RPS

WATER & SEWER SERVICING STRATEGY
ANGLICAN CARE GLOUCESTER PROJECT

Prepared for ***Anglican Care***

4 MAY 2018

Prepared by:

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Document Status

Version	Purpose of Document	Orig	Review	Review Date
Ver.1	Client Review	IM	MM	

Approval for Issue

Name	Signature	Date
Ian Murphy		

Contents

Appendices

Terms and Abbreviations

AHD	Australian Height Datum
ADWF	Average Dry Weather Flow
ILU	Independent Living Unit
MCC	Mid Coast Council
PDWF	Peak Dry Weather Flow
PWWF	Peak Wet Weather Flow
RL	Reduced Level
RPS	RPS Australia East Pty Ltd
SA	Storm Allowance

1.0 Introduction

RPS Australia East Pty Ltd has been commissioned by the APP Corporation on behalf of Anglican Care to prepare a water and sewer servicing report for the Anglican Care Gloucester RACF Project. This report addresses the provision of water and sewer services to the proposed development.

The proposed development of the site will require the construction of lead in sewer infrastructure to connect to the Mid Coast Council reticulated sewerage system.

The development site has a frontage to existing Mid Coast Council reticulation watermains.

1.1 Location

The proposed facility is to be located at Lot 1 Clement St, Gloucester

1.2 Development

The proposed development footprint for the project includes an aged care facility with 44 beds and 28 Independent Living Units (ILU).

1.3 Methodology

Consultation has been undertaken with the Mid Coast Council to determine the requirements for the provision of water and sewer services that meet Council standards.

A plan of the project site is attached at **Appendix 1.**

2.0 Water

The project site has a frontage to existing 250mm & 150mm asbestos cement watermains in Clement St.

Advice from Mid Coast Council indicates that the existing system can provide adequate volume to service the project needs but there is insufficient pressure in the system to satisfy fire fighting requirements.

Provision of adequate fire fighting flows will require the installation of a booster system on site. An appropriate booster system is to be detailed by the hydraulic engineer for the project.

A plan detailing existing water infrastructure in the area is attached at **Appendix 2.**

2.1 Design Water Demands

To estimate design flows, values provided by Mid Coast Council have been used. Theoretical loadings have been determined and are expressed in terms of equivalent tenements (ET). An ET is the theoretical water demand for an average residential lot. The criteria used to determine theoretical water design flows are summarised below:

Average Day Demand for new residential properties in the Mid Coast Council LGA = 205 kL/yr

For this project RACF beds have been determined at 1ET and ILU at 0.67ET.

- Average Day Demand (L/s) = 0.0065/ET
- Peak Day Demand (L/s) = ADD x PDD Factor
- Peak Day Factor – 3
- Peak Instantaneous Demand (L/s) = 0.04/ET
- Unaccounted Water = 13% of Average Day Demand

Design flows based on the potential lot yield are shown in **Table 2** below:

Table 1 Total Theoretical Water Loadings

Development Type	Estimated ET	Average Day Demand (l/s)	Peak Day Demand (l/s)	Peak Instantaneous Demand	Unaccounted Water (l/s)
RACF	44	0.29	0.86	1.76	0.04
ILU 1	8.71	0.06	0.17	0.35	0.01
ILU 2	3.35	0.02	0.06	0.13	0.01
ILU 3	2.01	0.01	0.04	0.08	0.01
ILU 4	3.35	0.02	0.06	0.13	0.01
ILU 5	1.34	0.01	0.03	0.05	0.01
Total	62.76	0.41	1.22	2.51	0.05

3.0 Sewer

The project site does not currently have a point of connection to the reticulated sewerage system in the area. A 150mm uPVC sewermain runs parallel to the southern boundary of the site. An extension of sewermains from this system will provide the site with a point of connection that meets Mid Coast Council's servicing requirements.

Provision of a point of connection to the project site involves the construction of approximately 255m x 150mm sewermain. The proposed sewermain will connect to the existing system at MH219929 and extend to the western boundary of the site. The proposed sewermain needs to connect to the existing system in this location to provide adequate cover under an existing stormwater drain.

Sewer sizing is confirmed by loading data below.

A concept design of the proposed sewer main is attached at **Appendix 3**.

3.1 Design Sewerage Loading

Design flows for development have been estimated using values in the Water Services Association of Australia (WSAA) Sewerage Code of Australia Hunter Water Corporation Version 2.0 to determine theoretical loadings in equivalent tenements (ET). An ET is the theoretical sewage flow from an average residential lot. For this development ET is calculated based on 62.76 ET.

The criteria used to determine theoretical sewer design flows are summarised below:

For this project RACF beds have been determined at 1ET and ILU at 0.67ET.

- Average Dry Weather Flow (ADWF) = 0.011l/s per ET
- Peak Dry Weather Flow (PDWF) = ADWF x 'r'
- Storm Allowance = 0.058 l/s per ET (for gravity systems)
- Peak Wet Weather Flow (PWWF) = PDWF + SA

Note: 'r' factor is from an empirical relationship based on ET.

Table 2 Overall Sewer Loadings

Stage	Yield	ADWF	r	PDWF	SA	PWWF
	(ET)	(L/s)		(L/s)	(L/s)	(L/s)
RACF	44	0.48	3.75	1.82	2.55	4.37
ILU 1	8.71	0.10	4.00	0.38	0.51	0.89
ILU 2	3.35	0.04	4.00	0.15	0.19	0.34
ILU 3	2.01	0.02	4.00	0.09	0.12	0.21
ILU 4	3.35	0.04	4.00	0.15	0.19	0.34
ILU 5	1.34	0.01	4.00	0.06	0.08	0.14
Total	62.76	0.69	3.53	2.43	3.64	6.07

Indicative Costs

Sewer Construction - $45,000

Survey, Investigation & Design – $8,500

Contingency - $10,000

Total Cost - $63,500

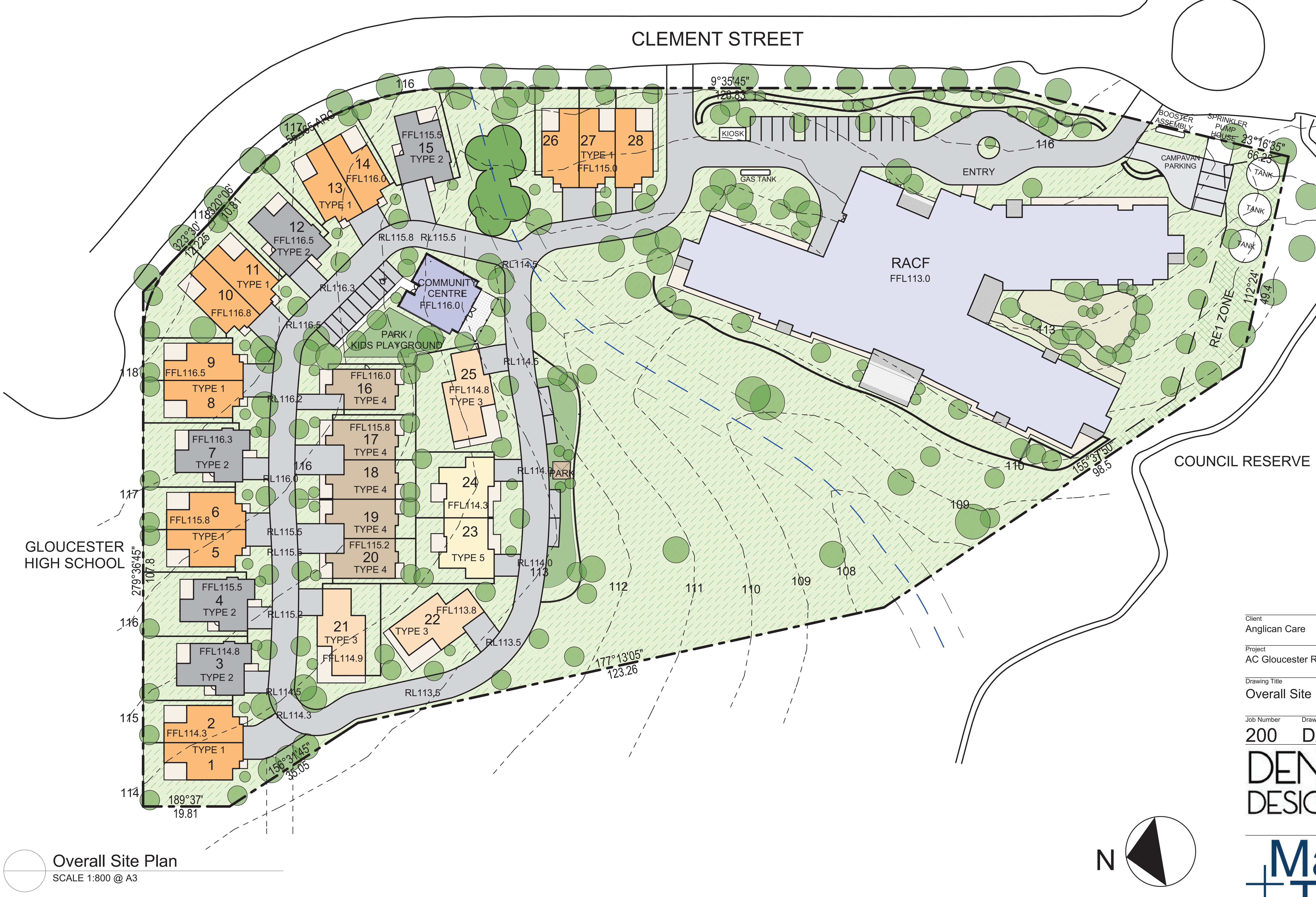
4.0 Conclusion

Provision of the sewerage infrastructure detailed above will provide the project site with access to services that meet Mid Coast Council requirements.

The site has a frontage to existing water mains that will require internal boosting to meet fire fighting requirements.

Appendix 1

Site Plan


CLEMENT STREET
GLOUCESTER HIGH SCHOOL
COUNCIL RESERVE
RACF
FFL113.0
COMMUNITY CENTRE
FFL116.0
PARK / KIDS PLAYGROUND
ENTRY
KIOSK
GAS TANK
BOOSTER ASSEMBLY
SPRINKLER PUMP HOUSE
CAMPAVAN PARKING
TANK
TANK
TANK
RE1 ZONE
PARK
1 TYPE 1 FFL114.3 2
3 TYPE 2 FFL114.8
4 TYPE 2 FFL115.5
5 TYPE 1 FFL115.8 6
7 TYPE 2 FFL116.3
8 TYPE 1 FFL116.5 9
10 TYPE 1 FFL116.8 11
12 TYPE 2 FFL116.5
13 TYPE 1 FFL116.0 14
15 TYPE 2 FFL115.5
16 TYPE 4 FFL116.0
17 TYPE 4 FFL115.8
18 TYPE 4
19 TYPE 4
20 TYPE 4 FFL115.2
21 TYPE 3 FFL114.9
22 TYPE 3 FFL113.8
23 TYPE 5
24 FFL114.3
25 FFL114.8 TYPE 3
26 27 TYPE 1 FFL115.0 28
9°35'45" 120.83
23°16'35" 66.25
112°24' 49.4
155°37'50" 98.5
177°13'05" 123.26
156°31'45" 35.05
189°37' 19.81
279°36'45" 107.8
323°30' 12.225
320°06' 10.81
55.35 ARC
RL115.8 RL115.5 RL114.5 RL116.3 RL116.5 RL116.2 RL116.0 RL115.5 RL115.5 RL115.2 RL114.5 RL114.3 RL113.5 RL113.5 RL114.0 RL114.0 RL114.5
118 117 116 115 114 113 112 111 110 109 108
N

Overall Site Plan
SCALE 1:800 @ A3

Client
Anglican Care

Project
AC Gloucester RACF Project

Drawing Title
Overall Site Plan

Job Number	Drawing Number	Issue
200	DA01	02

DEN-AD DESIGN & Co

Manns + Troup

Appendix 2

Water Infrastructure

TITLE: EXISTING WATER INFRASTRUCTURE

LOCATION: LOT 40 DP1227815
GLOUCESTER

DATUM: AHD
PROJECTION: MGA ZONE 56

DATE: 9TH MAY 2018
PURPOSE: WATER

AUTOCAD REF: 140020 BASE DRAWING
VERSION: A A3 (NW)

CLIENT: ANGLICAN CARE
JOB REF: PR 140020

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Appendix 3

Sewer Infrastructure

TITLE: SEWER CONCEPT PLAN

LOCATION: LOT 40 DP1227815 GLOUCESTER

DATUM: AHD
PROJECTION: MGA ZONE 56

DATE: 9TH MAY 2018
PURPOSE: SEWER

AUTOCAD REF: 140020 BASE DRAWING
VERSION: A A3 (NW)

CLIENT: ANGLICAN CARE
JOB REF: PR 140020

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