

**ENGINEERING
SERVICING REPORT**

**MURRAY ROAD AND
FELLOWS ROAD SITE**

QUEENSCLIFF

JUNE 2014

Engineering Servicing Report

Murray Road and Fellows Road Site, Queenscliff

June 2014

Document Status

Version	Document type	Reviewed by	Approved by	Date Issued
A	REPORT	J.LYNCH	B.VOCALE	10 June 2012

Project Details

Project Name:	ENGINEERING SERVICING REPORT
Client	PLANSIPHERE
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TGM Reference:	12306-201
Date:	6 th June 2014

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1 Introduction

The purpose for this report is to assess the servicing potential for future residential development at the Council owned land at the corner of Murray Road and Fellows Road in Queenscliff. The site has a land size area of 6.96 hectares and fronts Murray Road, Fellows Road and the Bellarine Highway. Site levels range from 0.17m AHD (Australian Height Datum) to 1.74m AHD although this is subject to more detailed survey data..

The report will focus on stormwater drainage and coastal inundation which has a major impact due to climate change and stormwater quality considerations.

The report also investigates servicing of the site for:

Sewerage reticulation and water supply, gas reticulation, telecommunications and electricity supply.

The report is based on reviewing background information, discussion with relevant statutory authorities and site inspection. Figure 1 below outlines the site plan in its current form today. Figure 2 to 5 are photographs of the site and adjoining roads.



Figure 1 – Site Locality Plan



Figure 2 – Corner of Murray and Fellows Road



Figure 3 –Murray Road looking south east from Fellows Road



Figure 4 –Fellows Road looking north from Bellarine Highway

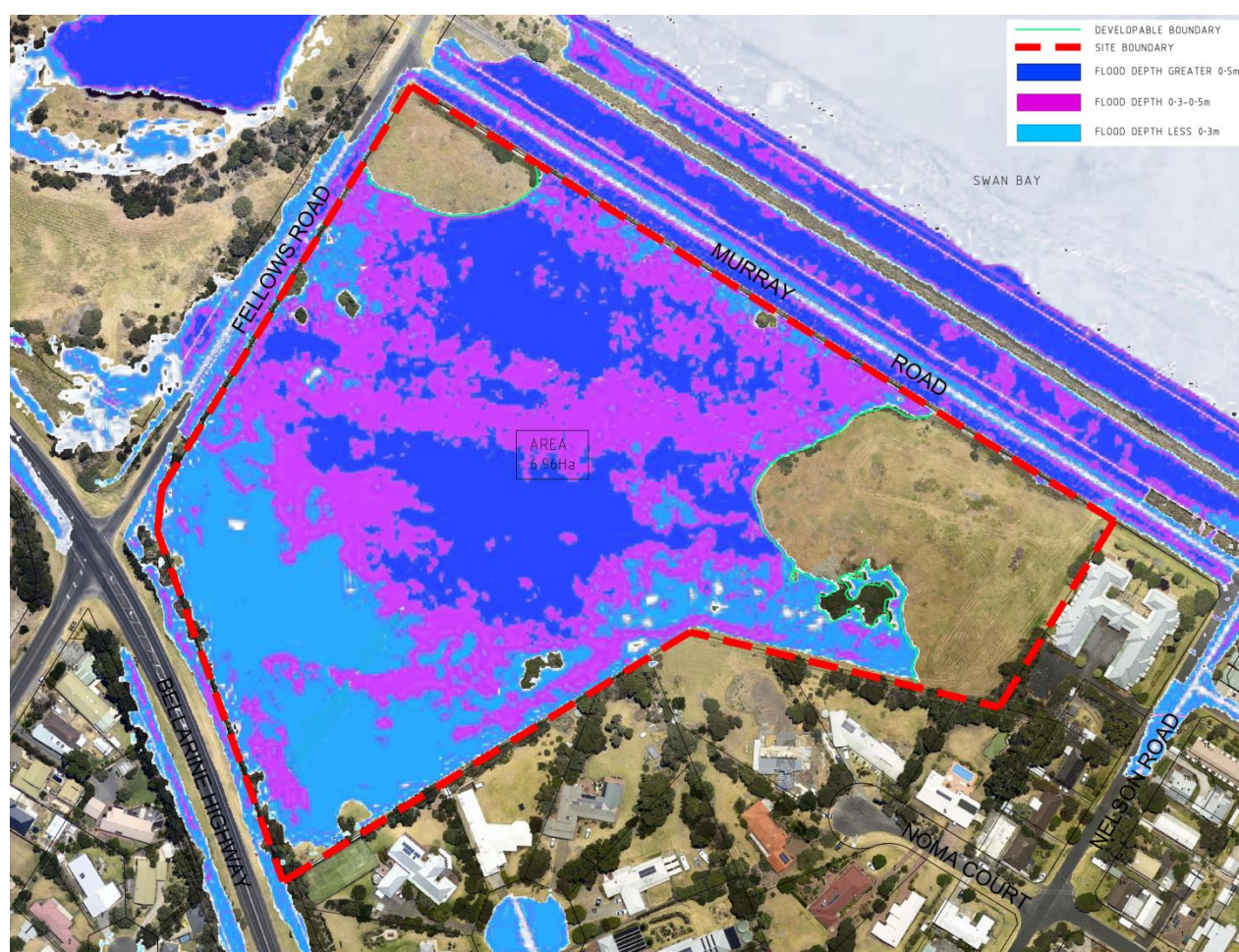


Figure 5 –Bellarine Highway looking south from Fellows Road

2 Stormwater

The authority responsible for regional waterways in the Queenscliff district is the Corangamite Catchment Management Authority (CCMA). For local drainage works the responsible authority is the Borough of Queenscliff. The CCMA has provided Flood Advice for this site dated 2 June 2014 with CMA reference F-2014-0345.

Most of the subject site is very low lying varying between 0.5-1.0 metre AHD, with significant areas also below 0.5m AHD. There are areas of the site that are above 1.0m, generally located in the north east area of the site. It is subject to coastal inundation with a current 1 in 100 year Average Recurrence Interval (ARI) flood level for the site nominated at 1.0m AHD (based on information provided by CCMA in 2014). Figure 1 below provided by the CCMA shows the extent to the 1 in 100 year ARI storm flood extent, which is approximately 80% of the site area.



The applicable 1 in 100 year ARI flood level for the subject site is **1.0m AHD** and was derived from the CSIRO's work titled "the effects of climate change on extreme sea levels along Victoria's Coast, McInnes et al., 2009".

The CCMA notes that the proposed Flood Level Enquiry meets the requirements to be considered infill coastal development and may be subject to assessment against the new guidelines for coastal Management Authorities. The new guidelines released by the Minister of Planning on the 8th June 2012, focus on sea level rise and storm events. The Victorian Planning Provisions Amendment VC94 was gazetted on the 4th July 2012 introducing the new strategies in Clause 13.01-1 for coastal inundation and erosion. The new Guidelines for Coastal Catchment Management Authorities for assessing the development in relation to sea level rise were also released and approved by the Minister for Water on the 8th June 2012.

In relation to the above guidelines the CCMA advises that an additional 200mm is added to the current 300mm freeboard requirement. Freeboard is the height above a defined flood level and is typically a factor of safety in setting habitable floor levels. This freeboard factors in effects such as wave action and water movement resulting in variation from topography. Therefore a total of 500mm freeboard (minimum) shall be added to the current defined flood level above.

The CCMA have noted that developments should not occur where there is a significant flood hazard. Safety is defined in terms of depth and velocity of the floodwater with an emphasis on people and vehicles. Safety for people and vehicles is assessed against Australian Rainfall and Runoff Project 10 Safety Criteria.

The criteria defined below are:

For people:

- Depth must not be greater than or equal to 0.5m; and
- Velocity must not be greater than or equal to 3.0m/sec; and
- The product of depth multiplied by velocity must not be greater than 0.4m² per second.

For vehicles:

- Depth must not be greater than or equal to 0.3m; and
- Velocity must not be greater than or equal to 3.0m/sec; and
- The product of depth multiplied by velocity must not be greater than 0.3m² per second.

The current conditions for the subject site and the surrounding areas indicate that a safety risk exists. Should any development occur on the subject site it shall be necessary that not only the development area is raised to ensure safety criteria is achieved but also the adjoining roads of Murray and Fellows Road. More precise data and analysis would be required to determine the expected velocity of water. However, given the topography the expected velocity is deemed to be quite low and therefore the raising of Murray and Fellows Road would only require minor increases in road levels.

The CCMA would consider that the areas identified as free from flooding would be available for future development within the subject site. Given the nature of the flood risk at the subject site and the frequency of inundation at this location the CCMA is unlikely to support subdivision of any land within the 1 in 100 year ARI flood extent.

The CCMA currently consider the subject site to be unsuitable for cut and fill, with minor works considered acceptable under strict controls, including no intrusion into the existing flood extents. The proposed option 1 development plan in Appendix 01 details the proposed development area based on minor cut and fill works above the 1 in 100 year ARI flood extent.

Contrary to the advice above TGM have proposed two additional options that would impact the flood extents, but only considered minor to moderate impact. These options are proposed from the perspective of considering the potential development of the land to be more viable with only minimal impact earthworks on the site.

Option 2 simply squares off the sections of land currently above the 1 in 100 year ARI flood extents with minor filling over the site where flood depths are still generally quite shallow.

Option 3 is based on option 2 but expands to filling more of the site, primarily adjacent to the Bellarine Highway and a 5.0 wide berm adjacent to the existing lots. This is deemed more moderate filling but still generally effects areas of the site where the flood depth range is less than 0.3m.

3 Sewerage Facilities

Barwon Water (BW) is the authority responsible for the provision of sewerage facilities.

Sewerage reticulation exists within the site. Barwon Water are currently preparing feasibility advice for the proposed site.

The land is zoned residential and there is potential to develop 20 – 100 lots on the land parcel. The adjacent area is sewered and the most appropriate connection point is a 4 metre deep manhole immediately upstream of the Nelson Road sewer pump station as shown in Figure 7 below.

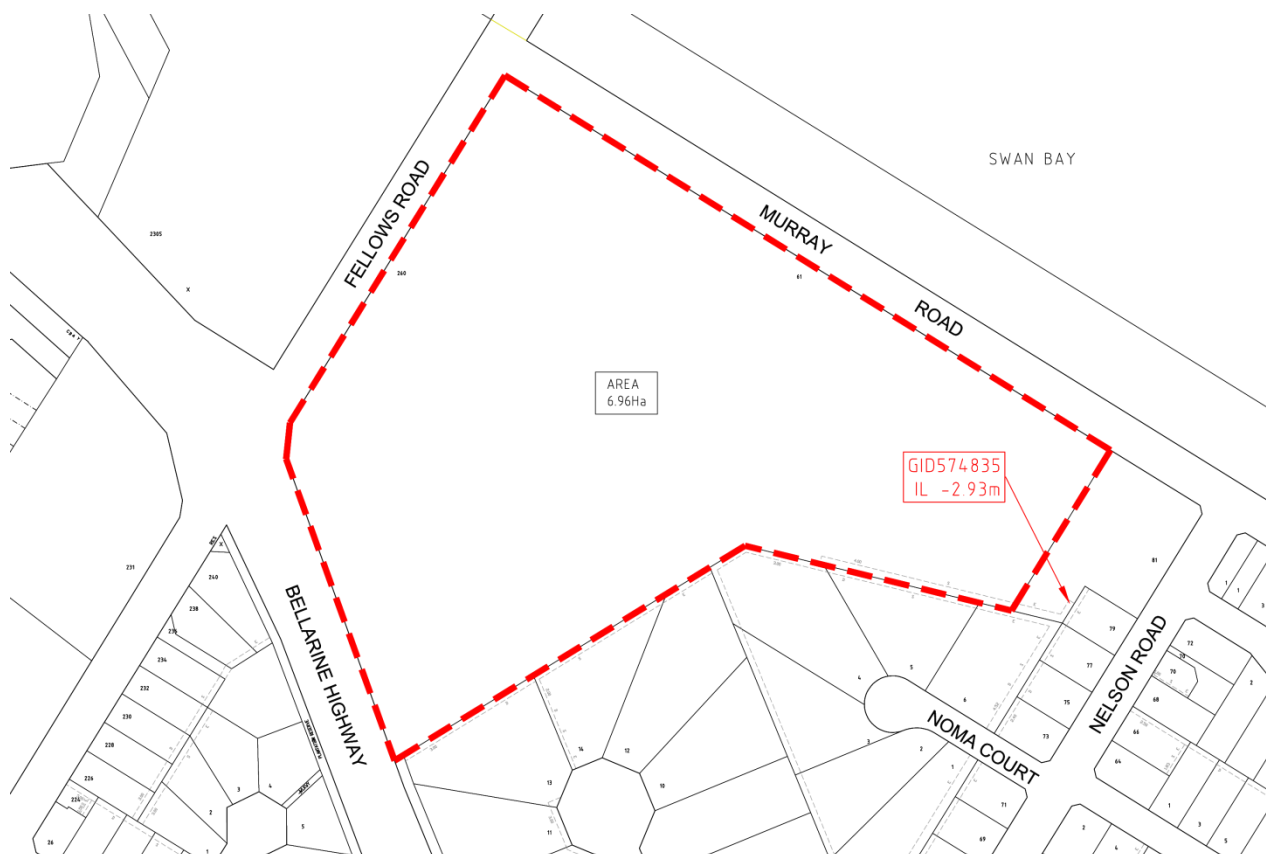


Figure 7 – Connection Point

4 Potable Water Supply

Barwon Water (BW) is the authority responsible for the provision of water supply facilities.

Water supply infrastructure is in the vicinity of the subject site but verbal advice is that upgrades on the system or extension to watermains are likely to be required.

All new watermains and associated infrastructure shall be constructed at the developer's cost and transferred to BW ownership.

The existing 100mm water main located in Fellows Road can supply lots facing Fellows Road. As there is no main in Murray Street the existing main in Nelson Road is to be extended along Murray Road and connect with the 100mm main in Fellows Road. Any internal roads will require 100mm mains as per Barwon Waters Land Development Manual.

5 Electricity Supply

PowerCor Geelong is the authority responsible for the electrical supply to the region in which the subject site lies. There is currently a high voltage overhead line that runs in the Bellarine Highway Road reserve. It is expected that this existing powerline is capable of provided electrical supply to the subject site. It is noted that should development occur only near Murray Road then external augmentation works are required to bring the supply from the Bellarine Highway. This is most likely via Fellows Road.

Electrical substations maybe required within any proposed development area strategically located as a PowerCor asset. These are best located within open space reserves and require a reserve or a designated easement in favour of PowerCor. The requirement for a substation is based on the sized of the development and the available supply in the network.

6 Gas Supply

SPI Networks (Gas) Pty Ltd is the authority responsible for the gas supply to the region in which the subject site lies within. Existing medium pressure gas mains exists near the development. It is noted that should development occur then external augmentation works are required to bring the supply from the either the Bellarine Highway via Fellows Road or from Nelsons Road via Murray Road.

7 Telecommunications

Recent changes to the telecommunications industry have seen the commencement of rollout of high speed broadband. NBN Co is the responsible authority for the rollout of the broadband. Should potential development within the site exceed 100 lots then it will fall within NBN's rollout criteria for new developments. Otherwise telecommunications can be provided by Telstra or an alternate telecommunication provider and a cost to the developer.

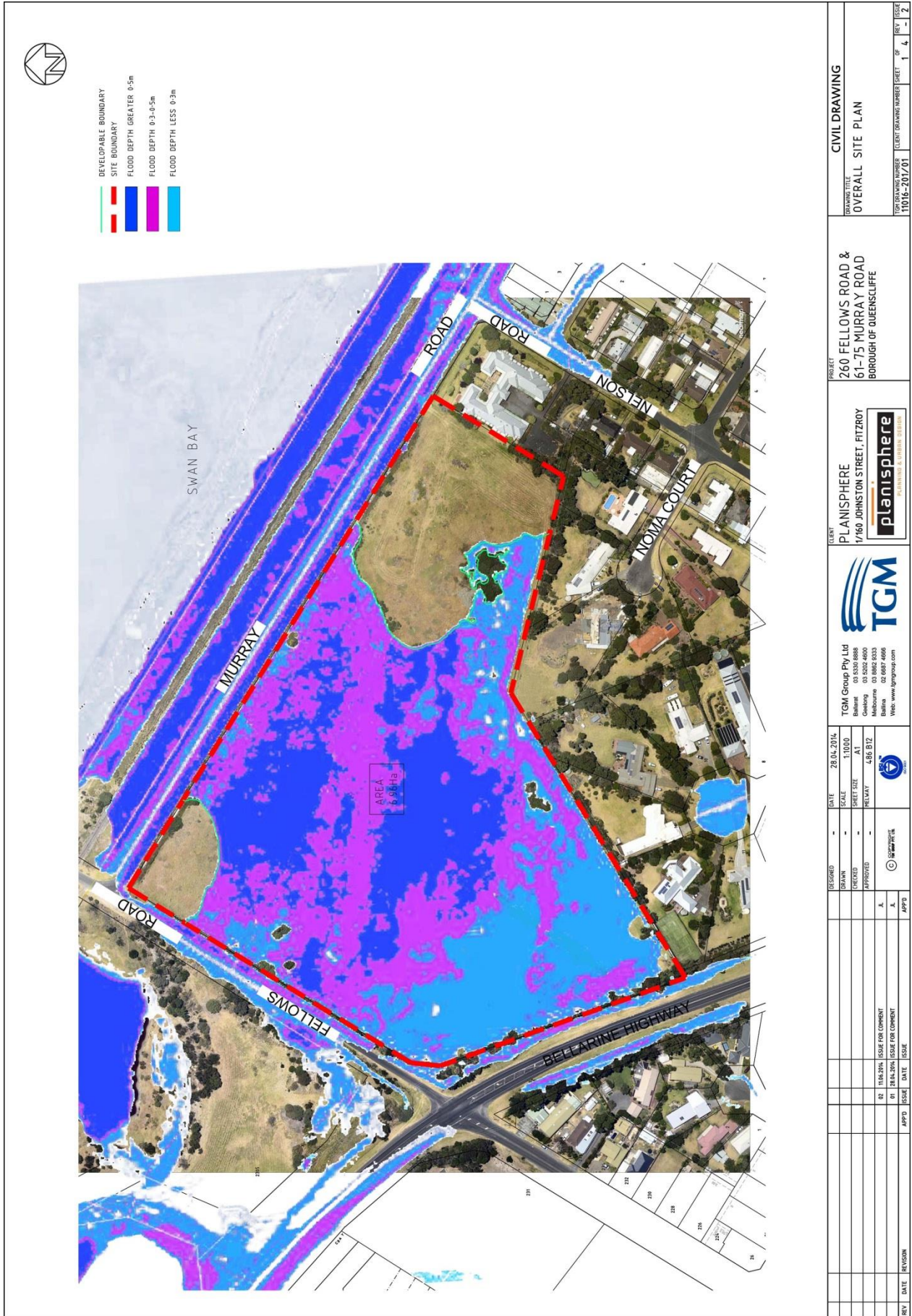
8 Conclusion

This report has assessed the servicing potential for future residential development at the Council owned land at the corner of Murray Road and Fellows Road in Queenscliff. Previous studies and data and recent flood advice from the CCMA state that there are significant flood issues associated with coastal inundation on the site and its surrounds. The CCMA have not supported the development of the site, other than those areas currently situated above the 1 in 100 year ARI flood extents, although this is subject to restrictions. TGM have recommended additional development of the site where minor to moderate filling could be achieved over areas where the flood depth range is generally below 0.3m. The CCMA has also stated that by developing this location for residential purposes increases the number of people at risk from future flooding, and as a result would increase the long term burden on the shire for those populations at risk from coastal hazards. This is influenced further by the effects of climate change that may result in sea level in the future.

In terms of other services the site general is well supported. Available supply and capacity for all other essential services are available up to high lot yields. However, external augmentation of most service infrastructure is necessary to bring the supply directly to the site boundaries.

9 Appendices

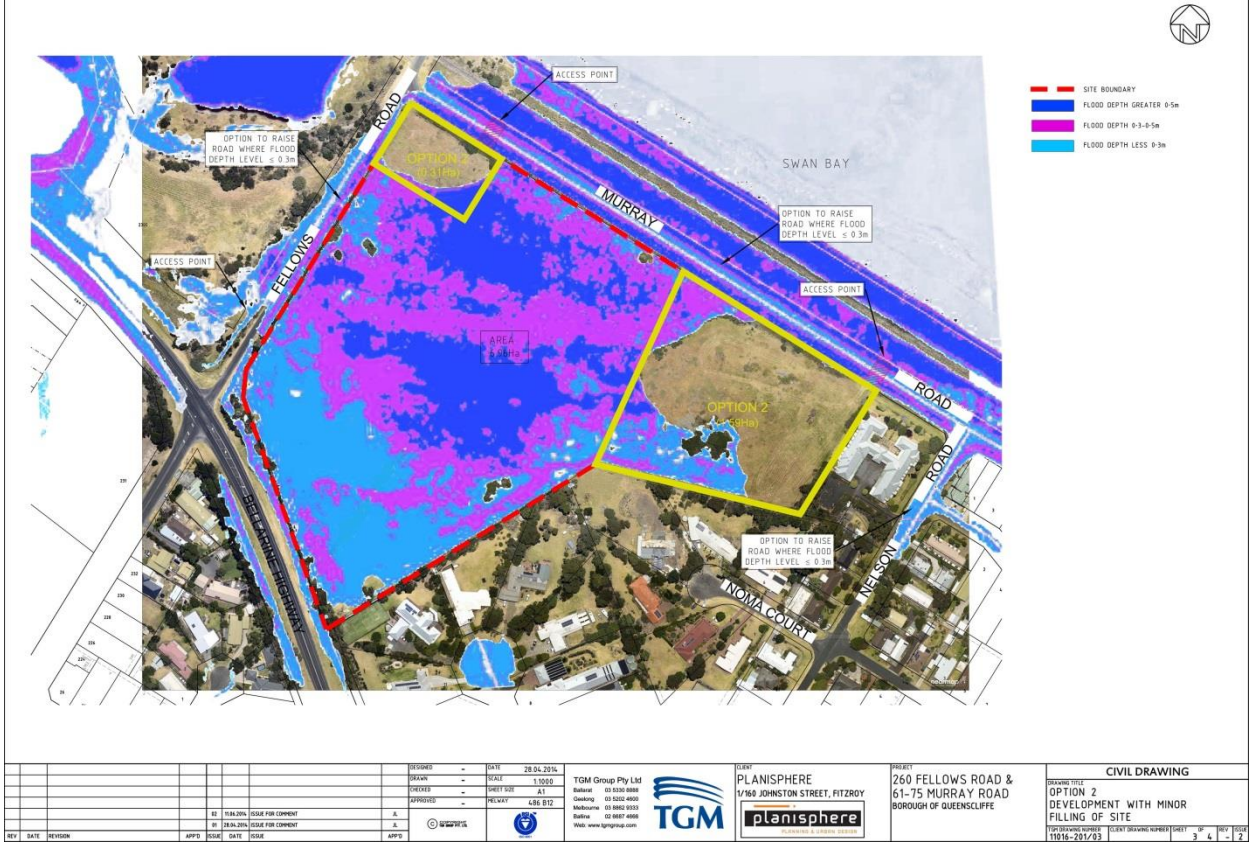
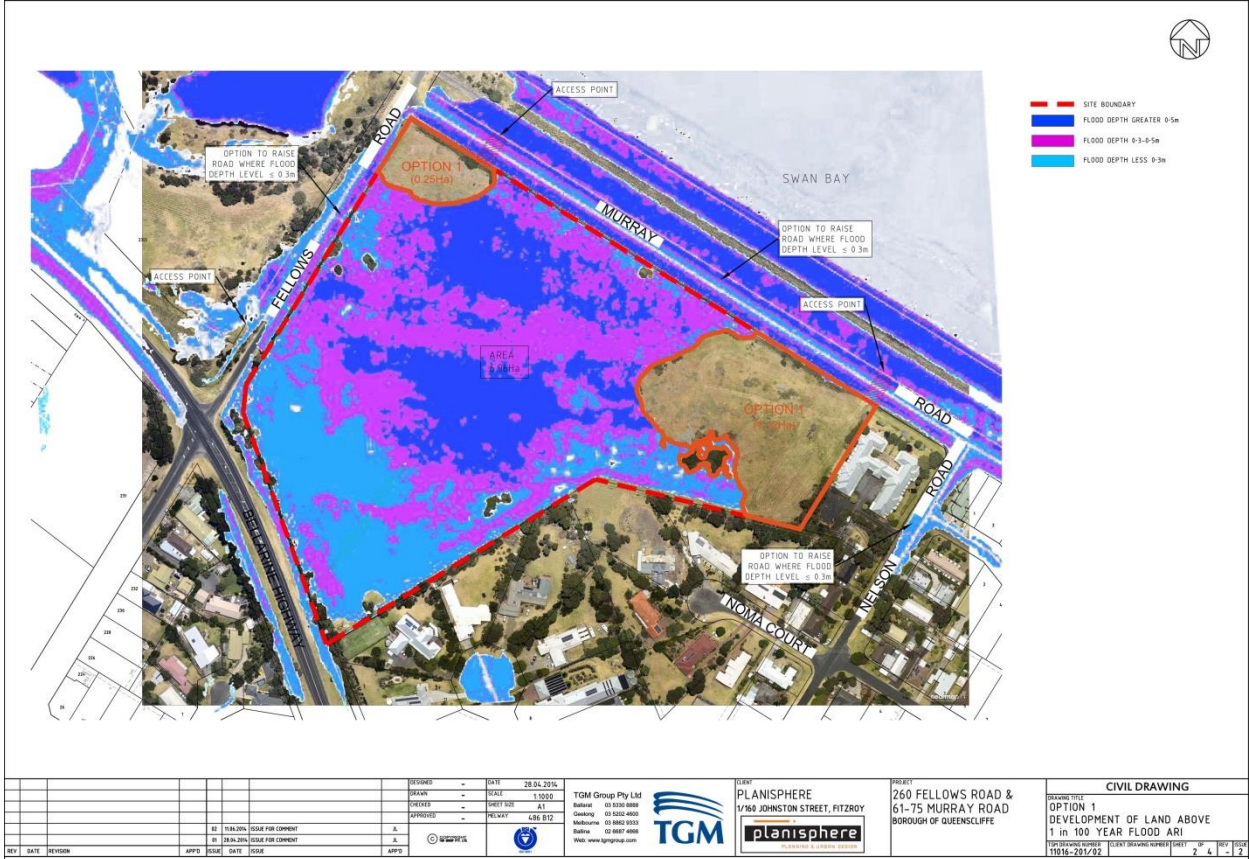
9.1 Appendix 01 | Overall Site Plan

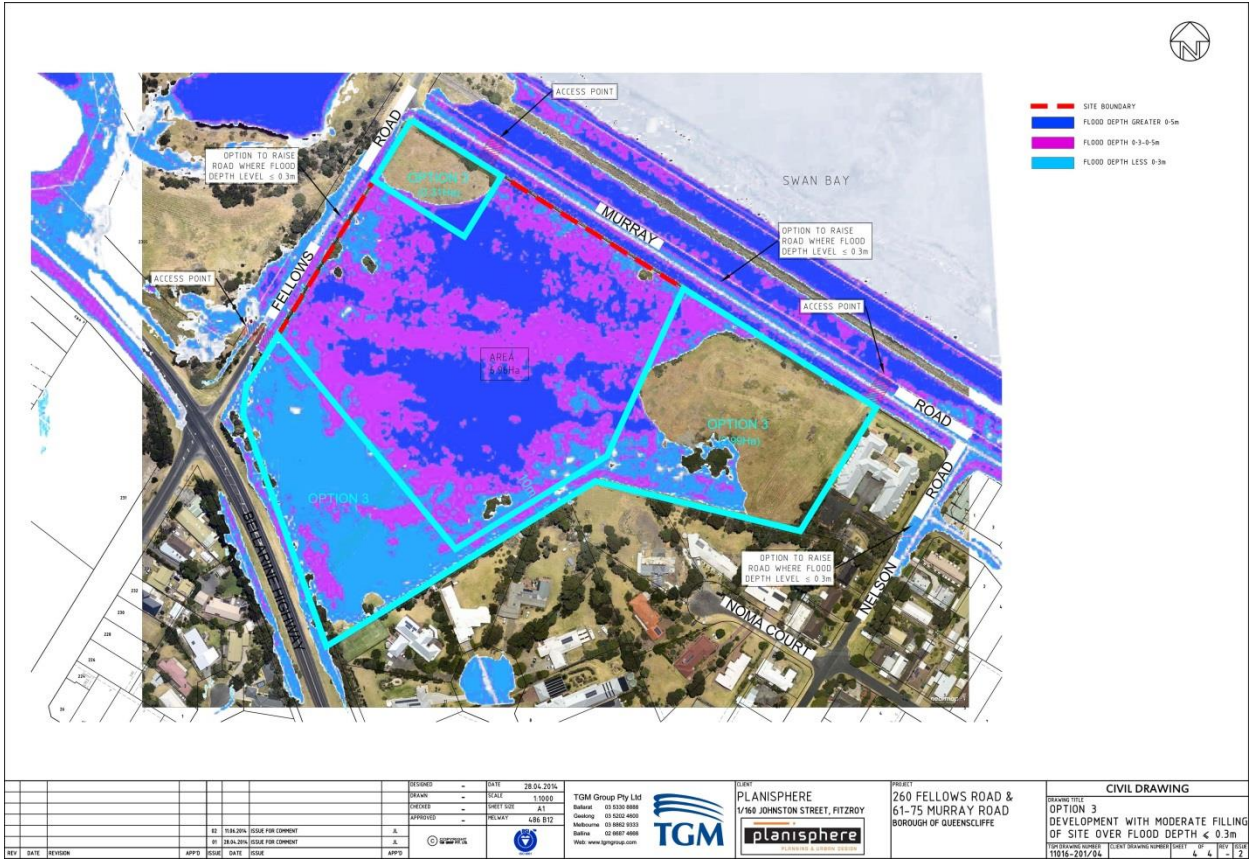


DEVELOPABLE BOUNDARY
SITE BOUNDARY
FLOOD DEPTH GREATER 0.5m
FLOOD DEPTH 0.3-0.5m
FLOOD DEPTH LESS 0.3m

REV	DATE	REVISION	APPD	ISSUE	DATE	ISSUE																
02	11/06/2014	ISSUE FOR COMMENT	J. A.																			
01	28/04/2014	ISSUE FOR COMMENT	J. A.																			
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				<p>TGM Group Pty Ltd Ballarat 03 5300 8888 Melbourne 03 9485 9333 Ballina 02 6657 4666 Web: www.tgmgroup.com</p> <p>Planisphere ARCHITECTS & ENGINEERS</p> <p>CLIENT PLANISPHERE 1/160 JOHNSTON STREET, FITZROY</p> <p>PROJECT 260 FELLOWS ROAD & 61-75 MURRAY ROAD BOROUGH OF QUEENSCLIFF</p> <p>CIVIL DRAWING DRAWING TITLE OVERALL SITE PLAN</p> <p>TYPICAL NUMBER 11016-201/01 CLIENT DRAWING NUMBER SHEET 1 OF 4 REV 2</p>																		

9.2 Appendix 01 | Development Options 1,2 & 3





DESIGNED - DATE 28.04.2014 DRAWN - SCALE 1:1000 CHECKED - SHEET SIZE A1 APPROVED - PROJECT 126 812		TGM Group Pty Ltd Ballarat 03 5282 8888 Geelong 03 5282 8555 Melbourne 03 9882 9333 Sydney 02 9497 4988 Web: www.tgmgroup.com		CLIENT PLANISPHERE 1/168 JOHNSTON STREET, FITZROY		PROJECT 260 FELLOWS ROAD & 61-75 MURRAY ROAD BOROUGH OF QUEENSLIFFE		DRAWING TITLE CIVIL DRAWING OPTION 3 DEVELOPMENT WITH MODERATE FILLING OF SITE OVER FLOOD DEPTH \leq 0.3m	
REV	DATE	DESCRIPTION	APPD	ISSUE	DATE	ISSUE	APPD	ISSUE	DATE
01	28.04.2014	ISSUE FOR COMMENT	A						
02	28.04.2014	ISSUE FOR COMMENT	A						