9 – Flooding & Infrastructure Services Report

Planning Proposal – SP16097 – Apollo Fabrications (June 2023)

Our Ref: NW30132-L01: BCP/bcp
Contact: Dr Brett C. Phillips

29th March 2021

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The Manager,
Apollo Fabrications Pty Ltd
10-12 Telegraph Road
YOUNG NSW 2594

Attention: Mr Caleb Jackson

Dear Caleb,

FLOODING ADVICE FOR 2, 10-12 AND 20 TELEGRAPH ROAD, YOUNG, NSW

In response to your request of 23 February 2021, we are pleased to provide the following advice on flooding of 2, 10-12 and 20 Telegraph Road, Young, NSW.

1. BACKGROUND

1.1 Location

The location of properties is indicated in **Figure 1**.

1.2 Proposed Development

A planning proposal is being prepared for a steel fabrication company called Apollo Fabrication who are based in Young, NSW. The subject properties are 4-20 Telegraph Road, Young.

Apollo Fabrication is looking to expand their operations to cover their landholdings.

Attachment A1 provides a survey of the eastern part of the overall landholding. This attachment identifies several features including:

- A steep bank within Lot 1171 DP 754611 and Lot 1154 DP 754611 which suggests that Victoria Gully extends into these two properties; and
- A gully which crosses Lot 3 DP374948 but the head of which appears confined to this property. This gully may provide some limited off-line flood storage of floodwaters conveyed down Victoria Gully.

Figure 1 Location of 2, 10-12 and 20 Telegraph Road, Young

Attachment A2 identifies the concept extent of earthworks on the eastern part of the overall landholding. It is noted that the proposed earthworks:

- Are outside the steep bank within Lot 1171 DP 754611 and Lot 1154 DP 754611 which suggests that development on these lots will not impact flood conveyance in Victoria Gully; and
- It is proposed to fill the gully within Lot 3 DP374948. This would eliminate the limited off-line flood storage of floodwaters conveyed down Victoria Gully on this lot.

Attachment A3 sets out a concept overall development of the landholding.

2. FLOOD RISK

2.1 2015 Young Floodplain Risk Management Study and Plan

As described in the 2015 Young Floodplain Risk Management Study and Plan[1]*:*

> *Young Shire Council commissioned the Floodplain Risk Management Study and Plan for the town of Young. The overall objectives of the Floodplain Risk Management Study (FRMS) were to assess the impacts of flooding, review existing Council policies as they relate to development of land in flood liable areas bordering Burrangong Creek and its tributaries, consider options for management of flood affected land and to develop a draft Floodplain Risk Management Plan (FRMP) which:*
>
> *(i) Proposes modifications to existing Council policies to ensure that the development of flood affected land is undertaken so as to be compatible with the flood hazard and risk.*
>
> *(ii) Proposes Flood Planning Levels for the various land uses in the floodplain.*
>
> *(iii) Sets out the recommended program of works and measures aimed at reducing over time, the social, environmental and economic impacts of flooding.*
>
> *(iv) Provides a program for implementation of the proposed works and measures.*
>
> *The FRMS focusses on Main Stream flooding from Burrangong Creek and its major tributary streams (Sawpit Gully, Victoria Gully, Petticoat Gully, Little Spring Creek and Big Spring Creek), Minor Tributary flooding caused by high flows in the minor un-named tributaries which drain to Burrangong Creek and its main tributaries, and Major Overland Flow (MOF) areas which occur in the three urban sub-catchments on the northern slopes (Railway Drain, Chance Gully and Golf Course Drain) which discharge to Burrangong Creek through the Central Business District (CBD) – Figures 2.1 and 2.2. Flooding problems on the MOF paths arise from surcharges of the trunk drainage systems, which comprise a mix of pipes, culverts and open drains.*
>
> *The solutions of problems resulting from surcharges of minor drainage lines in streets or in individual allotments remote from the MOF paths, are matters for stormwater management by Council and are outside the scope of the present investigation.*
>
> *…. Main stream flooding on Burrangong Creek, its tributary streams and along the MOF paths is "flash flooding" in nature. On the main arms of the creek system, flood levels peak about two hours after the commencement of heavy rainfall. On the smaller, urban catchments the time to peak on the MOF paths is less than one hour. Figure 2.3 shows the indicative extent of inundation for the 100 year ARI design flood. Figure 2.4 shows times of rise of floodwaters at representative locations in the drainage system.*
>
> *The channels of Burrangong Creek and its major tributary streams are incised and have a comparatively large hydraulic capacity, with flood events up to the 100 year ARI generally being conveyed without significant surcharges of the channels. Damages to urban development bordering the main creeks would not be significant at that level of flooding.*

[1] Lyall & Associates (2015) "The Town of Young Floodplain Risk Management Study and Plan", *Final Report*, Rev 1.4, 2 Vols, prepared for Young Shire Council, November.

Several Figures extracted from Volume 2 of Council's Flood Risk Management Study report are included in **Attachment B.** The area closest to the Telegraph Road properties is also clouded on the bottom right of the attached Figures. It is unclear if Council's flood study extended further east than mapped in the attached Figures.

2.2 Flood Depths

Attachment B1 plots the 100 yr ARI flood depths and extents in the vicinity of the western Telegraph Road properties in the overall landholding.

Attachment B2 plots the PMF flood depths and extents in the vicinity of the western Telegraph Road properties in the overall landholding.

It is noted from Attachments B1 and B2 that flooding is largely confined to Victoria Gully and does not inundate any of the land that it is proposed to develop or re-develop. It is anticipated that similar flooding is experienced on the western Telegraph Road properties except that there is limited storage of floodwaters in the gully in Lot 3 DP374948.

2.3 Flood and Floodplain Categories

Attachment B2 plots the following hydraulic and floodplain categories:

- High Hazard floodway
- Low Hazard Floodway and Flood Storage
- Intermediate Floodplain; and
- Outer Floodplain.

It is noted from Attachment B3 that flooding is flood and floodplain categories are largely confined to Victoria Gully and do not extend over any of the land that it is proposed to develop or re-develop on the western Telegraph Road properties. It is anticipated that similar mapping would be present on the western Telegraph Road properties except the gully in Lot 3 DP374948 which may be partly mapped as outer floodplain.

3. FLOOD IMPACT ASSESSMENT

Based on the mapping contained in the 2015 Young Floodplain Risk Management Study and Plan, a qualitative assessment of the potential impact of the proposed development on flooding has been undertaken as follows.

3.1 Mainstream Flood Impacts

It is noted from Attachments B1 and B2 that flooding is largely confined to Victoria Gully and does not inundate any of the land that it is proposed to develop or re-develop. It is anticipated that similar flooding is experienced on the western Telegraph Road properties except that there is limited storage of floodwaters in the gully in Lot 3 DP374948. On the basis that the properties that it is proposed to develop is not inundated in a 100 yr ARI flood (except possibly Lot 3 DP374948) it is expected that the proposed development will have nil impact of 100 yr ARI flooding. In the case of Lot 3 DP374948 it is expected that the loss of limited off-line storage of floodwaters in the gully may lead to minor local impacts on flooding in this location only.

3.2 On-Site Detention

Potential impacts on flood would occur if controls are not incorporated into the development to limit the impact of increases in imperviousness as a result of the proposed development on the range of floods from frequent floods up to the 100 yr ARI flood.

Based on representative imperviousness for industrial development, a hydrological analysis was undertaken to estimate the indicative Site Storage Requirement (m^3/ha) and Permissible Site Discharges (L/s/ha) to limit post-development peak runoff to no greater than pre-development peak runoff in 2 yr ARI and 100 yr ARI storms.

As described in the 2014 Young Flood Study, hydrologic modelling used a rainfall-runoff routing approach based on the RAFTS software to determine the discharge hydrographs from the rural parts of the catchment, and incorporated a DRAINS module to assess flows generated in the urban areas.

The assessments were undertaken using a DRAINS model of a 1 ha local catchment under Pre-development and Post-development Conditions. The DRAINS model parameters were based on the parameter values adopted for design flood modelling in the 2014 Young Flood Study.

Pre-development Conditions

The DRAINS model was setup as follows:

- ILSAX hydrological model using soil type = 3;
- Australian Rainfall and Runoff 1987 IFD;
- Antecedent Moisture Condition (AMC) = 3;
- Assumed 0% paved and 100% grassed catchment;
- Paved flow path roughness (n) = 0.02;
- Grassed flow path roughness (n) = 0.07;

The storm burst durations for the 2 yr ARI and 100 yr ARI storm bursts which were analysed ranged from 5 minutes to 120 minutes.

Post-development Conditions

Two changes were made from the pre-development conditions to account for concept industrial development:

- The imperviousness was increased to 90% paved and 10% grassed;
- A dual outlet OSD system was added at the catchment outlet.

A further assessment based on 70% imperviousness was also undertaken.

It was assumed that OSD systems will be designed such that the 2 yr ARI and 100 yr ARI peak flows under pre-development conditions would not be exceeded and that the storage would not overflow in the 100 yr ARI event.

Results

The critical storm durations for the 1 ha catchment under pre-development and post-development conditions are summarised in **Table 1**. The peak outflows under pre-development and post-development conditions without OSD are summarised in **Table 2**.

Table 1: Critical Storm Burst Durations

Scenario	2 yr ARI	100 yr ARI
Pre-Development	60 mins	20 mins
Post-Development	20 mins	20 mins

Table 2: Peak Flows

Scenario	2 yr ARI	100 yr ARI
Pre-Development	0.012 m^3/s	0.214 m^3/s
Post-Development without OSD	0.141 m^3/s	0.393 m^3/s

The indicative Site Storage Requirement (m^3/ha) and Permissible Site Discharges (L/s/ha) to limit post-development peak runoff to no greater than pre-development peak runoff in 2 yr ARI and 100 yr ARI storms determined from the DRAINS modelling are summarised in Table 3.

Table 3: Indicative PSD and SSR Requirements

Scenario	2 yr SSR (m^3/ha)	100 yr SSR (m^3/ha)	2 yr PSD (L/s/ha)	100 yr PSD (L/s/ha)
Post-Development (90% paved)	170	220	12	213
Post-Development (70% paved)	130	175	12	211

4. PLANNING CONSIDERATIONS

Flood Planning Considerations are set out in the Young LEP 2010 and the Young DCP 2011 as follows:

4.1 Young LEP 2010

Part 6 Additional Local Provisions

6.4 Water

(1) The objective of this clause is to maintain the hydrological functions of riparian land, waterways and aquifers, including protecting—

(a) water quality, and

(b) natural water flows, and

(c) the stability of the bed and banks of waterways, and

(d) groundwater systems.

(2) This clause applies to land identified as "Riparian Corridor" or "Groundwater Vulnerability" on the Natural Resources Sensitivity Water Map.

Attachment C1 is the relevant LEP Biodiversity Map. It appears that the proposed development is largely outside mapped areas of high diversity.

Attachment C2 is the relevant LEP Land Map. It appears that the proposed development is largely outside mapped sensitive land areas except for Lot 3 DP374948. This mapping appears to map the gully as a sensitive land area which is not supported by the vegetation which is absent from the gully – refer Figure 1 – nor by the survey which indicates that this is not the main watercourse.

Attachment C3 is the relevant LEP Water Map. It appears that the proposed development is largely outside mapped areas of riparian corridor except for Lot 3 DP374948. This mapping appears to map the gully as a riparian corridor which is not supported by the vegetation which is absent from the gully – refer Figure 1 – nor by the survey which indicates that this is not the main watercourse.

(3) Before determining a development application for land to which this clause applies, the consent authority must consider any adverse impact from the proposed development on—

(a) the water quality of receiving waters, and

(b) the natural flow regime, and

(c) the natural flow paths of waterways, and

(d) the stability of the bed, shore and banks of waterways, and

(e) the flows, capacity and quality of groundwater systems.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—

(a) the development is designed, sited and will be managed to avoid any adverse environmental impact, or

(b) if that impact cannot be avoided—the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

It is noted from Attachments B1 and B2 that flooding is largely confined to Victoria Gully and does not inundate any of the land that it is proposed to develop or re-develop. It is anticipated that similar flooding is experienced on the western Telegraph Road properties except that there is limited storage of floodwaters in the gully in Lot 3 DP374948. On the basis that the properties that it is proposed to develop are not inundated in a 100 yr ARI flood (except possibly Lot 3 DP374948) it is expected that the proposed development will have nil impact of 100 yr ARI flooding. In the case of Lot 3 DP374948 it is expected that the

loss of limited off-line storage of floodwaters in the gully may lead to minor local impacts on flooding in this location only.

Based on representative imperviousness for industrial development, a hydrological analysis was undertaken to estimate the indicative Site Storage Requirement (m3/ha) and Permissible Site Discharges (L/s/ha) to limit post-development peak runoff to no greater than pre-development peak runoff in 2 yr ARI and 100 yr ARI storms.

The indicative Site Storage Requirement (m3/ha) and Permissible Site Discharges (L/s/ha) to limit post-development peak runoff to no greater than pre-development peak runoff in 2 yr ARI and 100 yr ARI storms determined from the DRAINS modelling are summarised in Table 3.

6.6 Flood planning

(1) The objectives of this clause are as follows—

(a) to minimise the flood risk to life and property associated with the use of land,

(b) to allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change,

(c) to avoid significant adverse impacts on flood behaviour and the environment.

(2) This clause applies to land that is at or below the flood planning level.

(3) Development consent must not be granted for development on land to which this clause applies unless the consent authority is satisfied that the development—

(a) is compatible with the flood hazard of the land, and

(b) is not likely to significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and

(c) incorporates appropriate measures to manage risk to life from flood, and

(d) is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and

(e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.

(4) A word or expression used in this clause has the same meaning as it has in the NSW Government's Floodplain Development Manual published in 2005, unless it is otherwise defined in this clause.

(5) In this clause—

flood planning level means the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metre freeboard.

It is noted from Attachments B1 and B2 that flooding is largely confined to Victoria Gully and does not inundate any of the land that it is proposed to develop or re-develop. It is anticipated that similar flooding is experienced on the western Telegraph Road properties except that there is limited storage of floodwaters in the gully in Lot 3 DP374948. On the basis that the properties that it is proposed to develop are not inundated in a 100 yr ARI flood (except possibly Lot 3 DP374948) it is expected that the proposed development will

have nil impact of 100 yr ARI flooding. In the case of Lot 3 DP374948 it is expected that the loss of limited off-line storage of floodwaters in the gully may lead to minor local impacts on flooding in this location only. It is considered that the proposed development minimises the flood risk to life and property associated with the use of land.

Given the available mapping of the PMF which is far more extreme than changes in 100 yr ARI flooding as a result of climate change, it is considered that the proposed development is compatible with the land's flood hazard, taking into account projected changes as a result of climate change.

To avoid significant adverse impacts on flood behaviour and the environment, a hydrological analysis was undertaken to estimate the indicative Site Storage Requirement (m3/ha) and Permissible Site Discharges (L/s/ha) to limit post-development peak runoff to no greater than pre-development peak runoff in 2 yr ARI and 100 yr ARI storms.

The indicative Site Storage Requirement (m3/ha) and Permissible Site Discharges (L/s/ha) to limit post-development peak runoff to no greater than pre-development peak runoff in 2 yr ARI and 100 yr ARI storms determined from the DRAINS modelling are summarised in Table 3.

It is considered the proposed development is meets the objectives of Clause 6.6 Flood Planning.

4.2 Young DCP 2011

Appendix C Statements of Environmental Effects (SEE)

7.1.1 SEE Guidelines

K Drainage

Show how the proposal will deal with all aspects of drainage on the site:

- *have you proposed measures to maximise infiltration and minimise water runoff? (e.g. porous pavements, mulching and ground covers, low water demand native plants, rainwater tanks, stormwater reuse).*
- *Stormwater drainage: proposed management controls for flows entering within and leaving the site, proposed on-site detention calculations prepared by a consulting hydraulic engineer, justification that the proposed design measures will not increase stormwater runoff or adversely affect flooding on other land easements: provide copies of letters of intention to grant interallotment drainage easements across downstream properties*
- *Local flood mitigation measures*

To avoid significant adverse impacts on flood behaviour and the environment, a hydrological analysis was undertaken to estimate the indicative Site Storage Requirement (m3/ha) and Permissible Site Discharges (L/s/ha) to limit post-development peak runoff to no greater than pre-development peak runoff in 2 yr ARI and 100 yr ARI storms.

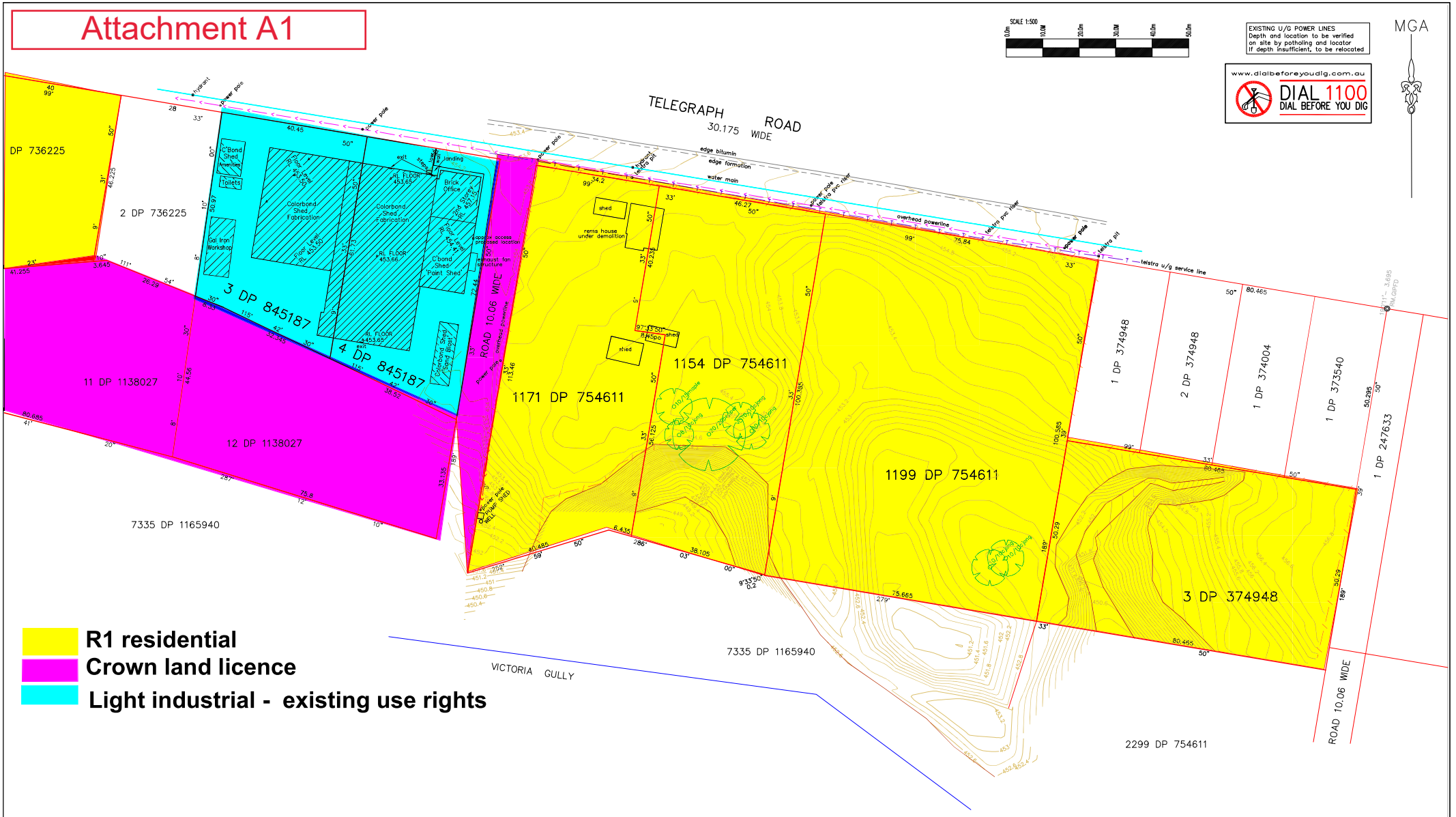
The indicative Site Storage Requirement (m3/ha) and Permissible Site Discharges (L/s/ha) to limit post-development peak runoff to no greater than pre-development peak runoff in 2 yr ARI and 100 yr ARI storms determined from the DRAINS modelling are summarised in Table 3.

The primary local flood mitigation measure is the proposed filling of the gully on Lot 3 DP374948.

Yours faithfully

.....
Dr Brett C. Phillips
Senior Principal
for **Cardno**

Attachment A1



DATUM AHD SSM 39765: RL 447.048
COORDINATES MGA ZONE 55 SSM 39765: E 620693.766, N 6201834.952

.	.	.
D	RAISE BUILDING PAD FFL 454.3, MODIFY EASTERN PAD AREA	20th Sept, 2017
C	RAISE BUILDING PAD 0.3!, EXTEND OUTER PAD	28th Aug, 2017
B	VOLUME AND BUILDING PAD	20th July, 2017
A	DETAIL AND CONTOUR SURVEY	12th July, 2016
ISSUE	AMENDMENT	DATE

I HEREBY CERTIFY THAT ENGINEERING WORKS SHOWN ON THIS PLAN ARE WORK-AS-EXECUTED AND HAVE BEEN CONSTRUCTED GENERALLY IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE DIRECTOR, IN ACCORDANCE WITH THE GENERAL REQUIREMENTS

NAME: .....
SIGNATURE: .....
CAPACITY: .....
DATE: .....

DATE	CHECKED
20th Sept 2017	WJC
DRAWN	APPROVED
WJC	WJC
DESIGNED	SCALE
WJC	PLAN 1:500 LS H5 1:500 LS V5 1:100

SHEET A1

C.P.C.
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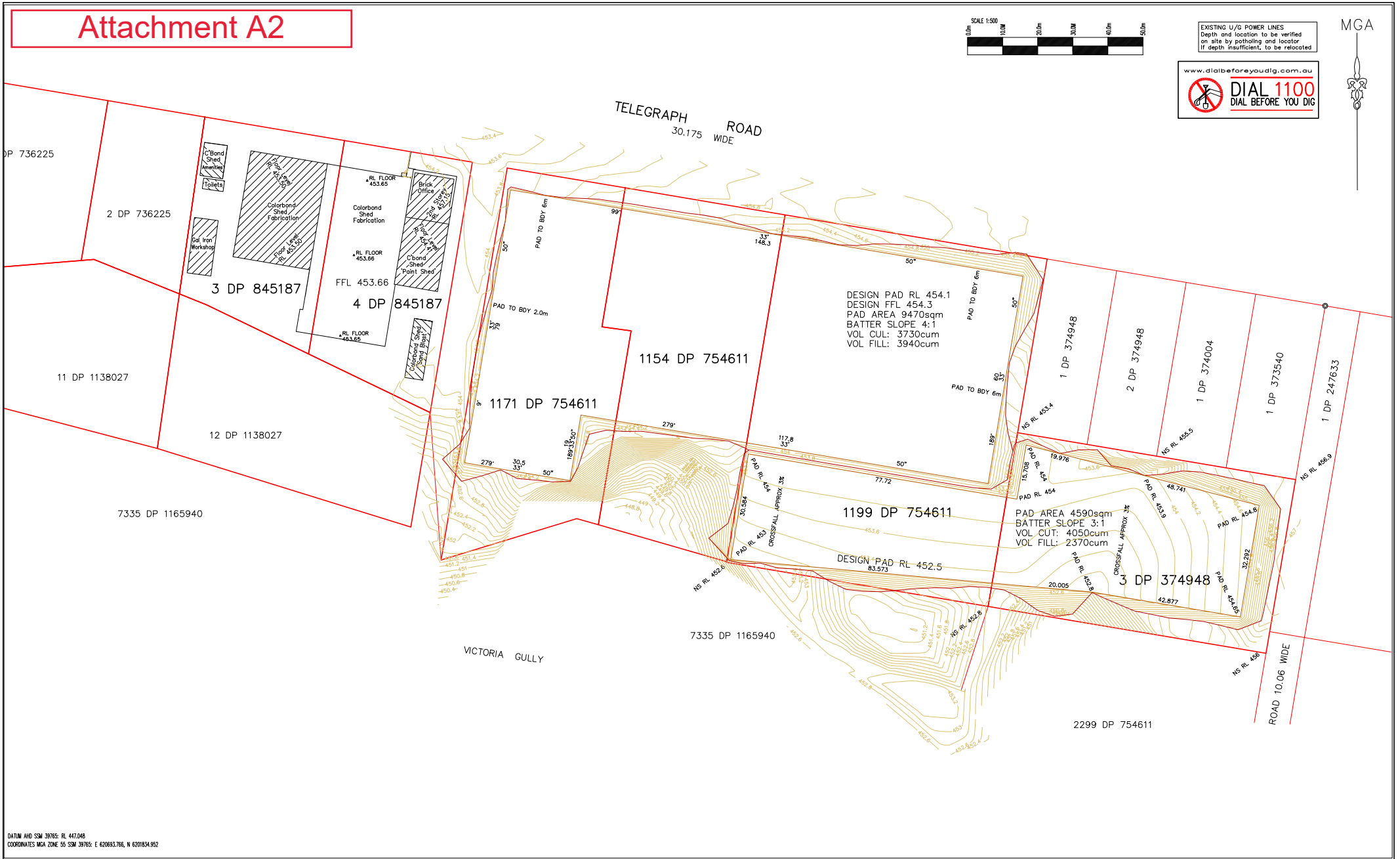
SHEET SUBJECT
PLAN VIEW
DETAIL AND CONTOURS

CLIENT
Apollo Fabrication Group Pty Ltd

PROJECT APOLLO FABRICATION GROUP PTY LTD
TELEGRAPH ROAD, YOUNG

ISSUE	PROJECT NO.	SHEET NO.	SHEET
D	18424	1 of 2	A1

Attachment A2



DATUM AHD SSM 39765: RL 447.048
COORDINATES MGA ZONE 55 SSM 39765: E 620693.766, N 6201834.952

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NAME: .....
SIGNATURE: .....
CAPACITY: .....
DATE: .....

DATE	CHECKED
20th Sept 2017	WJC
DRAWN	APPROVED
WJC	WJC
DESIGNED	SCALE PLAN 1:500 LS H5 1:500 LS V5 1:100
WJC	SHEET A1

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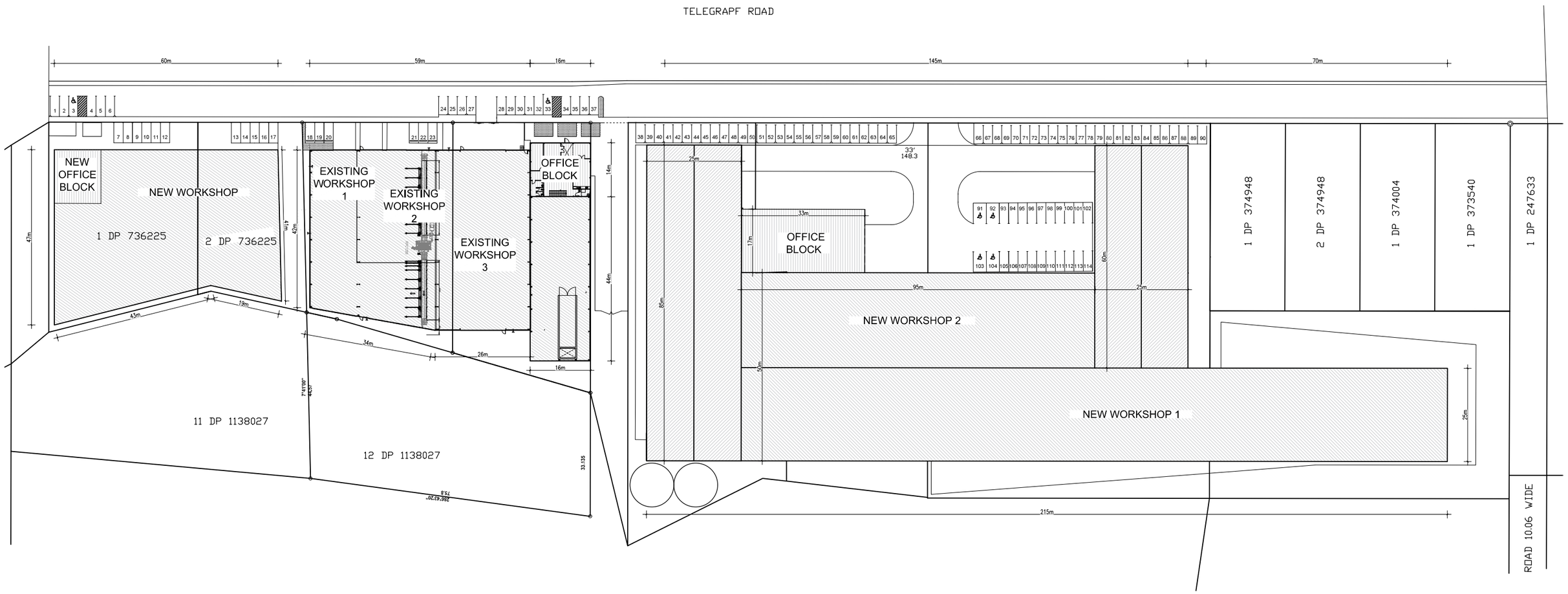
SHEET SUBJECT
DESIGN PAD CUT/FILL
DESIGN DETAIL AND CONTOURS

PROJECT APOLLO FABRICATION GROUP PTY LTD
TELEGRAPH ROAD, YOUNG

CLIENT
Apollo Fabrication Group Pty Ltd

ISSUE	PROJECT NO.	SHEET NO.	SHEET
D	18424	2 of 2	A1

Attachment A3



ISSUE	DATE	REASON FOR REVISION
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UNIQUE CAD EXPERIENCE

Client: APOLLO FABRICATION GROUP Pty Ltd

Project: PROPOSED ADDITION
2 - 20 Telegraph road, Young

Drawing: PROPOSED SITE PLAN

Job Number:

No. in Set: 2

Sheet No.: A 1.1

Scale: 1 : 750

Revision No.:

Date: 11.03.2021

Revision Date.:

Drawn: MG

A2

Lyall & Associates

NEXUS Environmental Planning Pty Ltd

YOUNG SHIRE COUNCIL

Attachment B

THE TOWN OF YOUNG
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN

VOLUME 2 – FIGURES

NOVEMBER 2015

Job No: DO315 File: YFRMSP V2 Figures [Rev 1.4].doc	Date: November 2015 Rev No: 1.4	Principal: BWL Author: BWL/SAB

LIST OF FIGURES

Attachment B1

Indicative Depth of Above-Floor Inundation (m)

Residential	Commercial	Public	
○	▽	□	0.00 to 0.20
○	▽	□	0.20 to 0.40
●	▼	■	0.40 to 0.60
●	▼	■	0.60 to 0.80
●	▼	■	0.80 to 1.00
●	▼	■	1.00 to 1.50
●	▼	■	1.50 to 2.00
●	▼	■	2.00 to 3.00
●	▼	■	3.00 to 4.00

Indicative Depth of Inundation (m)

	< 0.05
	0.05 to 0.10
	0.10 to 0.20
	0.20 to 0.30
	0.30 to 0.40
	0.40 to 0.50
	0.50 to 0.60
	0.60 to 0.70
	0.70 to 0.80
	0.80 to 0.90
	0.90 to 1.00
	> 1.00

PROPERTY FLOOD AFFECTATION SHOWN ON THIS FIGURE IS INDICATIVE ONLY, AS FLOOR LEVELS WERE ESTIMATED BY A "DRIVE-BY" SURVERY. SURVEY BY A REGISTERED SURVEYOR IS REQUIRED TO CONFIRM DEPTHS OF INUNDATION OF INDIVIDUAL PROPERTIES.

N

80 0 80 160 240 m

Scale: 1:8,000

Lyall & Associates

NOTE:

THE EXTENTS AND DEPTHS OF FLOODING SHOWN WERE DETERMINED FROM AIRBORNE LASER SCANNING SURVEY AND ARE APPROXIMATE ONLY.THE EXTENT OF INUNDATION IN INDIVIDUAL ALLOTMENTS NEAR THE FLOOD FRINGE SHOULD BE CONFIRMED BY SITE SPECIFIC SURVEY.

REFER TABLE A1 OF APPENDIX A OF FLOOD STUDY FOR PEAK FLOWS AND CRITICAL STORM DURATIONS AT LOCATIONS SHOWN.

ABOVE-FLOOR INUNDATION ONLY SHOWN FOR PROPERTIES LOCATED WITHIN THE MAJOR OVERLAND FLOW URBAN PRECINCT.

LEGEND

- Modelled Stormwater System
- Two-Dimensional Model Boundary
- Water Surface Elevation Contours (m AHD) (414)
- Q17 Peak Flow Location and Identifier
- Extent of Major Overland Flow Urban Precinct

THE TOWN OF YOUNG
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN

Figure 2.3
Sheet 3 of 3

INDICATIVE FLOOD EXTENTS
100 YEAR ARI

Attachment B2

Indicative Depth of Above-Floor Inundation (m)

Residential	Commercial	Public	
○	▽	□	0.00 to 0.20
○	▽	□	0.20 to 0.40
●	▼	■	0.40 to 0.60
●	▼	■	0.60 to 0.80
●	▼	■	0.80 to 1.00
●	▼	■	1.00 to 1.50
●	▼	■	1.50 to 2.00
●	▼	■	2.00 to 3.00
●	▼	■	3.00 to 4.00

Indicative Depth of Inundation (m)

	< 0.05
	0.05 to 0.10
	0.10 to 0.20
	0.20 to 0.30
	0.30 to 0.40
	0.40 to 0.50
	0.50 to 0.60
	0.60 to 0.70
	0.70 to 0.80
	0.80 to 0.90
	0.90 to 1.00
	> 1.00

PROPERTY FLOOD AFFECTATION SHOWN ON THIS FIGURE IS INDICATIVE ONLY, AS FLOOR LEVELS WERE ESTIMATED BY A "DRIVE-BY" SURVERY. SURVEY BY A REGISTERED SURVEYOR IS REQUIRED TO CONFIRM DEPTHS OF INUNDATION OF INDIVIDUAL PROPERTIES.

N

80 0 80 160 240 m

Scale: 1:8,000

Lyall & Associates

NOTE:

THE EXTENTS AND DEPTHS OF FLOODING SHOWN WERE DETERMINED FROM AIRBORNE LASER SCANNING SURVEY AND ARE APPROXIMATE ONLY.THE EXTENT OF INUNDATION IN INDIVIDUAL ALLOTMENTS NEAR THE FLOOD FRINGE SHOULD BE CONFIRMED BY SITE SPECIFIC SURVEY.

ABOVE-FLOOR INUNDATION ONLY SHOWN FOR PROPERTIES LOCATED WITHIN THE MAJOR OVERLAND FLOW URBAN PRECINCT.

LEGEND

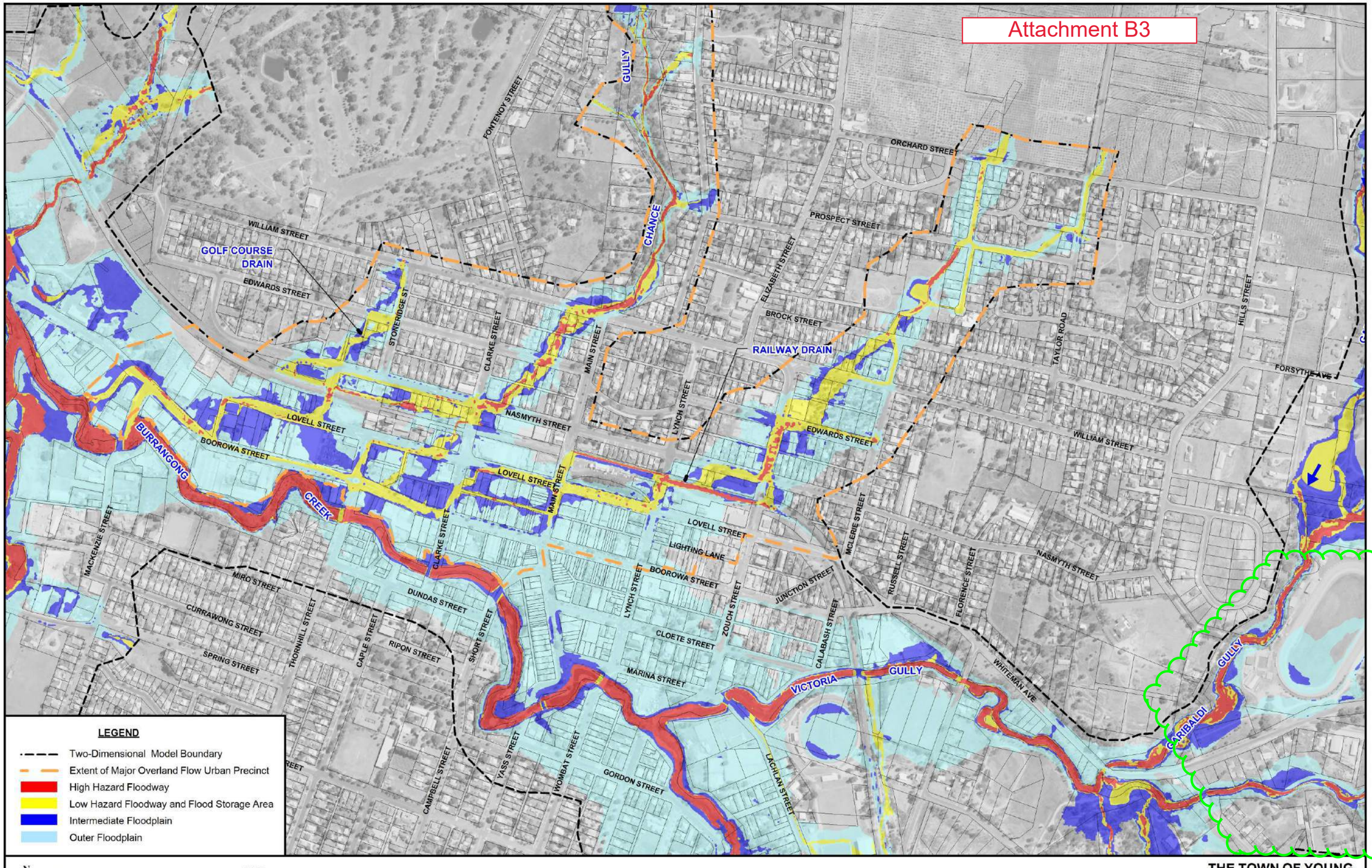
- Modelled Stormwater System
- Two-Dimensional Model Boundary
- Extent of Major Overland Flow Urban Precinct

THE TOWN OF YOUNG
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN

Figure 2.8

INDICATIVE DEPTHS OF ABOVE-GROUND AND ABOVE-FLOOR INUNDATION
MAJOR OVERLAND FLOW URBAN PRECINCT - PMF

Attachment B3



NOTE:

THE EXTENTS AND DEPTHS OF FLOODING SHOWN WERE DETERMINED FROM AIRBORNE LASER SCANNING SURVEY AND ARE APPROXIMATE ONLY. THE EXTENT OF INUNDATION IN INDIVIDUAL ALLOTMENTS NEAR THE FLOOD FRINGE SHOULD BE CONFIRMED BY SITE SPECIFIC SURVEY.

Lyall & Associates

THE TOWN OF YOUNG
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN

Figure A1.3
(Sheet 3 of 3)

FLOOD HAZARD MAP

Young Local Environmental Plan 2010

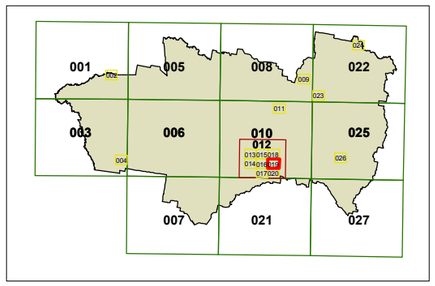
Natural Resources Sensitivity
Biodiversity Map - Sheet NRB_019

Natural Resource Sensitivity

Areas of High Biodiversity

Cadastre

Cadastre 1/3/10 © Dept of Lands



N
W E
S

0 100 200 metres

Scale: 1:10,000 @ A3

Projection: GDA 1994
Zone 55

Map Identification Number:

8750_COM_NRB_019_010_20100610

Attachment C1

Young Local Environmental Plan 2010

Natural Resources Sensitivity Land Map - Sheet NRL_019

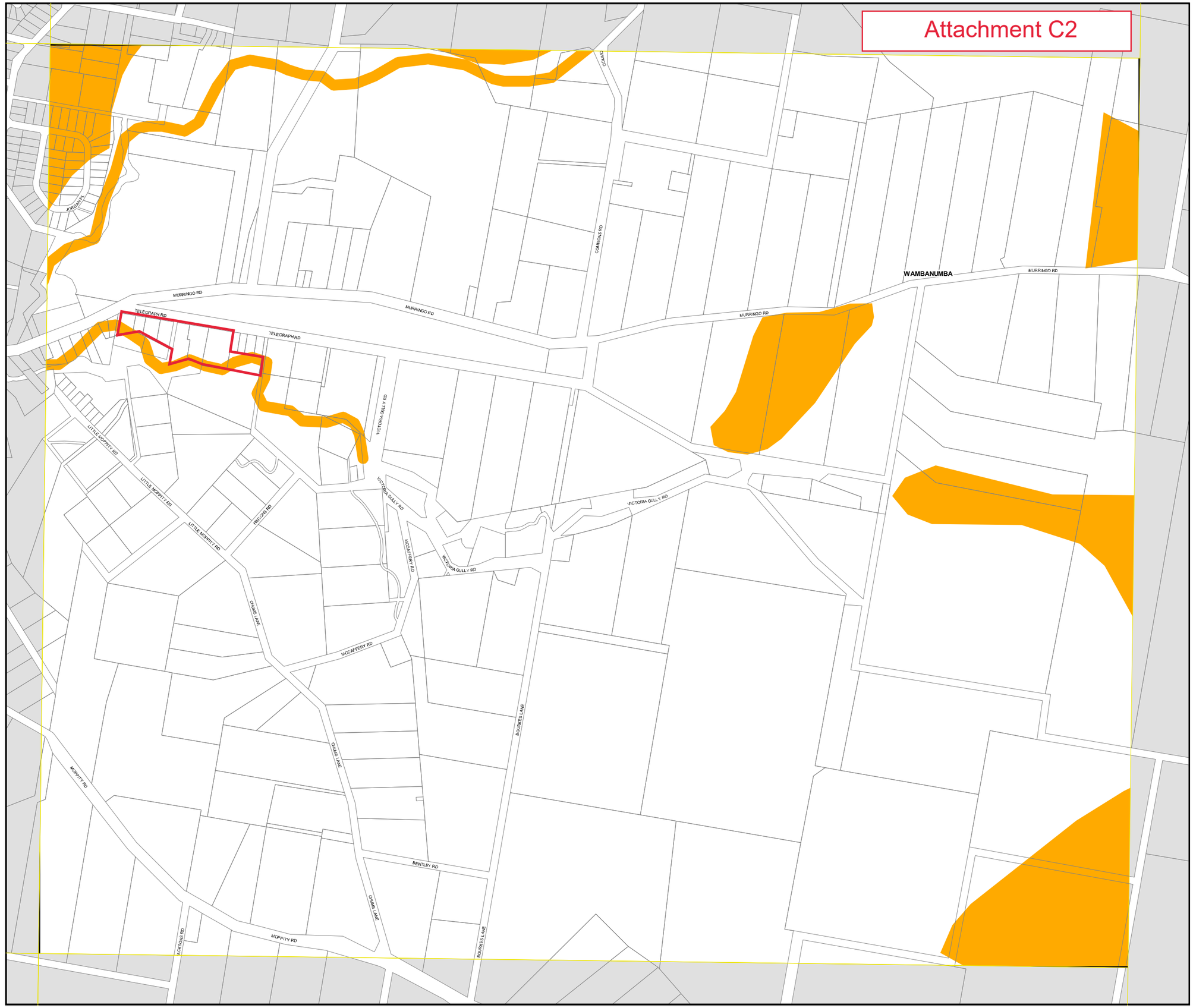
Sensitive Areas

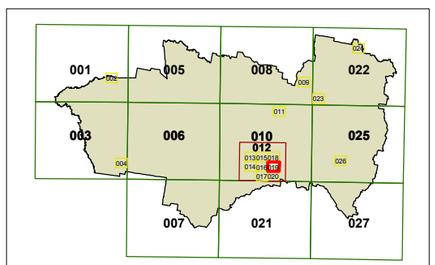
Sensitive Land Areas

Cadastre

Cadastre 1/3/10 © Dept of Lands

Attachment C2





N
W E
S

0 100 200 metres

Scale: 1:10,000 @ A3

Projection: GDA 1994
Zone 55

Map Identification Number:

8750_COM_NRL_019_010_20100610

Young Local Environmental Plan 2010

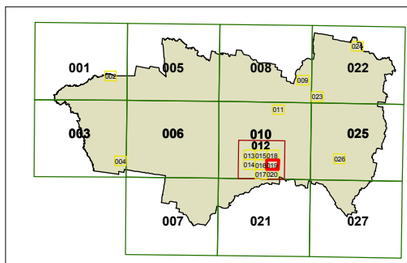
Natural Resources Sensitivity Water Map - Sheet NRW_019

Natural Resource Sensitivity

- Riparian Corridor
- Groundwater Vulnerability

Cadastre

- Cadastre 1/3/10 © Dept of Lands



N
W E
S

Projection: GDA 1994
Zone 55

0 100 200 metres

Scale: 1:10,000 @ A3

Map Identification Number:

8750_COM_NRW_019_010_20100610

Attachment C3

Technical Memorandum

To	Caleb Jackson, Apollo Fabrications	**From**	Justin Smith, Cardno
CC	None	**Date**	13 April 2021
Project	2-20 Telegraph Road, Young		
Subject	Utility Servicing feasibility memorandum – Revision 0		

Introduction

The purpose of this memorandum is to advise on the feasibility for utility servicing the proposed development extension for the industrial site at Apollo Fabrications located at 2-20 Telegraph Road, Young. Extensions of the existing facility will result in minor additional demand on the existing utility infrastructure in the area.

Limits of this memorandum

This memorandum has been developed using information on Dial Before You Dig (DBYD) searches. No site visits, investigations or discussions with service providers have been completed. Specifically regarding the water, sewer and electrical servicing, note the below:

1. Water and Sewer – Hilltops Council owns the water and sewer infrastructure in the area. None of their infrastructure shows on DBYD searches. Cardno contacted Council regarding this on 12/04/2021 and it was advised the network information could not be shared, but Council will undertake a review of the impact of the development on their services when the planning submission for the development is provided to Council
2. Electrical – Delta Star Designs completed a design for new electrical infrastructure to service the development, refer to essential energy certified drawings dated 18/05/2020. For the purposes of this memorandum, it is assumed this design has been completed to service the proposed development extension adequately.

Utilities

See below Table 1 for a summary of the utilities in the area and feasibility of connection:

Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035
16 Burelli Street, Wollongong
NSW,2500
+612 4228 4133 | www.cardno.com

Table 1 Utility Connection summary

Utility	Owner	Existing Infrastructure	Comments
Telecommunications	Telstra	Communications infrastructure on the Essential energy poles fronting the site on Telegraph Road	Replacement of the Telstra cable on the pole, or an additional cable may be required depending on bandwidth increase of the site. The underground Telstra main distribution network is located at the intersection of Whiteman and Telegraph road. The upgrade of the network may only be required to this intersection, which is approximately 50m.
Gas	Jemena	50mm Nylon Medium Pressure gas main running along Telegraph Road	It is unknown whether the existing development is serviced by this gas main, however if a gas service is required it could be arranged by contacting Jemena to determine demand needs.
Electricity	Essential Energy	Refer to design drawing complete by Delta Start Designs dated 18/05/2020	Electrical analysis completed by others as per design drawing
Water & Sewer	Hilltops Council	Unknown	Council to review upon submission of planning report (See note 1 under “Limits of this Memorandum”

Summary

In summary the proposed development extension appears to have existing telecommunications, gas and electrical infrastructure along Telegraph road fronting the property. An upgrade to the Telstra telecommunications network may be required depending on the bandwidth increase of the development. The location of the Water and Sewer networks is unknown due to Hilltop Council not able to disclose this information, Hilltop council will undertake a review of the site further once the planning submission has been completed.

Next steps for utility servicing is to contact all utility authorities to verify connection locations once more details of the proposed development loading increases is known.

The following information is enclosed with this memorandum:

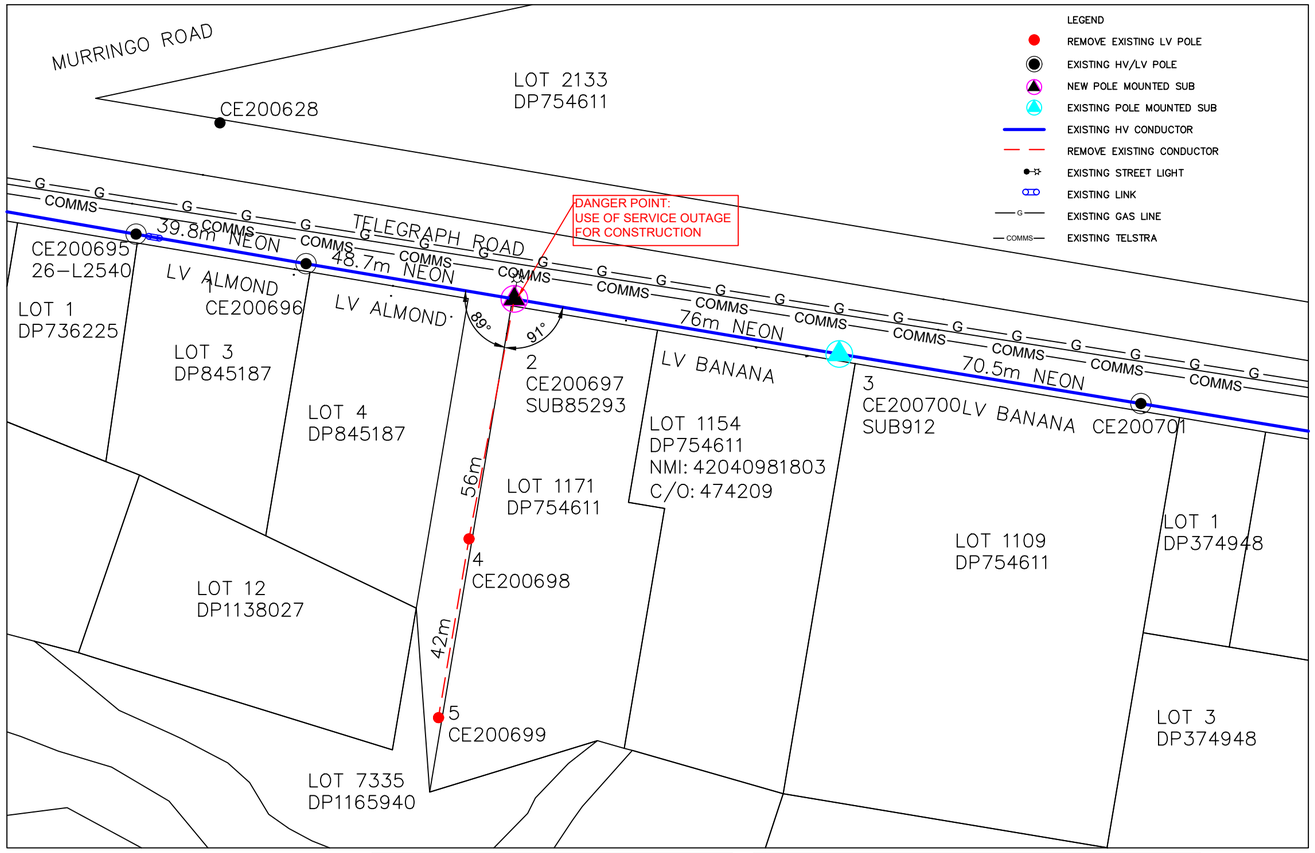
1. DBYD responses
2. Delta Star Designs Essential Energy design
3. Proposed development drawings

Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035
16 Burelli Street, Wollongong
NSW,2500
+612 4228 4133 | www.cardno.com

CEOF1070.01 & CEOF1070.02 DOCUMENTS COMPLETED FOR THIS PROJECT. CONSTRUCTING ASP TO ENSURE ALL CONTROL MEASURES FROM THESE DOCUMENTS ARE PUT IN PLACE PRIOR TO ANY CONSTRUCTION WORK AND IF ISSUES ARISE DURING CONSTRUCTION THEY CONSULT WITH LEVEL 3 ASP TO ENSURE ENVIRONMENTAL RISKS ARE ASSESSED IN ACCORDANCE WITH ESSENTIAL ENERGY POLICYS

RETURNED MATERIALS SCHEDULE HAS BEEN COMPLETED AND IS ATTACHED AS SEPARATE SHEET:
RETURNED ESSENTIAL ENERGY DEPOT: BATHURST FSC
ESSENTIAL ENERGY CONTACT: MICK WICKS 02 6338 3592

NOTES:
1. ALL MATERIALS USED WITHIN THE ESSENTIAL ENERGY NETWORK MUST BE ON CEOM7004 - MATERIALS INVENTORY: CONTESTABILITY (APPROVED). ANY ITEMS NOT ON THIS LIST MUST BE APPROVED FOR NON STANDARD INSTALLATION PRIOR TO BEING INSTALLED.
2. CERTIFIED DESIGN REMAINS VALID FOR A PERIOD OF 6 MONTHS AFTER CERTIFICATION BY ESSENTIAL ENERGY.
3. THE CONTRACTOR IS TO CHECK ALL DIMENSIONS ON SITE TO ENSURE ACCURACY AND NOTIFY DESIGNER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.
4. ALL CONSTRUCTION WORKS ARE TO COMPLY WITH ESSENTIAL ENERGY CONSTRUCTION STANDARDS AND RELEVANT AUSTRALIAN STANDARDS/CODES OF PRACTICE



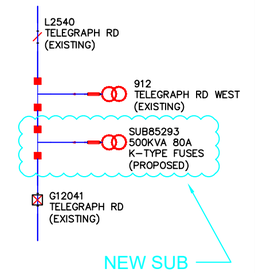
Overhead Construction Schedule

Location	Asset Label	Construction Number	Ass. Number	Construction Notes
1	CE200696			EXISTING POLE IS TO REMAIN AS IS
2	CE200697 SUB85293			REMOVE EXISTING POLE AND POLE ASSEMBLY AND RETURN TO EE
		7101.03	8	INSTALL NEW 12.5M 12KN TIMBER POLE SUNK 2.05M
		7103.10	P	FOOTING ID: 12.5 / 12PT 85 / P
		7101.54	1	INSTALL NEW 11KV 3PH SMALL DELTA COMP X-ARM FG72 @ 0.23m FROM POLE TOP
		7104.05	2	INSTALL NEW 11KV 500KVA POLE MOUNTED SUBSTATION
		7104.20	5	INSTALL NEW 11kV 3PH FUSE ARM ARRANGEMENT WITH NEW 80A K-TYPE FUSES
		7103.63	3	INSTALL NEW LV 4 WIRE STRAIN COMP X-ARM FG53 @ 1.8M FROM TOP X-ARM
		7104.23	4	INSTALL NEW 11kV 3PH 500KVA TOWN TRANSFORMER
				PRIMARY TAP SETTING 11,275V
		7104.24	5	INSTALL NEW 3PH 630A LV FUSE SWITCH DISCONNECTOR WITH 630A LV FUSES
				RE CONNECT EXISTING STREETLIGHT AT EXISTING HEIGHT AND EXISTING ORIENTATION, CLARENCE DISTANCES TO BE MAINTAINED AS PER 7107.07
		7104.25	2	INSTALL NEW MAX DEMAND INDICATOR
		7104.28	1	INSTALL NEW WOODEN POLE SUBSTATION LV NEUTRAL TERMINAL
		7109.11	4	INSTALL NEW TIMBER POLE SUBSTATION SEPARATE EARTHING SYSTEM AS PER NEUTRON REPORT
3	CE200700 SUB912			EXISTING POLE IS TO REMAIN AS IS
4	CE200698			REMOVE EXISTING POLE AND POLE ASSEMBLY AND RETURN TO EE
5	CE200699			REMOVE EXISTING POLE AND POLE ASSEMBLY AND RETURN TO EE

OVERHEAD CONDUCTOR SCHEDULE

FROM	TO	ACTION	CONDUCTOR DETAILS VOLTAGE/WIRES/CONDUCTORS	ROUTE LENGTH	DESIGN TENSION	RULING SPAN	MIN DESIGN GC @ MAX OPERATING TEMP 100°C
1	3	REINSTALL	3PH 11KV NEON 19/3.75 AAAC	124.7m	EXISTING	64.2m	7.86m
1	2	REINSTALL	LV 4 WIRE ALMOND 6/1/2.50 ACSR/GZ	48.7m	EXISTING	44.9m	7.65m
2	5	REMOVE	1 PH 7/0.064 HDBC CONDUCTOR	98m	-	-	-
2	3	REINSTALL	LV 4 WIRE BANANA 6/1/3.75 ACSR/GZ	76m	EXISTING	73.4m	6.39

HV SCHEMATIC
ZONE SUBSTATION – YOUNG
FEEDER – YOU3B8 YOUNG TOWN 5
MAINTENACE AREA – YOUNG – 26014 – 1590
1591 1600B



Stringing Table - RULING SPAN 44.9m

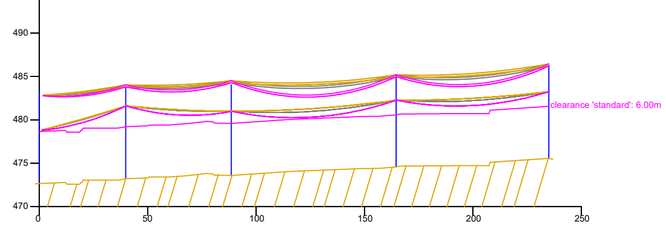
STRINGING CHART						LV ALMOND 6/1/2.50 ACSR/GZ @10%						
"SPAN LENGTH"	TENSIONS @ FOLLOWING TEMPERATURES											
	-5° C (kN)	0°C (kN)	5°C (kN)	10°C (kN)	15°C (kN)	20°C (kN)	25°C (kN)	30°C (kN)	35°C (kN)	40°C (kN)	45°C (kN)	50°C (kN)
48.7m	2.62	2.31	2.02	1.74	1.49	1.27	1.08	0.94	0.82	0.73	0.66	0.61
STRINGING CHART						LV ALMOND 6/1/2.50 ACSR/GZ @10%						
"SPAN LENGTH"	SAGS @ FOLLOWING TEMPERATURES											
	-5°C (m)	0°C (m)	5°C (m)	10°C (m)	15°C (m)	20°C (m)	25°C (m)	30°C (m)	35°C (m)	40°C (m)	45°C (m)	50°C (m)
48.7m	0.13	0.15	0.17	0.20	0.23	0.27	0.32	0.37	0.42	0.47	0.52	0.57
STRINGING CHART						LV ALMOND 6/1/2.50 ACSR/GZ @10%						
"SPAN LENGTH"	RETURN WAVE TIMINGS @ FOLLOWING TEMPERATURES											
	-5° C (s)	0°C (s)	5°C (s)	10°C (s)	15°C (s)	20°C (s)	25°C (s)	30°C (s)	35°C (s)	40°C (s)	45°C (s)	50°C (s)
48.7m	1.96	2.08	2.23	2.40	2.60	2.82	3.05	3.28	3.50	3.70	3.89	4.06

Stringing Table - RULING SPAN 73.4m

STRINGING CHART						LV BANANA 6/1/3.75 ACSR/GZ @13%						
"SPAN LENGTH"	TENSIONS @ FOLLOWING TEMPERATURES											
	-5° C (kN)	0°C (kN)	5°C (kN)	10°C (kN)	15°C (kN)	20°C (kN)	25°C (kN)	30°C (kN)	35°C (kN)	40°C (kN)	45°C (kN)	50°C (kN)
76m	4.72	4.19	3.71	3.31	2.96	2.68	2.44	2.24	2.08	1.94	1.82	1.72
STRINGING CHART						LV BANANA 6/1/3.75 ACSR/GZ @13%						
"SPAN LENGTH"	SAGS @ FOLLOWING TEMPERATURES											
	-5°C (m)	0°C (m)	5°C (m)	10°C (m)	15°C (m)	20°C (m)	25°C (m)	30°C (m)	35°C (m)	40°C (m)	45°C (m)	50°C (m)
76m	0.13	0.15	0.17	0.20	0.23	0.27	0.32	0.37	0.42	0.47	0.52	0.57
STRINGING CHART						LV BANANA 6/1/3.75 ACSR/GZ @13%						
"SPAN LENGTH"	RETURN WAVE TIMINGS @ FOLLOWING TEMPERATURES											
	-5° C (s)	0°C (s)	5°C (s)	10°C (s)	15°C (s)	20°C (s)	25°C (s)	30°C (s)	35°C (s)	40°C (s)	45°C (s)	50°C (s)
76m	1.96	2.08	2.23	2.40	2.60	2.82	3.05	3.28	3.50	3.70	3.89	4.06

Stringing Table - RULING SPAN 108.83m

STRINGING CHART						NEON 19/3.75 AAAC @6.69%						
"SPAN LENGTH"	TENSIONS @ FOLLOWING TEMPERATURES											
	-5° C (kN)	0°C (kN)	5°C (kN)	10°C (kN)	15°C (kN)	20°C (kN)	25°C (kN)	30°C (kN)	35°C (kN)	40°C (kN)	45°C (kN)	50°C (kN)
39.8m	6.95	6.03	5.25	4.60	4.08	3.66	3.33	3.05	2.83	2.65	2.49	2.36
48.7m	6.95	6.03	5.25	4.60	4.08	3.66	3.33	3.05	2.83	2.65	2.49	2.36
76m	6.95	6.03	5.25	4.60	4.08	3.66	3.33	3.05	2.83	2.65	2.49	2.36
70.5m	6.95	6.03	5.25	4.60	4.08	3.66	3.33	3.05	2.83	2.65	2.49	2.36
STRINGING CHART						NEON 19/3.75 AAAC @6.69%						
"SPAN LENGTH"	SAGS @ FOLLOWING TEMPERATURES											
	-5°C (m)	0°C (m)	5°C (m)	10°C (m)	15°C (m)	20°C (m)	25°C (m)	30°C (m)	35°C (m)	40°C (m)	45°C (m)	50°C (m)
39.8m	0.11	0.13	0.15	0.18	0.22	0.27	0.32	0.38	0.44	0.50	0.55	0.60
48.7m	0.19	0.22	0.26	0.31	0.36	0.43	0.49	0.56	0.63	0.69	0.75	0.81
76m	0.71	0.80	0.89	0.98	1.07	1.16	1.24	1.32	1.40	1.48	1.55	1.63
70.5m	0.56	0.64	0.72	0.81	0.89	0.98	1.06	1.14	1.22	1.29	1.37	1.44
STRINGING CHART						NEON 19/3.75 AAAC @6.69%						
"SPAN LENGTH"	RETURN WAVE TIMINGS @ FOLLOWING TEMPERATURES											
	-5° C (s)	0°C (s)	5°C (s)	10°C (s)	15°C (s)	20°C (s)	25°C (s)	30°C (s)	35°C (s)	40°C (s)	45°C (s)	50°C (s)
39.8m	1.82	1.95	2.11	2.30	2.53	2.79	3.06	3.33	3.58	3.80	4.00	4.19
48.7m	2.35	2.53	2.74	2.98	3.24	3.52	3.78	4.03	4.26	4.48	4.67	4.84
76m	4.53	4.80	5.07	5.32	5.56	5.97	6.00	6.19	6.38	6.55	6.71	6.87
70.5m	4.02	4.30	4.57	4.83	5.09	5.33	5.55	5.75	5.95	6.13	6.29	6.45

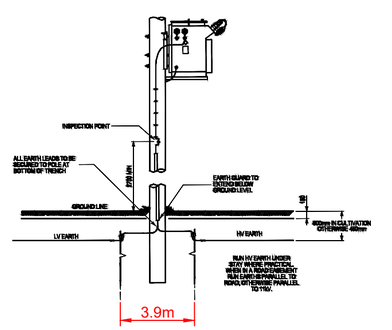


X axis scale 1:2000
Y axis scale 1:500

- "Everyday" environment @ 15 degrees
- "Max wind" environment @ 35 degrees
- "Hot" environment @ 65 degrees

PROJECT NOTES:
1. CABLE DESTINATION TAGS ARE REQUIRED ON ALL CABLES. TAGS ARE TO COMPLY WITH CEOP8042 CLAUSE 4.7
2. ALL EXCAVATION WORK TO COMPLY WITH ESSENTIAL ENERGY'S OPERATIONAL PROCEDURE: WORK NEAR ESSENTIAL ENERGY'S UNDERGROUND ASSETS CEOP8041.
3. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL ESSENTIAL ENERGY STANDARDS, AUSTRALIAN STANDARDS AND SERVICE AND INSTALLATION RULES OF NSW.
4. REFER TO BRIEFING FROM 1-6-17 THAT STATES THAT A DEDICATED SUBSTATION IN THE ROAD RESERVE CAN HAVE THE FUSES AS THE POINT OF COMMON COUPLING

CEOM7109.11
11, 22 & 33kV WOOD POLE SUBSTATION SEPARATE EARTHING SYSTEM



EARTH SYSTEM LAYOUT

EARTHING RESISTIVITY CHART		
TEST TAKEN BY:	David	
TEST METHOD	Wenner	
SOIL CONDITIONS	NORMAL	
DATE TAKEN:	16/01/2020	
EXPECTED HV EARTH RESISTANCE		10.1
EXPECTED LV EARTH RESISTANCE		10.1
TOP SOIL RESISTIVITY		13.6
BOTTOM SOIL RESISTIVITY		2
POLE ID	DISTANCE	RESISTIVITY
CE200697 SUB85293	1	18.6
	2	12.1
	4	8.6
	6	8.2
	8	7.9
	10	4.2

MINIMUM SEPARATION BETWEEN HV AND LV EARTHING SYSTEMS IS 3.9m

HV EARTHING
LENGTH OF STRIP EARTH 0m
ELECTRODE LENGTH 1.2m
NUMBER OF ELECTRODES 1
ELECTRODE SPACINGS 0m

LV EARTHING
LENGTH OF STRIP EARTH 0m
ELECTRODE LENGTH 1.2m
NUMBER OF ELECTRODES 1
ELECTRODE SPACINGS 0m

EPR HAZARD ZONES:
430V 1.6m
1000V 0.1m
NOTE: NO TELECOMMUNICATIONS EQUIPMENT IS PERMITTED WITHIN THE EPR HAZARD ZONES

Safety In Design Report

Project Location	YOUNG	CW Number	120599	Design Department	DSD L3
Designer	David Bridle	Qualification	Adv Dip ESI	Designation	Designer
Issue Date	18/02/2020	Revision	A		
Designer Intent	UPGRADE POLE 1242 AND INSTALL NEW 500 KVA 3PH POLE MOUNTED SUB REMOVE POLES CE200699 CE200698				
Note: This is not a list of all hazard present. This report only shows unusual or non standard hazards identified at time of design					
Design Safety Report - Residual Hazard Register					
Hazard		Location	Possible Controls		Life Cycle Phase
UNBALANCED POLE TOP LOADINGS		ALL POLES	SUPPORT POLES UNTIL LOADS ARE BALANCED		CONSTRUCTION
WORKING ON EXISTING POLES		ALL POLES	CHECK POLE STABILITY PRIOR TO CLIMBING - USE OF SERVICE OUTAGE TO WORK ON POLE		CONSTRUCTION

essential energy
CERTIFIED BY ESSENTIAL ENERGY
Certification No: 120599
Certified Date: 18/05/2020
Certified By: Jaspreet Rehal
This certification is subject to ESSENTIAL ENERGY'S standard certification terms.
Certified based on the information provided. Construction to comply with EE standards CEOM7099 & CEOM7199.

DIAL BEFORE YOU DIG www.1100.com.au
The Essential First Step.
Caution:
PLEASE REFER DBYD JOB: 19064401
DATE OF REQUEST:19/02/2020
UNDERGROUND ASSETS IN VICINITY. ALL SERVICES TO BE LOCATED PRIOR TO ANY EXCAVATION WORKS.
*DIAL BEFORE YOU DIG" SITE LOCATIONS ARE VALID FOR 30 DAYS AFTER DATE OF REQUEST. IT IS RECOMMENDED THAT NEW INFORMATION IS REQUESTED AT TIME OF CONSTRUCTION TO ENSURE NEW INFORMATION IS AVAILABLE.

Rev	Date	Comments	Designer
1	27/02/2020	DRAFT FOR CLIENT AND COUNCIL REVIEW	AH
A	17/04/2020	CERTIFICATION SUBMISSION	AH
B	18/05/2020	CERTIFICATION RESUBMISSION	AH

NOTE:
1. THE INTENDED PURPOSE OF THIS PLAN IS THAT OF A CONSTRUCTION DRAWING FOR ELECTRICAL RETICULATION REQUIREMENTS. THIS PLAN IS NOT TO BE USED BY ANY OTHER PERSON OR COMPANY. DELTA STAR DESIGNS ACCEPTS NO RESPONSIBILITY FOR ANY LOSS OR DAMAGE SUFFERED FROM USE OF THIS PLAN IN ANY CAPACITY FROM WHAT ITS INTENDED PURPOSE IS.
2. DIMENSIONS, AREAS AND ITEMS SHOWN ARE APPROXIMATE ONLY AND MAY VARY. THE ELECTRICAL DESIGN SHOWN MAY BE SUBJECT TO VARIATION DEPENDING ON CONDITIONS ENCOUNTERED DURING INSTALLATION WORKS.
3. THIS PLAN IS NOT TO BE REPRODUCED UNLESS THIS NOTE IS INCLUDED. WRITTEN CONSENT FROM DELTA STAR DESIGNS IS REQUIRED PRIOR TO REPRODUCING THIS PLAN.

DELTA STAR DESIGNS PTY LTD
ABN 50 620 147 319
LEVEL 3 ACCREDITATION 4782
PH 0438 451 010
PO BOX 1274
WAGGA WAGGA NSW 2650
INFO@DELTASTARDESIGNS.COM.AU
WWW.DELTASTARDESIGNS.COM.AU

Project Name	JACKSON NEW SUB	Contestable Works #	120599
		Designer	ANGUS
Project Location	TELEGRAPH ROAD YOUNG LOT 1154 DP754611	Checked	DARCY
		Revision	B
Customer	COMPLETE POWER	Issue Date	18/05/2020
		Scale	1:1000
DSD - 336	PLOT SIZE - A2	Sheet	1 OF 1