

**Town of Gawler
Council Assessment Panel**

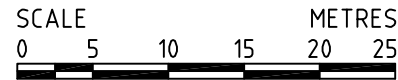
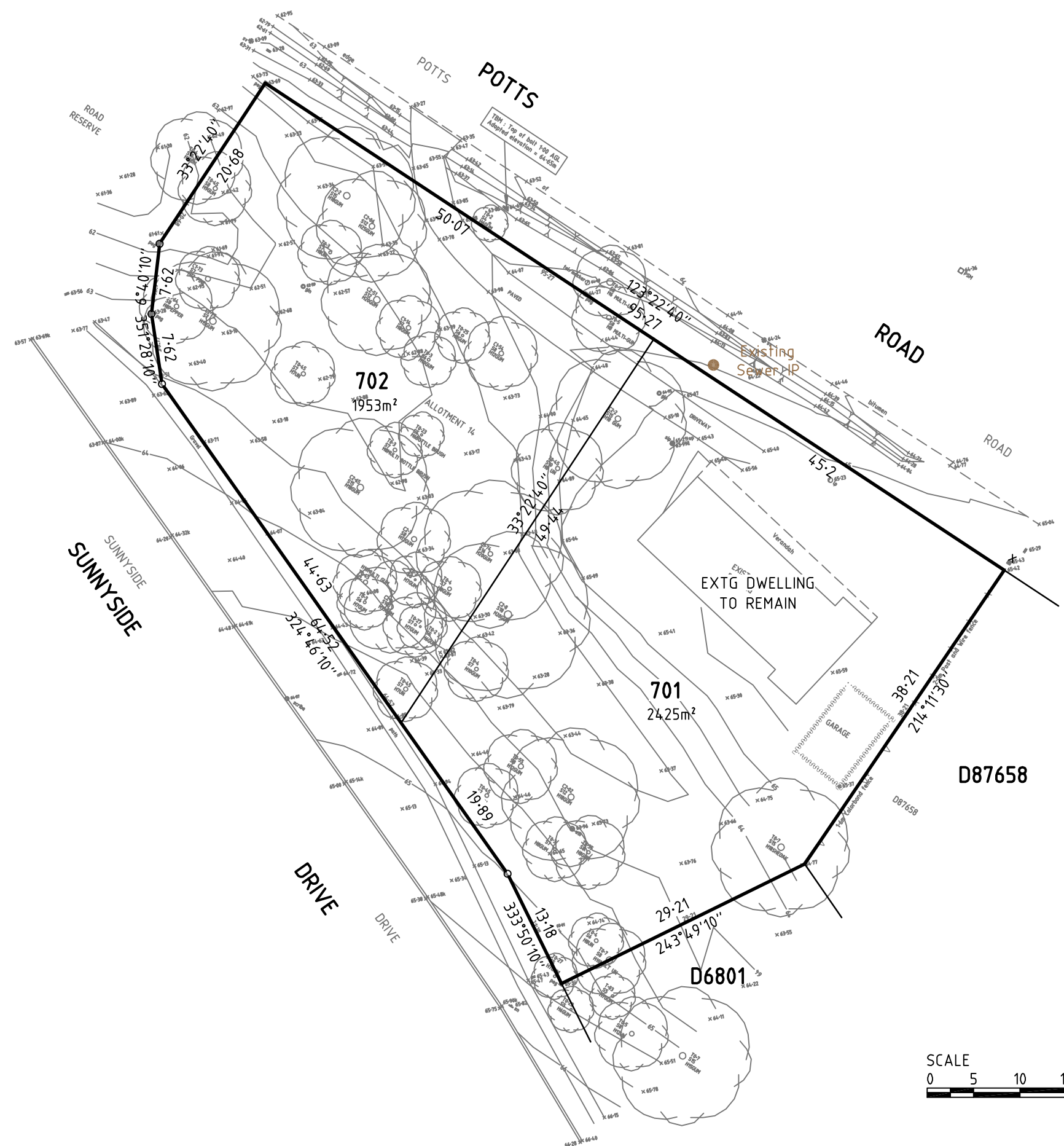
ATTACHMENTS UNDER SEPARATE COVER

Thursday 26 July 2018

Item		Page No
5.7	Development Application: 490/303/2017 (490/D018/17)	301
	Applicant: C G WYATT	
	Address: 23 Potts Road EVANSTON PARK 5116	
	Nature of Development: Land Division by Torrens Title (1 into 2) and removal of one Regulated Tree (Eucalyptus cladocalyx - Sugar Gum) & one Significant Tree (Eucalyptus camaldensis - River Red Gum)	
	Attachment 1 – Application Plans and Documentation	302
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SUBJECT TO SURVEY
TORRENS DIVISION

Attachment 1



DEVELOPMENT NUMBER: 490/D /17/001
DIVISION TYPE: TORRENS TITLE
VERSION: 28/4/2017
SHEET 1 OF 1 SHEETS
PLAN OF PROPOSED DIVISION
ALLOTMENT 14 IN F154015
TITLE REFERENCE(S): CT 5356/829
HUNDRED: MUNNO PARA AREA: EVANSTON PARK COUNCIL: GAWLER
COUNCIL ZONE: RESIDENTIAL COUNCIL POLICY AREA:
TOTAL SITE AREA: 4378m²
NO. EXISTING ALLOTMENT(S): 1 NO. PROPOSED ALLOTMENT(S): 2 NO. ADDITIONAL ALLOTMENT(S): 1
MAP REF: 6628-13-G
SITE ADDRESS: 23 POTTS ROAD EVANSTON PARK

ALL DIMENSIONS ARE SUBJECT TO SURVEY
AND FINAL PLAN OF DIVISION

EXISTING DWELLING TO PROPOSED ALLOT
701 IS TO REMAIN

ALL EXISTING STRUCTURES TO PROPOSED
ALLOT 702 ARE TO BE REMOVED

NEW WATER AND SEWER CONNECTIONS TO
BE PROVIDED BY CLIENT FOR SA WATER
INVESTIGATION AND COSTING

THIS APPLICATION IS FOR LAND DIVISION
APPROVAL ONLY

STATE SURVEYS

465B SOUTH ROAD, KESWICK SA 5035

TELEPHONE: 8293 2939

FACSIMILE: 8293 2949

EMAIL: planning@statesurveys.com.au

REFERENCE: 17112

DRAWN BY: EF



REAL PROPERTY ACT, 1886



The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



Certificate of Title - Volume 5356 Folio 829

Parent Title(s) CT 3405/107

Creating Dealing(s) CONVERTED TITLE

Title Issued	21/08/1996	Edition	4	Edition Issued	24/03/2017
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Estate Type

FEE SIMPLE

Registered Proprietor

CHRISTOPHER GREG WYATT
TIFFANY EMMA COLQUHOUN
OF 23 POTTS ROAD EVANSTON PARK SA 5116
AS JOINT TENANTS

Description of Land

ALLOTMENT 14 FILED PLAN 154015
IN THE AREA NAMED EVANSTON PARK
HUNDRED OF MUNNO PARA

Easements

NIL

Schedule of Dealings

Dealing Number	Description
12692815	MORTGAGE TO AUSTRALIA & NEW ZEALAND BANKING GROUP LTD. (ACN: 005 357 522)

Notations

Dealings Affecting Title NIL

Priority Notices NIL

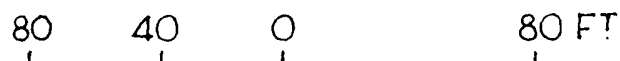
Notations on Plan NIL

Registrar-General's Notes NIL

Administrative Interests NIL

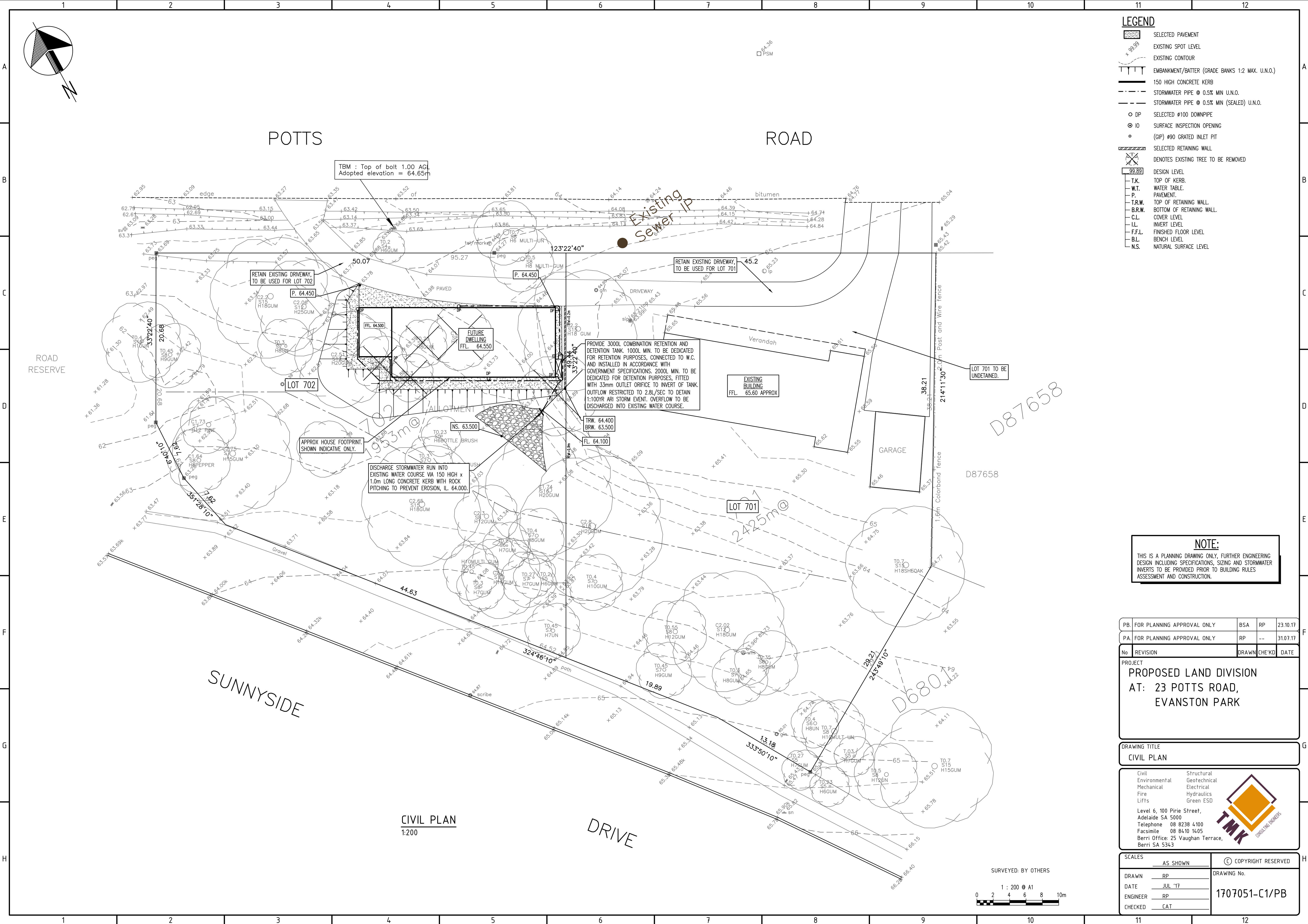


Register Search (CT 5356/829)
31/05/2017 03:35PM
17112
20170531010117
\$27.75



FOR METRIC CONVERSION	
1 FOOT	= 0.3048 METRES
1 INCH	= 0.0254 METRES
1 ACRE	= 0.404686 HECTARES
1 ROOD	= 1011.7 m ²
1 PERCH	= 25.29 m ²

NOTE: SUBJECT TO ALL LAWFULLY EXISTING PLANS OF DIVISION



LEGEND

SELECTED PAVEMENT

EXISTING SPOT LEVEL

EXISTING CONTOUR

EMBANKMENT/BATTER (GRADE BANKS 1:2 MAX. U.N.O.)

150 HIGH CONCRETE KERB

STORMWATER PIPE @ 0.5% MIN U.N.O.

STORMWATER PIPE @ 0.5% MIN (SEALED) U.N.O.

SELECTED 100 DOWNPIPE

SURFACE INSPECTION OPENING

(GIP) 90 GRATED INLET PIT

SELECTED RETAINING WALL

DENOTES EXISTING TREE TO BE REMOVED

DESIGN LEVEL

T.K. TOP OF KERB.

W.T. WATER TABLE.

P. PAVEMENT.

T.R.W. TOP OF RETAINING WALL.

B.R.W. BOTTOM OF RETAINING WALL.

C.L. COVER LEVEL.

I.L. INVERT LEVEL.

F.F.L. FINISHED FLOOR LEVEL.

B.L. BENCH LEVEL.

N.S. NATURAL SURFACE LEVEL.

NOTE:
THIS IS A PLANNING DRAWING ONLY. FURTHER ENGINEERING DESIGN INCLUDING SPECIFICATIONS, SIZING AND STORMWATER INVERTS TO BE PROVIDED PRIOR TO BUILDING RULES ASSESSMENT AND CONSTRUCTION.

PB	FOR PLANNING APPROVAL ONLY	BSA	RP	23.10.17
PA	FOR PLANNING APPROVAL ONLY	RP	--	31.07.17
No	REVISION	DRAWN	CHEK'D	DATE

PROJECT
**PROPOSED LAND DIVISION
AT: 23 POTTS ROAD,
EVANSTON PARK**

DRAWING TITLE
CIVIL PLAN

Civil
Environmental
Fire
Lifts

Structural
Geotechnical
Electrical
Hydraulics
Green ESD

Level 6, 100 Pirie Street,
Adelaide SA 5000
Telephone 08 8238 4100
Facsimile 08 8410 1405
Berri Office: 25 Vaughan Terrace,
Berri SA 5343

SCALES	AS SHOWN	© COPYRIGHT RESERVED
DRAWN	RP	DRAWING No.
DATE	JUL '17	1707051-C1/PB
ENGINEER	RP	
CHECKED	CAT	

SURVEYED: BY OTHERS

1 : 200 @ A1

0

2

4

6

8

10m



Site:	23 Potts Road, Evanston Park	Job Number:	1707051
Project Title:	Proposed Land Division	Date:	23 October 2017

ATTACHMENTS:

SW1 – SW3 - Stormwater Detention Calculations 1:100 Yr ARI, 'Critical Storm' Duration

DESIGN:

The pre development flow off the two allotments is 24.08L/sec. Lot 702 has an assumed roof area of 194m². The entire proposed roof area of Lot 702, which is 36.6% roof area of the combined allotments, is to be detained within a 2000L detention tank with 33mm orifice restrictor to outlet of tank to restrict outflow to 2.8L/sec. Remaining 63.4% roof area (existing house on Lot 701) as well as all surface water including paved and pervious areas are to be undetained.

Total post development flows from both sites is 22.05L/sec, less than the allowable 24.08L/sec. 1:100Yr ARI has been calculated.

Overflow from detention tank to be discharged into existing water course at rear of Lot 702 at 2.8L/sec, via a 150 high X 1m long kerb with rock pitching to prevent erosion.

GENERAL NOTES:

1. These calculations are to be read in conjunction with the relevant associated Drawings, Footing Construction Report, Civil Drawings and / or details.
2. All work is to comply with relevant SAA Standards and Guides.

AS 2876-1987: Concrete kerbs and channels (gutters) – manually or machine placed
 AS 2200-2006: Design charts for water supply and sewerage
 AS/NZS 3500: Plumbing and drainage
 AS 3798-1990: Guidelines on earthworks for commercial and residential developments
 AS 4000-1997:
 and General conditions of contract
 AS 2124-1992:

ARRB Special Report 35: Subsurface drainage of road structures
 Australian Rainfall and Run-off Volumes 1 and 2: A guide to flood estimation
 Austroads 2008 – Guide to pavement technology
 NAASRA 1987 – Pavement design
 Storm drainage design in small urban catchments: A handbook for Australian practice
 Water Sensitive Urban Design (WSUD) Engineering Procedure: Stormwater
 Water Services Association of Australia Code (WSAA).

For and on behalf of
TMK Consulting Engineers

Robert Pirone
Senior Civil Design Technical Officer



Ref.: 1707051

Date: 23-Oct-17

Design: BSA

Page: SW1

STORMWATER CALCULATIONS - DETERMINATION OF DETENTION TANK SIZES

Design Storm Intensity Table (mm/hr) - (from <http://www.bom.gov.au/cgi-bin/hydro/has/CDIRSWebBasic>)

STORM LOCATION Adelaide



Latitude 34°59'S; Longitude 138°44'E

Adelaide

DURATION	AVERAGE RETURN INTERVAL (YEARS)						
	1	2	5	10	20	50	100
5 mins	52.60	69.00	89.40	104.00	123.00	151.00	175.00
6 mins	49.10	64.50	83.50	96.70	115.00	141.00	163.00
10 mins	39.80	52.00	66.90	77.10	91.30	112.00	129.00
20 mins	28.30	36.80	46.80	53.40	62.80	76.20	87.30
30 mins	22.70	29.40	37.10	42.30	49.50	59.80	68.30
1 hour	15.20	19.70	24.60	27.90	32.50	39.00	44.40
2 hours	10.10	13.00	16.20	18.30	21.20	25.40	28.90
3 hours	7.92	10.20	12.70	14.30	16.60	19.90	22.50
6 hours	5.24	6.75	8.37	9.44	11.00	13.10	14.90
12 hours	3.45	4.44	5.52	6.23	7.23	8.65	9.83
24 hours	2.22	2.86	3.58	4.05	4.72	5.66	6.44
48 hours	1.38	1.78	2.24	2.55	2.98	3.60	4.11
72 hours	1.02	1.32	1.67	1.90	2.23	2.70	3.10

PRE-DEVELOPMENT

Design ARI (yr) 10 yr
 Design Duration (min) 10 min
 Design Storm Intensity (mm/hr) 77.10 mm/hr

Design Parameters	C	Area (m ²)	% Area Detained
Roof	0.90	334	0.00
Paving	0.75	362	0.00
Grass / Landscaping	0.15	3682	0.00
Other	0.00	0	0.00
Total Area		4378 m²	
	0.26		

Max pre-development flow $Q_i = \sum(C_i A_i / 3600)$:

Roof	6.44 L/s
Paving	5.81 L/s
Grass / Landscaping	11.83 L/s
Other	0.00 L/s

Pre-development flow = 24.08 L/s

Use Max Allowable Flow = 24.08 L/s

Note: The weighted average value of the runoff coefficient, C_w , includes roof, paving, grassed and landscaped areas of the site.

POST-DEVELOPMENT (*Determine Critical Storm)

Design ARI (yr) 100 yr
 Design Duration (min) 40 min
 Design Storm Intensity (mm/hr) 60.33 mm/hr

Design Parameters	C	Area (m ²)	% Area Detained
Roof	0.90	529	36.70
Paving	0.75	465.5	0.00
Grass / Landscaping	0.15	3383.5	0.00
Other	0.00	0	0.00
Total Area		4378 m²	
	0.30		

Summary of Design Flows

Undetained flow, $Q_u = \sum(C_i A_{i,u} / 3600)$:

Roof	5.05 L/s
Paving	5.85 L/s
Grass / Landscaping	8.51 L/s
Other	0.00 L/s

Design undetained flow = 19.41 L/s

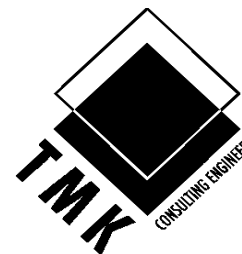
Max. outflows from detention tanks:

Site water runoff	
Pumped	0.00 L/s
Piped	0.00 L/s
Roof water runoff	
Orifice-restricted	2.64 L/s

Total Max. Design Outflow = 22.05 L/s

< 24.08 L/s Allowed ∴ OK

Duration (mins)	Intensity (mm/hr)	Proposed Inflow Rate (L/s)	Proposed Inflow Rate x Duration (L)	Orifice Outflow Rate (L/s)	Orifice Outflow Volume (L)	Net Storage (L)
5	175.00	8.5	2,548	-2.00	-360	2,188
6	163.00	7.9	2,848	-2.00	-432	2,416
7	154.50	7.5	3,149	-2.00	-504	2,645
8	146.00	7.1	3,401	-2.00	-576	2,825
9	137.50	6.7	3,604	-2.00	-648	2,956
10	129.00	6.3	3,757	-2.00	-720	3,037
11	124.83	6.1	3,999	-2.00	-792	3,207
12	120.66	5.9	4,217	-2.00	-864	3,353
13	116.49	5.7	4,410	-2.00	-936	3,474
14	112.32	5.5	4,579	-2.00	-1,008	3,571
15	108.15	5.2	4,724	-2.00	-1,080	3,644
16	103.98	5.0	4,845	-2.00	-1,152	3,693
17	99.81	4.8	4,941	-2.00	-1,224	3,717
18	95.64	4.6	5,013	-2.00	-1,296	3,717
19	91.47	4.4	5,061	-2.00	-1,368	3,693
20	87.30	4.2	5,085	-2.00	-1,440	3,645
25	77.80	3.8	5,664	-2.00	-1,800	3,864
30	68.30	3.3	5,967	-2.00	-2,160	3,807
35	64.32	3.1	6,555	-2.00	-2,520	4,035
40	60.33	2.9	7,028	-2.00	-2,880	4,148
45	56.35	2.7	7,384	-2.00	-3,240	4,144
50	52.37	2.5	7,625	-2.00	-3,600	4,025
55	48.38	2.3	7,749	-2.00	-3,960	3,789
60	44.40	2.2	7,758	-2.00	-4,320	3,438
75	40.53	2.0	8,851	-2.00	-5,400	3,451
90	36.65	1.8	9,606	-2.00	-6,480	3,126
120	28.90	1.4	10,099	-2.00	-8,640	1,459
150	25.70	1.2	11,226	-2.00	-10,800	426
180	22.50	1.1	11,794	-2.00	-12,960	1,166



Ref.: 1707051
Date: 23-Oct-17
Design: BSA
Page: SW2

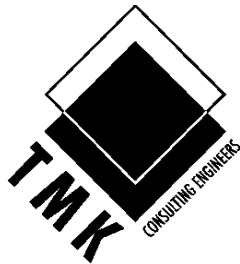
CRITICAL STORM DURATION ORIFICE OUTFLOW

Critical Storm Duration = 40 mins
Max Storage Volume = 4,148 Litres

***Notes:** This calculation is used for determining the critical storm duration at the location shown on the main calculation sheet for the case where the maximum outflow rate from the tank orifice is as shown in the table.

The Net Storage Volume values shown in this table are approximate. The design uses results obtained from calculations where the effects of the change in head in the storage tank and the Time of Concentration have been included.

The critical storm results are shown highlighted in bold italics.



Ref.: 1707051
Date: 23-Oct-17
Design: BSA
Page: SW3

STORMWATER CALCULATIONS - STORMWATER RUN-OFF - ORIFICE-RESTRICTED

Time of Concentration, T_C

Design Storm ARI (yr) 100 yr (from page SW1)
Design Storm Duration (mins) 40 mins (from page SW1)
Design Storm Intensity, i 60.33 mm/hr (from page SW1)

=> For run-off calculations, use $T_C =$ 5.0 mins <=Duration ∴ Use $T_C = 5$ mins.

Design Parameters	C	Area (m ²)	% Area Detained
Roof	0.90	529	36.70
Paving	0.75	465.5	0.00
Grass / Landscaping	0.15	3383.5	0.00
Other	0.00	0	0.00

Detained flow, $Q_d = \sum(C_i A_i / 3600)$:

Roof	2.93 L/s
Paving	0.00 L/s
Grass / Landscaping	0.00 L/s
Other	0.00 L/s

Design detained flow = 2.93 L/s

=> Try the following detention tank design parameters:

Max Allowable outflow from storage = 2.80 L/s (1.87 L/s is still available for outflow)
Number of orifice detention tanks 1 Each tank volume above orifice 2,000 L
Max. head allowed above orifice 1,400 mm => Each Tank Plan Area = 1.43 m²
Outlet coefficient, C_o 0.6
Orifice diameter, D_o 33 mm => Orifice area, $A_o = \pi(D_o/2)^2$ 855 mm²

Graph Time v Flow:

Time (mins)	InFlow (L/s)	OutFlow (L/s)
0	0.00	0.00
5	2.93	0.94
40	2.93	2.63
45	0.00	2.45

Max. Calculated Outflow:

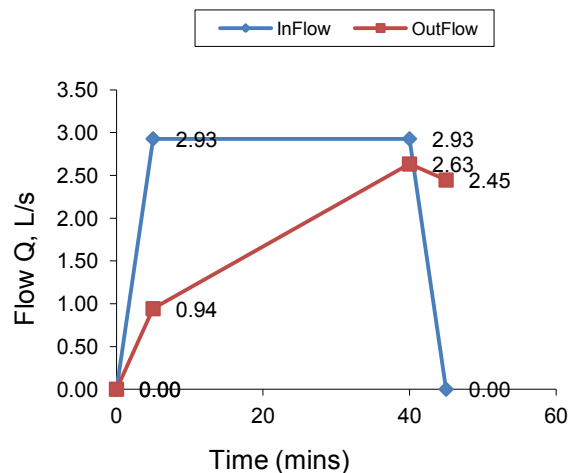
$Q_{max_{out}} = 2.64$ L/s

< 2.80 L/s Max. Allowed ∴ OK

Max. Calculated Head of Water:

$H = 1,310$ mm

< 1,400 mm Max. Allowed ∴ OK



=> Volume of Water To Be Detained:

$V = 1,871$ L
i.e. $V = 1.87$ m³

=>USE

20171506L001A/KSS

9 January 2018

Mr C Wyatt
c/- Phil McMahon Real Estate
607 Anzac Highway
GLENELG NORTH SA 5045

Attention: Mr Allan Edmonds

Dear Sir

FLOOD ADVICE - 23 POTTS ROAD EVANSTON PARK

As requested, we have undertaken an assessment of flooding at the above property and provide the following advice.

Background

It is proposed to subdivide the existing allotment at 23 Potts Road Evanston Park to create two allotments (proposed Lots 701 and 702). A plan showing the proposed land division and the building footprint of a residence to be constructed on the allotment is attached (TMK Drawing 1707051 – C1/PB – dated 23/10/17).

A watercourse runs through the property. This watercourse drains a largely rural catchment lying to the east of the property.

The proposed building footprint encroaches into the watercourse and as a result, the Town of Gawler has required that an assessment of flooding be undertaken to determine an appropriate minimum finished floor level for the proposed residence and to determine the impact on flood levels of the proposed filling for the residence.

Council Requirements

For development adjacent to watercourses, the Town of Gawler requires that:

- The minimum finished floor level for any proposed structures is set to provide protection from a 100 year average recurrence interval (ARI) flood (usually with 300 mm freeboard to the calculated flood level).
- The development does not adversely affect flood levels on adjacent properties.

The proposed development at Potts Road has been assessed in relation to these requirements.

Hydrology

The watercourse through the property has a catchment area of approximately 5 km² and is shown in Figure 1. A short distance upstream of the site, the watercourse divides into two tributaries. The southern tributary has the largest catchment, but also has a flood control dam, which acts to reduce peak flows.

The 100 year ARI peak flow likely to be generated by the catchment has been calculated as a part of work undertaken for the Gawler Stormwater Management Plan. The analysis undertaken for the Stormwater Plan involved construction of a hydrological model of the catchment using RORB, and included modelling of the mitigating effect of the flood control dam on peak flows and allowance for future development of parts of the upstream catchment.

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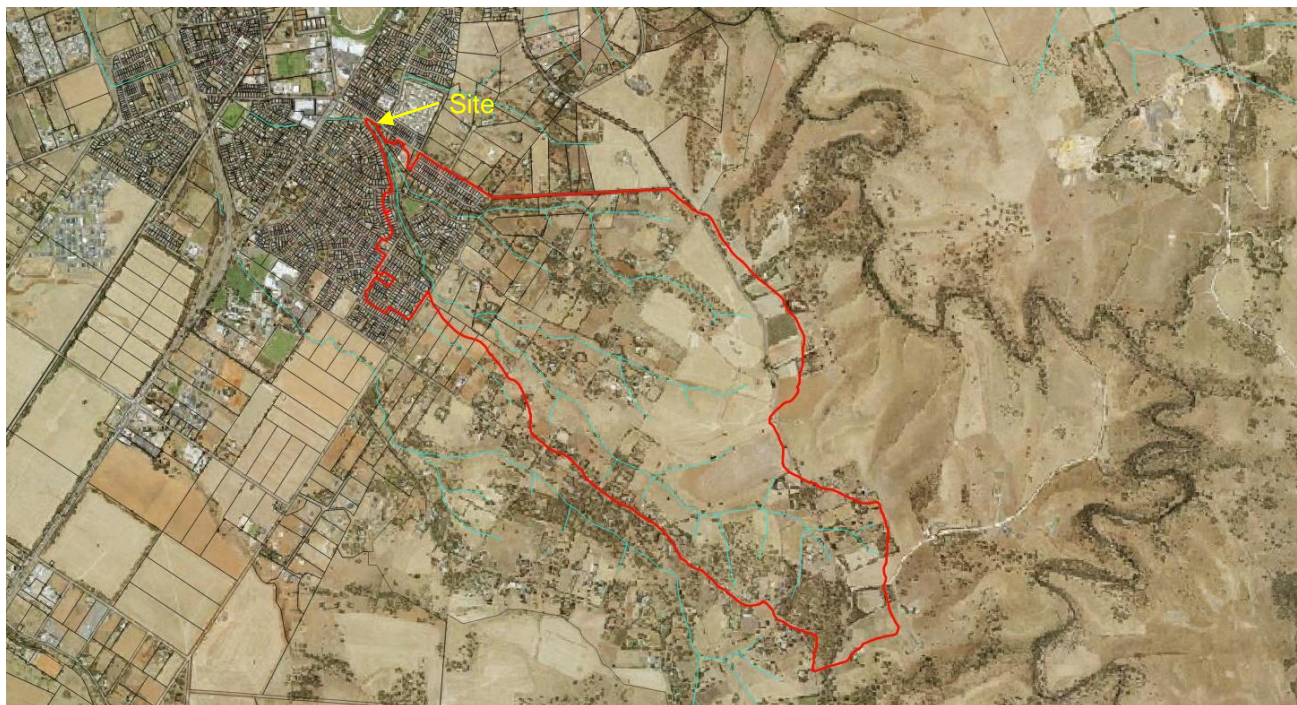
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A 100 year ARI peak flow of 11.4 m³/s was taken from this analysis and has been adopted for the site and used for the calculation of flood levels.

Figure 1: Catchment Area



Flood Level Assessment

Flood levels through the site were calculated using the HECRAS computer model. HECRAS is a hydraulic modelling package which can be used to perform one-dimensional steady flow water surface profile computations.

Modelling was undertaken for two scenarios as follows:

- Scenario 1: Undeveloped Site

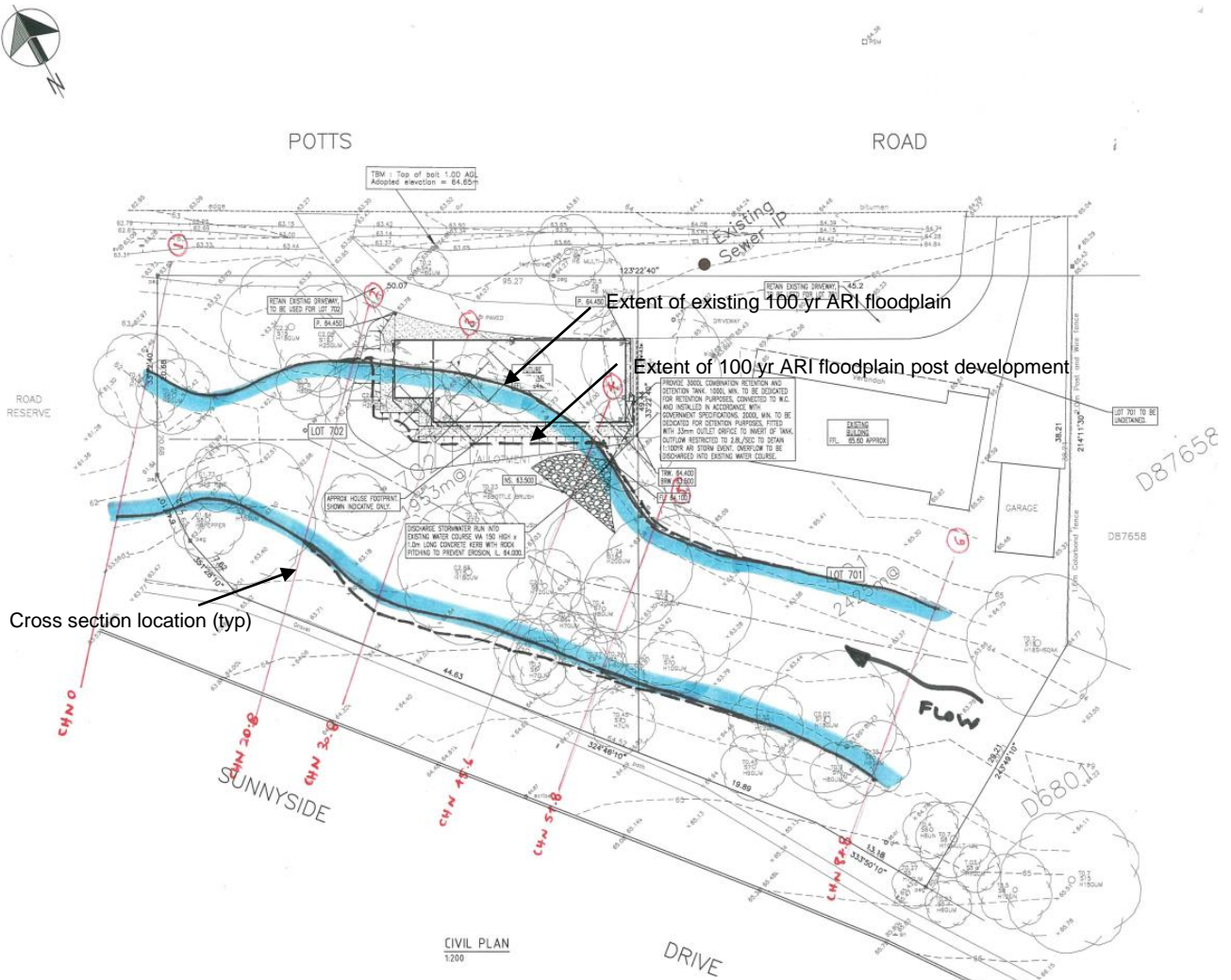
This scenario corresponds to the existing site conditions and was used to determine the base case against which any change in flood level brought about by the proposed development was assessed.

- Scenario 2: Developed Site

This scenario corresponds to the developed site as shown on the TMK Drawings.

The HECRAS model extended from the downstream boundary of Lot 702 to a point within 10 m of the upstream boundary of Lot 701. Cross sections used in the modelling were taken from the survey shown on the TMK drawings. The location of the modelled cross sections is shown in Figure 2 below. For the developed scenario, the cross sections were modified to reflect the fill extents shown on the TMK drawings.

Figure 2: 100 year ARI Floodplain Extents



The channel roughness used in the modelling was taken to be 0.06, based on a visual assessment of the existing creek.

A starting flood level at the downstream boundary of 62.3 mAHd was used. This flood level was taken from broad scale floodplain mapping of the 100 year ARI flood event undertaken for the Gawler Stormwater Management Plan.

Outputs from the HECRAS model are attached and include:

- A longitudinal profile showing the calculated 100 year ARI flood levels with and without the development
- The cross sections used for the existing scenario model; and
- The cross sections used for the developed scenario model.

The analysis showed that the filling for the proposed development will produce a localised increase in flood levels within Lot 702 of between 100 and 200 mm. At the upstream boundary of Lot 702, the increase reduces to 50 mm, with flood levels matching existing 15 m inside of Lot 701.

The calculated 100 year ARI flood level at the upstream boundary of Lot 702 was calculated to be 64.04 mAHD. At the upstream end of the existing residence on Lot 701, the 100 year ARI flood level was calculated to be 64.44 mAHD. The existing residence on Lot 701 has a finished floor level of 65.5 mAHD and is therefore well above the calculated 100 year ARI flood level and would be unaffected by the slight increase in level brought about by the proposed development.

Figure 2 shows the flood extents for the existing and proposed conditions. Due to the relatively steep sided nature of the watercourse, the increase in flood extent within Lot 701 is relatively minor.

Summary

Based on the modelling undertaken for this investigation, it has been concluded that:

- The proposed residence on Lot 702 should have a minimum finished floor level 64.35 mAHD (providing 300 mm freeboard to the 100 year ARI flood level).
- While the filling for the proposed development produces a localised increase in flood level, its effect on Lot 701 is minor, with the existing residence on this property being well above the 100 year flood level. The proposed development will not affect flooding elsewhere in a 100 year ARI event.

We note that the proposed filling extends into the existing floodplain, with the toe of the filling being close to the existing channel invert. The fill batters are shown to be 1V:2H. Flow velocities in the watercourse are calculated to be between 1 and 1.5 m/s in a 100 year ARI event. While the flow velocities are relatively low, there is some risk that erosion of the fill batter could occur. To mitigate against this risk, we would recommend that:

- The filling encroaches not closer to the watercourse than is shown on the TMK Drawings;
- The fill batter be stabilised using densely planted ground covers, or failing this is protected from scour by the placement of rockwork of nominal 300 mm minimum diameter;
- Footings for the proposed residence are pierced through the fill and founded on natural material.

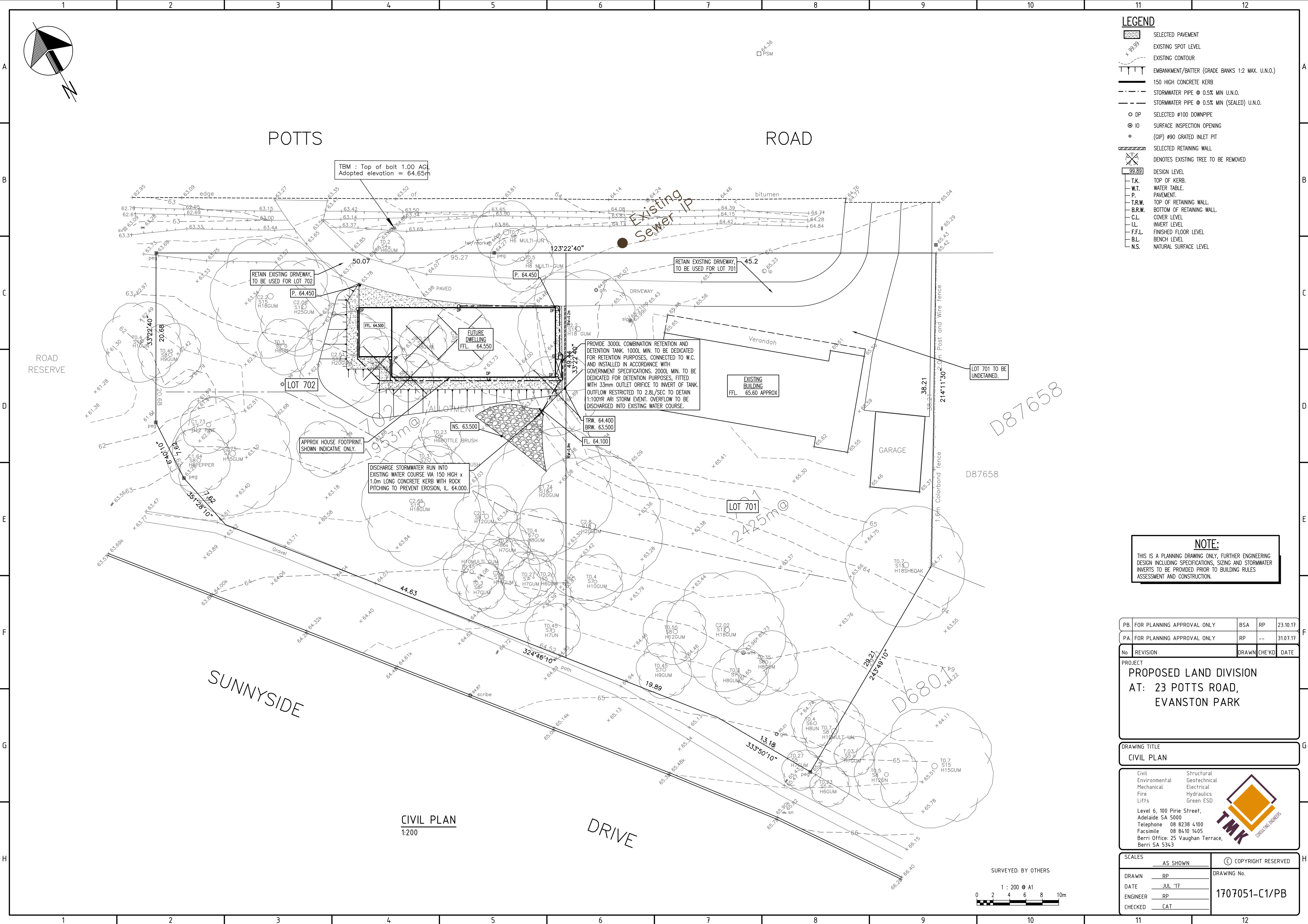
We trust that you will find the above information to be of assistance.

Yours faithfully
TONKIN CONSULTING

A handwritten signature in blue ink, appearing to read "M. Schalk".

KS SCHALK, FIEAust
Chartered Professional Engineer

Enc Proposed Development – TMK Drawing 1707051
HECRAS Calculations
Flood Risk Statement



LEGEND

SELECTED PAVEMENT

EXISTING SPOT LEVEL

NOTE:
THIS IS A PLANNING DRAWING ONLY, FURTHER ENGINEERING DESIGN INCLUDING SPECIFICATIONS, SIZING AND STORMWATER INVERTS TO BE PROVIDED PRIOR TO BUILDING RULES ASSESSMENT AND CONSTRUCTION.

PB	FOR PLANNING APPROVAL ONLY	BSA	RP	23.10.17
PA	FOR PLANNING APPROVAL ONLY	RP	--	31.07.17
No	REVISION	DRAWN	CHE'KD	DATE

PROJECT
PROPOSED LAND DIVISION
AT: 23 POTTS ROAD,
EVANSTON PARK

DRAWING TITLE
CIVIL PLAN

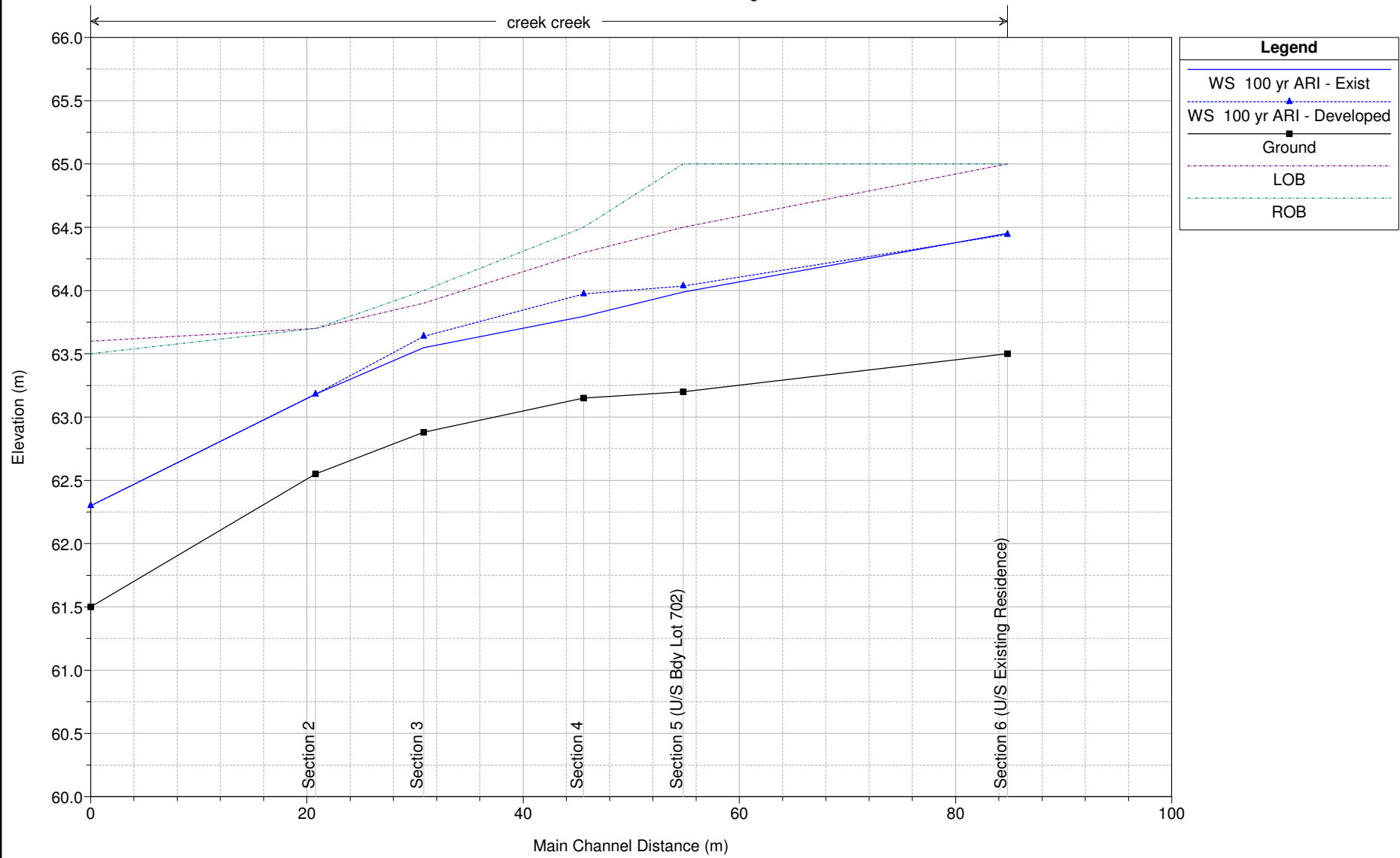
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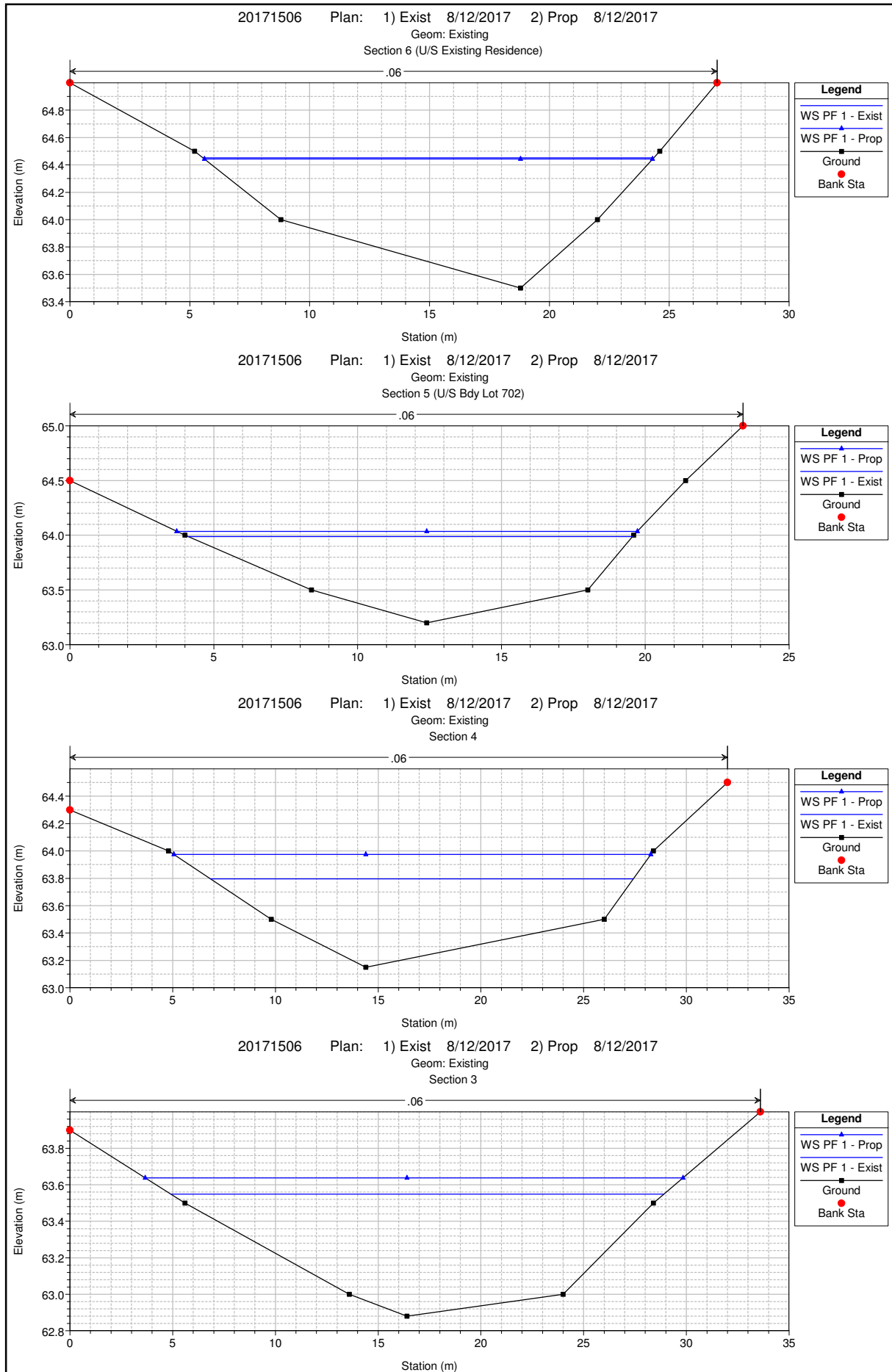
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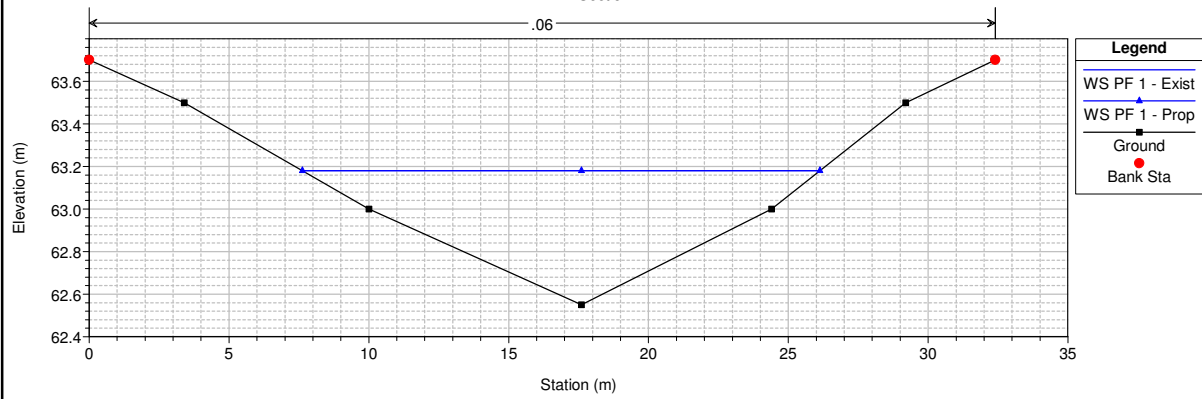
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Geom: Existing

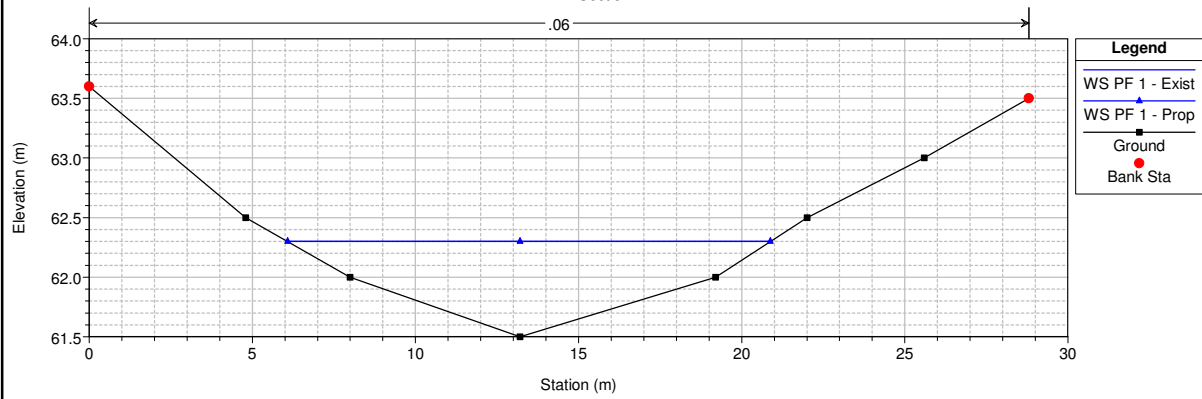


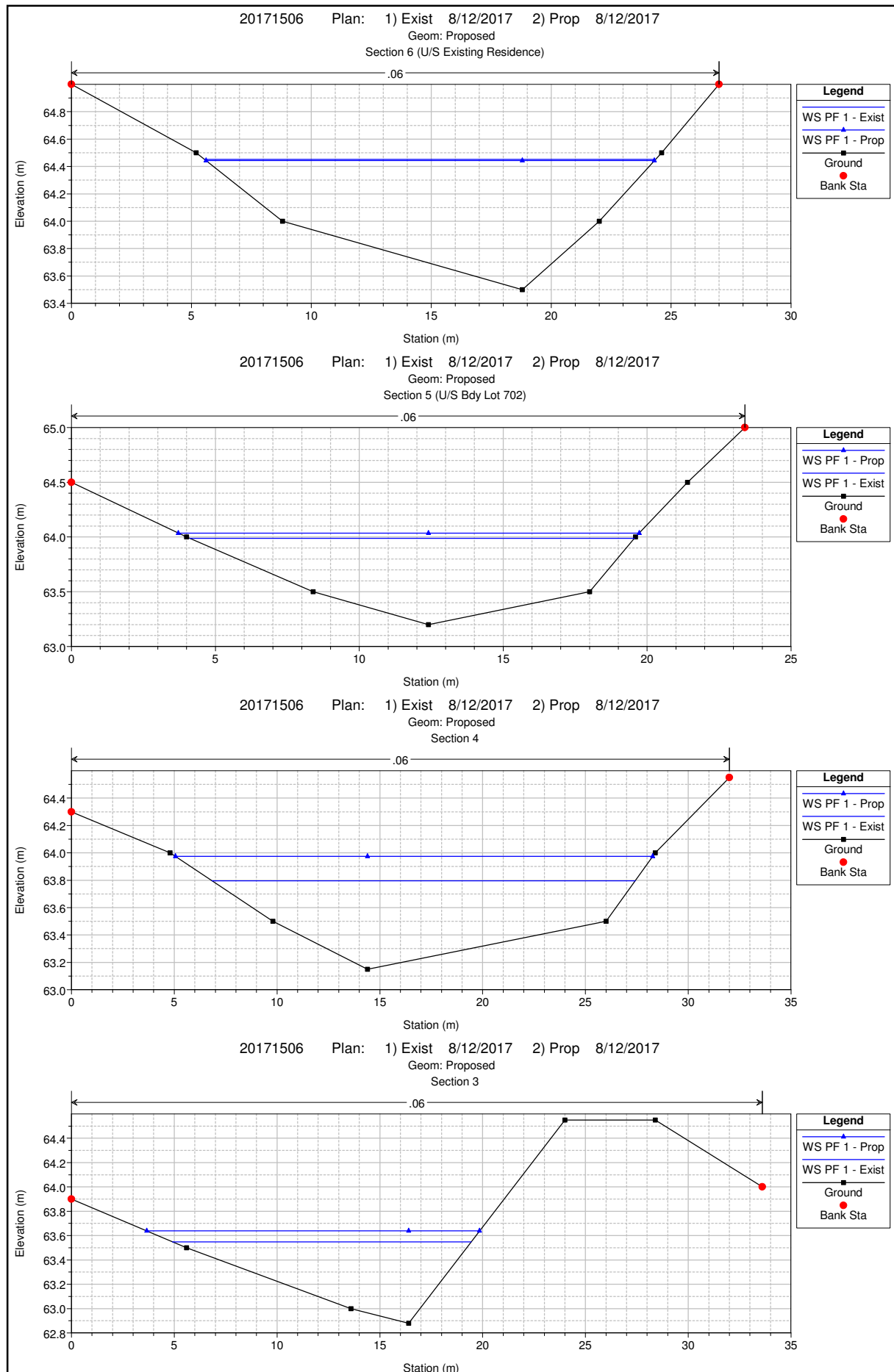


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 Geom: Existing
 Section 2

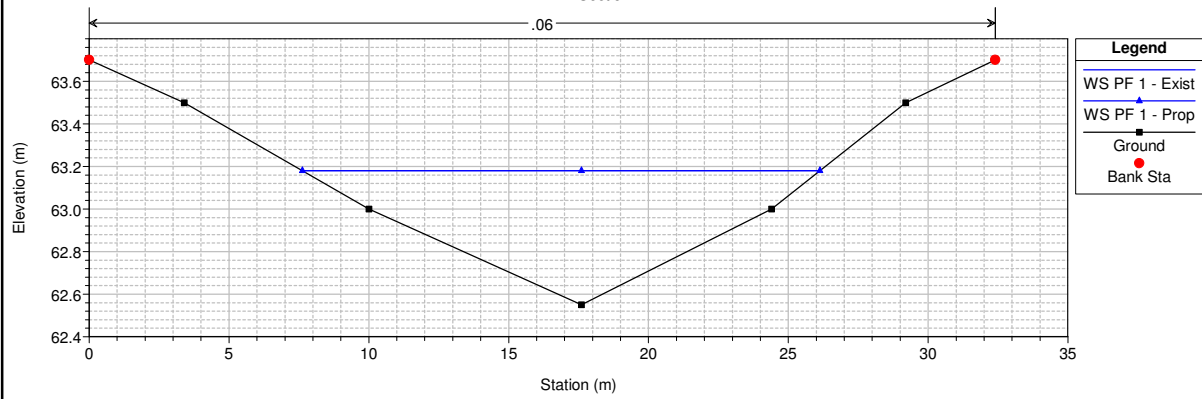


20171506 Plan: 1) Exist 8/12/2017 2) Prop 8/12/2017
 Geom: Existing
 Section 1

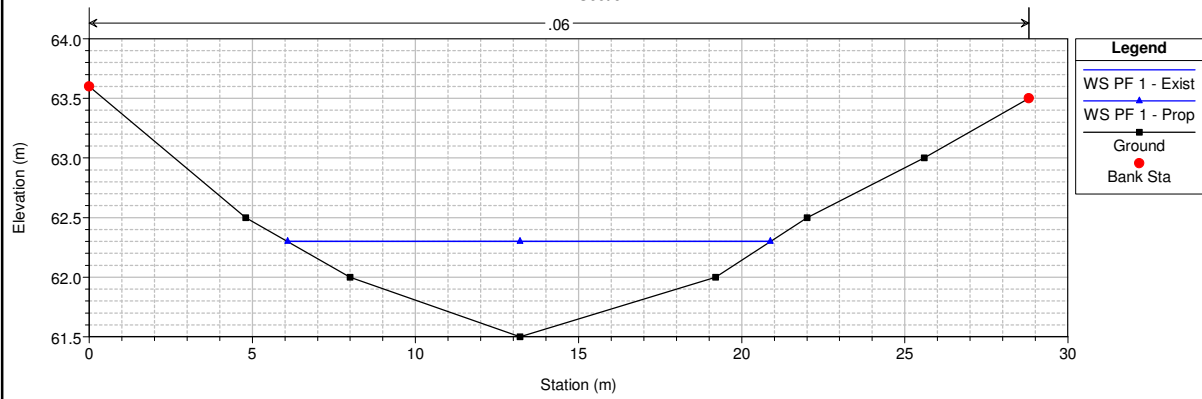




20171506 Plan: 1) Exist 8/12/2017 2) Prop 8/12/2017
 Geom: Proposed
 Section 2



20171506 Plan: 1) Exist 8/12/2017 2) Prop 8/12/2017
 Geom: Proposed
 Section 1



Flood Risk Statement

This statement forms part of, and is to be read in conjunction with, all flood reports and flood related data provided by Tonkin Consulting. Use of the flood reports and flood related data is conditional upon acceptance of this statement.

1. Flood risk is conventionally expressed in terms of Average Recurrence Interval which is the average or expected value of the period between exceedances of a given flood. For example, a flood with an average recurrence interval of 100 years:
 - is expected to be exceeded on average once in 100 years – a 1% probability of being exceeded in any given year
 - is expected to be exceeded at random - at a time which may be within any year of the 100 year interval, or not within the 100 year interval, or it may occur more than once in the 100 year interval.
2. The risk of inundation by flood is not eliminated, when the protection is based on specific Average Recurrence Interval criteria as exceedance of a flood of a specific Average Recurrence Interval is statistically inevitable.
3. Whilst care is taken to maximise the confidence in the predicability of flood risk, a degree of uncertainty is unavoidable.
4. Variations may occur, in the future, to the climate, catchment, watercourse or flood plain which could vary the flood risk.
5. The choice of the level of risk could consider, amongst others, the following factors:
 - likely damages and inconvenience
 - cost and time for replacement and repairs
 - type and use of the structure
 - access and safety during a flood
 - flood insurance cost and availability
 - intended life cycle of the structure
 - attitude of the owners of the structure to the acceptance of risk
 - the cost, practicality and environmental impact of reducing the risk further.
6. Denoted flood levels relate to predicted average water levels. FREEBOARD above a flood level, where noted, is an allowance for expected elevations of actual water levels, due to local disturbances, wave action and other causes, above the average water level, and is NOT A FACTOR OF SAFETY ALLOWANCE.
7. The flood report and data are the property of the client and the client shall determine and accept responsibility for the distribution of the report to others.

Further explanation of matters relating to flood risk is offered if required.

Document # - R0134-023PotRdEsp
Prepared for Phil McMahon Real Estate
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Tree Report – 23 Potts Road, Evanston Park



Executive Summary

The allotment of 23 Potts Road, Evanston Park is subject to residential development including the construction of a dwelling within the northern portion of the allotment. Many trees as well as a small water course exist within and adjacent to this allotment with some trees displaying healthy and structurally sound form while others display less integrity.

The development proposal has been planned to mitigate against unreasonable tree-damaging activity as well as flood concerns relating to the small water course. Many trees within the southern portion of the allotment display health and structural attributes that indicate they

Tree Report prepared by:
Adelaide Arb Consultants
Shane Selway

are worthy of retention during development and as such, this space was avoided to enable their protection.

Three trees located within the vicinity of the development proposal are controlled under the provisions of the *Development Regulations 2008* pertaining to the *Development Act 1993*. These trees include one *Eucalyptus cladocalyx* – Sugar Gum and two *Eucalyptus camaldulensis* – River Red Gum. The health of each of these trees is sustainable however the structural integrity of Trees 1 and 2 is less so. Tree 3 displays both good health and structure and its protection is required and achievable during development activities.

The structure of Tree 1 has partially failed at the primary union situated at four metres above ground level. No options exist to mitigate the potential for stem failure in this case without having severe detrimental effects to tree health. This tree is recommended to be removed despite any consideration to development activities and construction of a dwelling.

Tree 2 displays below average structural integrity with a series of stem bifurcations and codominance as well as included bark unions within the primary structure. Management options exist to enable the retention of this tree for the short term however these techniques will be ongoing and compounded by developmental impacts. Given the structural form of Tree 2, this tree is not considered an appropriate specimen for retention during development.

The retention of Tree 3 will require careful planning and construction techniques. The encroachment required within this trees protection zone is considered 'major encroachment' under the guidelines of Australian Standard AS4970-2009 *Protection of trees on development sites*. This tree however is expected to remain sustainable during and following development as demonstrated within the AS4970-2009 Tree Protection Zone Encroachment Considerations. As expressed within the assessment against these considerations, management options exist to maintain the tree in a sustainable manner.

These management options include the implementation of an altered footing design such as pier and beam footings. Excavation techniques for footing construction as well as services such as electricity, water, sewer, gas, telephone and storm water will also all be required to be conducted using non-destructive techniques and under the supervision of a suitably qualified AQF Level 5 Arboriculturist.

With tree protection and management recommendations outlined within this document implemented correctly, it is expected that Tree 3 will remain in its current condition following the completion of the development construction.

9th April 2018



Thank you for the opportunity to provide you with this advice. Should you require any further assistance or clarification, please do not hesitate to call or email me.

Yours sincerely

A handwritten signature in black ink, consisting of a series of loops and a long trailing line.

SHANE SELWAY

Senior Consulting Arboriculturist

Diploma of Arboriculture

International Society of Arboriculture – Certified Arborist AU-0270A

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Brief

Adelaide Arb Consultants were commissioned by Mr Allan Edmonds of Phil McMahon Real Estate to conduct a comprehensive tree assessment of three trees within and adjacent to the subject property.


The subject property is noted to be a residential allotment at 23 Potts Road, Evanston Park with the trees situated adjacent to the eastern and western boundary alignments.

The trees noted within this report are identified as ***Eucalyptus cladocalyx* - Sugar Gum** and ***Eucalyptus camaldulensis* – River Red Gum** with each displaying variable levels of health, integrity and Useful Life Expectancy.

The assessment criteria included the following attributes:

- Each tree's current health, structure and sustainability within their current environmental conditions.
- Each tree's control status under the current provisions of the *Development Act 1993* including an assessment against the relevant Town of Gawler Principles of Development Control.
- Relevant tree protection requirements under the current guidelines of Australian Standard AS4970-2009 *Protection of trees on development sites* to maintain the trees in their current condition during development and construction activities when appropriate.
- Crown management possibilities that conform to the current guidelines of Australian Standard AS4373-2007 *Pruning of amenity trees* to reduce the risk of potential branch failure and prolong the Useful Life Expectancy of the tree where relevant.
- Any other factors that were relevant to tree management in the situation.

Tree and Environmental Observations

Tree 1		<i>Eucalyptus cladocalyx</i> - Sugar Gum
Assessment Date	27 th February 2018	
GPS Location	34°37'25.45"S 138°44'29.50"E	
Height	16 metres	
Spread (Diameter)	9 metres	
Age	Mature	
Useful Life Expectancy	< 10 years	
Basic Health	Fair to Good	
Basic Structure	Fair to Poor	
Right: Tree 1 when viewed from the east and within the subject allotment.		
Circumference	2.05 metres	
Legislative Control	This tree's trunk circumference when measured at one metre above ground level is greater than two metres and less than three metres and it is therefore classified as a Regulated Tree under the current provisions of the <i>Development Act 1993</i> .	
Root Protection Zones		
Diameter @ Breast Height	0.63 metres	
Tree Protection Zone	= 0.63 x 12 = 7.56 metres as a radius from the centre of the trunk at ground level.	

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Diameter @ Root Buttress	0.69 metres
Structural Root Zone	$= (0.69 \times 50)^{0.42} \times 0.64$ = 2.83 metres as a radius from the centre of the trunk at ground level.

General Observations

Tree 1 is located within the recently divided allotment of 23 Potts Road and within the north western quadrant of this allotment. This tree is labelled Tree 1 on the attached site plan.

The tree consists of a single stem to four metres above ground level at which point the tree has previously been lopped. Three stems originate from the lopping point with each ascending and supporting a small number of radiating lateral branches to create an upright however, irregular structural form of the species.

The trees root zone consists of open soil areas surrounding the stem which has recently been levelled and cleared using machinery to enable development to proceed. While it appears that only minor clearance of the land has occurred, no data was provided to indicate the level of soil change that may have been conducted during the clearance process.

Tree health is considered to be fair to good. Foliage density, colour and size throughout the form are typical of the species and there are no significant signs of pests or disease to indicate health decline or environmental stress.

Tree structure is fair to poor. The primary union at four metres above ground level is defective and partially failed with separation of the union supporting the northern stem (Image 1). Structural attributes within the upper crown above this union are typical of the species however no reasonable remedial treatment or pruning options appear to be present to rectify the defect within the primary structure.



- *Image 1 (Right): The primary union at four metres above ground level which displays partial failure and has an elevated potential for failure.*

Development Plan Assessment

Objectives

The Town of Gawler considers the conservation of regulated trees that provide important aesthetic and environmental benefit.

The subject tree provides important aesthetic benefit to the local area however as an introduced native, its environmental contribution is less significant.

Development should occur in balance with preserving regulated trees that demonstrate one or more of the following attributes:

a) The subject tree contributes to the character and visual amenity of the local area.

The tree is situated within clear view from many public vantage points and displays an upright crown that is typical of the form if considerations is not given to the tree structure. This tree is therefore considered to contribute to the character and visual amenity of the immediate local area.

b) The tree is not indigenous to the local area.

The species *Eucalyptus cladocalyx* is indigenous to Kangaroo Island, the Flinders Ranges and two areas of the Eyre Peninsular.

c) The tree species is not listed as rare or endangered under the *National Parks and Wildlife Act 1972*.

d) The tree does not represent important habitat value for native fauna.

As an introduced native without nesting opportunities, the subject tree is not individually important to habitat of native fauna.

The subject tree is noted to contribute to the character and visual amenity of the local area indicating that it warrants preservation, if possible, during development activities.

Principles of Development Control

Development should have minimum adverse effects on regulated trees.

The development proposal has the potential to cause adverse effects to the future sustainability of the subject tree and due to the proportion of fill that is proposed to be added to its root development area.

A regulated tree should not be removed or damaged other than where it can be demonstrated that one or more of the following apply:

a) The subject tree is not diseased and however it does have a reduced Useful Life Expectancy.

The tree displays fair to good health attributes however has fair to poor structure and its lifetime should be expected to be reduced as a result of stem failure.

b) The tree does not represent a material risk to public or private safety.

While the tree currently represents an acceptable level of risk to public and private safety, development of the allotment in any form will result in an increased target frequency which will in turn result in the tree representing an unacceptable level of risk due to the potential for stem failure impacting a target.

c) The tree is not causing damage to a building.

d) Development that is reasonable and expected is not being restricted by the subject tree.


The proposed location for the construction a dwelling within the allotment is bound by the flood control and protection requirements set out for the allotment at the time of its subdivision. The subject tree will be impacted upon moderately however no alternative options exist to limit the building footprint within the trees root development area.

e) The work is not required for the removal of deadwood, treatment of disease and is not in the general interests of tree health.

The recommended management involves the complete removal of Tree 1.

Tree damaging activity other than removal should seek to maintain the aesthetic appearance and structural integrity of the tree.

The recommended management involves the complete removal of Tree 1.

Tree 2		<i>Eucalyptus camaldulensis</i> - River Red Gum
Assessment Date	27 th February 2018	
GPS Location	34°37'25.69"S 138°44'29.51"E	
Height	10 metres	
Spread (Diameter)	12 metres	
Age	Mature	
Useful Life Expectancy	> 10 years	
Basic Health	Fair to Good	
Basic Structure	Fair to Good	
Right: Tree 2 when viewed from the north east and within the subject allotment.		
Circumference	$1.34 + 1.91 = 3.25$ metres Average Circumference = 1.62 metres	
Legislative Control	This tree has a combined trunk circumference when measured at one metre above ground level that is greater than three metres. The average circumference of these trunks is greater than 0.625 metres and the tree is therefore classified as a Significant Tree under the current provisions of the <i>Development Act 1993</i> .	

Root Protection Zones	
Diameter @ Breast Height	0.41 + 0.58 metres
	$= (0.41)^2 + (0.58)^2$ metres $= 0.71$ metres
Tree Protection Zone	$= 0.71 \times 12$ $= \mathbf{8.52 \text{ metres as a radius from the centre of the trunk at ground level.}}$
Diameter @ Root Buttress	0.78 metres
Structural Root Zone	$= (0.78 \times 50)^{0.42} \times 0.64$ $= \mathbf{2.98 \text{ metres as a radius from the centre of the trunk at ground level.}}$

General Observations

Tree 2 is situated within a central aspect of the allotment 23 Potts Road. This tree is labelled tree 2 on the attached site plan.

The tree consists of a single stem to 800mm above ground level at which point it divides into two ascending stems. The dominant eastern stem further bifurcates at four metres above ground level to create three ascending stems in total. Each of these supports various western biased lateral branches to create an upright and western biased form that is irregular of the species.

The trees root zone consists of open soil areas surrounding the stem which has recently been levelled and cleared using machinery to enable development to proceed. While it appears that only minor clearance of the land has occurred, no data was provided to indicate the level of soil change that may have been conducted during the clearance process.

Tree health is fair to good. Foliage density, colour and size throughout the form are typical of the species and there are no significant signs of pests or disease to indicate health decline or environmental stress.

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Tree structure is fair. The primary union at 800mm above ground level displays included bark while repeated bifurcations creating stem co-dominance are constant throughout the height of the form (Image 2). While some upper crown branch unions display minor included bark also, most are free of recognisable defects. Lateral branches display typical elongation, taper and distribution for the species and good options are present to maintain the structure of this tree.

- *Image 2 (Right): The repeated occurrence of bifurcation within the primary structure, each with minor included bark. This indicates that this defect is due to the genetic makeup of the tree and can be expected to continue throughout the form and its development.*



Development Plan Assessment

Objectives

88. The Town of Gawler considers the conservation of Significant Trees, in Metropolitan Adelaide, that provide important aesthetic and environmental benefit.

The subject tree provides moderate aesthetic benefit to the local area and as an indigenous species that does not display nesting opportunities or links to significant wildlife corridors, has likewise limited but some environmental value.

Trees are a highly valued part of the Metropolitan Adelaide environment and are important for a number of reasons including high aesthetic value, conservation of bio-diversity, provision of habitat for fauna, and conservation of original and remnant vegetation.

While indiscriminate and inappropriate significant tree removal should be generally prevented, the conservation of significant trees should occur in balance with achieving appropriate development.

The subject tree displays attributes that indicate it is not suitable for retention during development.

Principles of Development Control

322 - Where a Significant Tree achieves at least one of the following attributes, development should aim to preserve it:

a) The tree makes a moderate contribution to the character and amenity of the local area.

The medium sized and irregular crown form for the species make a moderate amenity contribution to the local area.

b) The tree is indigenous to the local area however its species is not listed as a rare or endangered species under the *National Parks and Wildlife Act 1972*.

c) The tree does not represent important habitat for native fauna.

While the species is indigenous to the local area, no nesting hollows were notable within the structure and the tree is isolated from integral wildlife corridors by residential development.

d) The tree is not part of a wildlife corridor of a remnant area of native vegetation.

While the species is indigenous to the local area it is separated from integral wildlife corridors by the development of residential areas of Gawler and Evanston.

e) The tree is not important to the maintenance of biodiversity within the local environment.

The trees contribution to biodiversity is limited due to its isolation from wildlife corridors.

f) The tree does not form a notable visual element within the local area.

The subject tree is not particularly striking, remarkable, eminent or worthy or particular note from public vantage points surrounding the allotment.

323 – Development should be undertaken so that it has minimum adverse effect on the health of a Significant Tree.

The subject tree displays poor structural attributes and management options to enable the trees sustainable retention for the long term are limited. Furthermore, the tree's health will be adversely affected by development activities.

324 – Significant Trees should be preserved and tree-damaging activities should not be undertaken unless one or more of the following exist:

(a) In the case of tree removal;

(1) (i) the tree is not diseased however its Useful Life Expectancy is reduced.

The tree displays below average structural form with a series of bifurcations causing codominant stems. The primary union displays included bark indicating that there is an elevated potential for failure at this point. Stem failure will result in the trees Useful Life Expectancy being surpassed.

(ii) the tree does not represent an unacceptable risk to public and private safety.

The potential for stem failure is elevated due to the presence of codominant stems that originate from an included bark union within the primary structure however the current target frequency is low and therefore the failure is not likely to result in damage or injury. It should be noted that the development proposal will increase the target frequency and therefore will increase the risk associated with this tree.

(iii) the tree is not located within a Bushfire Prone Area.

(iv) the tree has not caused and is not threatening to cause damage to a substantial building or structure of value.

All other reasonable remedial treatments and measures have been determined to be ineffective.

The concern relating to the structural integrity of the specimen may be alleviated for a moderate time frame using pruning techniques outlined within Australian Standard ASS4373-2007 *Pruning of amenity trees* however given the repeated nature of bifurcation throughout the form, the pruning management required can be expected to be ongoing and has the potential to limit future management options by removing available pruning nodes through reduction pruning.

- (2) it has been demonstrated that all reasonable alternative development options and design solutions have been considered to prevent substantial tree-damaging activity occurring.**

The proposed location of the construction of a dwelling within the established allotment is restricted to flood mitigation options and no alternative options exist within the allotment that will have a lesser effect to the subject tree or other equally important tree assets.

- 325 – The development does involve ground work activities including excavation, filling, and sealing of surrounding surfaces however these activities will be undertaken to enable the aesthetic appearance, health and integrity of a significant tree, including its root system to not be adversely affected.**


The Development Application involves the placement of fill over the root system of the subject tree which should be expected to have a severe effect to tree sustainability if its retention is required during development. Retention of this tree is not recommended due to tree structure concerns as well as impacts to tree sustainability as a result of development activities.

- 326 - The subject land has already been divided however development within the allotment is expected to result in a substantial tree-damaging activity occurring to a significant tree.**

The Development Application involves the placement of fill over the root system of the subject tree which should be expected to have a severe effect to tree sustainability if its retention is required during development. Retention of this tree is not recommended due to tree structure concerns as well as impacts to tree sustainability as a result of development activities.

No alternative options exist to enable reasonable development within the allotment that will have a lesser effect to the subject tree or other equally important tree assets.

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Tree 3		<i>Eucalyptus camaldulensis</i> - River Red Gum
Assessment Date	27 th February 2018	
GPS Location	34°37'26.12"S 138°44'30.70"E	
Height	12 metres	
Spread (Diameter)	14 metres	
Age	Mature	
Useful Life Expectancy	> 10 years	
Basic Health	Good	
Basic Structure	Fair to Good	
Right: Tree 3 when viewed from the north east and adjacent to the road surfacing of Potts Road.		
Circumference	2.10 metres	
Legislative Control	This tree's trunk circumference when measured at one metre above ground level is greater than two metres and less than three metres and it is therefore classified as a Regulated Tree under the current provisions of the <i>Development Act 1993</i> .	

Root Protection Zones	
Diameter @ Breast Height	0.62 metres
Tree Protection Zone	$= 0.62 \times 12$ = 7.44 metres as a radius from the centre of the trunk at ground level.
Diameter @ Root Buttress	0.68 metres
Structural Root Zone	$= (0.68 \times 50)^{0.42} \times 0.64$ = 2.81 metres as a radius from the centre of the trunk at ground level.

General Observations

Tree 3 is located within the eastern neighbouring allotment to the subject land and is approximately one and a half metres from the dividing boundary fence. This tree is labelled Tree 3 on the attached site plan.

The tree consists of a single ascending stem that supports many radiating lateral branches. These branches support many further radiating lateral branches to create an upright domed form that is typical of the species.

The trees root zone consists of open soil surrounding the stem which has recently been levelled and cleared using machinery throughout the western extent of the root zone. A dwelling exists ten metres east of the stem which makes a minor encroachment within the trees root development area. The lands to the west of Tree 3 have been levelled and cleared in a similar state to the areas surrounding Trees 1 and 2 however no data was provided to determine the proportion of soil alteration that may have occurred.

Tree health is fair to good. Foliage density, colour and size throughout the form are typical of the species and there are no significant signs of pests or disease to indicate health decline or environmental stress.

Tree structure is good to fair. Root and trunk buttressing is well formed which leads into good trunk and branch taper. Branch unions throughout the form are free of recognisable defects while distribution of lateral branches is typical for the species and good options are present to maintain the structure of this tree.

Development Plan Assessment

Objectives

The Town of Gawler considers the conservation of regulated trees that provide important aesthetic and environmental benefit.

The subject tree provides important aesthetic benefit to the local area and makes a minor contribution to the environmental maintenance of the local area.

Development should occur in balance with preserving regulated trees that demonstrate one or more of the following attributes:

- a) The subject tree contributes to the character and visual amenity of the local area.**
The tree is situated within clear view from many public vantage points and displays a well-formed crown that makes a positive contribution to the character and visual amenity of the immediate local area.
- b) The tree is indigenous to the local area.**
The species *Eucalyptus camaldulensis* is indigenous to a vast proportion of mainland Australia as well as most areas throughout Gawler.
- c) The tree species is not listed as rare or endangered under the *National Parks and Wildlife Act 1972*.**
- d) The tree does not represent important habitat value for native fauna.**
The subject tree does not display suitable nesting opportunities and it is not individually important to habitat of native fauna.

The subject tree is noted to contribute to the character and visual amenity of the local area and is indigenous to its location indicating that it warrants preservation during development activities.

Principles of Development Control

Development should have minimum adverse effects on regulated trees.

The development proposal is achievable without the need to cause adverse effects to the future sustainability of the subject tree however development design solutions will need to be implemented to enable this.

A regulated tree should not be removed or damaged other than where it can be demonstrated that one or more of the following apply:

- a) The subject tree is not diseased and does not have a short life expectancy.**
The tree displays good health attributes and will remain sustainable both during and post the development construction process.

-
- b) The tree does not represent a material risk to public or private safety.**
 - c) The tree is not causing damage to a building.**
 - d) Development that is reasonable and expected is not being restricted by the subject tree.**
 - e) The work is not required for the removal of deadwood, treatment of disease and is not in the general interests of tree health.**

While the development proposal is not expected to cause tree-damaging activities to occur to the subject tree, no significant benefit to general tree health will arise because of the development.

Tree damaging activity other than removal should seek to maintain the aesthetic appearance and structural integrity of the tree.

The development proposal will not result in substantial damage to the structural integrity or health sustainability of the regulated tree noted within this document.

Discussion

The allotment of 23 Potts Road, Evanston Park is the subject of potential development activities including the construction of a dwelling and associated infrastructure. This allotment is situated within an established residential area however its situation enabled the establishment and retention of many medium to large eucalypts within and adjacent to its boundaries.

Development options have been considered for this allotment involving the construction of a dwelling within the northern portion. This area has been designated for development due to the presence of a minor water course that traverses the southern half of the allotment. Flood mitigation options therefore have restricted development potential within the allotment.

Three trees were identified within the area of development that are likely to be affected by construction activities. These trees are identified as *Eucalyptus cladocalyx* – Sugar Gum and *Eucalyptus camaldulensis* – River Red Gum. Each of the trees identified as mature and display medium to large sized crowns.

The trunk circumference of the subject trees exceeds two metres at one metre above ground level indicating that each is controlled as a Regulated Tree under the provisions of the *Development Act 1993*. Tree 2 displays a trunk circumference that exceeds three metres and as stated within the *Development Regulations 2008*, Regulated Trees with a circumference greater than three metres are controlled as Significant Trees under the *Development Act 1993*.

The health of each of the trees is noted to be fair to good or good. With this view, management to improve tree health is not required however some management will be to maintain the health of trees required to be retained.

The structure of the trees is variable. Tree 1 displays fair to poor structure due to the partial failure of the primary union while Tree 2 displays below average crown architecture and an included bark union within its primary structure. The structural management of these trees is unlikely to be successful in maintaining the trees in a sustainable condition for the long term and their removal is recommended. Further to this, the level of encroachment caused by the development will add further complications to the sustainable retention of these trees at an acceptable level of risk to public and private safety.

The development proposal will cause encroachment to occur within the TPZ of each of the subject trees. This level of encroachment equates to 24.4% for Tree 1, 58.4% for Tree 2 and 28.35% for Tree 3. In all cases, the proportion of encroachment exceeds the definition of 'Minor Encroachment' described within Australian Standard AS4970-2009 *Protection of trees on development sites*.

The structural attributes noted for Trees 1 and 2 indicate that these trees are not suitable for retention during development and therefore, given all of the relevant information relating to tree structure and potential damage during development, their removal is recommended.

Tree 3 however, displays good health and structural attributes and has an extended Useful Life Expectancy. Management options are therefore required to assist in maintaining this tree in a sustainable form both during and following the completion of the development. Australian Standard AS4970-2009 prescribed the following criteria to investigate the trees potential to withstand developmental impacts.

1. Location and distribution of roots

The subject tree has been cultivated within an open soil garden area with a dwelling located to the east of the stem. This dwelling is situated separate from the tree and therefore no known restrictions to root development are present. The trees species identification however, is noted to develop a dimorphic root system meaning root density is situated within both surface soil areas as well as deeper soil profiles. As such, the development proposal encroachment will not cause damage to all root density within the area of the development footprint.

2. Potential for root mass to be damaged or removed

As stated above, the tree species identification develops a dimorphic root system meaning root density is situated within both surface soil areas as well as deeper soil profiles and not all root density will be damaged within the area of the development footprint. Services to the dwelling will require careful design and construction methodology to ensure root development is not disturbed or damaged during construction activities.

3. Tree species and its tolerance to root disturbance

The species *Eucalyptus camaldulensis* – River Red Gum is well known for its ability to adapt to altered growing environments. This is due to its indigenous cultivation zones being concentrated on river banks and flood zones. The changing soil conditions of flood sediment and erosion in these areas are similar to those caused by development and as such, the species is highly tolerant to root disturbance.

4. Age, vigour and tree size

The subject tree is noted to be mature however displays good vigour and vitality. The health of the subject tree will also assist in its potential to remain sustainable both during and following the proposed development within the Tree Protection Zone.

5. Lean and tree stability

The tree displays an upright form and there is no indication that it is unstable in the ground. The development proposal does not occur within the tree's Structural Root Zone and therefore no alterations to tree integrity is likely.

6. Soil characteristics, topography & drainage

The Soil Association Map of the Adelaide Region shows that the soils within the tree location are of red-brown clay soils with granular structure. The subject species is indigenous to these soil profiles and it displays no signs of disease, health decline or instability.

7. The presence of existing structures

The existing dwelling to the east is expected to have restricted root development to a minor extent however this dwelling does not encroach within the trees Tree protection Zone. No other known restrictions exist within the vicinity of the tree.

8. Design Factors

Design factors to limit soil disturbance have been considered and implemented including the implementation of pier and beam footing design to the proposal to maintain root development within the Tree Protection Zones.

With the above considerations, the development proposal will require tree protective measures to be carefully implemented for the duration of its construction. The design of footings and installation of serves will be required to be conducted using tree sensitive measures however as these measures exist, it is expected that Tree 3 will remain sustainable following the completion for the development process.

It is also acknowledged that Trees 1 and 2 could be maintained using the same tree protection measures that have been outlined for Tree 3. The structural integrity of Trees 1 and 2 are below average to poor and as such, each of these trees is not recommended to be maintained during development activities.

I therefore support the application to remove Tree 1 and 2 and construct a dwelling and associated infrastructure as shown on the attached site plan. The following tree protection measures are provided to enable the sustainable retention of Tree 3.

Recommendations

The removal of Trees 1 and 2 is recommended for the following reasons:

- Tree 1 displays partial failure of the primary union.
- Tree 1 has a high potential for stem failure as a result of the partially failed stem union.
- Tree 2 displays a repeated occurrence of co-dominant stems and bark inclusions throughout its primary structure.
- Tree 2 has an elevated potential for branch and stem failure as a result of the presence of included bark unions throughout its primary structure.
- Both Trees 1 and 2 are restricting development that is reasonable and expected. The situation of the small water course to the south as well as other Regulated/Significant Trees indicates that the location of the proposed dwelling will have the least possible proportion of tree impact within the allotment while achieving reasonable development.
- There are no reasonable remedial treatments, development options or design solutions available to reduce the potential for stem failure from either tree and prolong their Useful Life Expectancies.

The following management recommendations are provided to manage the health, structure and aesthetic condition of Tree 3 during development and construction activities:

Tree Protection Zone establishment

- Define and outline the Tree Protection Zone around the subject tree within the subject allotment. The Tree Protection Zone radius is to be equivalent to that expressed within the Root Protection Zones of the Tree and Environmental Observations. **Note:** Tree Protection Zones consider both crown and root protection.
- Determine and mark all areas of acceptable encroachment within the allotment to allow for Tree Protection Zone alterations as per the attached Development Proposal Plan.
- Construct a tree protective fence at the perimeter of the Construction Zone and within the subject allotment only. Perimeter fencing such as the Colorbond® fence at the eastern allotment boundary must be retained to form part of the tree protection fence also. Where perimeter fencing is to be removed, temporary fencing will be required to maintain the restricted area of the Tree Protection Zone. The tree protection fence location has been delineated within the attached development proposal plans as the blue perforated line.
- Tree protection fencing must be constructed and in place before any machinery or materials are brought to site and before the commencement of any works including pier excavation. Once erected, this fencing must not be moved or altered without the approval of the project arborist.
- Fencing materials must comply with the guidelines of Australian Standard AS4687-2007 *Temporary fencing and hoardings*. Fence panels should be fitted with shade cloth to reduce the transport of dusts and particulate matter. This will also reduce the potential for undesirable liquids to be inadvertently projected into the Tree Protection Zone.
- All visible faces of the Tree Protection Zones to the construction area must be signed with appropriate Tree Protection Zone signage. A copy of such is attached at the completion of this report and may be duplicated as required without permission. No alterations to the Tree Protection Zone sign however are permissible without written consent from the author.



- The following is an extract from Australian Standard AS4970-2009 *Protection of trees on development sites* demonstrating tree protection fencing however, should any part of the tree protection fence construction become problematic, immediate consultation with the project arborist is recommended.

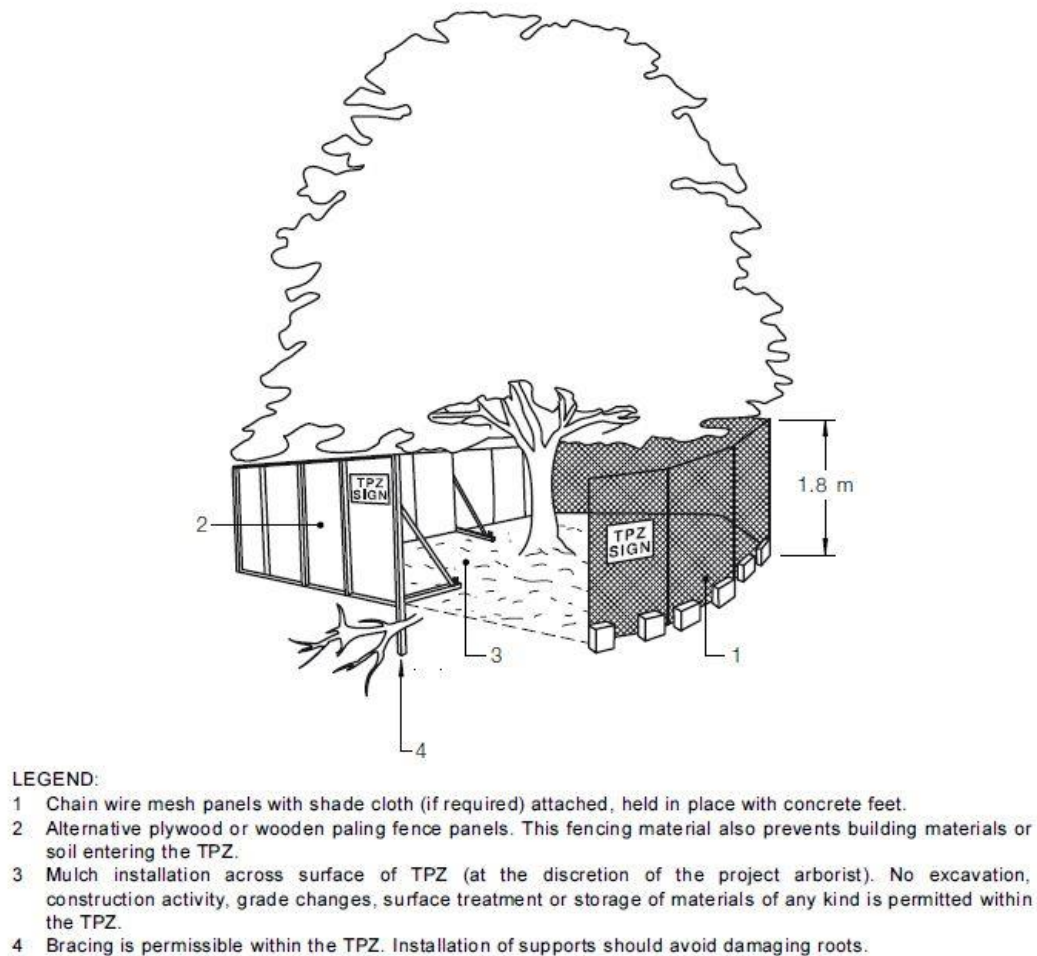


FIGURE 3 PROTECTIVE FENCING

Above: Australian Standard AS4970-2009 Protection of trees on development sites, p16.

Other Tree Protection Measures

- Remove all weeds within the Tree Protection Zone (by hand or use of appropriate herbicide such as glyphosate-based chemicals) and cover the entire available open earth area between the retaining wall and the western boundary fence with composted mulch, 100 millimetres in depth.
- Soil moisture levels should be monitored on a regular basis by the project arborist and a temporary irrigation system may be required throughout the confines of the Tree Protection Zone.

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- The following activities are not permissible within the open earth areas of the Tree Protection Zone:-

- | | |
|---|---|
| 1. Machine excavation including trenching | 8. Placement/storage of fill |
| 2. Storage of materials | 9. Lighting of fires |
| 3. Preparation of chemicals including cement products | 10. Soil level alterations |
| 4. Parking of vehicles and plant | 11. Temporary or permanent installation of utilities and signs |
| 5. Refuelling | 12. Physical damage to the tree including attaching anything to the tree. |
| 6. Dumping of waste | |
| 7. Washing and cleaning of equipment | |

Development Design and Construction Considerations

The development proposal in its current stage includes the construction of a dwelling and associated services within the northern half of the allotment. This will cause a substantial encroachment to occur within the trees TPZ area and therefore, the following building design considerations need to be expressed in the design phase of the development process.

- Services to the dwelling including but not limited to **sewer, water, gas, telephone, electricity** and **storm water** are to be installed outside of the Tree Protection Zone. Where these services are proposed to be installed within the Tree Protection Zone, non-destructive excavation methods will be required for their installation.
- The design of the dwelling footing is to be of a pier and beam style. This design is to allow for air ventilation to the areas of the soil profile below the dwelling being supported by piers.
- Any alteration to the soil gradient (including for the construction of footings within the Tree Protection Zone) will be required to be conducted using non-destructive excavation techniques under the supervision of a suitably qualified AQF Level 5 Arboriculturist.
- Pavement surfacing that traverses within the Tree Protection Zone must be constructed above the existing soil gradient without alteration and incorporate the use of pervious materials. Gravel and decking are also acceptable.
- Certification of Tree Protection Compliance as per AS4970-2009 is required to be undertaken by a suitably qualified AQF Level 5 Arboriculturist as per the following Developmental Timeline extract.

Development Compliance

Through various stages of development, compliance certification provided in writing by a suitably qualified AQF Level 5 Arboriculturist is required.

These are outlined as follows with compliance recommended to be supplied to council as a condition of Development Approval:

INDICATIVE STAGES IN DEVELOPMENT AND THE TREE MANAGEMENT PROCESS

Stage in development	Tree management process	
	Matters for consideration	Actions and certification
Planning (Sections 2 and 3)		
Site acquisition	Legal constraints	
Detail surveys	Council plans and policies Planning instruments and controls Heritage Threatened species	Existing trees accurately plotted on survey plan
Preliminary tree assessment	Hazard/risks Tree retention value	Evaluate trees suitable for retention and mark on plan Provide preliminary arboricultural report and indicative TPZs to guide development layout
Preliminary development design	Condition of trees Proximity to buildings Location of services Roads Level changes Building operations space Long-term management	Planning selection of trees for retention Design review by proponent Design modifications to minimize impact to trees
Development submission	Identify trees for retention through comprehensive arboricultural impact assessment of proposed construction. Determine tree protection measures Landscape design	Provide arboricultural impact assessment including tree protection plan (drawing) and specification
Development approval	Development controls Conditions of consent	Review consent conditions relating to trees
Pre-construction (Sections 4 and 5)		
Initial site preparation	State based OHS requirements for tree work Approved retention/removal Refer to AS 4373 for the requirements on the pruning of amenity trees Specifications for tree protection measures	Compliance with conditions of consent Tree removal/tree retention/transplanting Tree pruning Certification of tree removal and pruning Establish/delineate TPZ Install protective measures Certification of tree protection measures

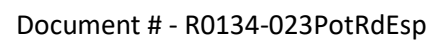
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Construction (Sections 4 and 5)		
Site establishment	Temporary infrastructure Demolition, bulk earthworks, hydrology	Locate temporary infrastructure to minimize impact on retained trees Maintain protective measures Certification of tree protection measures
Construction work	Liaison with site manager, compliance Deviation from approved plan	Maintain or amend protective measures Supervision and monitoring
Implement hard and soft landscape works	Installation of irrigation services Control of compaction work Installation of pavement and retaining walls	Remove selected protective measures as necessary Remedial tree works Supervision and monitoring
Practical completion	Tree vigour and structure	Remove all remaining tree protection measures Certification of tree protection
Post construction (Section 5)		
Defects liability/ maintenance period	Tree vigour and structure	Maintenance and monitoring Final remedial tree works Final certification of tree condition

NOTES:

- 1 Owing to variations in planning legislation this table is a general indication of the process only.
- 2 Certification of tree protection and condition should be carried out by the project arborist.

Site Plan



**Tree
Protection
Zone**



NO ACCESS

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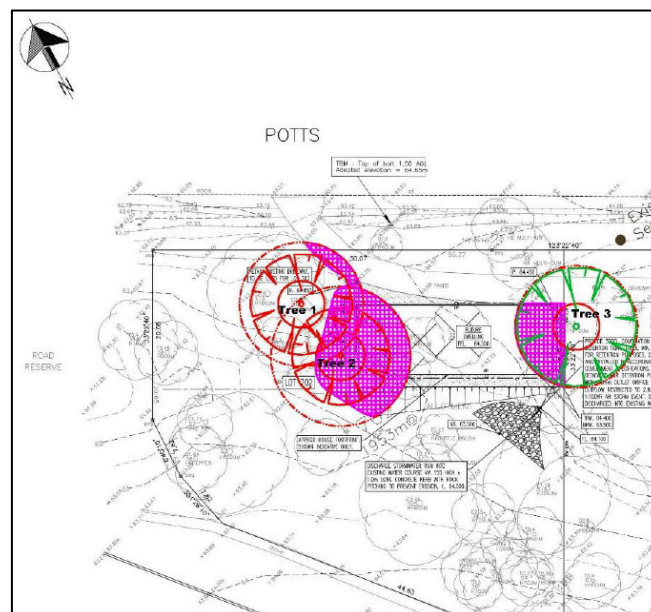
Email: dn@dn.com.au

Web: www.dn.com.au

Arboriculture - Botany - Ecology - Eucalypt Research

Tree Report – 23 Potts Road, Evanston Park, SA

Arboricultural assessment of three regulated trees in relation to a proposed development



Arboricultural assessment and report requested by James Booker, Senior Development Assessment Planner at the *Town of Gawler Council*, on the 18th of May 2018.

Arboricultural report prepared by Dean Nicolle following a site inspection and tree assessment on the 23rd of May 2018.

Report dated the 23rd of May 2018.

BACKGROUND

The proposed development of land at 23 Potts Road in Evanston Park has the potential to impact on three regulated trees located on the subject site (see Figure 1).

This report assesses the three trees with regard to their retention worthiness, and recommends an appropriate Tree Protection Zone (TPZ) and High Use Setback (HUS) for each tree.

Important generic information regarding the Tree Protection Zones and High Use Setbacks is provided; following which each of the trees is individually assessed. The report is concluded by a summary of findings and recommendations.

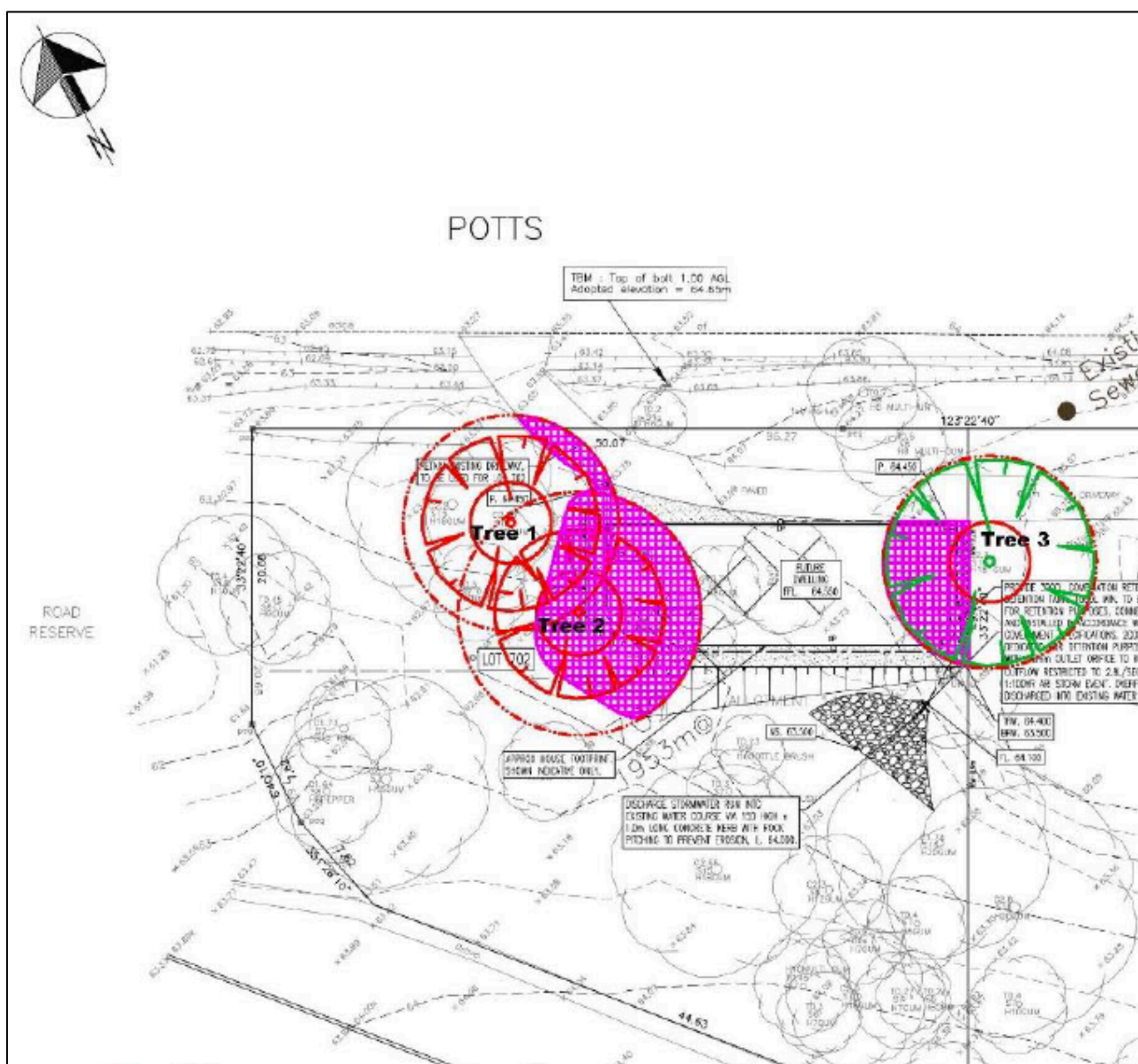


Figure 1. Extract from the site plan in the Shane Selway report, indicating the location of the three trees subject to this report.

METHODOLOGY

This tree assessment has been conducted in accordance with Australian Standard *AS4970-2009 Protection of Trees on Development Sites* (2009), which provides best practices for the planning and protection of trees on development sites. The Standard provides guidance on how to determine which trees are appropriate for retention, and on the means of protecting those trees during construction.

The Tree Protection Zones (TPZs) have been calculated using methods which conform to *AS 4970*, as detailed below. Information and recommendations provided in this report concerning variations to the calculated TPZ, and allowable encroachments within the TPZ are in accordance with the guidelines provided in the Australian Standard (*AS 4970*).

The retention worthiness of each tree reflects its overall ‘value’, and is based on the following data:

- Historical significance (*National Trust of South Australia*);
- Legal status (*Development Act 1993*);
- Tree origin;
- Current health;
- Further life expectancy;
- Biodiversity value;
- Landscape value;
- Tree structure; and
- Risk to safety

Each tree was scored for each of these nine characteristics (see Table 1). The sum of scores for the tree provides a total score - The higher the total score, the more valuable the tree (see Table 2). The total score for a tree can vary from -110 (lowest point value for all nine characteristics) to 120 points (highest point value for all nine characteristics).

Table 1. Scoring for retention worthiness. The characteristics and character states used to score each tree to determine its retention priority.

Historical significance (NTSA*)	<i>National importance</i> Score: 40	<i>State importance</i> Score: 30	<i>Regional importance</i> Score: 20	<i>Local importance</i> Score: 10	<i>Not listed on NTSA¹</i> Score: 0			
Legal status	<i>Significant</i> Score: 10		<i>Regulated</i> Score: 5		<i>Other</i> Score: 0			
Origin	<i>Remnant</i> Score: 10	<i>Remnant/semi</i> Score: 8	<i>Semi-remnant</i> Score: 5	<i>Semi- / planted</i> Score: 3	<i>Planted</i> Score: 0	<i>Planted / weed</i> Score: -5	<i>Weed</i> Score: -10	
Health	<i>Excellent</i> Score: 10	<i>Above average</i> Score: 8	<i>Average</i> Score: 5	<i>Below average</i> Score: 3	<i>Poor</i> Score: 0		<i>Very poor</i> Score: -10	<i>Dead</i> Score: -20
Further life expectancy	<i>30+ years</i> Score: 10	<i>20+ years</i> Score: 8	<i>10–20+ years</i> Score: 5	<i>10–20 years</i> Score: 2	<i><10–20 yrs</i> Score: 0	<i><5–10 yrs</i> Score: -5	<i><5 years</i> Score: -10	<i><2 yrs</i> Score: -20
Biodiversity	<i>Very high</i> Score: 10	<i>High</i> Score: 8	<i>Moderate</i> Score: 5	<i>Low</i> Score: 2	<i>Negligible</i> Score: 0		<i>Invasive</i> Score: -10	
Landscape	<i>Very high</i> Score: 10	<i>High</i> Score: 8	<i>Mod to high</i> Score: 5	<i>Moderate</i> Score: 3	<i>Low to mod</i> Score: 0		<i>Low</i> Score: -10	
Structure	<i>Excellent</i> Score: 10		<i>Above average</i> Score: 5		<i>Average</i> Score: 0	<i>Below average</i> Score: -5	<i>Poor</i> Score: -10	<i>Very poor</i> Score: -20
Risk to safety	<i>Very low</i> Score: 10	<i>Low</i> Score: 7	<i>Low to mod</i> Score: 4		<i>Moderate</i> Score: 0	<i>Mod to high</i> Score: -5	<i>High</i> Score: -10	<i>Very high</i> Score: -20

Table 2. Retention worthiness by tree score. The five retention worthiness categories, indicating for each category the score required, the general description, and the development constraints appropriate.

Retention worthiness	Score	General description	Development constraints
Very highly worthy of retention	>64 points	Remnant or semi-remnant trees in sound health, with a long life expectancy, of superior structure, and with a significant biodiversity value and landscape value	Priority 1A trees are relatively rare and should be retained by appropriate development design and construction.
Highly worthy of retention	45 to 64 points	Trees in sound health and/or with a long life expectancy, of generally sound structure (or where defects can be practically mitigated or managed), and usually with a significant biodiversity value and/or landscape value.	Priority 1 trees should be retained by appropriate development design and construction.
Moderately worthy of retention	30 to 44 points	Trees in sound healthy and/or with an expected moderate to long-life expectancy, of reasonable structure (or where defects can be mostly mitigated or managed), and of moderate to high biodiversity value and/or landscape value	Priority 2 trees should be retained wherever possible, by appropriate development design and construction.
Scarcely worthy of retention	10 to 29 points	Trees often of reduced health and/or having a short to moderate life expectancy, and/or may have some structural flaws, and are generally of lower biodiversity value and/or lower landscape value	Priority 3 trees should not constrain site development but may be retained if the proposed design and construction allows.
Not worthy of retention	<10 points	Trees in poor health and/or having a short life expectancy, and/or have significant structural flaws that cannot be practically mitigated or managed, and/or are of no or little biodiversity value and/or landscape value	Priority 4 trees should not constrain site development and should be removed in the case of site development, even if they do not constrain site development.

¹ National Trust of South Australia register of significant trees.

TREE PROTECTION ZONES (TPZs) – Generic information

The Tree Protection Zone (TPZ) also relates to the *roots of the tree*, and is necessary to *maintain the health of the tree* during and following the proposed development of the site, by limiting construction activities and machinery access within the TPZ.

The Tree Protection Zone does not indicate the root extent (root spread) of the tree, as the root extent is usually greater than the TPZ in most trees. The TPZ merely designates the area in which soil disturbance must be minimised (and therefore root damage minimised) in order to maintain the health, longevity and stability of the tree.

A Tree Protection Zone is not a ‘sterile zone’ or an ‘exclusion zone’ for all activities and development, but instead defines the area around the tree in which tree-sensitive design and construction techniques *must* be employed, in order to maintain the health, longevity and structure of the tree.

The TPZ has been calculated using a method that conforms to the *Australian Standard for the Protection of Trees on Development Sites (AS 4970)*. The Australian Standard allows for the use of species- and tree-specific data to modify the factorial (up or down) to be more specific to the tree being assessed; i.e. relating to the tolerance of the species to root disturbance and the age class of the tree for its species. The adjustment of the factorial from a minimum of 6 (for young trees of species highly tolerant of soil disturbance) to a maximum of 18 (for old trees of species highly susceptible to soil disturbance) will result in a larger or smaller TPZ for individual trees compared to the generic factorial of 12 which is used where data on the species and individual tree have not been taken into account.

AS 4970 suggests that Tree Protection Zones be capped at a minimum of 2.0 metres from the centre of the tree (regardless of whether the calculated TPZ is actually smaller than this figure) and capped at a maximum of 15.0 metres from the centre of the tree (regardless of whether the calculated TPZ is actually larger than this figure). However there is *no biological basis* for the lower or upper capping of TPZs, and as such, TPZs are not capped here. All TPZ distances are a minimum distance required (in metres) from the centre (trunk) of the tree at natural ground level.

Encroachment of up to 10% of the area of the TPZ is acceptable provided the encroached area of TPZ is gained elsewhere on the subject site and adjoining the outer edge of the TPZ. Encroachment within more than 10% of the area of the recommended TPZ may detrimentally affect the health of the tree by extensively severing or otherwise damaging the root system of the tree. *Pre-existing developed areas (e.g. fully sealed surfaces) within the calculated TPZ radius are not considered part of the effective TPZ area.*

Activities that should be excluded from the TPZ include any mechanical soil removal (excavation), deposition (storage of fill) or cultivation (disturbance) associated with the proposed development, whether for earthworks, trenching, landscaping, or other associated works.

Non-linear fence or pylon footings (i.e. bored pier/post holes and screw-pile piers) are acceptable within the TPZ. As such, structures constructed using pier and beam footings are possible within the TPZ. Other structures and construction activities within the TPZ (such as residential driveways, footpaths, roadways, built-form structures, etc.) may be acceptable in some cases, provided tree-sensitive design and construction methods are employed, which may include:

- 1) Laying services within piping or conduits under the TPZ using directional under-boring.
- 2) Construction of hard surfaces (including roadways, driveways, footpaths and floors) over existing soil levels (to avoid the excavation of natural soil) and using structural soil as fill and open-sealed or permeable paving where necessary.
- 3) Pier & beam or screw-pile constructed structures that do not require area-excavation (cut) or linear-excavation (trenching) of soil.
- 4) Hand excavation in association with other root-sensitive excavation (e.g. a soil vacuum) to enable larger-sized roots to be retained in-situ. Such excavation is usually used as an exploratory method to ascertain the location and depth of larger-sized roots, which may dictate the required levels/positions of infrastructure.
- 5) Like-for-like replacement of any exiting surfaces or structures in the TPZ with new surfaces or structures constructed in the same position where within the TPZ.

HIGH USE SETBACKS (HUSs) – Generic information

The High Use Setback (HUS) relates to the *crown of a tree*, and is recommended to maintain an acceptable level of risk to property and to safety from the subject tree following the development of the site.

Recommended minimum high use setbacks are formulated using numerous factors, including:

- Tree species and species characteristics including root structure, canopy characteristics and failure tendency;
- Current tree size and structure;
- Trunk habit and canopy weighting;
- Anticipated future tree size and structure under existing and proposed conditions;
- Anticipated site use.

High Use Setbacks may vary from one side of a tree to the other due to the trunk lean, crown weighting and other crown characteristics of the tree, as well as the topography of the site.

Encroachment of private open space and residential structures into the High Use Setback is likely to increase the risk to safety associated with a tree to an unacceptable level over the long-term (i.e. following any development of the site). All residential dwellings and at least 50% of the private open space for each residence should occur outside of the HUS, with highest-use areas preferentially located outside of the HUS.

TREE ONE



Figure 2. Tree One. Looking approximately west from the subject site.

TREE ASSESSMENT – *Tree One*

Species: *Eucalyptus cladocalyx* subsp. *petila* (sugar gum).

Key references: Nicolle (2016). *Taller Eucalypts for Planting in Australia - Their Selection, Cultivation and Management*. Pp. 66 – 67.

Nicolle (2013). *Native Eucalypts of South Australia*. Pp. 34 – 35.

Legal status: A **regulated** tree as defined by the *Development Act 1993*.

- *Species:* *Eucalyptus cladocalyx*
- *Trunk circ. at one metre:* 2.08 metres
- *Distance to dwelling/pool:* Not applicable for this species
- *Bushfire Risk:* Excluded area
- *Living/dead status:* Alive
- *Exemptions:* No generic exemptions

<u>Biodiversity value:</u>	Moderate. A reproductively mature specimen of a locally exotic Australian native species; no bird-habitable hollows are evident.
<u>Landscape value:</u>	Moderate to high. The tree is conspicuous from Potts Road.
<u>Species origin:</u>	Exotic to the locality.
<u>Tree origin:</u>	Certainly planted.
<u>Estimated age:</u>	25 – 45 years.
<u>Health:</u>	Above average.
<u>Actual life expectancy:</u>	Another 20+ years.
<u>Useful life expectancy:</u>	Exceeded.
<u>Structure:</u>	Very poor. The primary trunk trifurcation has extensive decay (see Figure 3).
<u>Risk to safety:</u>	Currently considered to be moderate and marginally unacceptable, and increasing over time.

WORTHINESS FOR RETENTION – *Tree One*

Tree One is considered to be **not worthy of retention** (score -17).
It is recommended that the tree be removed in the case of site development.

TREE PROTECTION ZONE (TPZ) – *Tree One*

As the tree is not worthy or retention, a TPZ is not provided for this tree.

STRUCTURAL ROOT ZONE (SRZ) – *Tree One*

As the tree is not worthy or retention, a HUS is not provided for this tree.



Figure 3. The primary trunk trifurcation in Tree One, which is structurally defective and has a very high likelihood of structural failure.

TREE TWO



Figure 4. Tree Two. Looking approximately west from the subject site.

TREE ASSESSMENT – *Tree Two*

Species: *Eucalyptus camaldulensis* subsp. *camaldulensis* (river red gum).

Key references: Nicolle (2016). *Taller Eucalypts for Planting in Australia - Their Selection, Cultivation and Management*. Pp. 56 – 59.

Nicolle (2013). *Native Eucalypts of South Australia*. Pp. 44 – 45.

Legal status: A **regulated** tree as defined by the *Development Act 1993*.

- *Species:* *Eucalyptus camaldulensis*
- *Trunk circ. at one metre:* 2.55 metres
- *Distance to dwelling/pool:* Not applicable for this species
- *Bushfire Risk:* Excluded area
- *Living/dead status:* Alive
- *Exemptions:* No generic exemptions

<u>Biodiversity value:</u>	High. A reproductively mature specimen of a locally indigenous species; no bird-habitable hollows are evident.
<u>Landscape value:</u>	Moderate. The tree is quite visible from Potts Road.
<u>Species origin:</u>	Indigenous to the locality.
<u>Tree origin:</u>	Certainly planted.
<u>Estimated age:</u>	20 – 40 years.
<u>Health:</u>	Above average.
<u>Actual life expectancy:</u>	Another 20+ years.
<u>Useful life expectancy:</u>	Another 20+ years.
<u>Structure:</u>	Average. Although some primary junctions are acutely-angled, they are healthy and appear to be structurally sound.
<u>Risk to safety:</u>	Currently considered to be low and acceptable.

WORTHINESS FOR RETENTION – *Tree Two*

Tree Two is considered to be **moderately worthy of retention** (score 39).

TREE PROTECTION ZONE (TPZ) – *Tree Two*

A TPZ of 4.8 metres radius from the centre of the tree has been calculated.

This TPZ is based on the species having a high tolerance to soil disturbances and the tree being a mature specimen of the species (50 to 180 years old) = multiplying factor of nine. Thus: 0.796 (trunk diameter at breast height) x 6 = 4.8 metres.

Any development proposed within the TPZ of the tree should consider the information and guidelines provided in the *TREE PROTECTION ZONES (TPZs) – Generic information* section of this report.

HIGH USE SETBACK (HUS) – *Tree Two*

A HUS of 12.0 metres radius from the centre of the tree to the west hemisphere and 6.0 metres radius from the centre of the tree to the east hemisphere is recommended.

This HUS considers the biased trunk lean and canopy weighting of the tree and the anticipated increase in the size of the tree over time.

Any development proposed within the HUS of the tree should consider the information and guidelines provided in the *HIGH USE SETBACKS (HUSs) – Generic information* section of this report.

TREE THREE



Figure 5. Tree Three. Looking approximately south-west from the subject site.

TREE ASSESSMENT – Tree Two

Species: *Eucalyptus camaldulensis* subsp. *camaldulensis* (river red gum).

Key references: Nicolle (2016). *Taller Eucalypts for Planting in Australia - Their Selection, Cultivation and Management*. Pp. 56 – 59.

Nicolle (2013). *Native Eucalypts of South Australia*. Pp. 44 – 45.

Legal status: A **regulated** tree as defined by the *Development Act 1993*.

- *Species:* *Eucalyptus camaldulensis*
- *Trunk circ. at one metre:* 2.10 metres
- *Distance to dwelling/pool:* Not applicable for this species
- *Bushfire Risk:* Excluded area
- *Living/dead status:* Alive
- *Exemptions:* No generic exemptions

<u>Biodiversity value:</u>	High. A reproductively mature specimen of a locally indigenous species; no bird-habitable hollows are evident.
<u>Landscape value:</u>	Moderate to high. The tree is conspicuous from Potts Road.
<u>Species origin:</u>	Indigenous to the locality.
<u>Tree origin:</u>	Certainly planted.
<u>Estimated age:</u>	20 – 40 years.
<u>Health:</u>	Above average.
<u>Actual life expectancy:</u>	Another 20+ years.
<u>Useful life expectancy:</u>	Another 20+ years.
<u>Structure:</u>	Above average.
<u>Risk to safety:</u>	Currently considered to be low and acceptable.

WORTHINESS FOR RETENTION – *Tree Three*

Tree Three is considered to be **highly worthy of retention** (score 46).

TREE PROTECTION ZONE (TPZ) – *Tree Three*

A TPZ of 3.9 metres radius from the centre of the tree has been calculated.

This TPZ is based on the species having a high tolerance to soil disturbances and the tree being a mature specimen of the species (50 to 180 years old) = multiplying factor of nine. Thus: 0.653 (trunk diameter at breast height) x 6 = 3.9 metres.

Any development proposed within the TPZ of the tree should consider the information and guidelines provided in the *TREE PROTECTION ZONES (TPZs) – Generic information* section of this report.

HIGH USE SETBACK (HUS) – *Tree Three*

A HUS of 12.0 metres radius from the centre of the tree to the north hemisphere and 8.0 metres radius from the centre of the tree to the south hemisphere is recommended.

This HUS considers the biased trunk lean and canopy weighting of the tree and the anticipated increase in the size of the tree over time.

Any development proposed within the HUS of the tree should consider the information and guidelines provided in the *HIGH USE SETBACKS (HUSs) – Generic information* section of this report.

SUMMARY of FINDINGS and RECOMMENDATIONS

A summary of my arboricultural findings for the three trees subject of this report is provided below.

Tree One

- Not worthy of retention.
- It is recommended that the tree be removed in the case of site development.

Tree Two

- Moderately worthy of retention.
- Calculated Tree Protection Zone of 4.8 metres radius.
- Recommended High Use Setback of 12.0 metres radius to the north hemisphere and 6.0 metres radius to the south hemisphere.

Tree Three

- Highly worthy of retention.
- Calculated Tree Protection Zone of 3.9 metres radius.
- Recommended High Use Setback of 12.0 metres radius to the north hemisphere and 8.0 metres radius to the south hemisphere.

I thank you for the opportunity to provide this arboricultural assessment and report. If you require further information or clarification please contact me for assistance.



Dean Nicolle
Ph.D.; B.Sc.(Hons.) Botany; B.App.Sc. (Natural Resource Management).

From: DPTI:Gawler East Link Road Project
To: [James Booker](#)
Subject: RE: Land division - 23 Potts Rd.
Date: Friday, 13 April 2018 09:43:10 AM
Attachments: [image001.jpg](#)
[image002.gif](#)
[image003.gif](#)
[image004.gif](#)
[image005.gif](#)
[3005564-20171207-23 POTTS.PDF](#)

Hi James,

Thank you for your email.

As you are aware, Potts Road will be upgraded and widened within the existing road corridor as part of the Gawler East Link Road Project.

Although the property boundary for 23 Potts Road extends further North than the other properties on the Southern side of Potts Road and a consistent boundary alignment would be desirable, there are no plans to undertake Property Acquisition from 23 Potts Road at this time. It is proposed to design a reduced road cross-section in front of 23 Potts Road to avoid acquisition.

Council must consider the ultimate cross section, streetscape and building setback requirements as appropriate when determining the suitability of the new building envelope at 23 Potts Road.

Kind regards,

Gawler East Link Project Team

Department of Planning, Transport and Infrastructure

T 1300 282 939 • E dpti.gawlereastlinkroadproject@sa.gov.au

www.dpti.sa.gov.au



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From: James Booker [<mailto:James.Booker@gawler.sa.gov.au>]

Sent: Tuesday, 3 April 2018 3:25 PM

To: DPTI:Gawler East Link Road Project <DPTI.GawlerEastLinkRoadProject@sa.gov.au>

Cc: Jessica Lewig <Jessica.Lewig@gawler.sa.gov.au>

Subject: Land division - 23 Potts Rd.

Dear Sir/Madam,

Please find the referral that was sent through to DPTI late last year regarding this application for land division at 23 Potts Rd, Evanston Park.

A referral to DPTI is not required under Schedule 8 of the Development Regulations 2008. Council seeks your comments in regards to the future Gawler East Link Road and its alignment

Attachment 6

From: [Dean Nobbs](#)
To: [James Booker](#)
Subject: RE: 23 Potts Road, Evanston Park
Date: Thursday, 08 March 2018 05:04:51 PM
Attachments: [image001.jpg](#)
[image002.jpg](#)
[image003.jpg](#)
[image004.jpg](#)
[image005.jpg](#)
[image006.jpg](#)

Hi James,

I reviewed the Tonkin flood report and they have addressed the issues of:

1. Setting a floor level based on HEC-RAS modelling of the watercourse. Current floor level is adequate.
2. Potential for increasing the risk of flooding adjacent properties as a result of reducing the watercourse flow area. Impact on upstream flood level is limited to the upstream Lot.
3. Increased risk of erosion of fill in the watercourse. The applicant should provide erosion control on the batter to reduce the risk of erosion of the batter during high flow events. It will be important to protect the toe of the batter to reduce the risk of undermining.

It's not ideal to be filling in the watercourse, however the watercourse is most likely low in environmental value and the impact of filling in the watercourse is most likely low.

It is noted that there is a tree on the western side of the proposed building which is going to be impacted by filling over the trunk and root zone. This tree has not been shown as being removed.

See you next Thursday.

Thanks James.

Kind Regards,

Dean Nobbs | Senior Development & Environmental Engineer Consultant
Town of Gawler | PO Box 130 Gawler SA 5118
Mobile 0422 150 775
www.gawler.sa.gov.au

From: James Booker
Sent: Tuesday, 06 March 2018 12:31 PM
To: Dean Nobbs <Dean.Nobbs@gawler.sa.gov.au>
Subject: FW: 23 Potts Road, Evanston Park

Hi Dean,

The applicant for the Potts Rd land division has provided some flood information from Tonkins for this DA.

Please let me know what you think.

Cheers

James Booker | Senior Development Assessment Planner
Town of Gawler | PO Box 130 Gawler SA 5118
Ph (08) 8522 9224



Site visit 16 August 2017



