacotts
CONSULTING ENGINEERS
T +61 2 8203 1550 | www.woolacotts.com.au
Ground Floor, 32a Brown Street, Chatswood, NSW 2067
This drawing is copyright and shall not be used, reproduced or copied in any form without written permission of Woolacotts Consulting Engineers Pty Ltd.

Job Number	Approved	Verified	Prepared
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HANSEN YUNCKEN
NSW GOVERNMENT Education

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NORTHROP ENGINEERS
(02) 9241 4189
MECH. ELEC.
STEENEN WARMING
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HYD
WOOLACOTTS
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FIRE
MCS FIRE ENGINEERING
(041) 2292 2745

PERUMAL PEDAVOLI ARCHITECTS
T: 02 9291 0000
WEB: www.pp-arch.com.au
Nominated Architect:
Vince Pedavoli NSW Reg No 5045
LANDSCAPING
TAYLOR BRAMMER LANDS. ARCH.
(02) 9387 1865

PERUMAL PEDAVOLI
WAGGA WAGGA PS
NEW HIGH QUALITY CLASSROOMS
DRAWING NAME
OVERALL SITE PLAN
ARCHITECTS

PROJECT NORTH

0 5000 10000 15000 20000 25000 30000
SCALE 1 : 500 @ A1

DRAWN	CHECKED	VERIFIED	DATE
			SEPTEMBER, 2019

DRAWING NUMBER: NHQC2-WW-HY-DWG-00_S002

PROJECT CODE	SCH. REF.	DISC.	TYPE	BLOCK#	SERIES#	REVISION

P2

APPENDIX F – ESSENTIAL ENERGY DIP



DESIGN INFORMATION PACKAGE

FOR Project: 117944 Commercial/Industrial Development - Estella Rd Estella - Wagga Wagga Primary School

Design Information Issue Date: 8/11/2018.

Northrop Engineers Pty Ltd
Level 11, 345 George St
SYDNEY NSW 2000

Introduction

Thank you for your application requesting electrical reticulation design information for the proposed supply to **Lot 4, DP 1218378**

Project Address: Estella Rd Estella NSW 2650

Customer Name: Hayball

General

1. The project number **117944** has been established and shall be used for all future reference and payment transactions.
2. The content of this Design Information Package has been compiled on the basis of certain conditions and restrictions. The designer shall incorporate these requirements within the electrical reticulation design prepared for presentation to Essential Energy.
3. The Design Information Package will be valid for a period of 180 days from the above date. If an updated package is required, please send an email request to contestableworks@essentialenergy.com.au and quote the project number.
4. Essential Energy is providing this information in good faith, to assist you to complete designs for certification. Essential Energy cannot and does not warrant the accuracy or completeness of the information and does not accept any liability for inaccuracies or lack of information. It is the responsibility of the applicant or Accredited Service Provider to independently confirm the accuracy or otherwise, of any information.

Connection Point & Specific Design Information

The regulatory category for the project is: **Commercial and Industrial Developments**

The nominated connection point on the network will be at Asset Nos: **CE8675 and CE8674.**

Connection Point Voltage: **11,000 Volts 3Ø**

Connection Contract

A connection application has not been submitted. This Design Information Package is based on the information supplied with the request.

A connection contract must be in place into prior to submitting a design package for certification. If the information supplied with the connection application does not match the information supplied with the request for design information, Essential Energy may require the Design Information Package to be reissued and additional charges may apply.

Existing Asset Details

The existing High Voltage Conductor is: **19/3.75 AAAC**

New Asset Details:

The Minimum size for the New HV conductor / cable required: **11kV 240mm 3 Core AL XLPE**

The New Substation size required is: **750 kVA 3Ø**

- New Substation HV Fuses are: **63 Amp (Padmount)**
- New Substation LV Fuses are: **400 Amp (Padmount)**

Refer to CEOS5099 – Distribution: Transformer Fusing

To request Asset Numbers please email Contestable Works stating the number and type required.

Primary Tap setting

Primary Tap setting for this transformer is to be included on the drawing for certification.

The primary tap setting for this transformer: 11,000V – 100%

Earth Fault Protection Settings for Neutron Earthing Analysis

Site Asset Number: 71-F3251

Phase to Earth fault level at site (Amps): 2372

X/R ratio at site: 2.96

Number of interconnected Substations: na

Estimated number of connections per substation: na

SEF Active: Y

Upstream protective device: HV substation fuses

Project Specific Comments:

Your application to provide electrical supply to the proposed Wagga Wagga Primary School has been approved.

Your connection points will be at poles CE8675 and CE8674. Install a high voltage overhead to underground termination points at the poles, install new high voltage cables towards the new 3-ph 750kV 3-way RMU pad mount substation, making a high voltage ring network.

All works are to comply with Essential Energy Overhead/Underground Design & Construction Manual, NSW Service and Installation Rules of NSW, AS/NZS 7000 and AS/NZS 3000.

Created easements are to be shown with dimension for the new substation and relevant underground route in compliance to CEOP8046 requirements.

Please supply the LV Connection Offer Number with your design submission.

Zone Substation: CHI Carthwrights Hill

Feeder: CHI3B4 Estella

Maintenance Area: Wagga City 71C13

The nearest Essential Energy Depot is: **Wagga Wagga**

Project Funding Arrangements

Essential Energy's policy CEOP2513.06 Connection Policy – Connection Charges sets out the circumstances in which Essential Energy requires a retail customer or real estate developer to pay the cost of connecting their premises or development to Essential Energy's network.

A copy of CEOP2513.06 can be downloaded from Essential Energy's website: www.essentialenergy.com.au.

In accordance with CEOP2513.06 the following funding arrangements will apply to this project:

Customer funded:

- All works

Pioneer Scheme - Reimbursement

General

AER requires that Essential Energy administer a Pioneer Scheme from 1 July 2014 in accordance with the requirements of the AER Connection Charge Guidelines for Electricity Retail Customers – Under Chapter 5A of the National Electricity Rules, and Essential Energy's Connection Policy as approved by the AER.

Requirements of the Pioneer Scheme are outlined in Essential Energy's document *CEO2513.06 Connection Policy – Connection Charges*.

Project specific

The customer is required to complete and sign a CEOF6283 Pioneer Scheme Application Form regardless of whether a pioneer scheme is being implemented or not. The Level 3 ASP must submit the form with the design package for certification.

Network Service (ANS) Charges

Compulsory network fees for this project are calculated in accordance with the Australian Energy Regulator (AER), Charges for Monopoly Services.

Your client is to be advised of any compulsory network fees that are applicable to this project.

Total fees for the Design Information stage of this project are **\$620.84**

Note that invoicing sent to you (separately) will detail the breakup of this amount.

Other fees that may be applied to this project are listed in the document titled 'Price Schedule for Ancillary Network Services - 1 July 2017' that can be found at Essential Energy's website: (<http://www.essentialenergy.com.au/content/electricity-network-pricing-and-information>).

Alternatively, further information on the Schedule of rates can be located on the AER's website: <http://www.aer.gov.au/node/11485>

*** Note - ANS fees exclude GST and are subject to annual price increases in accordance with the National Regulatory Framework. Care should be taken to select the fee appropriate to this project type. Design certification fees will be based on the date of receipt of a complete and correct submission for certification. All other fees will be based on the work completion date. (eg. date of outage, commissioning, inspection).**

GENERAL DESIGN INFORMATION

Project correspondence

All correspondence and submissions for the project should be sent to:

contestableworks@essentialenergy.com.au

To avoid delays, please include the project number **117944** in the email subject line.

Design Standards

Applicable Essential Energy design standards include:

- CEOM7001 – Network Services – Design Construction Drawings,
- CEOM7097 – Overhead Design Manual,
- CEOM7098 – Underground Design Manual
- CECM1000.70 - Environmental Impact Assessment NSW
- CEOM5113.02 - High Voltage A.C. Distribution Earthing

Other applicable standards or regulations include:

- Work Health and Safety Act 2011 (NSW)
- Work Health and Safety Regulation 2011 (NSW)
- Electricity Supply Act 1995 (NSW)
- Environmental Planning and Assessment Act 1979 (NSW)

- AS/NZS 7000:2010 Overhead Line Design
- AS1158 : Road Lighting
- AS 2067: Power installations exceeding 1kV A.C.
- Energy Networks Association EG-0 Power System Earthing Guide.
- Appropriate WorkCover NSW standards, guides and directives.
- Appropriate Environmental Protection Authority of NSW standards, guides and directives.

Network Optimisation

The Level 3 ASP must ensure that the design is carried out in such a way as to optimise future network operating and maintenance costs rather than solely minimising initial connection costs. Consideration should be given to utilising or upgrading existing assets (eg. poles and transformers) where possible.

When assessing connection proposals, Essential Energy will use network optimisation considerations to determine which connection proposals are acceptable.

Other Services

The Level 3 ASP must carry out a Dial Before You Dig search and is responsible for ensuring that the design does not impact on other services, e.g. telecommunication, gas, water etc. DYBD information should be clearly shown on the design.

In the event the works or design needs to be varied, amended or rectified due to a conflict with other services, the Level 3 ASP is responsible for any subsequent redesign required.

The Level 3 ASP must also ensure that the design will not conflict with proposed services to be installed in conjunction with the development.

Materials

All materials specified in the design must comply with CEOM7004 – Materials Inventory: Contestability (Approved)

Non-standard materials may only be used with written permission from Essential Energy. Please submit requests to the Contestable Design & Certification department with full details justification and engineering certification where required.

All assets to be removed from the Essential Energy network within this project are to be nominated on the operational form CEOF 2098 and returned to the Essential Energy regional store located at **Wagga FSC**. The stores contact for this project is **Damien Maloney** who can be contacted during office hours on **02 6933 5856**. This requirement should be clearly noted on the project design.

Work Health and Safety

The Work Health and Safety Act 2011 (NSW) and the Work Health and Safety Regulation 2011 (NSW) assign significant responsibilities to designers, constructors and the person who commissions the works.

Regulation 295 of the Work Health and Safety Regulation 2011 requires a designer to provide a designer safety report to the person who commissioned the design. For the purpose of this legislation the connection applicant is the person who commissions the design and Essential Energy is the entity who will take ownership of the assets upon connection to the network.

A copy of the designer safety report must be included with every design or design amendment submitted to Essential Energy for certification.

At a minimum, the Designer Safety Report **must** include:

- a description of the purpose for which the plant or structure was designed;
- the results of any calculations, testing, analysis or examination;
- any conditions necessary to ensure that the plant, or structure is without risks to health and safety when used for a purpose for which it was designed, or when carrying out any activity related to the plant or structure such as construction, maintenance, and demolition.

The Designer Safety Report should be written with an appropriate level of detail to match the size and complexity of the project.

The Level 3 ASP should link or attach the Designer Safety Report to the design construction plans (and other relevant documents) to ensure the safety information contained within the report is considered by future parties who may work on the designed assets (e.g. during construction, maintenance, decommissioning, demolition etc. phases of the asset lifecycle).

Easements

The Level 3 ASP should consider easements requirements during the design route analysis.

The customer is responsible for all costs associated with the easement creation including solicitor fees, surveying costs and compensation payable to affected landowners.

Where easements are to be created outside of land to be subdivided, satisfactory arrangements must be in place prior to submitting a design package for certification. For further information, please refer to CEOP8046 *Network Planning: Easement Requirements*.

Easements over Crown land, Crown roads or waterways must be obtained by Essential Energy through the compulsory acquisition process. Please contact the Contestable Design & Certification team for further advice.

Approvals

The Level 3 ASP must seek approvals from the local council, all road controlling authorities and any land occupier affected by the proposed electrical works. The Electricity Supply Act 1995 (NSW), State Environmental Planning Policy (Infrastructure) 2007 (NSW) and the Roads Act 1993 (NSW) have specific requirements in this regard.

In accordance with Section 45 of the Electricity Supply Act, notification of the proposed works must be given to the local council. The council is allowed up to 40 days to comment and the ASP required must duly consider all responses received.

In accordance with Regulation 42 of the State Environmental Planning Policy (Infrastructure) 2007, notification of proposed substations, or works on an existing substation, must be given to both the local council and to occupiers of all adjacent land. The council and adjacent land owners are allowed up to 21 days to comment. The Level 3 ASP must duly consider all responses received.

For works in, on or over a classified road, Section 138 of the Roads Act requires the proponent to obtain consent from the appropriate road controlling authority, and either consent, or concurrence from the RMS.

Copies of notices to the local council and occupiers of adjacent land, any comments received or a letter stating that no response was received, and any required consent letters are to be provided to Essential Energy with the certification package.

Copies of notices to the RMS (and other road controlling authorities where applicable) and the written consent received must be provided to Essential Energy with the certification package for any works on classified roads.

Design Certification

Please note the following information regarding design package submissions:

1. In addition to specific requirements outlined in aforementioned clauses, the design package shall be prepared in accordance with the technical design requirements as specified in Essential Energy's Design and Construction standards.
2. All relevant documents shall be submitted with the design for certification. (see Required Documents Schedule)
3. Essential Energy will carry out an initial review of the design package and issue certification of the design drawing to indicate that the package is compliant.
4. If it is found that the design package is not compliant with Essential Energy's technical or drawing standards, or specific design requirements, a rejection notice will be issued outlining the reasons for rejection. Design rechecking charges will be applied.

5. Certification will remain valid for a period of 6 months. If construction of the proposed works has not commenced before this period expires, the design package must be updated and re-submitted for certification prior to submission of the Notice to Commence Construction.

In certifying any design, Essential Energy makes no warranty, express or implied, that the design is:

1. Fit for its intended purpose
2. Suitable for the site conditions
3. Free of design defects (i.e. errors and omissions)

The Level 3 ASP (and Level 1 ASP at commencement of construction) acknowledges that Essential Energy has not inspected the site, and therefore, is unfamiliar with the site conditions.

Design certification is granted exclusively based on the submitted design with respect to the construction standards in force at the time. It has no reference to any underlying assumptions or conditions.

Responsibility for the correctness and suitability of the design remains with the Level 3 ASP after certification. Essential Energy will request the Level 3 ASP to correct any design defects discovered after certification is granted and resubmit the design package for certification. Design rechecking charges will be applied.

Environmental

Environmental Impact Assessment

An environmental impact assessment of the project will be required. The assessment is to be completed in accordance with Essential Energy's Environmental Impact Assessment (EIA) Policy CECM1000.70.

A completed *CEOF1070.01 Environmental Impact Assessment: Screening Worksheet*, and *CEOF1070.02 Review of Environmental Factors Worksheet*, must be submitted with design construction plans and other documents for certification by Essential Energy. An information sheet *CEOH1070.02a REF Worksheet: Information Sheet for use by Accredited Service Providers* is available in Essential Energy's online document library to assist ASPs with the completion of CEOF1070.02.

Please ensure ALL required supporting documentation such as threatened species searches, evidence of community consultation, and notifications to council are included.

Please note, Essential Energy is offering Environmental Impact Assessment training for Level 3 ASPs in early 2017. From 1 July, 2017, this training will be mandatory for any person that completing an EIA for a contestable works project.

Vegetation Management

CEOP2010 Vegetation Clearing Guidelines for New Power Lines outlines the requirements for the clearing of vegetation prior to the installation of new overhead and underground powerlines. The document details responsibilities of Level 3 ASPs in the preparation of their design.

If the project requires the clearing (or trimming) of vegetation, the Level 3 ASP must:

1. Ensure their EIA contains details of the required clearing and approvals for the work.
2. Prepare a Site Specific Vegetation Clearing Management Plan (SSVCMP).
3. Specify the width of the required Clearing Zone taking into account the minimum Clearing Zone dimensions (Section 3.2.5) and other factors such as conductor blowout.
4. Include a reference to the SSVCMP on the design construction plan.
5. Ensure the Level 1 ASP who will construct the project is provided a copy of the SSVCMP.

The SSVCMP plan must address all the issues identified in the Environment Impact Assessment. For example, site remediation to prevent the onset of erosion. A list of the minimum information to be included in SSVCMP is in Section 4 of CEOP2010. Essential Energy's certifying officer will assess the submitted EIA and SSVCMP prior to certifying the design.

Clearing works must not commence until design certification has occurred.

Substation Sites

Substations must comply with the requirements of Essential Energy standard construction drawings and design manuals. Level 3 ASPs are reminded of the following requirements:

General:

- Unimpeded access is to be provided for Essential Energy vehicles and staff to substation sites. All substations shall be placed in a location which allows access for a crane borer/erector.
- All padmount substations that are to be installed above the 1:100 year flood level for the local area. Evidence that this requirement is satisfied is to be obtained from the local council, and made available to Essential Energy.
- If an existing substation structure is being altered for any reason, then the structure is to be brought up to the current Essential Energy standards.

Earthing:

- All earthing shall comply with the Essential Energy's policy CEOM5113.02 High Voltage A.C. Distribution Earthing Procedure.
- All earthing designs shall be based on Essential Energy's distribution earthing design software package (Neutron). A copy of the Neutron software package is available on request through neutron@essentialenergy.com.au.
- Level 3 ASPs are required to print an Earthing Report from Neutron and submit it with the design construction drawings for certification.
- Full details of the earthing design must be included on the design drawing.
- Should the customer be upgrading an existing substation, then the suitability of the existing earthing should be assessed for compliance with the current standards. If the existing earthing does not comply, it must be upgraded accordingly.

Interference to Other Network Customers

Level 3 ASPs must be aware:

All motor starting must comply with the NSW Service and Installation Rules. Motors will require an approved form of reduced current starting, and motor re-starting to be delayed or non-automatic (manual) following a power outage.

Large motors, arc furnaces, rectifiers (e.g. welders), large inverters, single phase to three phase converters, x-ray machines etc. can degrade the power quality at the customer's own installation and cause adverse effects to the supply of other customers and to Essential Energy's equipment e.g. interference with the frequency injection signal.

The effects from such equipment on power quality may include:

- Voltage sags and swells;
- Harmonics & Inter-harmonics;
- Voltage fluctuations;
- Voltage unbalance;
- Impulsive and oscillatory transients;
- Notching.

Any new load must comply with the relevant Australian Standards, NSW Service and Installation Rules and the Electricity Supply Act 1995 to prevent interference to other customers and electrical equipment.

Level 3 ASPs must notify Essential Energy if it is determined that the customer's load is likely to cause interference to Essential Energy's network.

Entry into Private Property

Only an authorised officer of Essential Energy may exercise Notice of Entry powers described in the NSW Electricity Supply Act 1995.

Level 3 ASPs providing contestable design services are not authorised officers of Essential Energy.

During a design investigation, the Level 3 ASP and/or their customer, must obtain the land owner or occupier consent to enter the land and carry out surveying and design related tasks.

Schedule of Documents to be submitted with the Certification Package:

- ☐ Electrical plan for certification (in pdf and dwg format)
- ☐ LVDROP report showing voltage drop calculations
- ☐ Pole and conductor loading calculations
- ☐ Neutron earthing report
- ☐ Designer safety report
- ☐ Site Specific Vegetation Clearing Management Plan (where applicable)
- ☐ Evidence of easement creation or Deed of Agreement
- ☐ All Local Council, Land Occupier, RMS and other authority correspondence and consent
- ☐ Enhancement Letters
- ☐ CEOF9082 – Consent Form – Customer Funded Project.
- ☐ CEOF9093 – Consent Form – Schedule of Works Required.
- ☐ CEOF6127 – Public Lighting: Installation and Connection Consent.
- ☐ CEOF6011 – Design Submission Form
- ☐ CEOF6283 – Contestable Works: Pioneer Scheme Application (Land Owner Only) or
CEOF6283.01 – Contestable Works: Pioneer Scheme Application (Land Owner and Leaseholder)
- ☐ CEOF1070.01 – Environmental Impact Assessment: Screening Worksheet
- ☐ CEOF1070.02 – Review of Environmental Factors Worksheet and related searches and approval documents
- ☐ CEOF2098 – Company Form (Network) Returned Redundant Materials Check List
- ☐ AHIMS Report
- ☐ Flora / Fauna search results
- ☐ Dial Before You Dig (DBYD) reference number

Essential Energy forms are available at: www.essentialenergy.com.au/content/contestable-works

Incomplete or incorrect certification packages will be rejected (Design rechecking charges will apply to subsequent submissions).

Design information issued by **Name:** Robert Zaragoza
Contact Number: 02 6933 5874

List of attachments:

- ☐ Smallworld
- ☐ Enmac
- ☐ Pole Data
- ☐ Environmental Report