Newton Denny Chapelle
SURVEYORS PLANNERS ENGINEERS

Appendix D

Preliminary Engineering Services Report

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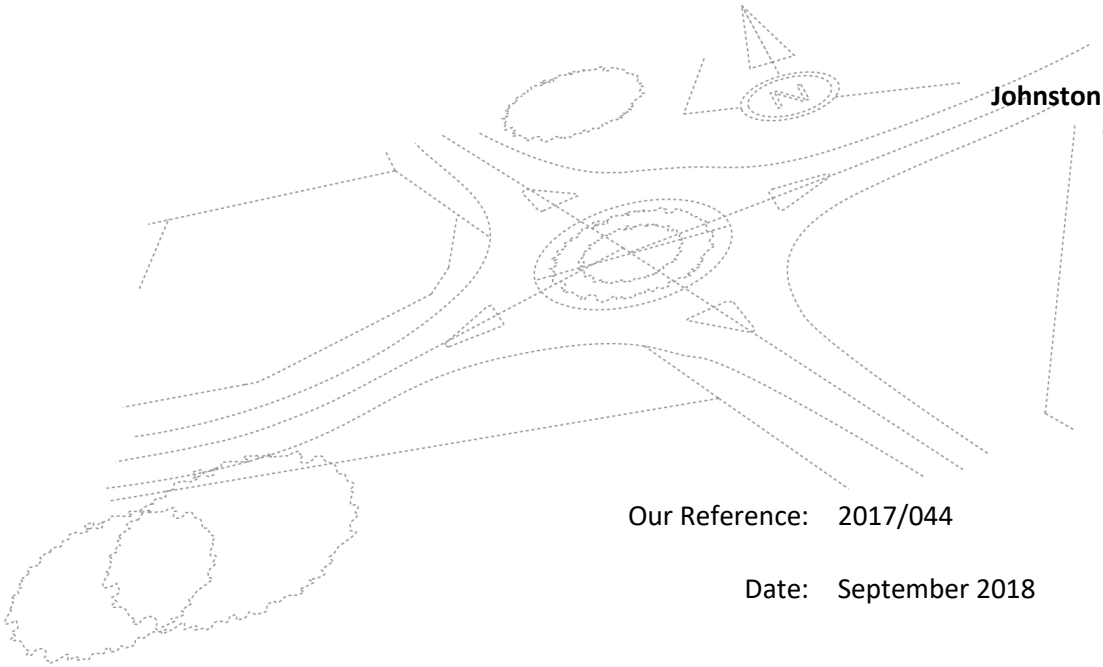
Engineering Services Report

Planning Proposal for Industrial Rezoning

Upon:

Lots 14-20 Section 6 DP 976660, Lots 1 – 12 Section 6 DP 976660, Lot 1 DP 783330 and Unformed Road Reserve



Johnston Street Casino

Our Reference: 2017/044

Date: September 2018

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-	13/07/2018	Issued for Client Review	CP	
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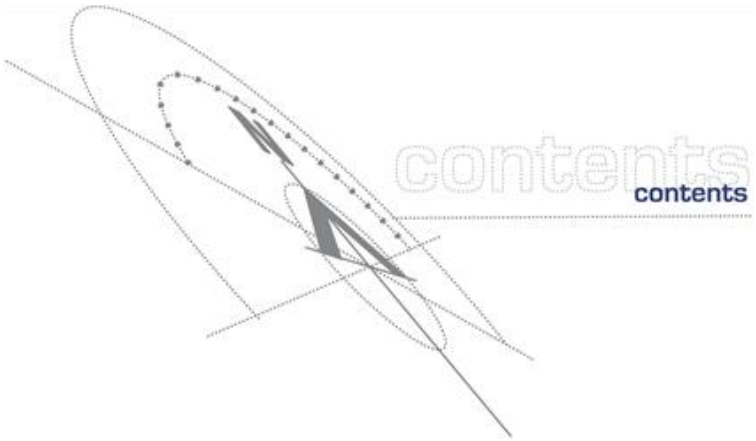


Table of Contents

Appendices

Executive Summary

This Engineering Services Report is to accompany the application for the proposed industrial rezoning of Lots 14-20 Section 6 DP 976660, Lots 1 – 12 Section 6 DP 976660, Lot 1 DP 783330 and Unformed Road Reserve at Johnston Street, Casino.

This report details conceptually how the site may be developed to comply with the relevant approvals, polices, standards and regulations required for an industrial subdivision in the Richmond Valley Council Local Government Area. The following components have been assessed:

- Earthworks – The site will be filled to achieve the minimum habitable floor level and provide adequate stormwater drainage. Based on a minimum habitable floor level of 21.5m in the North East corner of the site a maximum of 2.5m fill height is expected.
- Road Layout and Access – The proposed road layout provides east / west connection between the existing Cassino Drive Industrial Estate and the future development area to the east identified in Casino Urban Land Release Strategy. A new connection to the surrounding regional road network via the Bruxner Highway will also be provided as the primary access point for the development.
- Stormwater Attenuation – The Stormwater Attenuation targets outlined in the DCP can be achieved for the site. Attenuation is to be provided at the northern and southern discharge points of the site. It is anticipated that this storage could be provided via stormwater attenuation basins.
- Stormwater Quality – The stormwater quality objectives for the site can be achieved. A bioretention basin has been modelled to conceptually demonstrate that compliance is possible.
- Water – The site may be serviced by the extension of the existing water mains in Irving and Cassino Drives.
- Sewer – It is proposed that the development may be serviced by a private pressure sewer network. The low pressure sewer rising main may connect to existing Richmond Valley gravity sewer network.

1 Introduction

This Engineering Services Report has been prepared to accompany the application for the proposed Industrial rezoning located at Johnston Street (Lots 14-20 Section 6 DP 976660, Lots 1 – 12 Section 6 DP 976660, Lot 1 DP 783330 and Unformed Road Reserve), refer Figure 1-1.

Figure 1-1 – Development Site

2 Report Scope

This report focuses on providing sufficient concept engineering design details to facilitate a high level understanding of the proposed works. The works covered by this report include new infrastructure for roads, earthworks, stormwater (quality and attenuation) and servicing provisions for the proposed development.

2.1 Reference Documents

The following documents have been referenced in the preparation of this report:

- Richmond Valley Council, Development Control Plan, Part I – Other Considerations;
- Water by Design, MUSIC Modelling Guidelines 2010;
- Sydney Catchment Authority, Using MUSIC in Sydney's Drinking Water Catchment;
- Northern Rivers Local Government, Development Design Guidelines.

3 Site Description

3.1 Existing Site Conditions

The site is currently used for agricultural purposes (cattle grazing) and situated north of the Bruxner Highway (Johnston Street) on the eastern entry into Casino. The site is relatively flat with a minor ridge running east to west approximately 175m north of the southern boundary dividing the site.

The areas surrounding the development site can be summarised as:

- Northern Boundary – is formed with an unformed road reserve.
- Eastern Boundary – is formed with an unformed road reserve and existing dwelling.
- Southern Boundary – is formed with the Bruxner Highway.
- Western Boundary – is formed the existing Cassino Drive industrial subdivision.

3.2 Description of Proposed Development

The proposed development involves the rezoning of the existing agricultural land for industrial use. Development on the site will involve the construction of infrastructure including roads, stormwater, water, sewer, electrical and communications.

4 Bulk Earthworks

The site will be filled to achieve the minimum 100 year flood level and enable effective stormwater drainage to be installed. It is anticipated that the site will be filled similar to the adjacent Cassino Drive industrial development. The developed site will be crested along the existing minor ridge to approximately maintain the current drainage regime.

Based on an assumed level of 19.95m in the north east corner approximately 1.35m of fill will be required to achieve the 100 year flood level of 21.3m. Allowing for drainage a maximum fill height of 2.3m is anticipated. The point of maximum fill is expected to be along the existing east-west crest approximately 175m north of the southern boundary. Further investigation of the bulk earthworks levels are to be undertaken in conjunction with the stormwater design during detailed design phase. Open swale trunk drainage may be investigated to reduce the maximum fill height.

The site is not mapped as acid sulfate soil prone.

5 Flooding

As shown in Figure 5-1 the Richmond Valley Council flood map (Casino Floodplain Hazard Categories) the bulk of the site falls within an area for which the flood planning status is unclear with it identified as either 'Possible High Depth Hazard' or 'Low Hazard' whilst small portions of the site are mapped as 'Low Hazard'.

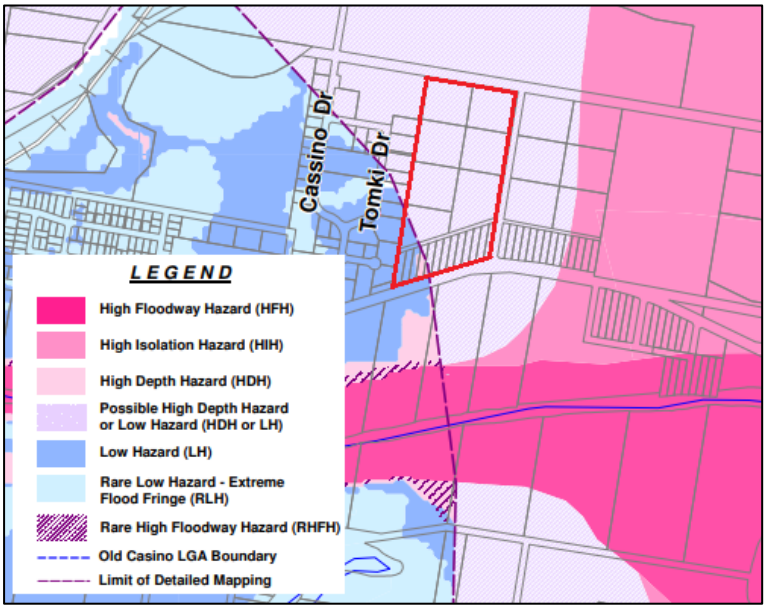


Figure 5-1 – RVC Flood Planning Level

It is proposed to fill the site to achieve the 100 year flood level (refer Section 4). It is anticipated that this will reduce the flood hazard to a Rare Low or Low flood hazard similar to the nearby Settlers Estate and adjacent Cassino Drive industrial estate. As the site falls outside the current detailed mapping it is recommended that further flood modelling is conducted to confirm the flood hazard and any effects caused by filling the site.

6 Traffic and Access

A conceptual road layout is detailed in the attached Indicative Layout Plan 5i. The proposed road layout provides east / west connection between the existing Cassino Drive Industrial Estate (via the extension of Irving Drive) and the future development area to the east identified in Casino Urban Land Release Strategy. A new connection to the surrounding regional road network via the Bruxner Highway will also be provided as the primary access point for the development. The location and design of this intersection have been detailed in Bitzios Consulting report *2740 Bruxner Highway, Casino Traffic Impact Assessment*.

All roads within the development are to be in accordance with the requirements of the Northern Rivers Development Design Manual that requires a minimum 13m wide road with 3.5m wide verges.

7 Stormwater Management

Stormwater management will be dependent on the final layout and bulk earthworks design. Stormwater generated by the development will be captured, treated and attenuated in accordance with the Richmond Valley Council requirements prior to release from site. This stormwater assessment is intended to demonstrate that the treatment targets are achievable through high level concept modelling. The actual location and configuration of these devices are to be determined at the development application stage.

7.1 Catchment Areas

The pre-development site is approximately 14.355Ha and consists of primarily grassed agricultural land. An impervious area of 90% has been adopted in accordance with the fraction impervious requirements outlined in the Queensland Urban Drainage Manual (QUDM).

The site will be filled to achieve the minimum flood level and also enable the site to the drained. It is anticipated that the developed site will drain towards the northern and southern boundaries (refer Plan 5i). This is in keeping with the current drainage regime of the site where water flows towards the south east and north east corners of the site. Water discharged from the southern side of the site will be piped under the Bruxner Highway. The land to the south of the highway is also associated with this development with provision to be made for this water to be conveyed to south to the Richmond River.

Water will be discharged across the northern boundary and will be diffused to ensure flows are not concentrated on adjacent land. It is understood that potential development of the adjacent northern site is currently being considered by Council. Opportunity exists (with the approval of adjacent landholders) to integrate the stormwater management of this area and convey these flows north to Barlings Creek and its associated lagoons.

7.2 Stormwater Quality

The pollutant reduction targets for the proposed development are outlined in Part I of the RVC Development Control, refer to Figure 7-1:

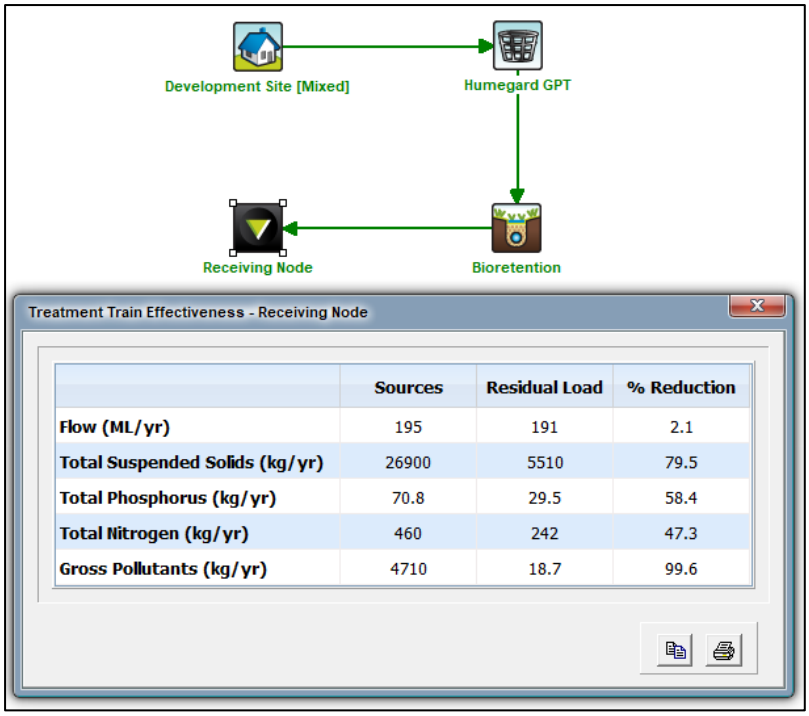
Table I-9.1 Stormwater Quality Targets

Contaminant	Target
Coarse Sediment (0.1 to 0.5 mm)	80% mean annual reduction from baseline
Fine particles (<0.1 mm)	50% mean annual reduction from baseline.
Total Phosphorus	45 % mean annual reduction from baseline
Total Nitrogen	45% mean annual reduction from baseline
Litter	70 % mean annual reduction from baseline
Hydrocarbons, motor fuels, oils and greases	90% mean annual reduction from baseline

Figure 7-1 - Stormwater Quality Targets (excerpt from RVC DCP - Part I)

A MUSIC model has been created for the site to ensure the quality reduction targets can be achieved. The rainfall data from the Lismore Airport has been used and the lumped catchment modelling parameters outlined by Water by Design have been adopted.

A simplistic treatment train including a Gross Pollutant Trap and 1,000m² bioretention basin has been modelled for the site. The MUSIC model is shown in Figure 7-2:



	Sources	Residual Load	% Reduction
Flow (ML/yr)	195	191	2.1
Total Suspended Solids (kg/yr)	26900	5510	79.5
Total Phosphorus (kg/yr)	70.8	29.5	58.4
Total Nitrogen (kg/yr)	460	242	47.3
Gross Pollutants (kg/yr)	4710	18.7	99.6

Figure 7-2 - Concept MUSIC Model

As shown above the pollutant reduction targets can be achieved for the site. It is noted that there is opportunity to integrate the stormwater treatment system with the adjacent proposed residential subdivision (South of the Bruxner Highway).

7.3 Stormwater Attenuation

The stormwater attenuation targets for the proposed development are outlined in Part I of the RVC Development Control, refer to Figure 7-3:

Table I-9.3 Stormwater Targets

Element	Target
Peak flowrates (m3/s)	The following targets apply: ➢ Flowrates at any point are not to increase during storms for the 2 and 5 year ARI event; or ➢ As specified within specific drainage sub catchment policy recognised by Council; or ➢ As specified within Council standards.
Mean annual stormwater post development volumes (ML/yr).	The following targets apply ➢ Mean annual stormwater volumes reduced by at least 10 % from baseline; or ➢ As specified within specific drainage sub catchment policy recognised by Council; or ➢ As specified within Council standards.

Figure 7-3 - RVC Stormwater Attenuation Targets

The site has been modelled in the Watercom Drains program with the assumed catchment impervious areas outlined above. Attenuation storage of 2,500m³ has been modelled for the site. It is anticipated that this storage could be provided via sediment basins prior to be discharged. The following simplistic Drains model has been developed for the site:

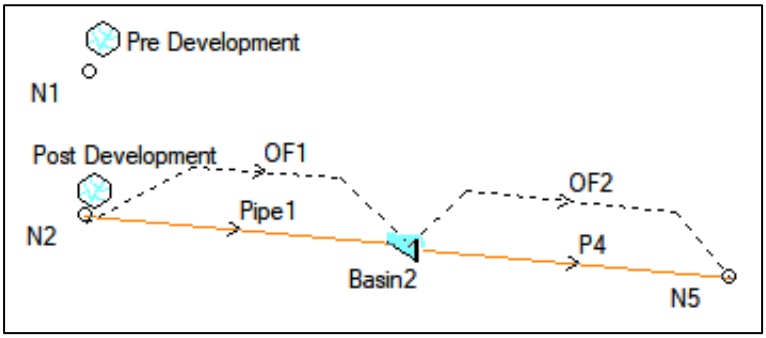


Figure 7-4 - Drains Model

The model has been run for the 2 and 5 year ARI events with the results presented in Figure 7-5 and Figure 7-6 below:

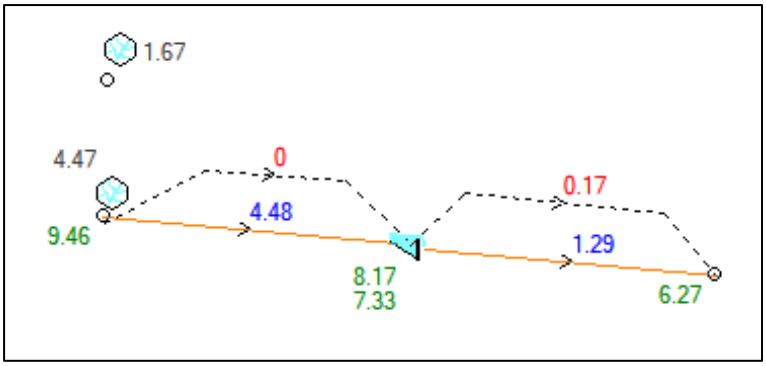


Figure 7-5 - Drains Results - Minor Event 2 Year ARI

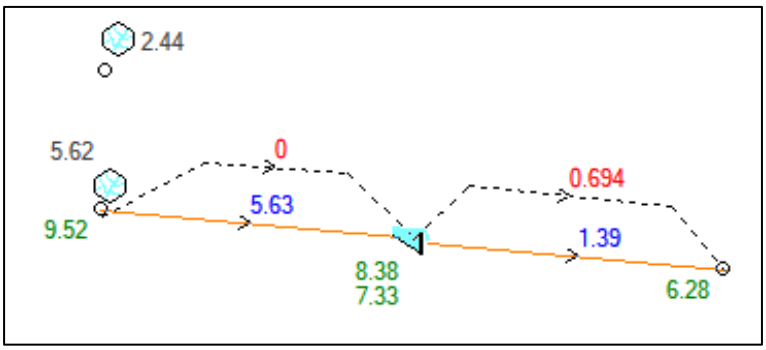


Figure 7-6 - Drains Results - Minor Event 5 Year ARI

As shown above sufficient attenuation storage can be provided for the site to achieve the peak flow rate targets specified in the DCP. Stormwater attenuation will need to be provided for both the northern and southern catchments prior to discharge. It is anticipated that this will be provided adjacent to the northern and southern boundaries prior to discharge. The exact location and configuration are to be determined at the development application stage.

8 Sewer Services

The development will be provided with a connection to the greater Casino gravity sewer network. Due to the flat nature of the site it is proposed to install a private pressure sewer network within the site (similar to that installed at Woodburn). These systems require a low pressure sewer rising main to be installed within the Road Reserve at Subdivision stage. The subsequent development upon each industrial allotment will require a small private pump station to be installed to service each development lot. It is anticipated that the low pressure sewer rising main will discharge into the existing gravity manhole in front of 10 Irving Drive, refer Figure 8-1.

Figure 8-1 - Sewer Connection Point

9 Water Reticulation

It is anticipated that the existing adjacent water reticulation network will be extended to service the development. It is expected that the primary connection point will be via the extension of the existing Ø150mm main within Irving Drive. If required the existing Ø150mm main within Cassino Drive can be extended east along the Bruxner Highway to provide an additional connection for the southern side of the site and interconnection between the surrounding water reticulation network.

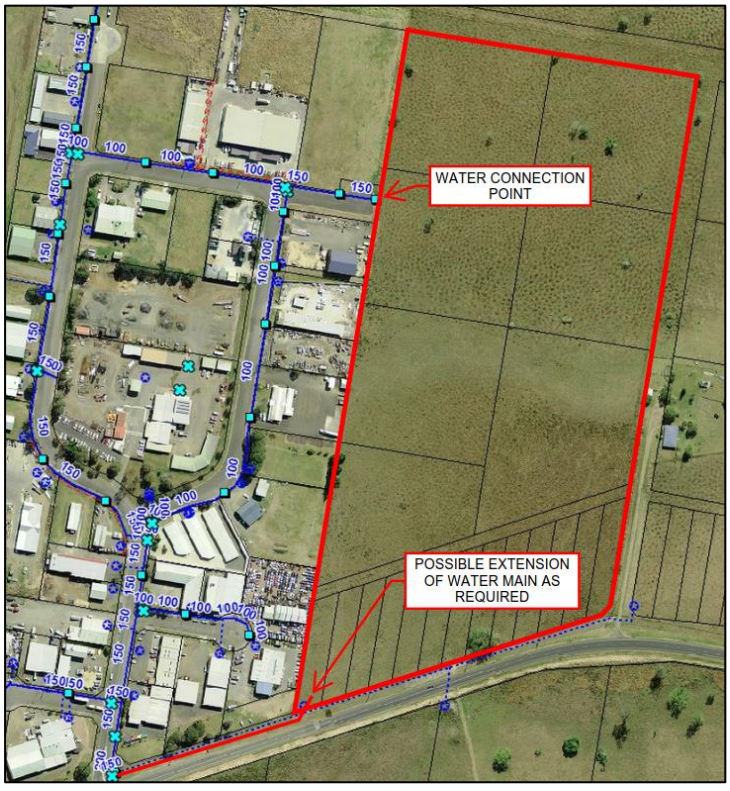


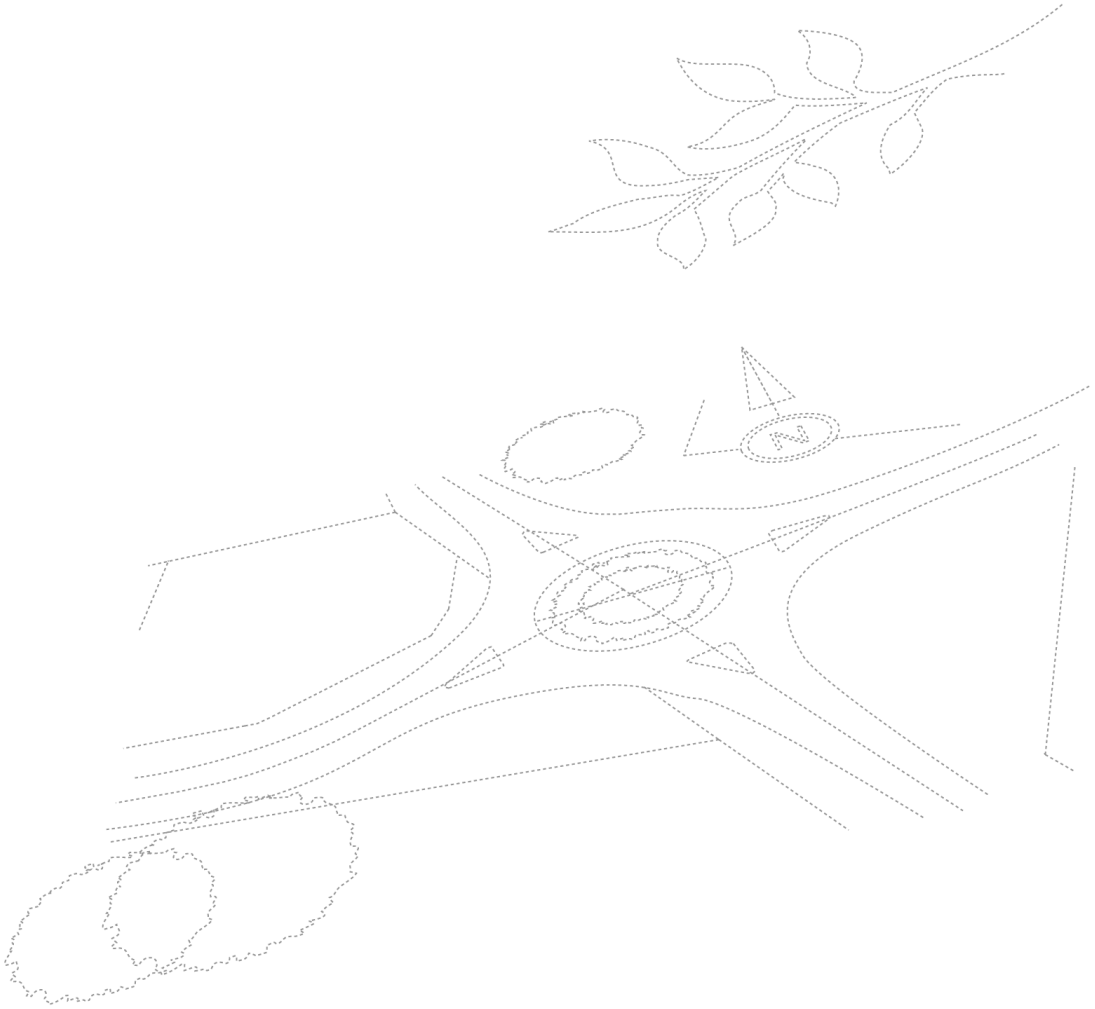
Figure 9-1 - Water Connection Points

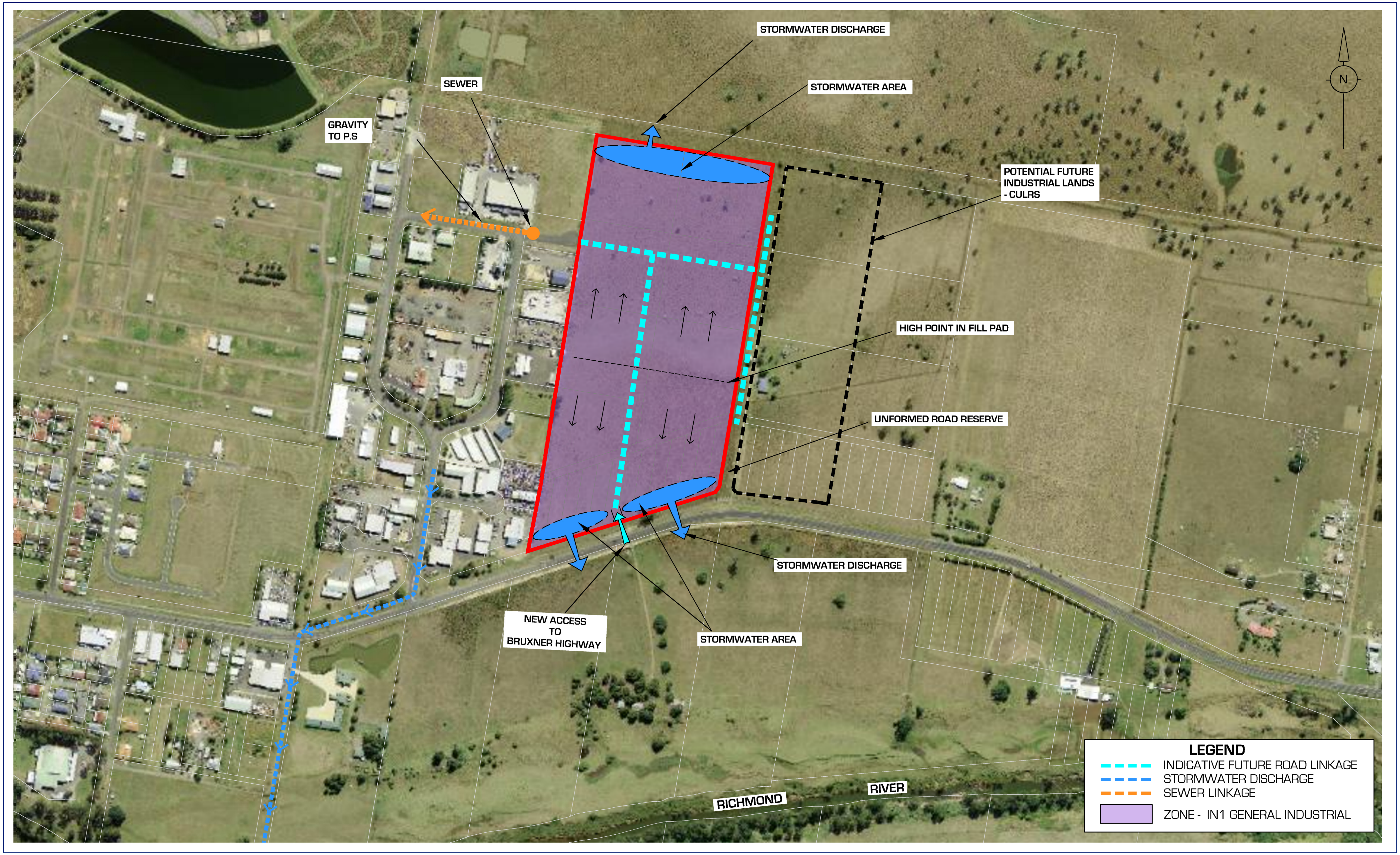
Based on the Water Directorate determination of Equivalent Tenements for future unknown light industrial development the site is estimated to generate an additional 216ET (approx.) of water demand.

10 Electrical and Communications

Underground power and communications will be provided throughout the development. It anticipated that these services will be installed within the Road Reserve during the construction of the subdivision. The design of these work will be undertaken by a specialised consultant at the construction certificate phase.

Appendix A Concept Plans





REV	DATE	AMENDMENT
A	06.02.17	
B	04.06.18	NOTES
C	30.08.18	NOTES, ALL PLANS IN SET MADE TO REV C
D		
E		

SOURCE PLAN: www.maps.six.nsw.gov.au - accessed 06.02.17

\industrial\planning\planning plans\ndc plans\cad files\17044 - imeson - industrial.dwg - plan 5 - indicative layout

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PH: 6662 5000
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PLAN 5i - INDICATIVE LAYOUT

CLIENT: J & G IMESON

LOCATION: LOT 1 - 20 DP 976660 & LOT 1 DP 783330
BRUXNER HIGHWAY
CASINO NSW

REV C

DATE: 30.08.18
SCALE: 1 : 5,000@A3
REF: 17/044
DRAWN: bk