

SOUTHERN  
MIDLANDS  
COUNCIL



# ATTACHMENTS

## SPECIAL COUNCIL MEETING

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Wednesday 9<sup>th</sup> February 2022  
10.00 a.m.

<b>Item 4.1</b>	Attachment 1- Development Application Documents Attachment 2 – TasWater Span Attachment 3 - Representations
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**APPLICATION FOR PLANNING PERMIT – USE AND DEVELOPMENT**  
**Subdivision Development**

Use this form to apply for planning approval in accordance with section 57 and 58 of the *Land Use Planning and Approvals Act 1993*

**Applicant / Owner Details:**

**Owner / s Name** JMG Engineers and Planners OBO DFY Investment Pty Ltd

Postal Address 117 Harrington Street Phone No: 6231 2555  
 Hobart 7000 Fax No:

Email address [planning@jmg.net.au](mailto:planning@jmg.net.au)

**Applicant Name**  
 (if not owner)

Postal Address Phone No:  
 Fax No:

Email address:

**Description of proposed use and/or development:**

Address of new use and development: 10 East Bagdad Road, Bagdad 7030

Certificate of Title details CT 36069/1

Description of proposed use or development: 56 Residential Lots Subdivision with one public open space; constructing new stromwater infrastructure; demolishing existing buildings; creating new road; removing the existing track

Current use of land and buildings for each title: One residential building (CT 36069/1)

E.g. are there any existing buildings on these titles?  
 If yes, what are the main buildings used as?

Please tick ✓ answer

Is the property Heritage Listed: Yes  No

Please attach any additional information that may be required by Part 8.1 Application Requirements of the Planning Scheme.

Signed Declaration



**I/we hereby apply for a planning approval to carry out the use or development described in this application and in the accompanying plans and documents, accordingly I declare that:**

1. The information given is a true and accurate representation of the proposed development. I understand that the information and materials provided with this development application may be made available to the public. I understand that the Council may make such copies of the information and materials as, in its opinion, are necessary to facilitate a thorough consideration of the Development Application. I have obtained the relevant permission of the copyright owner for the communication and reproduction of the plans accompanying the development application, for the purposes of assessment of that application. I indemnify the Southern Midlands Council for any claim or action taken against it in respect of breach of copyright in respect of any of the information or material provided.
2. I am the applicant for the planning permit and I have notified the owner/s of the land in writing of the intention to make this application in accordance with Section 52(1) of the *Land Use Planning Approvals Act 1993* (or the land owner has signed this form in the box below in "Land Owner(s) signature);

Applicant Signature	Applicant Name (print)	Date
	Mat Clark	07/09/2021

Applicant Signature	Applicant Name (print)	Date

or

Land Owner(s) Signature	Land Owners Name (please print)	Date
 <small>Delegate of Minister for Infrastructure Michael Ferguson MP</small>		6/12/2021

Land Owner(s) Signature	Land Owners Name (please print)	Date

Salamanca Building Parliament Square  
4 Salamanca Place, Hobart TAS  
GPO Box 536, Hobart TAS 7001 Australia  
Email [permits@stategrowth.tas.gov.au](mailto:permits@stategrowth.tas.gov.au) Web [www.stategrowth.tas.gov.au](http://www.stategrowth.tas.gov.au)  
Ref: SRA-21-463

Mingming Ma  
JMG Engineers and Planners  
By email: [planning@jmg.net.au](mailto:planning@jmg.net.au)

Dear Mingming

**Crown Landowner Consent Granted - 10 East Bagdad Road, Bagdad (bordering Midland Highway)**

I refer to your recent request for Crown landowner consent relating to the development application at 10 East Bagdad Road, Bagdad (bordering Midland Highway) for 56 lot subdivision and stormwater infrastructure.

I, Fiona McLeod, Director Asset Management, State Roads, having been duly delegated by the Minister under Section 52 (1F) of the *Land Use Planning and Approvals Act 1993* (the Act), and in accordance with the provisions of Section 52 (1B) (b) of the Act, hereby give my consent to the making of the application, insofar as it affects the State road network and any Crown land under the jurisdiction of this Department.

The consent given by this letter is for the **making of the application only** insofar as that it impacts Department of State Growth administered Crown land and is with reference to your application dated 8 September 2021, and the documents approved, as follows:

Approved Document Name	Author	Date Received	Notes
Crown Landowner Consent Application Form – 10 East Bagdad Road, Bagdad	Mingming Ma (JMG Engineers and Planners)	08/09/2021	
Planning Permit Application Form – 10 East Bagdad Road, Bagdad, dated 07/09/2021	Mat Clark (JMG Engineers and Planners OBO DFY Investment Pty Ltd)	08/09/2021	
Certificate of Title Documents – Folio Text – Folio Plan – FR 36069/1		08/09/2021	
Concept Services Overall Plan	JMG Engineers and Planners	08/09/2021	J213045PH, Drawing No. P01, Rev. P1, dated 07/09/2021
Concept Services Internal Plan	JMG Engineers and Planners	08/09/2021	J213045PH, Drawing No. P02, Rev. P1, dated 07/09/2021
Typical Sections and Detail	JMG Engineers and Planners	08/09/2021	J213045PH, Drawing No. P03, Rev. P1, dated 07/09/2021
Planning Report	JMG Engineers and Planners	08/09/2021	For DFY Investment Pty Ltd, 10 East Bagdad Road, Bagdad – Subdivision Application, September 2021, Version 1.0, Dated 03/09/2021

Stormwater Report	JMG Engineers and Planners	01/12/2021	10 East Bagdad Road, Proposed Subdivision Stormwater Report, Nov 2021, Version 4 dated 30.11.2021
Traffic Impact Statement	Midson Traffic Pty Ltd	02/11/2021	10 East Bagdad Road, Traffic Impact Assessment, prepared for JMG Engineers, dated 29 October 2021

In giving consent to lodge the subject development application, the Department notes that the works in the State road network will require the following additional consent:

1. The consent of the Minister under Section 16 of the Roads and Jetties Act 1935 to undertake works within the State road reservation.

For further information please visit <http://www.transport.tas.gov.au/road/permits> or contact [permits@stategrowth.tas.gov.au](mailto:permits@stategrowth.tas.gov.au)

2. The consent of the Minister under Section 17B of the *Roads and Jetties Act 1935* to concentrate and discharge drainage to the State road reserve.

The proponent must submit a drainage plan, including catchment area, flows and drainage design for any area discharging to the State road reserve.

If any enlargement of the existing State road drainage infrastructure is required in order to carry any additional drainage, these works must be undertaken under the supervision and to the satisfaction of an officer designated by the Minister. If such works are required, the costs associated with the works will be payable by the proponent.

The proponent is responsible for the ongoing maintenance of their own infrastructure.

It is recommended that the proponent initiates early discussions with the Department concerning the overall stormwater design associated with the application to assist in streamlining the consent process.

For further information please contact Road Assets at [roadassets.utilities@stategrowth.tas.gov.au](mailto:roadassets.utilities@stategrowth.tas.gov.au).

The Department reserves the right to make a representation to the relevant Council in relation to any aspect of the proposed development relating to its road network and/or property.

Yours sincerely



Fiona McLeod  
**DIRECTOR ASSET MANAGEMENT**

Delegate of  
**Minister for Infrastructure and Transport**  
Michael Ferguson MP

6 December 2021

cc: General Manager, Southern Midlands Council

## INSTRUMENT OF DELEGATION

### *Land Use Planning and Approvals Act 1993*

I, **MICHAEL FERGUSON MP**, being and as the Minister of the Crown responsible for the administration of land under section 52(1B)(a) of the *Land Use Planning and Approvals Act 1993* (the Act) pursuant to section 52(1F) of the Act, hereby revoke all previous delegations made under section 52(1B) of the Act as made in the Instruments of Delegations dated 31 July 2018, and hereby delegate the performance and exercise of my functions and powers under the provisions set out below to the persons holding, occupying or acting in the position as listed next to that provision of the said Act, being an office or position within the Department of State Growth.

	<b>Position</b>	<b>Position No</b>
Section 52 (1B)	General Manager State Roads	370470
	Director Network Management	372521
	Director Asset Management	372535
	Manager Transport Network Planning	371844

Dated this 30<sup>th</sup> day of June 2021

SIGNED:



MICHAEL FERGUSON  
Minister for Infrastructure and Transport

JMG Ref: J213045PH

18<sup>th</sup> November 2021

The General Manager  
Southern Midlands Council  
Via [development@southernmidlands.tas.gov.au](mailto:development@southernmidlands.tas.gov.au)  
Attention: Louisa Brown

Dear Louisa,

**SA 2021/13 - DEVELOPMENT APPLICATION - SUBDIVISION 56 LOTS - 10 EAST BAGDAD ROAD, BAGDAD**

Please refer to the following with regards to the 'request for additional information letter' received from Southern Midlands Council, dated 7<sup>th</sup> October 2021.

The required additional information is addressed in the sequence below.

**Validity**

Department of State Growth (DSG) is awaiting Council approval of the updated subdivision plan to issue the Crown Consent.

**1. Subdivision Layout**

*a) Right of Way accesses*

The right of way access has been resolved as the public road now continues to the boundary of 1844 Midland Highway.

*b) Lot 29 - stormwater detention area*

We have undertaken a further assessment of the capacity of the south-eastern corner of 1844 Midland Highway to discharge to the creek and have concluded this is unlikely given the required depth of the pipe. Thus Lot 29 will need to be retained as a detention area and will be transferred to Council as part of its stormwater reticulation network.

*c) Future road connection*

The connection can be a public road now and goes to the boundary of 1844 Midland Highway.

*d) Public Open Space*

Whilst we understand Council want to minimise public open space on this site, a pedestrian connection to a Crown Reserve is a reasonable proposal. Council will need this area to access its stormwater assets thus transferring it to the

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ABN 76 473 834 852  
ACN 009 547 139  
as trustee for Johnstone  
McGee & Gandy  
Unit Trust

[www.jmg.net.au](http://www.jmg.net.au)

Crown is not appropriate. The connection from the proposed road to the creek as a separate lot is logical, but the degree it is considered public open space is a matter for the condition in the permit.

e) *Pedestrian connectivity*

The requested pedestrian connection requested is now incorporated into the bus stop. As Public Open Space, this is considered in the assessment as per (d).

f) *Footpath in the Highway Reserve*

It would seem the width between the curb and the property boundary is largely unchanged from that accommodating the current footpath. Thus we see no obstacle to continuing this down to the new walkway connection. If this additional width is seen as critical, it can be conditioned on the permit as road widening.

## 2. Bushfire Assessment

The Bushfire Assessment Report is enclosed in the updated planning report attached to address the relevant provisions under the E1.0 Bushfire-Prone Areas Code.

## 3. Traffic Impact Assessment

Keira Grundy, Environment and Planning Approval Officer from DSG has indicated '*In relation to traffic impacts, State Roads would normally require a TIA for a development of this site, noting a TIA considers additional impacts such as sightlines and pedestrian movements. However, in this instance, Traffic Engineering having confirmed that TIS from a suitable professional confirming the current intersection treatment is adequate for the expected traffic generation will suffice.*

*We will await the following prior to providing Crown Landowner Consent:*

- *Acceptance of the revised subdivision layout by Council*
- *A TIS by a suitable qualified professional to be acceptance of State Roads'*

The Traffic Impact Statement has been undertaken and forms part of the updated planning report.

## 4. Stormwater Management Plan

The Concept Services Report in the updated planning report addresses this issue.

## 5. TasWater RFI

The Concept Services Report in the updated planning report addresses this issue.

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We trust this satisfies Council's request however if further information or clarification is required with respect to this request, please contact me on 6231 2555 or at [planning@jmg.net.au](mailto:planning@jmg.net.au).

Yours faithfully

JOHNSTONE McGEE & GANDY PTY LTD



MINGMING MA  
TOWN PLANNER

# ATTACHMENT A

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## Updated Planning Report

# PLANNING REPORT

FOR DFY INVESTMENT PTY LTD  
10 EAST BAGDAD ROAD, BAGDAD  
SUBDIVISION APPLICATION



November 2021



**Engineers & Planners**  
*Your Vision is Our Mission*

19/11/2021



**Johnstone McGee and Gandy Pty Ltd**

incorporating Dale P Luck & Associates  
(trading as JMG Engineers and Planners)  
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Issuing Office: 117 Harrington Street, Hobart 7000								
JMG Project No.								
Document Issue Status								
Ver.	Issue Date	Description	Originator		Checked		Approved	
1.0	03.9.21	Draft Planning Report	MMM		SZ		MSC	

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**Limitations & Disclaimers**

- 1 This report presents information and opinions which are to the best of our knowledge accurate. JMG accepts no responsibility to any purchaser, prospective purchaser, or mortgagee of the property who relies in any way on this report.
- 2 JMG has no pecuniary interests in the property or sale of the property.

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Appendix A - Title Information

Appendix B - Subdivision Proposal Plan

Appendix C - Concept Services Plans

Appendix D - Bushfire Hazard Report

Appendix E - Noise Assessment

Appendix F - Notification Letter

Appendix G - Traffic Impact Statement

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# 1 Executive Summary

Mr Yannarakis has engaged Johnstone McGee and Gandy Pty Ltd (JMG) to prepare a subdivision application for land at 10 East Bagdad Road, Bagdad (CT 36069/1). Approval is sought under s.57 of the *Land Use Planning and Approvals Act 1993*.

The development is on land within the Village Zone and is partially subject to Bushfire Prone Areas overlay and Waterway and Coastal Protection Areas overlay under the *Southern Midland Interim Planning Scheme 2015*. The title is enclosed in Appendix A.

The proposed development is for:

- 53 lots subdivision with one public land, one future road reserve and one public open space
- Demolition of existing buildings
- Construction of stormwater infrastructure on Crown Land Road Reserve
- Removal of existing track
- Creation of a new road in the subject lot

The development is shown in Subdivision Plans in Appendix B.

The proposed development generates the following discretions under *the Southern Midland Interim Planning Scheme* (the Planning Scheme):

- 16.5 Development Standards for Subdivision
  - 16.5.1 Lot Design P2, P3;
  - 16.5.2 Roads P1;
  - 16.5.3 Ways and Public Open Space P1;
- E5.0 Road and Railway Assets Code
  - E5.5.1 Existing road accesses and junctions P3
  - E5.6.1 Development adjacent to roads and railways P1

The proposal has been assessed against all relevant Scheme criteria and is found to either comply with Acceptable Solutions or satisfy the relevant Performance Criteria. The application is considered to be acceptable with respect to the Scheme requirements and therefore ought to be supported by the Planning Authority.

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## 2 Introduction

JMG Engineers and Planners have been engaged by DFY Investment Pty Ltd to prepare a planning application for a subdivision at 10 East Bagdad Road, Bagdad.

The report serves to provide an assessment of the proposed development and works against the provisions of the *Southern Midlands Interim Planning Scheme 2015* ('the Planning Scheme')

## 3 Site, Location and Context

The subject site is located at 10 East Bagdad Road, Bagdad (CT 36069/1), which has an area of 4.8ha with 27m frontage to East Bagdad Road and 155m frontage to Midland Highway - as shown in Figure 1. The existing access is 200m long with 3m in width to two existing dwellings and sheds via East Bagdad Road. The surrounding houses are mainly single-storey residential buildings. The land that immediately adjoins to the subject site from the south is vacant. There is a row of trees on the common boundary with the southern vacant lot. There is an existing rivulet on the eastern side of the development site. The slope is gently from south to north in the subject site.

The proposed development will require works on multiple titles, services will be provided through Crown Land Road Reserve - CT 7095/14, CT 203439/1, CT 6785/15 and CT 8494/1 (refer to Appendix A Title Information and Appendix C Concept Services Plans). The subject site is sewer serviced land as indicated in the LISTmap. The proposed subdivision will extend Taswater's potable water and sewerage network. All services will be managed on-site.



Figure 1: Subject Site and Surrounding Features. Source from LISTmap.

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## 4 Proposed Development

The proposed development is for 56 residential lot subdivisions, with lots ranging from 600 m<sup>2</sup> - 997 m<sup>2</sup>, with 1100 m<sup>2</sup> of public open space which connects to Bagdad Rivulet. The existing buildings will be demolished and the existing rectangle track will be removed to level out the subject site for subdivision and road access. The proposed lots will be accessed via a new subdivision road branching from East Bagdad Road and a network of internal roads. The proposed road is 18m in width and approximately 560m long from East Bagdad Road. Stormwater infrastructure will be connected across Lot 29 to Midlands Highway, and along with Midlands Highway on the Crown Land Road Reserve. All proposed infrastructure is detailed in Concept Services Plans Appendix C.

The development is proposed to be undertaken in five stages:

Stage 1: Lot 1, Lots 40, 41, 54-56 & 32-39 (Public Open Space 100, Public Land 102, and proposed road 101)

Stage 2: Lots 2-12 & 42-47

Stage 3: Lots 13-21 & 48-49

Stage 4: Lots 22-26 & 50-53

Stage 5: Lots 27 & 31

Subdivision and staging plans are attached as Subdivision Proposal Plan Appendix B.

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## 5 Policy Assessment

### 5.1 Southern Midlands Interim Planning Scheme 2015

The applicable planning instrument in the assessment of the application is the *Southern Midlands Interim Planning Scheme 2015*. The site is zoned Village and partially subject to the Bushfire Prone Areas overlay (the north area of the lot) and the Waterway and Coastal Protection Areas overlay (the southeast corner path) as shown in Figure 2.

The north and west sides of the proposed site are both within the same zone. The Utilities Zone and Particular Purpose Zone is immediately adjoining from the west boundary and south boundary respectively. Rural Resource Zone is adjoining on the east boundary of the proposed site.

The application generates the following discretions under the Planning Scheme:

- 16.5 Development Standards for Subdivision
  - 16.5.1 Lot Design P2, P3;
  - 16.5.2 Roads P1;
  - 16.5.3 Ways and Public Open Space P1;
- E5.0 Road and Railway Assets Code
  - E5.5.1 Existing road accesses and junctions P3
  - E5.6.1 Development adjacent to roads and railways P1

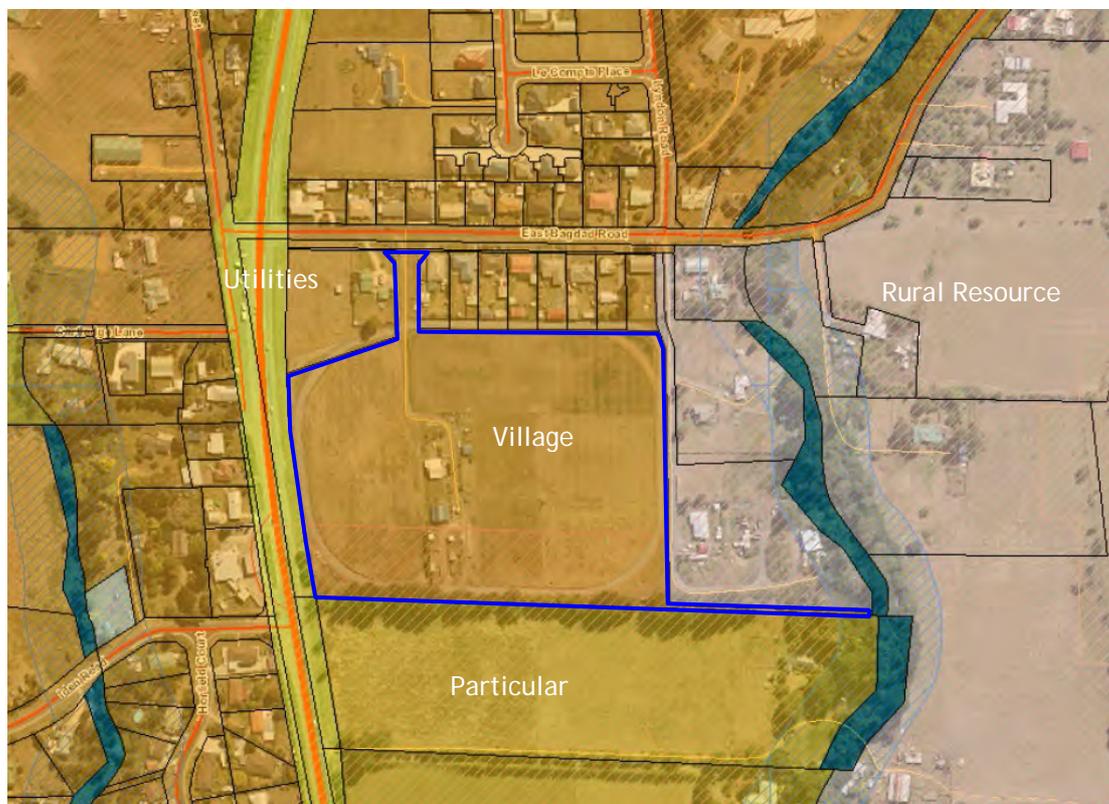


Figure 2: Zoning map of the site and surrounding area. Source from LISTmap.

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### 5.1.1 9.10 Subdivision

Clause 9.10.2 specifies a permit for development involving a plan of subdivision is discretionary, unless:

- (a) *for adjustment of a boundary in accordance with clause 9.3.1;*
- (b) *the subdivision is prohibited in accordance with clause 8.9; or*
- (c) *the plan of subdivision must not be approved under section 84 Local Government (Building and Miscellaneous Provisions) Act 1993.*

The proposed subdivision is not for the adjustment of a boundary (a).

The proposed residential lot subdivision is not prohibited under Clause 8.9 (b).

On the basis above, the proposed subdivision is automatically discretionary under clause 9.10.2.

## 5.2 Village Zone

### 16.1 Zone Purpose

The purpose of the Zone is stated as follows:

#### 16.1.1 Zone Purpose Statements

##### 16.1.1.1

*To provide for small rural centres with a mix of residential, community services and commercial activities.*

##### 16.1.1.2

*To provide for residential and associated development in small communities.*

##### 16.1.1.3

*To ensure development is accessible by walking and cycling*

##### 16.1.1.4

*To allow for a small shopping precinct that may include supermarket, tourism related business and a range of shops and rural services.*

##### 16.1.1.5

*To allow for office based employment provided that it supports the viability of the centre and the surrounding area and maintains an active street frontage.*

##### 16.1.1.6

*To provide for the efficient utilisation of existing reticulated services in the serviced villages of Bagdad, Campania, Colebrook, Kempton and Tunbridge.*

The application is for the subdivision of the land, that will allow for a mix of uses in accordance with 16.1.1.1, including residential and associated development (such as open space) in accordance with 16.1.1.2, that are accessible by walking and cycling via the extension to the existing road on to the site in accordance with 16.1.1.3.

The proposed development is in the subdivision stage and will not limit the potential to provide for a small shopping precinct, and/or office-based employment (16.1.1.5).

The existing services will be provided and utilized efficiently throughout the different stages of the subdivision around the village of Bagdad (16.1.1.6).

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As the application is for subdivision only and there is no change to the use of the site, the proposal complies with the 16.2 Use Table.

As the proposed lot is for subdivision only, therefore provisions under 16.3 Use Standards and 16.4 Development Standards for Buildings and Works are not considered applicable.

### 16.5 Development Standards for Subdivision

#### 16.5.1 Lot Design

<b>Objective:</b>	
<p>To provide for new lots that:</p> <p>(a) have appropriate area and dimensions to accommodate development consistent with the Zone Purpose and any relevant Local Area Objectives or Desired Future Character Statements;</p> <p>(b) contain building areas which are suitable for development, consistent with the Zone Purpose, located to avoid hazards and values;</p> <p>(c) are capable of providing for a high level of residential amenity including privacy, good solar access; and passive surveillance of public spaces;</p> <p>(d) are not internal lots, except if the only reasonable way to provide for efficient use of land;</p> <p>(e) are provided in a manner that provides for the efficient and ordered provision of infrastructure.</p>	
<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
<p>A1</p> <p>The size of each lot must be no less than as specified below, except if for public open space, a riparian or littoral reserve or utilities:</p> <p>(a) no less than 600 m<sup>2</sup> and no more than 1,000 m<sup>2</sup> (except balance lot) if in Bagdad, Campania, Kempton;</p> <p>(b) no less than 800 m<sup>2</sup> and no more than 1,500 m<sup>2</sup> (except balance lot) if in Colebrook;</p> <p>(c) no less than 5,000 m<sup>2</sup> if located in Parattah, Tunbridge or Tunnack</p>	<p>P1</p> <p>***</p>

Proposed residential lots range from 600m<sup>2</sup> - 997m<sup>2</sup>. Lot 100 is a public open space with 1100m<sup>2</sup> with another land 207m<sup>2</sup> (between Lot 33 and Lot 34). Lot 102 is 1421m<sup>2</sup> for stormwater detention. Those areas will be designated as a public open space and public land hence are not subject to the maximum lot size limitation.

The application, therefore, complies with sub-clause 16.5.1 A1 (a).

<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
<p>A2</p> <p>The design of each lot must provide a minimum building area that is rectangular in shape and complies with all of the following, except if for public open space, a riparian or littoral reserve or utilities:</p> <p>(a) clear of the frontage, side and rear boundary setbacks;</p>	<p>P2</p> <p>The design of each lot must contain a building area able to satisfy all of the following:</p> <p>(a) be reasonably capable of accommodating residential use and development;</p> <p>(b) meets any applicable standards in codes</p>

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<p>(b) not subject to any codes in this planning scheme</p> <p>(c) clear of title restrictions such as easements and restrictive covenants;</p> <p>(d) has an average slope of no more than 1 in 5</p> <p>(e) has the long axis of the developable area facing north or within 20 degrees west or 30 degrees east of north;</p> <p>(f) is a minimum of 10 m x 15 m in size.</p>	<p>in this planning scheme;</p> <p>(c) enables future development to achieve maximum solar access, given the slope and aspect of the land;</p> <p>(d) minimises the need for earth works, retaining walls, and fill and excavation associated with future development;</p> <p>(e) provides for sufficient useable area on the lot for both of the following;</p> <p>(i) on-site parking and manoeuvring;</p> <p>(ii) adequate private open space.</p>
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The proposed site is partially within the Bushfire Hazard Prone Areas, therefore it cannot meet Acceptable Solution (b) thus Performance Criteria needs to be considered.

As shown on the subdivision plan, all lots can accommodate the minimum 10m x 15m dimension requirement free and reasonably capable of accommodating residential use and development (a).

The building areas have been considered against the applicable standards within relevant Codes (b).

The southwest corner of the subject site has a gentle slope from north to south, the rest of the subject site has a gentle slope up to the north. The number of lots oriented north/south maximized the solar access, and complies with sub-clause (c);

As the gradient of the subject site's slope from east to west is relatively minor, the need for earth works, retaining walls, fill and excavation associated with future development will be none or minimal (d).

The proposed lot has a sufficient useable area for on-site parking and manoeuvring (i) as well as adequate private open space (ii).

Based on the above, the proposal satisfies 16.5.1 P2.

Acceptable Solutions	Performance Criteria
<p>A3</p> <p>The frontage for each lot must be no less than 15 m, except if for public open space, a riparian or littoral reserve or utilities or if an internal lot.</p>	<p>P3</p> <p>The frontage of each lot must satisfy all of the following:</p> <p>(a) provides opportunity for practical and safe vehicular and pedestrian access;</p> <p>(b) provides opportunity for passive surveillance between residential development on the lot and the public road,</p> <p>(c) is no less than 6m.</p>

Although frontages for the majority of lots comply with requirements, there are few lots (Lots 8 - 10 and Lots 16 - 18) that do not satisfy the 15m requirement, thus the Performance Criteria needs to be considered.

The smallest frontage is 6m, which is still sufficient for practical and safe vehicular and pedestrian access to the proposed lot (a).

The minimum frontage of 6m is adequate to accommodate a driveway along with a small front room with a window alongside, enabling passive surveillance between residential development on the lot and the public road (b).

As stated above, the minimum frontage is not less than 6m (c).

On the basis above, the proposal complies with 16.5.1 P3.

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<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
A4 <i>No lot is an internal lot.</i>	P4 ***

No lot is an internal lot, and as such complies with 16.5.1 A4.

<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
A5 <i>Setback from a new boundary for an existing building must comply with the relevant Acceptable Solution for setback.</i>	P5 ***

The existing building will be demolished, therefore, 16.5.1 A5 is not applicable.

### 16.5.2 Roads

<b>Objective:</b>	
<p>To ensure that the arrangement of new roads within a subdivision provides for all of the following:</p> <ul style="list-style-type: none"> <li>(a) the provision of safe, convenient and efficient connections to assist accessibility and mobility of the community;</li> <li>(b) the adequate accommodation of vehicular, pedestrian, cycling and public transport traffic;</li> <li>(c) the efficient ultimate subdivision of the entirety of the land and of neighbouring land.</li> </ul>	
<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
A1 <i>The subdivision includes no new road.</i>	<p>P1</p> <p><i>The arrangement and construction of roads within a subdivision must satisfy all of the following:</i></p> <ul style="list-style-type: none"> <li><i>(a) the route and standard of roads accords with any relevant road network plan adopted by the Planning Authority;</i></li> <li><i>(b) the appropriate and reasonable future subdivision of the entirety of any balance lot is not compromised;</i></li> <li><i>(c) the future subdivision of any neighbouring or nearby land with subdivision potential is facilitated through the provision of connector roads and pedestrian lanes, where appropriate, to common boundaries;</i></li> <li><i>(d) an acceptable level of access, safety, convenience and legibility is provided through a consistent road function hierarchy;</i></li> <li><i>(e) cul-de-sac and other terminated roads are not created, or their use in road layout design is kept to an absolute minimum;</i></li> <li><i>(f) connectivity with the neighbourhood road network is maximised;</i></li> </ul>

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	<p><i>(g) the travel distance between key destinations such as shops and services is minimised</i></p> <p><i>(h) walking, cycling and the efficient movement of public transport is facilitated</i></p> <p><i>(i) provision is made for bicycle infrastructure on new arterial and collector roads in accordance with Austroads Guide to Road Design Part 6A;</i></p> <p><i>(j) any adjacent existing grid pattern of streets is extended, where there are no significant topographical constraints.</i></p>
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As the proposed lot has a new road, therefore it cannot meet the Acceptable Solution thus the Performance Criteria needs to be considered.

The relevant Planning Authority, Southern Midlands Council, does not appear to have adopted a road network plan therefore sub-clause (a) is not considered relevant.

A balance lot is not proposed, and the proposed roads make provision for the subdivision of any balance lot included in each stage of the subdivision (b).

The proposed subdivision will facilitate both pedestrian and road networks through the subject site to the common boundary (c).

The proposed subdivision road would achieve an acceptable level of access, safety, convenience, and legibility by providing a consistent road function hierarchy with proposed road widths and pedestrian infrastructure (footpaths) being in accordance with the Local Government Association Tasmania (LGAT) standard drawing TSD-R06-v2 (d).

There are no cul-de-sacs or terminated roads proposed within the subdivision (e).

The subject lot is connecting with East Bagdad Road and the adjacent vacant lot is within a Particular Purpose Zone with limited subdivision potential. Therefore the proposal complies with sub-clause (f).

The subdivision layout minimizes travel distances by providing for an ordered and logical layout (g).

Walking and cycling activity will be facilitated by the proposed open space links and road reserve widths, which are sufficient to accommodate footpaths (h).

The subdivision would only accommodate local roads, therefore, sub-clause (i) is not considered applicable.

There is no existing grid pattern of streets immediately adjoining the subject site that could be extended by the proposed subdivision. Therefore, sub-clause (j) is not applicable.

On the basis above, the proposal is consistent with 16.5.2 P1.

### 16.5.3 Ways and Public Open Space

<b>Objective:</b>	
<p>To ensure that the arrangement of ways and public open space provides for all of the following:</p> <p>(a) the provision of safe, convenient and efficient connections to assist accessibility and mobility of the community;</p> <p>(b) the adequate accommodation of pedestrian and cycling traffic.</p>	
<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
A1	P1

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<p><i>No Acceptable Solution.</i></p>	<p><i>The arrangement of ways and public open space within a subdivision must satisfy all of the following:</i></p> <p><i>(a) connections with any adjoining ways are provided through the provision of ways to the common boundary, as appropriate;</i></p> <p><i>(b) connections with any neighbouring land with subdivision potential is provided through the provision of ways to the common boundary, as appropriate;</i></p> <p><i>(c) connections with the neighbourhood road network are provided through the provision of ways to those roads, as appropriate;</i></p> <p><i>(d) convenient access to local shops, community facilities, public open space and public transport routes is provided;</i></p> <p><i>(e) new ways are designed so that adequate passive surveillance will be provided from development on neighbouring land and public roads as appropriate;</i></p> <p><i>(f) provides for a legible movement network;</i></p> <p><i>(g) the route of new ways has regard to any pedestrian &amp; cycle way or public open space plan adopted by the Planning Authority;</i></p> <p><i>(h) Public Open Space must be provided as land or cash in lieu, in accordance with the relevant Council policy.</i></p> <p><i>(i) new ways or extensions to existing ways must be designed to minimise opportunities for entrapment or other criminal behaviour including, but not limited to, having regard to the following:</i></p> <p><i>(i) the width of the way;</i></p> <p><i>(ii) the length of the way;</i></p> <p><i>(iii) landscaping within the way;</i></p> <p><i>(iv) lighting;</i></p> <p><i>(v) provision of opportunities for 'loitering';</i></p> <p><i>(vi) the shape of the way (avoiding bends, corners or other opportunities for concealment).</i></p>
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As there is no Acceptable Solution for 16.5.3 A1, the Performance Criteria needs to be considered.

The connection will be provided between East Bagdad Road and a new road (a).

The proposed subdivision provides a connection with the existing East Bagdad Road and the neighbouring land from the northern boundary (b).

The proposed subdivision provides a connection with Bagdad Road and the neighbouring land from the northern boundary, satisfying sub-clause (c).

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The proposed road is sufficient for occupants to visit and access local shops, community facilities, public open space and public transport (d).

The proposed road is 18m in width which would provide passive surveillance from the development on neighbouring land and public roads (e).

The network of streets provides for clear and logical connections that are well lit and visible, as part of a legible movement network (f).

The relevant Planning Authority, Southern Midlands Council, does not appear to have adopted any pedestrian & cycleway or public open space plan, therefore sub-clause (g) is not considered relevant.

As 3.2.1.2 (4) *Public Open Space under the Local Government (Building and Miscellaneous Provisions) Act 1993* indicated, 5% of the unimproved value of the land need to be provided as cash in lieu of public open space. The proposed subdivision would provide 5% of the value in accord with the recommendations of the *Local Government Act 1993* (h).

The proposed way is 18m in width with an area of 11260m<sup>2</sup>, with appropriate lighting and, are in a straight layout without bends, therefore minimizing opportunities for entrapment and other criminal behaviour (i).

On the basis above, the proposal complies with 16.5.3 P1.

#### 16.5.4 Services

<b>Objective:</b>	
<i>To ensure that the subdivision of land provides adequate services to meet the projected needs of future development.</i>	
<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
A1 <i>Each lot must be connected to a reticulated potable water supply in Bagdad, Campania, Kempton, Colebrook and Tunbridge.</i>	P1 <i>No Performance Criteria.</i>

All residential lots will be connected to reticulated water, sewer and stormwater infrastructure, and are appropriate to support future use of residential and other uses permissible in the zone. The application accordingly complies with clause 16.5.4 A1.

<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
A2 <i>Each lot must be connected to a reticulated sewerage system in Bagdad, Campania, Kempton and Colebrook.</i>	P2 ***

All residential lots will be connected to the reticulated sewerage system, and as such the proposal complies with 16.5.4 A2.

<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
A3 <i>Each lot must be connected to a stormwater system able to service the building area by gravity.</i>	P3 ***

All residential lots will be connected to a stormwater system able to service the building area by gravity, the proposal complies with 16.5.4 A3.

Details of services are provided within the Concept Services Report which is enclosed in Appendix C.

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### 5.3 Code and Overlay

The proposed subdivision is partially within the Bushfire-Prone Areas, therefore the Bushfire-Prone Areas Code needs to be considered as indicated in E1.2.1. The subject site will provide a public open space in the southeast corner to connect with the Bagdad Rivulet. The public open space is within the Waterway and Coastal Protection Areas overlay for only a small area as indicated in Figure 2. As the new stormwater pipe will be under the public open space, provisions under E11.0 Waterway and Coastal Protection Code need to be considered. As such, E5.0 Road and Railway Assets Code, E6.0 Parking and Access Code, and E7.0 Stormwater Management Code will be addressed.

#### E1.0 Bushfire-Prone Areas Code

The Bushfire Hazard Report prepared to support this proposal can be found in Appendix D and adequately addresses the criteria of the Bushfire-Prone Areas Code. No relevant discretions are generated.

#### E5.0 Road and Railway Assets Code

The proposed residential lots are a sensitive use adjacent to a Utilities Zone (Midlands Highway) within 50m, therefore a Noise Assessment (Appendix E) will be provided to address the conflicts between sensitive uses and major roads were minimised.

A Traffic Impact Statement is enclosed in Appendix G to address relevant provisions under Road and Railway Assets Code. The subdivision is supported on traffic engineering grounds.

#### E5.5 Use Standards

##### E5.5.1 Existing road accesses and junctions

<b>Objective:</b>	
<i>To ensure that the safety and efficiency of roads is not reduced by increased use of existing accesses and junctions.</i>	
<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
A1 <i>The annual average daily traffic (AADT) of vehicle movements, to and from a site, onto a category 1 or category 2 road, in an area subject to a speed limit of more than 60km/h, must not increase by more than 10% or 10 vehicle movements per day, whichever is the greater.</i>	P1 ***

The proposed subdivision will use the existing access from East Bagdad Road which is not a category 1 or category 2 road and the speed limit is not greater than 60km/h, therefore sub-clauses under A1 is not considered applicable.

<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
A2 <i>The annual average daily traffic (AADT) of vehicle movements, to and from a site, using an existing access or junction, in an area subject to a speed limit of more than</i>	P2 ***

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60km/h, must not increase by more than 10% or 10 vehicle movements per day, whichever is the greater.	
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The proposed subdivision will use the existing access from East Bagdad Road which is not a category 1 or category 2 road and the speed limit is not greater than 60km/h, therefore sub-clauses under A2 is not considered applicable.

Acceptable Solutions	Performance Criteria
<p>A3</p> <p><i>The annual average daily traffic (AADT) of vehicle movements, to and from a site, using an existing access or junction, in an area subject to a speed limit of 60km/h or less, must not increase by more than 20% or 40 vehicle movements per day, whichever is the greater.</i></p>	<p>P3</p> <p><i>Any increase in vehicle traffic at an existing access or junction in an area subject to a speed limit of 60km/h or less, must be safe and not unreasonably impact on the efficiency of the road, having regard to:</i></p> <ul style="list-style-type: none"> <li><i>(a) the increase in traffic caused by the use;</i></li> <li><i>(b) the nature of the traffic generated by the use;</i></li> <li><i>(c) the nature and efficiency of the access or the junction;</i></li> <li><i>(d) the nature and category of the road;</i></li> <li><i>(e) the speed limit and traffic flow of the road;</i></li> <li><i>(f) any alternative access to a road;</i></li> <li><i>(g) the need for the use;</i></li> <li><i>(h) any traffic impact assessment; and</i></li> <li><i>(i) any written advice received from the road authority.</i></li> </ul>

As the proposal is for 56 lots subdivision, it is assumed that the daily traffic of vehicle movements will be intensified for the existing access from East Bagdad Road. It cannot meet the Acceptable Solution thus Performance Criteria needs to be considered.

The proposed subdivision lots are for residential use, the existing access will be upgraded to a road from East Bagdad Road. The residential use will minimize impacts on the efficiency of the road by providing a safe access and by adequately designing the access road to ensure road efficiency is maximised (a);

As the proposal is for residential use, all traffic generated will be non-commercial and the accesses and junctions are of a suitable width and design for this purpose (b);

The proposed road is 18m in width and is designed to provide sufficient space for vehicles to access and minimize conflicts between the new road and East Bagdad Road (c);

Based on the Tasmanian Government 'State Road Hierarchy', the new road is from East Bagdad Road which is not a category 1 or 2 road. It has a speed limit of 50km/h with gentle traffic flow, therefore it is considered appropriate for future use (d)(e);

There is no alternative access to a road as the proposed lot will use the new road via East Bagdad Road (f);

The proposed subdivision is for future residential use. It is to supply a diverse range of housing stock in a growth area. Therefore, the increase in traffic volumes is considered warranted (g);

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As the proposed development is for subdivision only, all roads will be designed to the necessary standards to ensure the traffic volume will minimize the impact on the East Bagdad Road, therefore traffic impact assessment will not be provided (h);

No written advice has been received from the road authority, therefore sub-clause (i) is not considered applicable.

On the basis above, the proposed development is considered to satisfy E5.5.1 P1.

**E5.5.2 Existing level crossings**

<b>Objective:</b>	
<i>To ensure that the safety and the efficiency of the rail network is not reduced by access across part of the rail network.</i>	
<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
A1 <i>Where use has access across part of a rail network, the annual average daily traffic (AADT) at an existing level crossing must not be increased by greater than 10% or 10 vehicle movements per day, whichever is the greater.</i>	P1 ***

The proposed subdivision does not have access across any rail network, therefore E5.5.2 A1 is not considered applicable.

**E5.6 Development Standards**

**E5.6.1 Development adjacent to roads and railways**

<b>Objective:</b>	
<i>To ensure that development adjacent to category 1 or category 2 roads or the rail network:</i>	
<ul style="list-style-type: none"> <li>(a) ensures the safe and efficient operation of roads and the rail network;</li> <li>(b) allows for future road and rail widening, realignment and upgrading; and</li> <li>(c) is located to minimise adverse effects of noise, vibration, light and air emissions from roads and the rail network.</li> </ul>	
<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
A1.1 <i>Except as provided in A1.2, the following development must be located at least 50m from the rail network, or a category 1 road or category 2 road, in an area subject to a speed limit of more than 60km/h:</i>	P1 <i>The location of development, from the rail network, or a category 1 road or category 2 road in an area subject to a speed limit of more than 60km/h, must be safe and not unreasonably impact on the efficiency of the road or amenity of sensitive uses, having regard to:</i>
<ul style="list-style-type: none"> <li>(a) new buildings;</li> <li>(b) other road or earth works; and</li> <li>(c) building envelopes on new lots.</li> </ul>	<ul style="list-style-type: none"> <li>(a) the proposed setback;</li> <li>(b) the existing setback of buildings on the site;</li> <li>(c) the frequency of use of the rail network;</li> </ul>
A1.2 <i>Buildings, may be:</i>	
<ul style="list-style-type: none"> <li>(a) located within a row of existing</li> </ul>	

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<p><i>buildings and setback no closer than the immediately adjacent building; or</i></p> <p><i>(b) an extension which extends no closer than:</i></p> <p><i>(i) the existing building; or</i></p> <p><i>(ii) an immediately adjacent building.</i></p>	<p><i>(d) the speed limit and traffic volume of the road;</i></p> <p><i>(e) any noise, vibration, light and air emissions from the rail network or road;</i></p> <p><i>(f) the nature of the road;</i></p> <p><i>(g) the nature of the development;</i></p> <p><i>(h) the need for the development;</i></p> <p><i>(i) any traffic impact assessment;</i></p> <p><i>(j) any recommendations from a suitably qualified person for mitigation of noise, if for a habitable building for a sensitive use; and</i></p> <p><i>(k) any written advice received from the rail or road authority.</i></p>
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As the proposed subdivision is within 50m of the Utilities zone, therefore, it cannot meet the Acceptable Solution thus the Performance Criteria needs to be considered.

The proposed building areas have setbacks ranging from 12m to 47m from the west boundary, the minimum distance between the proposed building area to the edge of Midlands Highway is more than 23m (a) (b).

Access will not be provided from the Midlands Highway and does not involve the rail network (c).

The speed limit is 80 km/hr, and as such a Noise Assessment is enclosed in Appendix E to address the sub-clause (d) (e) (j).

The nature of the road is category 1 road as it is a highway (f).

The development is for residential lot subdivision to meet market demand for housing (g) (h).

A traffic impact assessment is not required as the access to the lot is from East Bagdad Road, not Midlands Highway (i).

There is no written advice received from the rail or road authority (k).

On the basis above, the proposal complies with E5.6.1 P1.

#### ***E5.6.2 Road accesses and junctions***

<b><i>Objective:</i></b>	
<i>To ensure that the safety and efficiency of roads is not reduced by the creation of new accesses and junctions.</i>	
<b><i>Acceptable Solutions</i></b>	<b><i>Performance Criteria</i></b>
<b><i>A1</i></b> <i>No new access or junction to roads in an area subject to a speed limit of more than 60km/h</i>	<b><i>P1</i></b> <i>***</i>

There is no new access or junction to the East Bagdad Road, therefore, E5.6.2 A1 is not applicable.

<b><i>Acceptable Solutions</i></b>	<b><i>Performance Criteria</i></b>
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<p>A2</p> <p><i>No more than one access providing both entry and exit, or two accesses providing separate entry and exit, to roads in an area subject to a speed limit of 60km/h or less.</i></p>	<p>P2</p> <p>***</p>
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There is no more than one access provided to the subdivision lot and the speed limit of East Bagdad Road is 50km/h. Therefore, it complies with E5.6.2 A2.

#### **E5.6.3 New level crossings**

As the proposal does not adjoin or located within a rail network, therefore E5.6.3 A1 is not considered applicable.

#### **E5.6.4 Sight distance at accesses, junctions and level crossings**

<p><b>Objective:</b></p>	
<p><i>To ensure that accesses, junctions and level crossings provide sufficient sight distance between vehicles and between vehicles and trains to enable safe movement of traffic.</i></p>	
<p><b>Acceptable Solutions</b></p>	<p><b>Performance Criteria</b></p>
<p>A1</p> <p><i>Sight distances at:</i></p> <p>(a) <i>an access or junction must comply with the Safe Intersection Sight Distance shown in Table E5.1; and</i></p> <p>(b) <i>rail level crossings must comply with AS1742.7 Manual of uniform traffic control devices - Railway crossings, Standards Association of Australia.</i></p>	<p>P1</p> <p>***</p>

The existing access is from East Bagdad Road with a speed limit of 50km/h, the sight distance is more than 80m. Therefore the access complies with the standards within Table E5.1, satisfying sub-clause (a);

As there are no rail level crossings close to or within the subject site, therefore sub-clause (b) is not considered applicable.

#### **E6.0 Parking and Access Code**

As the proposed development is for subdivision, therefore only relevant provisions will be addressed in this section.

#### **E6.7.1 Number of Vehicular Accesses**

<p><b>Objective:</b></p>
<p><i>To ensure that:</i></p> <p>(a) <i>safe and efficient access is provided to all road network users, including, but not limited to: drivers, passengers, pedestrians, and cyclists, by minimising:</i></p> <p>(i) <i>the number of vehicle access points; and</i></p> <p>(ii) <i>loss of on-street car parking spaces;</i></p> <p>(b) <i>vehicle access points do not unreasonably detract from the amenity of adjoining land uses;</i></p>

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<i>(c) vehicle access points do not have a dominating impact on local streetscape and character.</i>	
<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
A1 <i>The number of vehicle access points provided for each road frontage must be no more than 1 or the existing number of vehicle access points, whichever is the greater.</i>	P1 ***

There is only one access proposed with the subdivision, therefore it complies with E6.7.1 A1.

#### **E6.7.2 Design of Vehicular Accesses**

<b>Objective:</b>	
<i>To ensure safe and efficient access for all users, including drivers, passengers, pedestrians and cyclists by locating, designing and constructing vehicle access points safely relative to the road network.</i>	
<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
A1 <i>Design of vehicle access points must comply with all of the following:</i>  <i>(a) in the case of non-commercial vehicle access; the location, sight distance, width and gradient of an access must be designed and constructed to comply with section 3 - "Access Facilities to Off-street Parking Areas and Queuing Areas" of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking;</i>  <i>(b) in the case of commercial vehicle access; the location, sight distance, geometry and gradient of an access must be designed and constructed to comply with all access driveway provisions in section 3 "Access Driveways and Circulation Roadways" of AS2890.2 - 2002 Parking facilities Part 2: Off-street commercial vehicle facilities.</i>	P1 ***

The proposal is considered to comply with the Acceptable Solution A1 for this clause as while the design of vehicle access points will be the subject of further detailed design, the proposed subdivision layout will allow for access points that are consistent with the relevant section of AS/NZS 2890.1:2004.

#### **E6.7.14 Access to a Road**

<b>Objective:</b>	
<i>To ensure that access to the road network is provided appropriately.</i>	
<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
A1	P1

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<i>Access to a road must be in accordance with the requirements of the road authority.</i>	<i>No Performance Criteria.</i>
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The proposed access complies with the requirements of the road authority, details are enclosed in the Concept Services Plan (Appendix C).

### ***E7.0 Stormwater Management Code***

As no development is exempt from this code as indicated in E7.4.1, therefore, provisions under E7.0 Stormwater Management Code need to be considered.

The south-eastern corner of 1844 Midland Highway on site is to discharge to the creek, it is unlikely given the required depth of the pipe. Therefore, Lot 102 will be retained as a detention area and will be transferred to Council as part of its stormwater reticulation network.

#### ***E7.7.1 Stormwater Drainage and Disposal***

<b><i>Objective:</i></b>	
<i>To ensure that stormwater quality and quantity is managed appropriately.</i>	
<b><i>Acceptable Solutions</i></b>	<b><i>Performance Criteria</i></b>
A1 <i>Stormwater from new impervious surfaces must be disposed of by gravity to public stormwater infrastructure.</i>	P1 ***

The services design for the subdivision is considered to satisfy the Acceptable Solution A1 as it demonstrates that stormwater will be disposed of by gravity.

Proposed stormwater mains will service all new lots and roads and connect to existing stormwater infrastructure, as indicated on the attached Concept Services Plans in Appendix C.

<b><i>Acceptable Solutions</i></b>	<b><i>Performance Criteria</i></b>
A2 <i>A stormwater system for a new development must incorporate water sensitive urban design principles R1 for the treatment and disposal of stormwater if any of the following apply:</i> <i>(a) the size of new impervious area is more than 600 m2;</i> <i>(b) new car parking is provided for more than 6 cars;</i> <i>(c) a subdivision is for more than 5 lots.</i>	P2 ***

As the development is in the subdivision stage, therefore the sub-clauses (a) and (b) are not applicable.

The proposed subdivision is for 56 new lots. The stormwater system for the proposed subdivision incorporates Water Sensitive Urban Design Principles for the treatment and disposal of stormwater (c).

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Water sensitive urban design principles are proposed within a proposed public lot (proposed lot 29) shown on Concept Services Plans in Appendix C indicating details of stormwater treatment infrastructure. Therefore, it is considered to comply with E7.7.1 A2.

<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
<p><b>A3</b></p> <p><i>A minor stormwater drainage system must be designed to comply with all of the following:</i></p> <p>(a) <i>be able to accommodate a storm with an ARI of 20 years in the case of non-industrial zoned land and an ARI of 50 years in the case of industrial zoned land, when the land serviced by the system is fully developed;</i></p> <p>(b) <i>stormwater runoff will be no greater than pre-existing runoff or any increase can be accommodated within existing or upgraded public stormwater infrastructure.</i></p>	<p><b>P3</b></p> <p><i>No Performance Criteria.</i></p>

The minor stormwater drainage system, which consists of underground piped drainage and pits, show the proposed layout of the piped system on the Concept Services Plans P01, P02 & P03 (Appendix C) however, the piped system has not been detailed designed to show pipe sizes to accommodate for a 20-year ARI storm event. It is considered to be more efficient to place a condition of any future planning permit that this minor stormwater drainage system be provided in conjunction with (conditioned) detailed engineering drawings, so that the proposed development will comply with the E7.7.1 A3.

<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
<p><b>A4</b></p> <p><i>A major stormwater drainage system must be designed to accommodate a storm with an ARI of 100 years.</i></p>	<p><b>P4</b></p> <p><i>No Performance Criteria.</i></p>

It is considered the proposed development will be able to accommodate the major stormwater drainage system in that the proposed development will comply with the E7.7.1 A4 if the minor system is exceeded E7.7.1 A3.

## **E11.0 Waterway and Coastal Protection Code**

### **E11.7.1 Building and Works**

<b>Objective:</b>	
<i>To ensure that buildings and works in proximity to a waterway, the coast, identified climate change refugia and potable water supply areas will not have an unnecessary or unacceptable impact on natural values.</i>	
<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
<p><b>A1</b></p> <p><i>Building and works within a Waterway and Coastal Protection Area must be within a building area on a plan of subdivision approved under this planning scheme.</i></p>	<p><b>P1</b></p> <p><i>Building and works within a Waterway and Coastal Protection Area must satisfy all of the following:</i></p> <p>(a) <i>avoid or mitigate impact on natural values;</i></p>

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	<p>(b) <i>mitigate and manage adverse erosion, sedimentation and runoff impacts on natural values;</i></p> <p>(c) <i>avoid or mitigate impacts on riparian or littoral vegetation;</i></p> <p>(d) <i>maintain natural streambank and streambed condition, (where it exists);</i></p> <p>(e) <i>maintain in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation</i></p> <p>(f) <i>avoid significantly impeding natural flow and drainage;</i></p> <p>(g) <i>maintain fish passage (where applicable);</i></p> <p>(h) <i>avoid landfilling of wetlands;</i></p> <p>(i) <i>works are undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and "Tasmanian Coastal Works Manual" (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.</i></p>
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As a building area is not on an approved subdivision plan, the proposal cannot meet the Acceptable Solution, thus the Performance Criteria needs to be considered.

The proposed development locates the building areas on sites without any vegetation, works in proximity to a waterway within the public open space (Lot 100) will require some removal of vegetation for stormwater infrastructure purposes, therefore the impact on natural values is minimized and mitigated (a).

As the stormwater infrastructure will be installed within a small area and not within any streambed, therefore sub-clauses (b) (c) (d) and (e) are not met.

As indicated above the stormwater infrastructure will not have a significant impact on natural flow and vegetation (f).

As the proposed site does not have a water body or watercourse, therefore sub-clause (g) is not applicable.

As the proposed site does not have a wetland, therefore sub-clause (h) is not applicable.

The construction work will avoid unnecessary use of machinery and will undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and "Tasmanian Coastal Works Manual" (DPIPWE, Page and Thorp, 2010) (i).

On the basis above, the proposed subdivision complies with E11.7.1 P1.

<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
A2 <i>Building and works within a Future Coastal Refugia Area must be within a building area on a plan of subdivision approved under this planning scheme.</i>	P2 ***

As the proposed site is not within a Future Coastal Refugia Area, therefore E11.7.1 A2 is not applicable.

<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
-----------------------------	-----------------------------

19/11/2021

<p><b>A3</b> <i>Buildings and works within a Potable Water Supply Area must be within a building area on a plan of subdivision approved under this planning scheme.</i></p>	<p><b>P3</b> <i>No Performance Criteria.</i></p>
---	--

As the proposed site is not within a Potable Water Supply Area, therefore E11.7.1 A3 is not applicable.

<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
<p><b>A4</b> <i>Development must involve no new stormwater point discharge into a watercourse, wetland or lake.</i></p>	<p><b>P4</b> <i>No Performance Criteria.</i></p>

As shown in the Concept Services Report (Appendix C), no new stormwater point will discharge into a watercourse, wetland, or lake. Therefore, the proposal complies with 11.7.1 A4.

#### *E11.7.2 Buildings and Works Dependent on a Coastal Location*

As none of the proposed development is dependent on a coastal location, Clause E11.7.2 does not apply to this application.

### **E11.8 Subdivision Standards**

#### *E11.8.1 Subdivision*

<p>Objective: To ensure that:</p> <p>(a) works associated with subdivision in proximity to a waterway, the coast, identified climate change refugia and potable water supply areas will not have an unnecessary or unacceptable impact on natural values;</p> <p>(b) future development likely to be facilitated by subdivision is unlikely to lead to an unnecessary or unacceptable impact on natural values.</p>	
<b>Acceptable Solutions</b>	<b>Performance Criteria</b>
<p><b>A1</b> Subdivision of a lot, all or part of which is within a Waterway and Coastal Protection Area, Future Coastal Refugia Area or Potable Water Supply Area must comply with one or more of the following:</p> <p>(a) be for the purpose of separation of existing dwellings;</p> <p>(b) be for the creation of a lot for public open space, public reserve or utility;</p> <p>(c) no works, other than boundary fencing works, are within a Waterway and Coastal Protection Area, Future Coastal Refugia Area or Potable Water Supply Area;</p>	<p><b>P1</b> ***</p>

19/11/2021

(d) the building area, bushfire hazard management area, services and vehicular access driveway are outside the Waterway and Coastal Protection Area, Future Coastal Refugia Area or Potable Water Supply Area.	
--	--

As the proposed development is for subdivision and the creation of a lot for public open space within a Waterway and Coastal Protection Area, the proposal complies with E11.8.1 sub-clause (b).

<i>Acceptable Solutions</i>	<i>Performance Criteria</i>
A2 <i>Subdivision is not prohibited by the relevant zone standards.</i>	P2 ***

The proposed subdivision is not prohibited by relevant zone standards, therefore it complies with 11.8.1 A2.

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## 6 Conclusion

The proposed development includes the subdivision of land into 53 residential lots, including one area of Public Open Space, one public land for stormwater detention and a future road reserve. The existing buildings and sheds will be demolished to accommodate the subdivision layout.

The proposed development is located within the Village zone and is partially subject to the Bushfire-Prone Areas overlay and the Waterway and Coastal Protection Areas overlay under the *Southern Midlands Interim Planning Scheme 2015*.

The application generates the following discretions under the *Southern Midlands Interim Planning Scheme 2015*:

- 16.5 Development Standards for Subdivision
  - 16.5.1 Lot Design P2, P3;
  - 16.5.2 Roads P1;
  - 16.5.3 Ways and Public Open Space P1;
- E5.0 Road and Railway Assets Code
  - E5.5.1 Existing road accesses and junctions P3
  - E5.6.1 Development adjacent to roads and railways P1

The proposal has been assessed against the relevant performance criteria and found to comply. In conclusion, the application is considered to meet the relevant Planning Scheme standards and therefore should be supported by the Planning Authority.

19/11/2021

## APPENDIX A

---

### Title Information

SEARCH OF TORRENS TITLE

VOLUME 36069	FOLIO 1
EDITION 5	DATE OF ISSUE 29-Jul-2021

SEARCH DATE : 06-Sep-2021

SEARCH TIME : 10.44 AM

DESCRIPTION OF LAND

Parish of STRANGFORD, Land District of MONMOUTH  
Lot 1 on Diagram 36069  
Derivation : Part of 60A-1R-34Ps. Gtd. to C.A. Galletly and  
Anor.  
Prior CT 4477/80

SCHEDULE 1

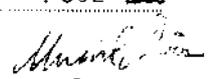
M901708 TRANSFER to DFY INVESTMENT PTY LTD Registered  
29-Jul-2021 at 12.01 PM

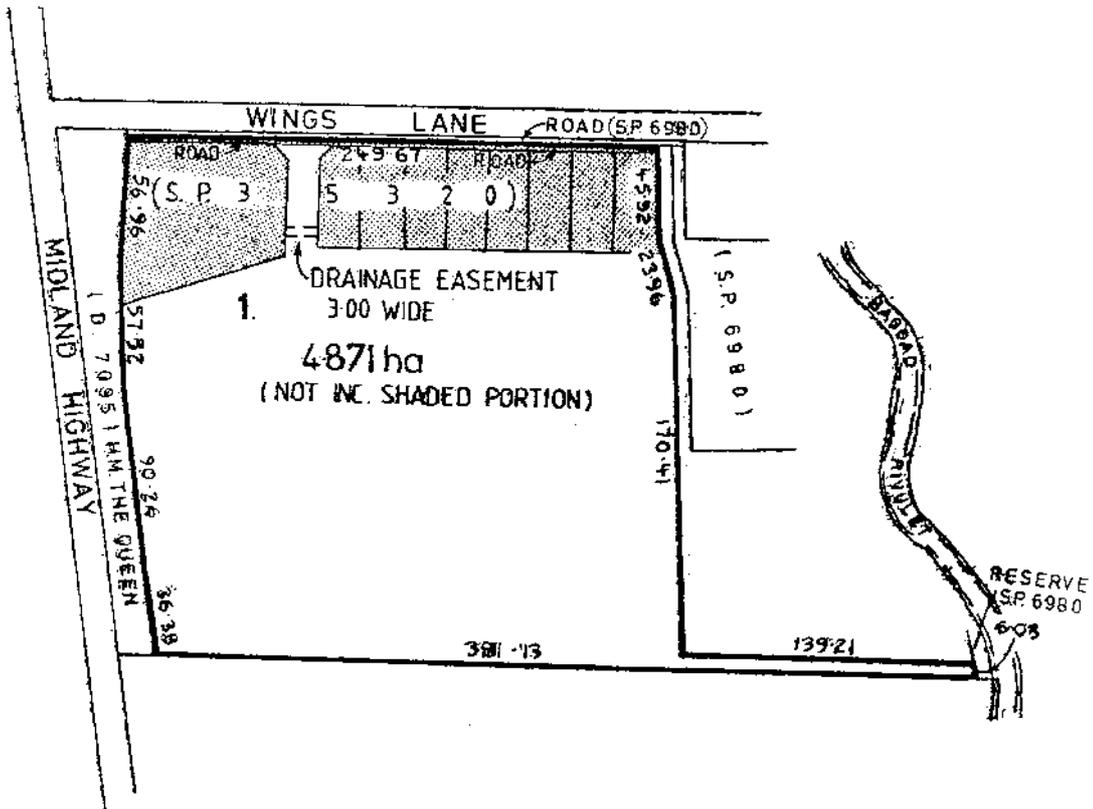
SCHEDULE 2

Reservations and conditions in the Crown Grant if any  
BURDENING EASEMENT: Right of Drainage [appurtenant to Lots 2  
to 9 on Sealed Plan No. 35320) over the Drainage  
Easement shown on Diagram No. 36069  
M905486 MORTGAGE to Butler McIntyre Investments Ltd  
Registered 29-Jul-2021 at 12.02 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

Owner	<p><b>PLAN OF TITLE</b> of land situated in the <b>MONMOUTH STRANGFORD</b> COMPILED FROM P.462</p> <p>SCALE 1:2500 MEASUREMENTS IN METRES</p>	Registered Number <b>D.36069</b>
Title Reference 3486-75		Approved - 4 JUL 2021
Grantee		 Recorder of Titles



SEARCH OF TORRENS TITLE

VOLUME 7095	FOLIO 14
EDITION 2	DATE OF ISSUE 30-Aug-1999

SEARCH DATE : 06-Sep-2021

SEARCH TIME : 10.40 AM

DESCRIPTION OF LAND

Parish of STRANGFORD, Land District of MONMOUTH  
 Lot 14 on Diagram 7095  
 Derivation : Part of 60 Acres 1 Rood 34 Perches originally  
 granted to Claude Armytage Galletly and Reginald Armytage  
 Galletley and duly surrendered as appears by Transfer No.  
 A490000  
 Prior CT 3486/74

SCHEDULE 1

THE CROWN

SCHEDULE 2

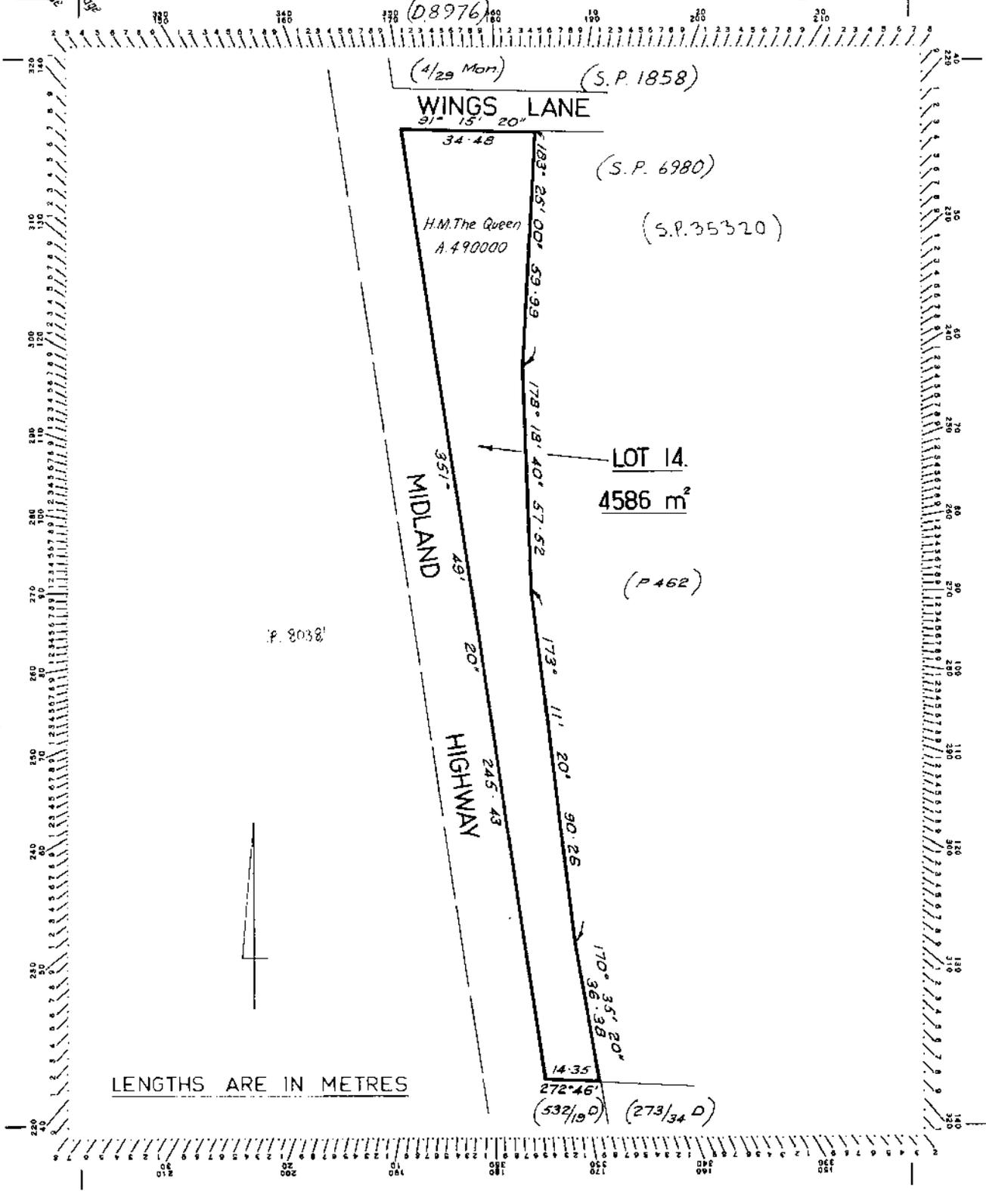
Reservations and conditions in the Crown Grant if any

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

7095      48/3-1/26. A898      D. 7095

<b>Owner:</b> <i>Claude Lastie Kingston.</i>	<b>PLAN OF SURVEY</b> by Surveyor <i>A. R. Hilder.</i> of land situated in the	Registered Number: <b>D7095</b>
<b>Title Reference:</b> <i>CT 2616/57.</i>	LAND DISTRICT OF MONMOUTH. PARISH OF STRANGFORD.	Effective from: <i>4-8-15</i>
<b>Grantee:</b> <i>Part of 60° 1' 34" granted to Armytage Galletly and Another.</i>	Scale: 1 : 1000	<b>P/I</b> <i>M. Hutchinson</i> Recorder of titles



SEARCH OF TORRENS TITLE

VOLUME 203439	FOLIO 1
EDITION 2	DATE OF ISSUE 22-Sep-1999

SEARCH DATE : 06-Sep-2021

SEARCH TIME : 10.40 AM

DESCRIPTION OF LAND

Parish of STRANGFORD, Land District of MONMOUTH  
 Lot 1 on Plan 203439  
 Derivation : Part of Lot 31065 Gtd to Lyall William Newcomen  
 Cooper and duly surrendered by Transfer No. A252395  
 Prior CT 2244/58

SCHEDULE 1

A252395 Transfer to THE CROWN

SCHEDULE 2

Reservations and conditions in the Crown Grant if any

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

ORIGINAL - NOT TO BE REMOVED FROM TITLES OFFICE

3902 05

TASMANIA

REAL PROPERTY ACT, 1862, as amended



CERTIFICATE OF TITLE

Register Book  
Vol. Fol.

2244 58

HER MAJESTY THE QUEEN is now seised in demesne by right of Her Imperial Crown subject nevertheless to such encumbrances liens and interests as are notified by Memorial underwritten or endorsed hereon of all that piece of land situated in the Parish of Strangford Land District of Monmouth containing

ONE ROOD SIXTEEN PERCHES AND TWO TENTHS OF A PERCH

delineated in the diagram hereon and in the public maps of the State - - deposited in the Office of the Surveyor-General originally granted to - LYALL WILLIAM NEWCOMEN COOPER, and duly surrendered as appears by TRANSFER NO. A252395

IN WITNESS whereof I have hereunto signed my name and affixed my seal this **23 MAY 1967**

*M. Hutchinson*

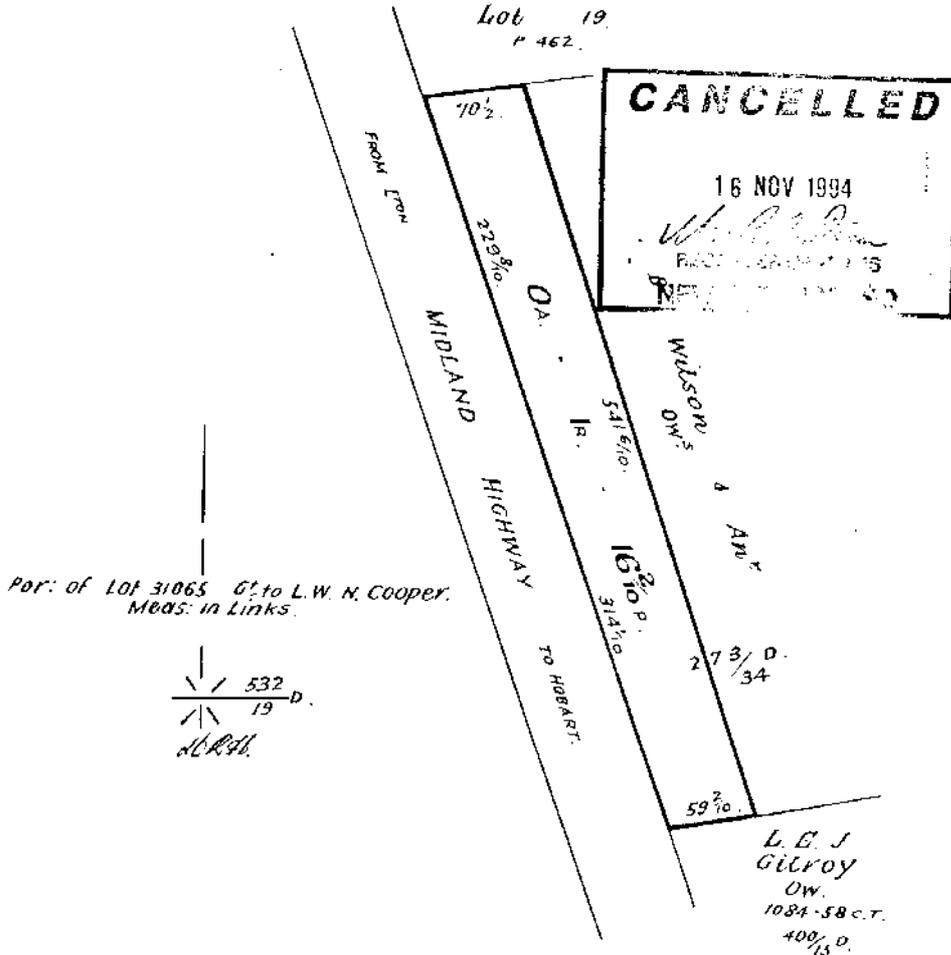
RECORDER OF TITLES



THE RECORDER OF TITLES ARE NO LONGER SURSISTING.

Lot 1 of this plan consists of all the land comprised in the above-mentioned cancelled folio of the Register

REGISTERED NUMBER  
**203439**



First Edition. Registered **23 MAY 1967**  
Derived from C. T. Vol. 739 Fol. 84-Transfer A252395-B. Wilson & anor.

SEARCH OF TORRENS TITLE

VOLUME 6785	FOLIO 15
EDITION 2	DATE OF ISSUE 01-Sep-1999

SEARCH DATE : 06-Sep-2021

SEARCH TIME : 10.40 AM

DESCRIPTION OF LAND

Parish of STRANGFORD, Land District of MONMOUTH  
 Lot 15 on Diagram 6785  
 Derivation : part of 60 acres 1 rood 34 perches Gtd to Claude  
 Armitage Galletly and Reginald Armitage Galletly and duly  
 acquired by Notification No. A485203  
 Prior CT 3468/4

SCHEDULE 1

THE CROWN

SCHEDULE 2

Reservations and conditions in the Crown Grant if any

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

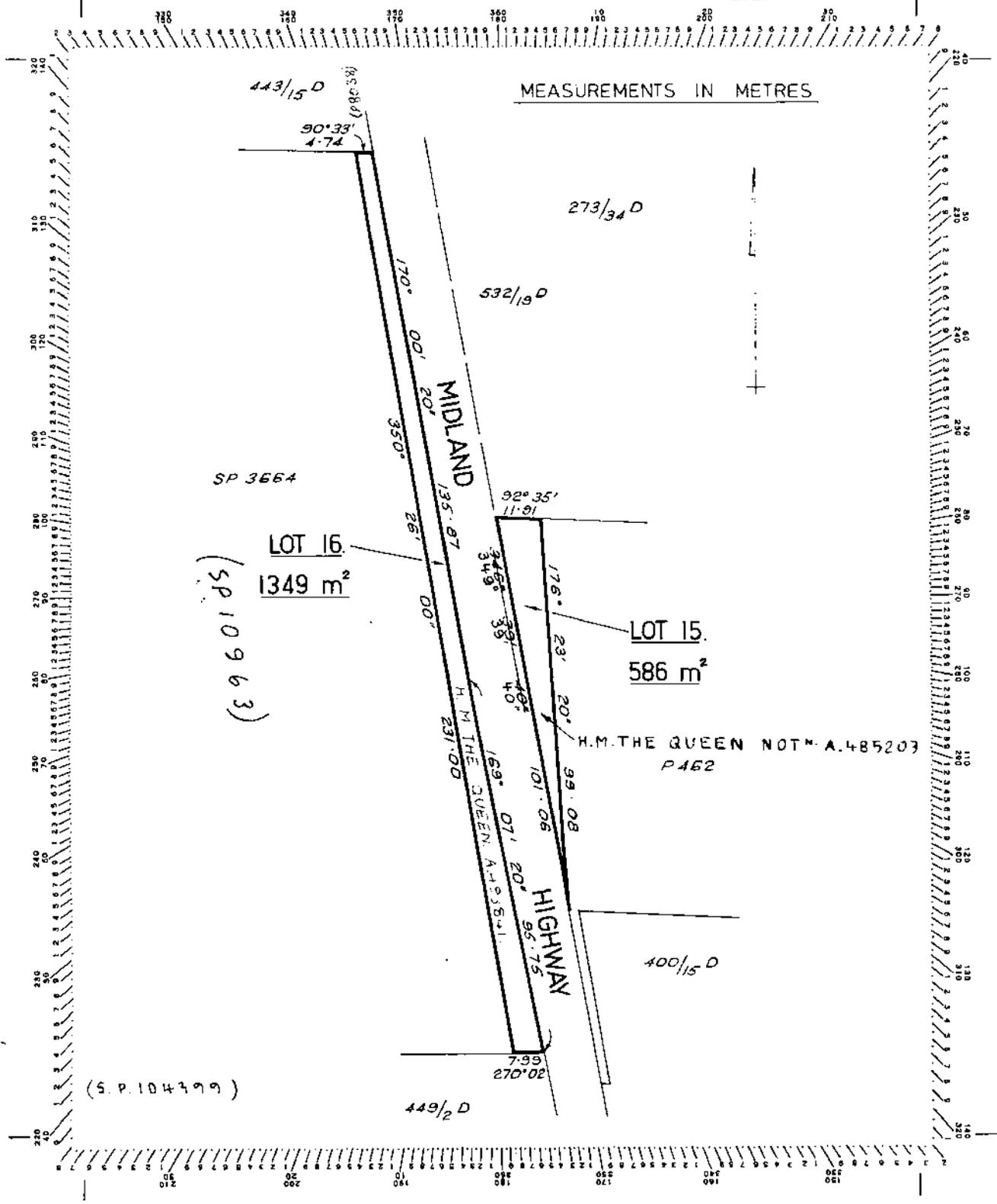
6785 27 MAR 1975

A901

<p><b>Owners:</b> Lot 15 - Barry Ernest Lewis Edwards. Lot 16 - Elliot Arthur &amp; Helen Joan Booth.</p>	<p><b>PLAN OF SURVEY</b> by Surveyor <u>A. R. Hilder</u> of land situated in the</p>	<p><b>Registered Number:</b> <b>D6785</b></p>
<p><b>Title References:</b> Lot 15 - CT 2314/59. Lot 16 - CT 3158/13.</p>	<p><b>LAND DISTRICT OF MONMOUTH.</b></p>	
<p><b>Grantees:</b> Lot 15 being part of 60° 1' 34" gfd to C.A. Galletly and Arr., and Lot 16 being part of 180° 3' 33" gfd to C.A. Galletly and Arr.</p>	<p><b>PARISH OF STRANGFORD.</b>  Scale: 1 : 1000</p>	

**Effective from:**

**P/I** Recorder of titles



SEARCH OF TORRENS TITLE

VOLUME 8494	FOLIO 1
EDITION 2	DATE OF ISSUE 24-Aug-1999

SEARCH DATE : 06-Sep-2021

SEARCH TIME : 10.40 AM

DESCRIPTION OF LAND

Parish of STRANGFORD, Land District of MONMOUTH  
 Lot 1 on Diagram 8494  
 Derivation : Part of 60A-1R-34Ps. Granted to Claude Armytage  
 Galletly and Reginald Armytage Galletly  
 Prior CT 3625/33

SCHEDULE 1

THE CROWN

SCHEDULE 2

Reservations and conditions in the Crown Grant if any

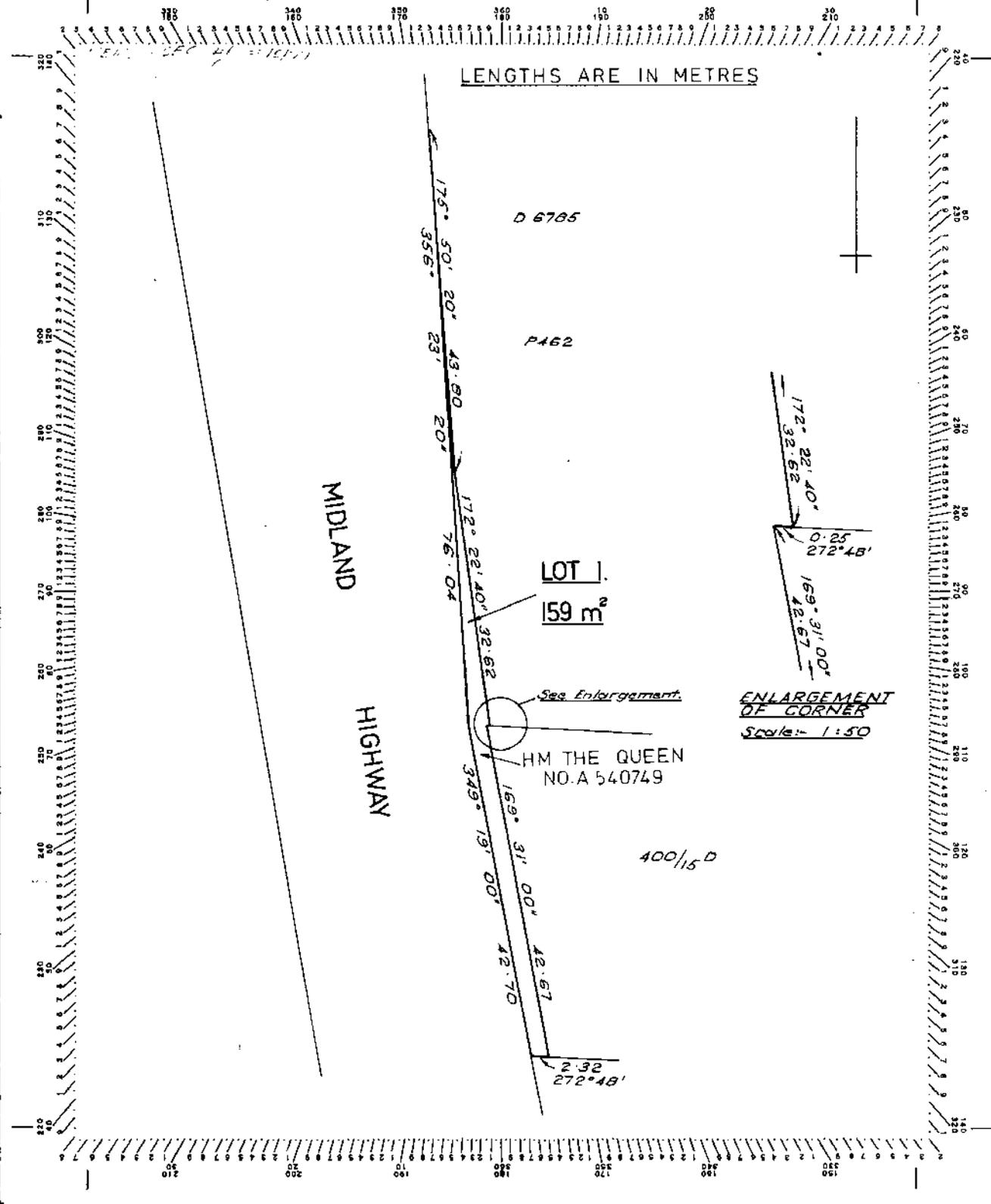
UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

A1169

D 8494

<b>Owner:</b> <i>Barry Ernest Lewis Edwards.</i>	<b>PLAN OF SURVEY</b> by Surveyor <i>A. R. Hilder.</i> of land situated in the	<b>Registered Number:</b> <b>D8494</b>
<b>Title Reference:</b> <i>CT 3502/27.</i>	<b>LAND DISTRICT OF MONMOUTH,</b> <b>PARISH OF STRANGFORD.</b>	Approved: <b>29 JUN 1977</b> Effective from:
<b>Grantee:</b> <i>Part of 60° 1' 34" granted to Claude Armytage Galletly &amp; Ann. Reginald Armytage Galletly.</i>	Scale: - 1:500	<b>P/I</b> <i>[Signature]</i> Recorder of titles



19/11/2021

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## APPENDIX B

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### Subdivision Proposal Plan



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10 X 15 BUIL  
  
STAGING:  
STAGE 1 LOT1, LOTS 40,41  
STAGE 2 LOTS 2 - 12 & 42 -  
STAGE 3 LOTS 13 - 21 & 48  
STAGE 4 LOTS 22 - 26 & 50  
STAGE 5 LOTS 27 & 31

AMENDMENTS		
No.	Revision/Issue	Date
6	REV 6	15-10-21
7	Stormwater Detention Lot Added	17-11-21

**LEARY COX & CRIPPS**  
LAND & ENGINEERING SURVEYORS

Unit G04 40 Molle Street,  
HOBART TAS 7000  
P 03 6118 2030  
E admin@lccsurvey.com

Project Name and Address  
**10 EAST BAGDAD ROAD  
EAST BAGDAD**

Drawing Title  
**PLAN OF SUBDIVISION**

Client  
DFY INVESTMENTS PTY LTD  
CT 36069 / 1

SCALE  
0 10 25 35  
1:1250 at A3

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19/11/2021

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## APPENDIX C

### Concept Services Report

REPORT

# 10 East Bagdad Road Proposed Subdivision Stormwater Report

November 2021



**Johnstone McGee & Gandy Pty Ltd**

ABN 76 473 834 852 ACN 009 547 139

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Issuing Office: 117 Harrington Street, Hobart JMG Project No. J213045PH								
Document Issue Status								
Ver.	Issue Date	Description	Originator		Checked		Approved	
1	16.11.2021	Issued for Approval	CAG		CJM		GLA	
2	18.11.2021	SW Quality added	CAG		CJM		GLA	
3	19.11.2021	1% AEP FLOWS ADDED	CAG		CJM		GLA	
4	30.11.2021	Catchment 1 Area Updated & Overland Flow	CAG		CJM		GLA	

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Appendix A - Lot Layout

Appendix B - Site Pre and Post Development Catchments

Appendix C - Existing and Proposed Stormwater System

Appendix D - Stormwater Calculations

Appendix E - DSG Stormwater Drawings

# 1. Introduction

A 54 lot residential subdivision is proposed for an existing rural lot located on the corner of the Midland Highway and East Bagdad Road, known as 10 East Bagdad Road.

This report aims to describe the main control and management characteristics for the proposed stormwater system as well defining the minimum volume of detention necessary to ensure the site stormwater discharge post development to the Midland Highway is limited to the sites pre development 1% Annual Exceedance Probability (AEP) flows



Image 1 - Development Site

## 2. Stormwater

The proposed development site is approximately 5.50Ha in size and is made up of predominantly grassland with some minor improvements including sheds, driveways and a pacing track. Along East Bagdad Road existing developed properties on the southern side of the road drain towards the site and contribute to stormwater flows from the development. The site typically falls northeast to southwest with an average grade of approximately 2.50%. A ridge positioned north/south through the site splits the eastern side of the site into a catchment of approximately 0.75Ha which drains to the east and into Bagdad Rivulet, the majority of the site west of the ridge, 4.8Ha, drains towards the Midland Highway via an existing water hole in the south western corner of the site before entering the roadside open drain located on the eastern side of the Midland Highway. Downstream, or south of the site, stormwater flows in the open drain before entering a grated pit located over a 600mm culvert opposite the Iden Road junction. This culvert passes under the highway and down Iden Road before entering Horfield Creek. See DSG drawings A0087.030 sheet 2213 to 2215 included in Appendix D for design drawings of the highway drainage.

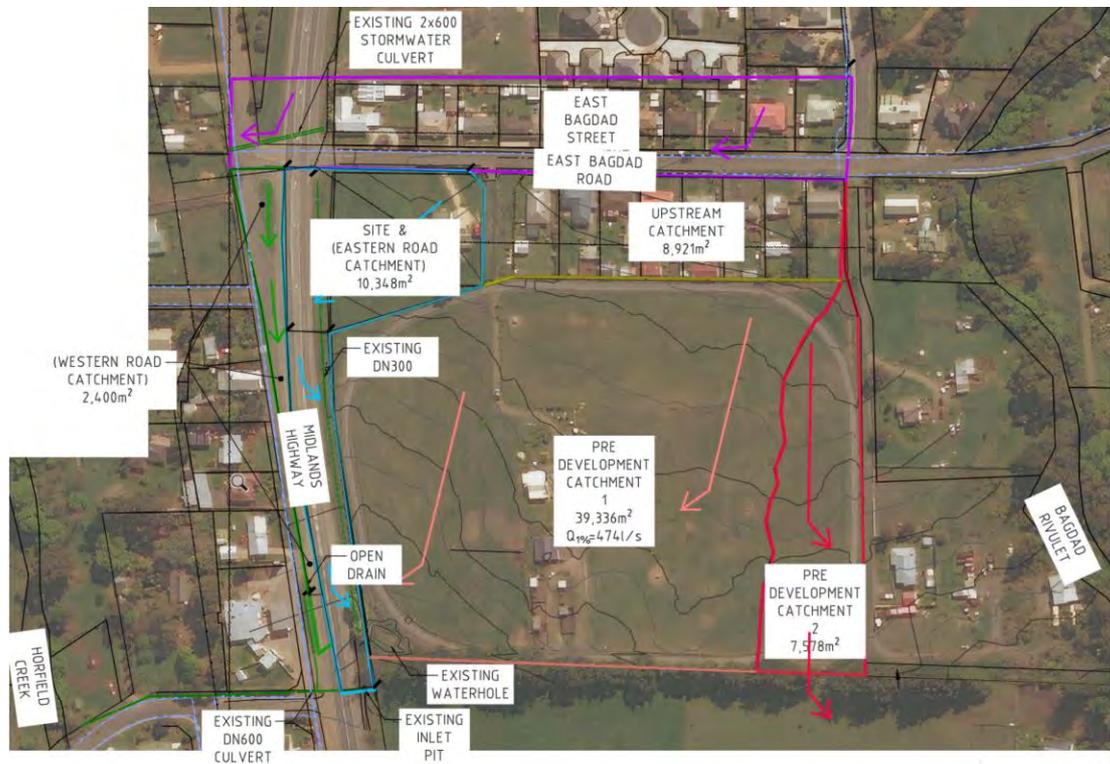


Image 2 - Existing Stormwater Catchments

Stormwater collected along the eastern side of the Midland Highway, immediately south of the East Bagdad Road junction, is collected in a DN300 piped system which discharges to an open drain parallel with the southern portion of the site. Just south of the southern site boundary, water is transferred under the Midland Highway in a DN600 culvert, this pipe flowing down Iden Road to where it discharges into Horfield Creek.

East Bagdad Road intersects flows from the north of the site and diverts these under the Midland Highway in twin DN600 pipes located immediately to the north of the junction.

## 2.1 Pre-Developed Flow Conditions

Analysis of stormwater capacity is divided into two parts:

- The site catchment, which considers the natural surface conditions.
- The developed area, which considers the detention volume required to limit post-development flow from site to pre-development levels and the internal drainage layout.

All flow analysis was conducted with the rational method, in accordance with AR&R 1987, and utilised 2019 Rainfall IFD data obtained from the Bureau of Meteorology analysis of the AR&R Climate Change scenario of a predicted 16.3% increase in rainfall intensities was also undertaken.

The 2019 AR&R IFD's utilise terminology that differs from that in the 1987 edition and as such the following assumptions have been made:

A 1:10 year ARI event was approximated to be equivalent to a 10% AEP (while the 1:20 and 1:100 year events match the 5% and 1% respectively).

### Subdivision Catchment Areas

The undeveloped subdivision catchment areas can be seen in drawing Appendix B - Drawing C02. Analysis of flow was determined as above, adopting 40% average permeability. The total discharge from the site for a 1% AEP event was calculated as 0.474m<sup>3</sup>/sec. The key catchment areas are shown in Table 1, including the point at which they discharge.

Table 1 - Undeveloped Catchment

Catchment	Area (m <sup>2</sup> )	T <sub>c</sub> (mins)	1% AEP Flow (m <sup>3</sup> /sec)	1% AEP Flow with Climate Change (m <sup>3</sup> /sec)	Discharge Point
Catchment 1 & Upstream Developed	48257	20	0.474	0.557	Southwestern corner via dam to drainage system along the Midland Highway
Catchment 2	7580	20	0.065	.075	South eastern property boundary - Bagdad Rivulet

## 2.2 Post Developed Flow Conditions

It is proposed that the new residential lots and roadways be serviced with a piped stormwater drainage system with capacity to convey rainfall events up to AEP 5% with flows above this being conveyed by the new road network to the Catchment 1 discharge point.

The Department of State Growth proposes a 1% AEP storm event analysis of the discharge to the State road reserve as the Midland Highway is considered a Category 1 road. Therefore, this condition requires a no net increase in discharge into the highway drainage system between Pre & Post development condition for the 1% AEP event.

For the post development flow conditions, the following assumptions have been made:

- The average water pipe velocity across the catchment is approximately 1.50 m/s.
- The impervious surface maintains the same value of roughness across the site.

The new stormwater system will convey water from the following catchments:

Catchment 1 - The western portion of the site, including all of the new roadways, drain to the south western corner of the site to a new stormwater bio retention basin

Catchment 2 - The lots located on the eastern and southern boundary of the site are to be drained along the new POS walkway to a new discharge point to Bagdad Rivulet.

The developed stormwater network plan can be seen in Appendix B - Drawing P03.



Image 3 - Proposed Stormwater Catchments

The post-development flow was calculated using the rational method, with house, footpath and roads spaces contributing an average 70% as impervious throughout the site.

Table 2 details the key values for a 1% AEP & 1%AEP with Climate Change pre and post development event and specifies the location at which this flow discharges.

Table 2 - Discharge Location & Volumes

	Undeveloped Discharge Rate (m3/sec)	Undeveloped Discharge Rate with Climate Change(m3/sec)	Peak Unretained Developed 5 min TOC Discharge Rate (m3/sec)	Peak Unretained Developed 5 min TOC Discharge Rate with Climate Change(m3/sec)
Catchment 1 - Midland Hwy DN600 culvert	0.474	0.557	1.042	1.384
Catchment 2 - Bagdad Rivulet	0.065	0.0760	0.177	0.206

The catchment 1 proposed stormwater network results in the collection and detention of flow, to the southwest corner of the site, so as it can be contained in a single stormwater detention facility before discharging from the site to the existing system on the Midland Highway. To limit the Developed Discharge Rate from site to Pre-development values a maximum allowable discharge rate for catchment 1 is to be adopted as 0.474m<sup>3</sup>/sec. The flow to the Midland Highways system will be managed with a suitably sized detention pond. The volume required to do so is discussed in Section 2.3.

For catchment 2 it is considered that the existing rivulet has sufficient capacity to accommodate the short time of concentration of the post development 1% peak flows, <10 min, and small increase in peak discharge of, 0.112m<sup>3</sup>/s. This compares to the significantly longer time of concentration and capacity of the existing rivulet.

### 2.3 Storage Requirements

Boyd's Formula, see equation 1 below, was used to calculate the storage volume required to detain rainfall events of duration less than or equal to the Time of Concentration, and determine an approximation of the total storage volume required.

$$S_{max} = V_1 \left( 1 - \frac{Q_p}{I_p} \right) \quad (1)$$

Where

$S_{max}$	Maximum Volume of Temporary Storage	(m <sup>3</sup> )
$V_1$	Volume of Inflow Flood	(m <sup>3</sup> )
$Q_p$	Peak of Outflow Hydrograph	$\left( \frac{m^3}{s} \right)$
$I_p$	Peak of Inflow Hydrograph	$\left( \frac{m^3}{s} \right)$

A summary of all tabulated data can be seen in Appendix D.

Analysis of the site with over a number of storm durations ranging from 5 minutes to 2 hours, with a restricted outflow rate of 0.474m<sup>3</sup>/s, concluded that a 10-minute duration storm required a maximum storage for a 1% AEP event of ≈284m<sup>3</sup>.

It is proposed a bio-retention basin be located at the southwestern corner of the site in the vicinity of the existing dam, as shown on the drawing below.

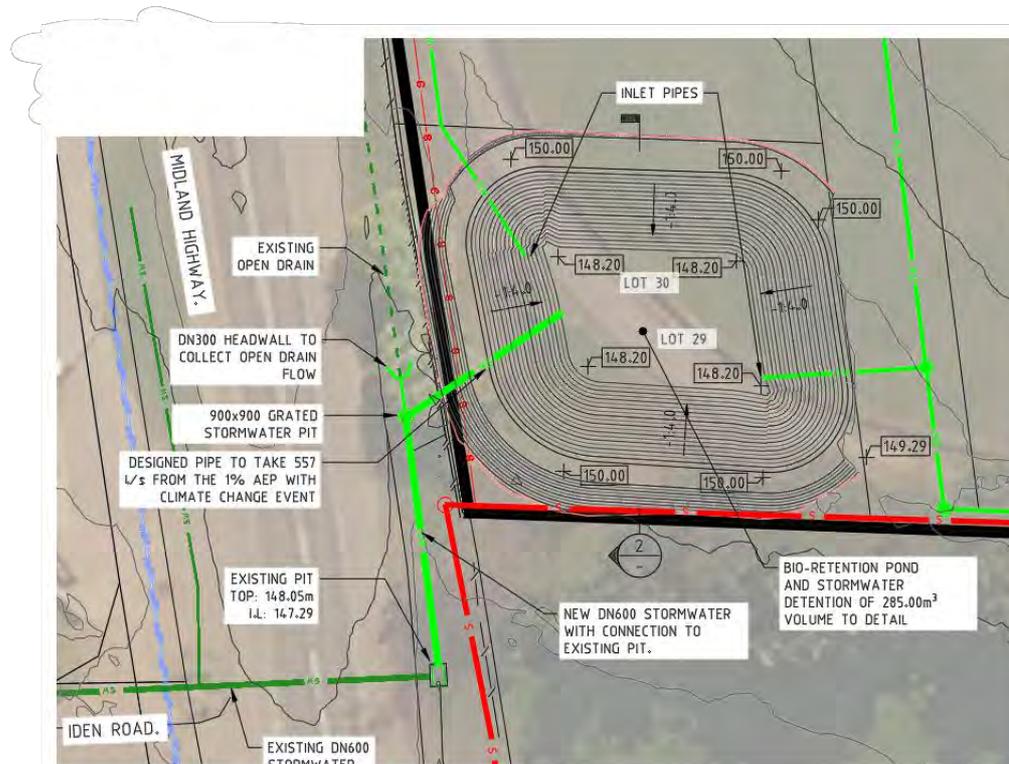


Image 4 - Bio-Detention Pond Location

The discharge from the detention pond will be via an orifice sized to limit flows to the pre development 1% AEP flow rate, this orifice will drain into a large grated outlet pit with a pipe connection into the highway road reservation and the existing pipe under the highway. In the event that the capacity of the downstream pipework was exceed grated inlets on the piped system would act as surcharge pits.

Analysis of the capacity of the highway pipe indicated that it has a HGL capacity of 561 l/s. See Image 6 below and discussion in section 2.4.

## 2.4 Overland Flow Paths

The proposed road layout within the subdivision provides 1% AEP flow paths from the northwest of the site through to the detention pond in the southeast corner of the site. Kerb and channel within the new road network will be used to containing flows to the new road pavement. A spillway from the road into the detention can be provided adjacent to the eastern side of the detention ensure all flows from catchment 1 are confined to the detention pond before exiting the site through the detention pond outlet pit and associated pipework.

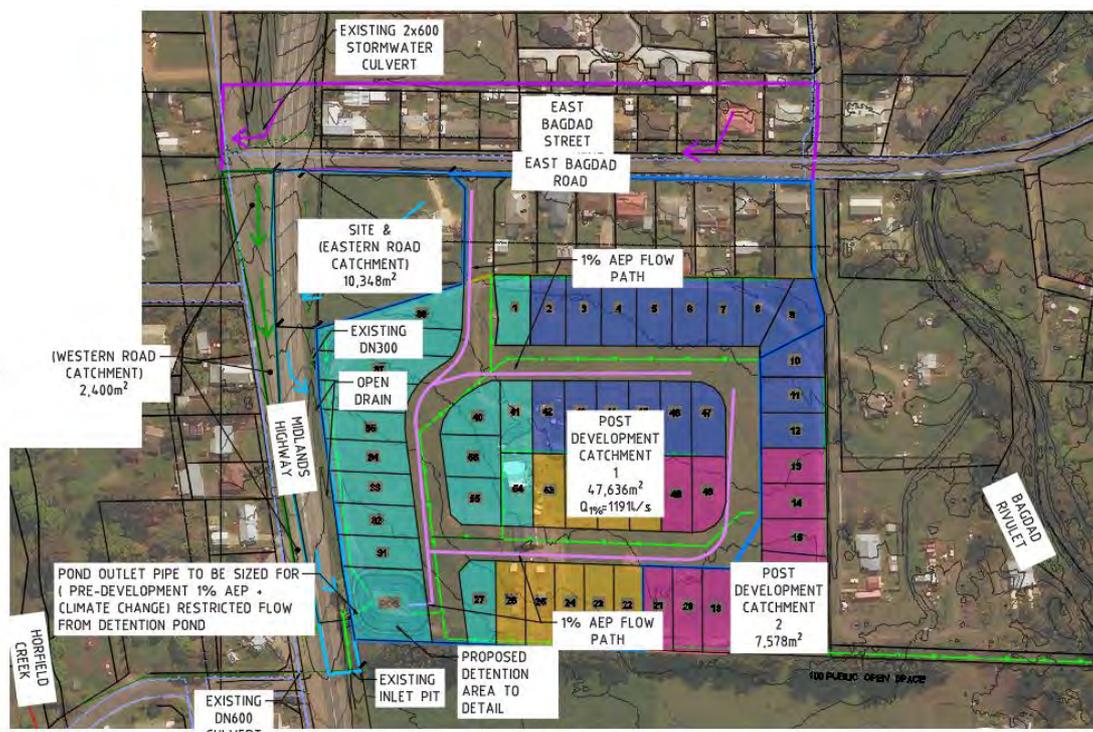


Image 5 - 1% AEP + C.C. Overland Flow Path

1% AEP detained flows from catchment 1 will be limited to predevelopment levels rates of  $0.474\text{m}^3/\text{s}$  or if climate change is considered this rate can be increased to  $0.557\text{m}^3/\text{s}$  as this would be the rate of discharge coming into the road reservation from the existing site if no development was to occur.

The water will be directed to the DN600 pipe under the Midland Highway which has a calculated HGL capacity of  $0.56\text{m}^3/\text{s}$

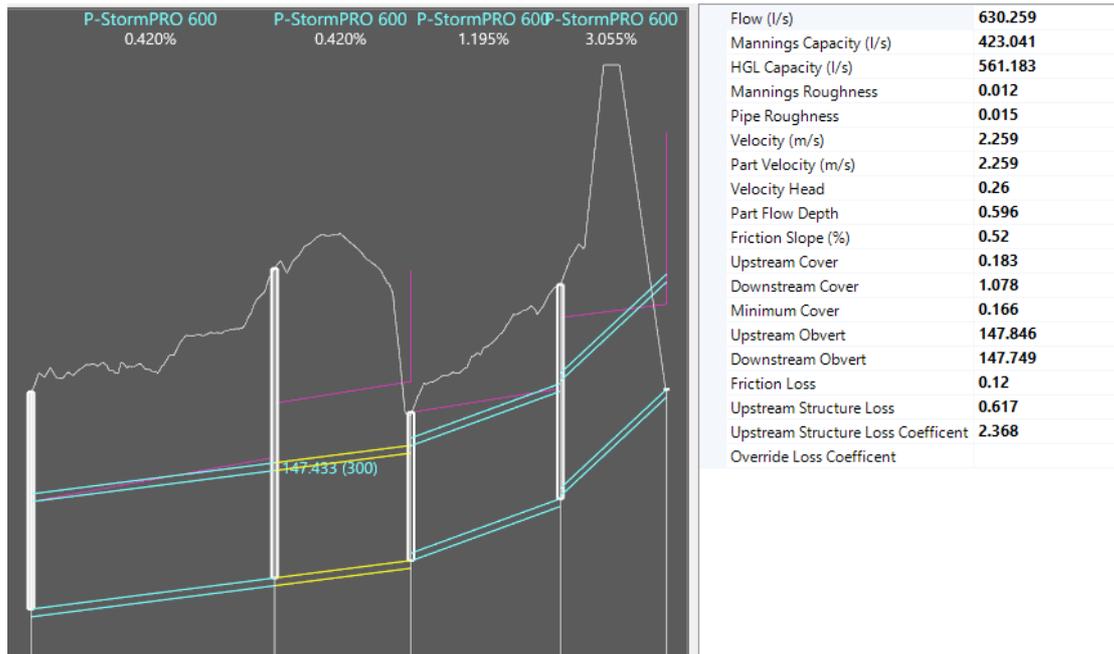


Image 6 - DN600 Highway Culvert Capacity

The current inlet on the DN600 pipe which consists of a nom. 900x600 grate would be prone to blockage and is unlikely, even when clean, to provide inlet capacity to take flows from the existing undeveloped site and road reservation. The construction of the new system will provide the opportunity to install additional inlet pits and a headwall to accept the upstream flows and better utilize the capacity of the existing pipe. In the event that the existing pipe is running at capacity flows will bypass the culvert inlet and flow south down the Midland Highway in the large table drain and adjacent road reserve, the highway through this section being above the level of the natural surface to the east.

As 1 % AEP discharge flows will not be increased as a result of the detention being provided the risk of flooding of the Midland Highway is not increased.



Image 7 - Existing Inlet Pit Midland Highway Table Drain



Image 8 -Midland Highway Table Drain South of DN600 Pipe

## 2.5 Stormwater Quality

MUSIC (Model for Urban Stormwater Improvement Conceptualisation) software was used to analyse the treatment efficiency of the proposed stormwater system. The model utilised input parameters defined in the 'Draft NSW MUSIC Modelling Guidelines: August 2010' and 6min interval rainfall data for Hobart for the period 1990 to 2010.

Catchment areas used in the analysis are shown in Image 7

### Catchment 1

Includes the existing lots along East Bagdad Road, New lots through the centre and western side of the site and all new roadways flow to the bio retention basin to be constructed in the south western corner of the site. Refer Appendix C, drawing J213045PH-P03 for basin typical section and dimensions.

### Catchment 2

Encompasses the new residential lots 10-21 on the eastern side of the site, this water flowing untreated to Bagdad Rivulet



Image 8 - Proposed Stormwater Catchments

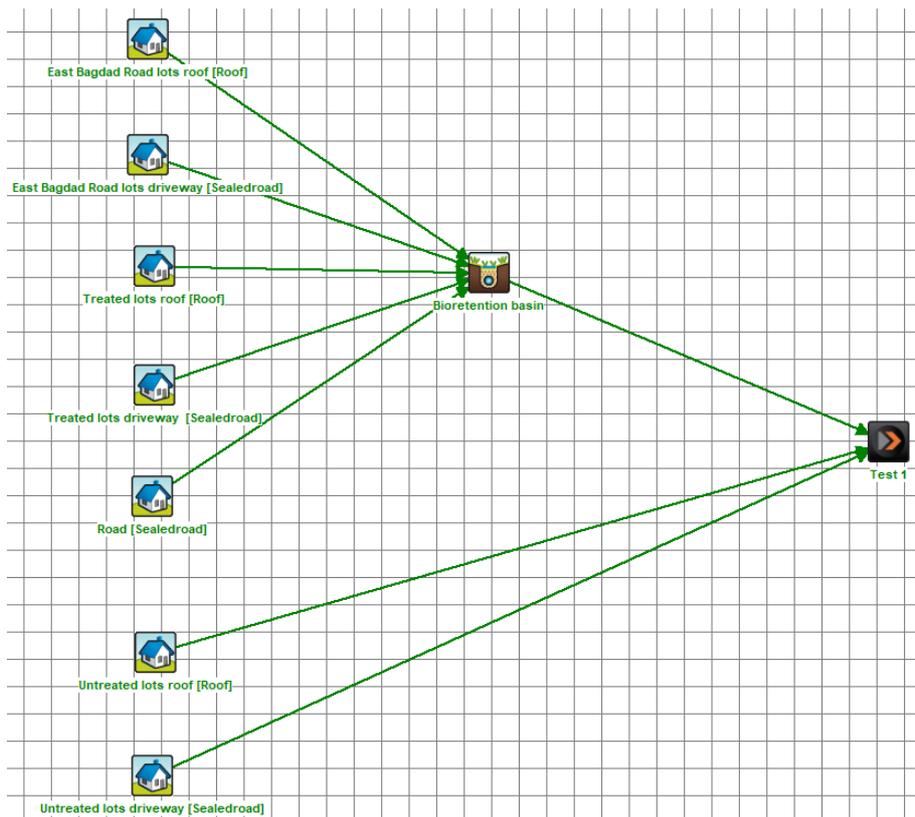


Image 9: Stormwater treatment MUSIC Model

The results from the MUSIC modelling are tabulated below.

Table 1 - Treatment Train Effectiveness

	Sources	Residual Load	% Reduction
Flow (ML/yr)	9.56	7.08	26
Total Suspended Solids (kg/yr)	1420	261	81.6
Total Phosphorus (kg/yr)	3.01	1.21	59.9
Total Nitrogen (kg/yr)	21.7	11.1	48.9
Gross Pollutants (kg/yr)	367	53.3	85.4

The proposal meets the acceptable solution A2 of the interim planning scheme which implies that a stormwater system for a new development must incorporate water sensitive urban design principles for the treatment and disposal of stormwater. The treatment system is seen to exceed the requirements of the water quality targets as detailed in the State Stormwater Strategy, 2010

- 80% reduction in the annual average load of total suspended solids
- 45% reduction in the annual average load of total phosphorus
- 45% reduction in the annual average load of total nitrogen

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**APPENDIX A**  
Lot Layout

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10 X 15 BUILDING  
STAGING:  
STAGE 1 LOT1, LOTS 40,41  
STAGE 2 LOTS 2 - 12 & 42 -  
STAGE 3 LOTS 13 - 21 & 48  
STAGE 4 LOTS 22 - 26 & 50  
STAGE 5 LOTS 27 & 31

AMENDMENTS		
No.	Revision/Issue	Date
6	REV 6	15-10-21
7	Stormwater Detention Lot Added	17-11-21

**LEARY COX & CRIPPS**  
LAND & ENGINEERING SURVEYORS

Unit G04 40 Molle Street,  
HOBART TAS 7000  
P 03 6118 2030  
E admin@lccsurvey.com

Project Name and Address  
**10 EAST BAGDAD ROAD  
EAST BAGDAD**

Drawing Title  
**PLAN OF SUBDIVISION**

Client  
DFY INVESTMENTS PTY LTD  
CT 36069 / 1

SCALE  
0 10 25 35  
1:1250 at A3

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## APPENDIX B

---

### Site Pre and Post Development Catchments

**SAFETY IN DESIGN REPORT**  
In accordance with the Workplace Health & Safety Act and Regulations, JMG have considered the potential hazards and risks that are specific to this design.  
The design has been identified as:  
The design has been identified as:  
The design has been identified as:  
The design has been identified as:



REV	DATE	RESPONSE TO COUNCIL RFI	REMARK
DA	12.11.2021		

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PROJECT  
PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD - 7030  
TITLE  
CATCHMENT PLAN  
PRE-DEVELOPMENT

Accepted Discipline Head (Discipline Head)	Date
Accepted Team Leader (Team Leader)	Date
Approved Principal (Principal)	Date

SCALES @ A1	DESIGNED BY	DRAWN BY
1:750	DESIGNED	DRAWN
	PLOT DATE	22/11/2021

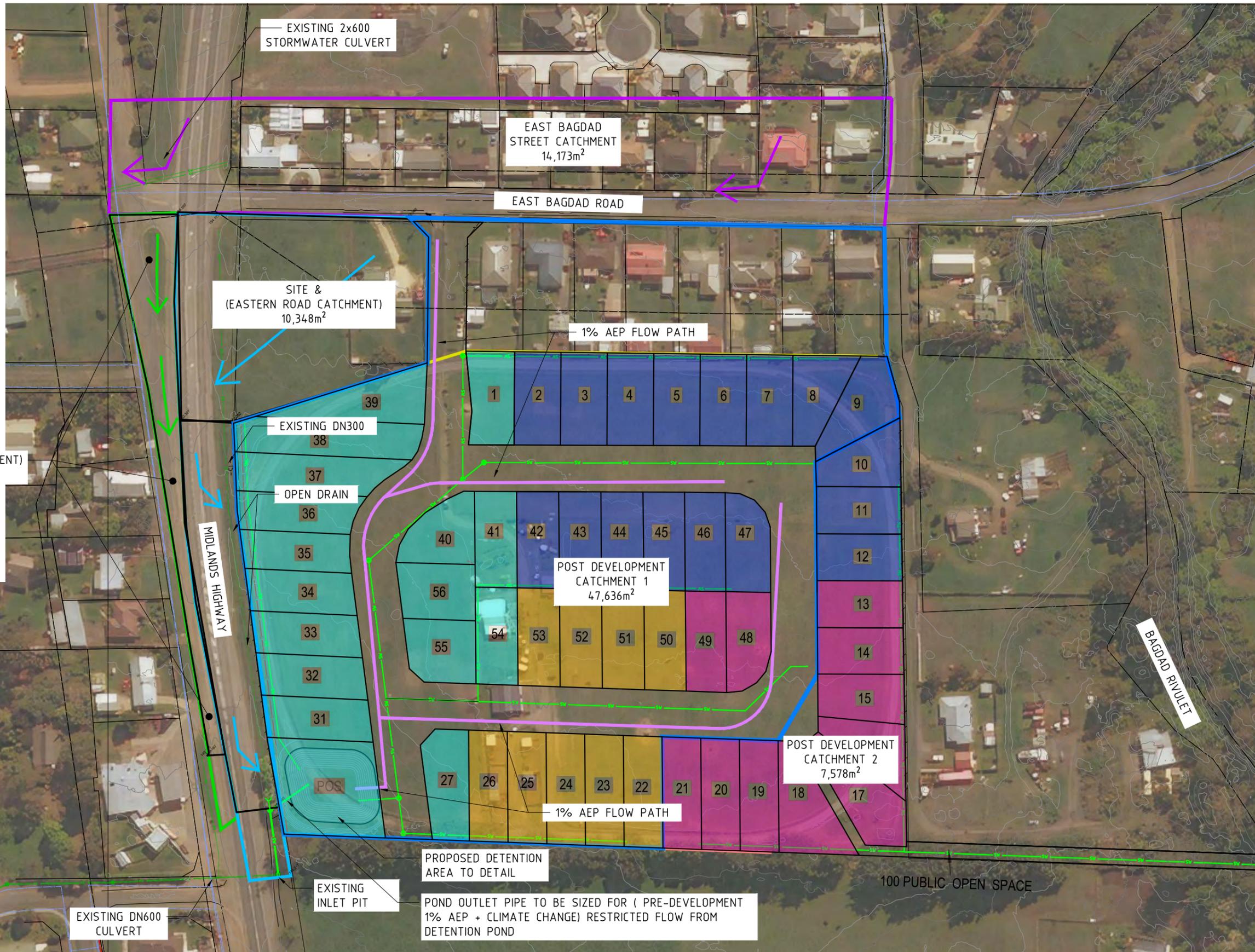
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PROJECT NO.	J213045PH
DWG NO.	P04
REVISION	DA

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The following table shows an overview of the design team's assessment of the risks that are specific to this design.  
The report does not constitute a guarantee of the design team's liability under the Act to identify, report, mitigate and manage all aspects of risk and safety.



DA1 29.11.2021 POST DEVELOPMENT AREA REVISED  
DA1 12.11.2021 RESPONSE TO COUNCIL RFI  
REV DATE REMARK

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The report does not constitute a guarantee of the design team's liability under the Act to identify, report, mitigate and manage all aspects of risk and safety.

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PROJECT  
PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD - 7030

TITLE  
CATCHMENT PLAN  
POST-DEVELOPMENT  
(1% AEP)

Accepted Discipline Head (Discipline Head)	Date
Accepted Team Leader (Team Leader)	Date
Approved Principal (Principal)	Date

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PLOT DETAILS CATCHMENT PLAN.DWG  
PROJECT NO. J213045PH

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DWG NO.	REVISION
P05	DA1

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## APPENDIX C

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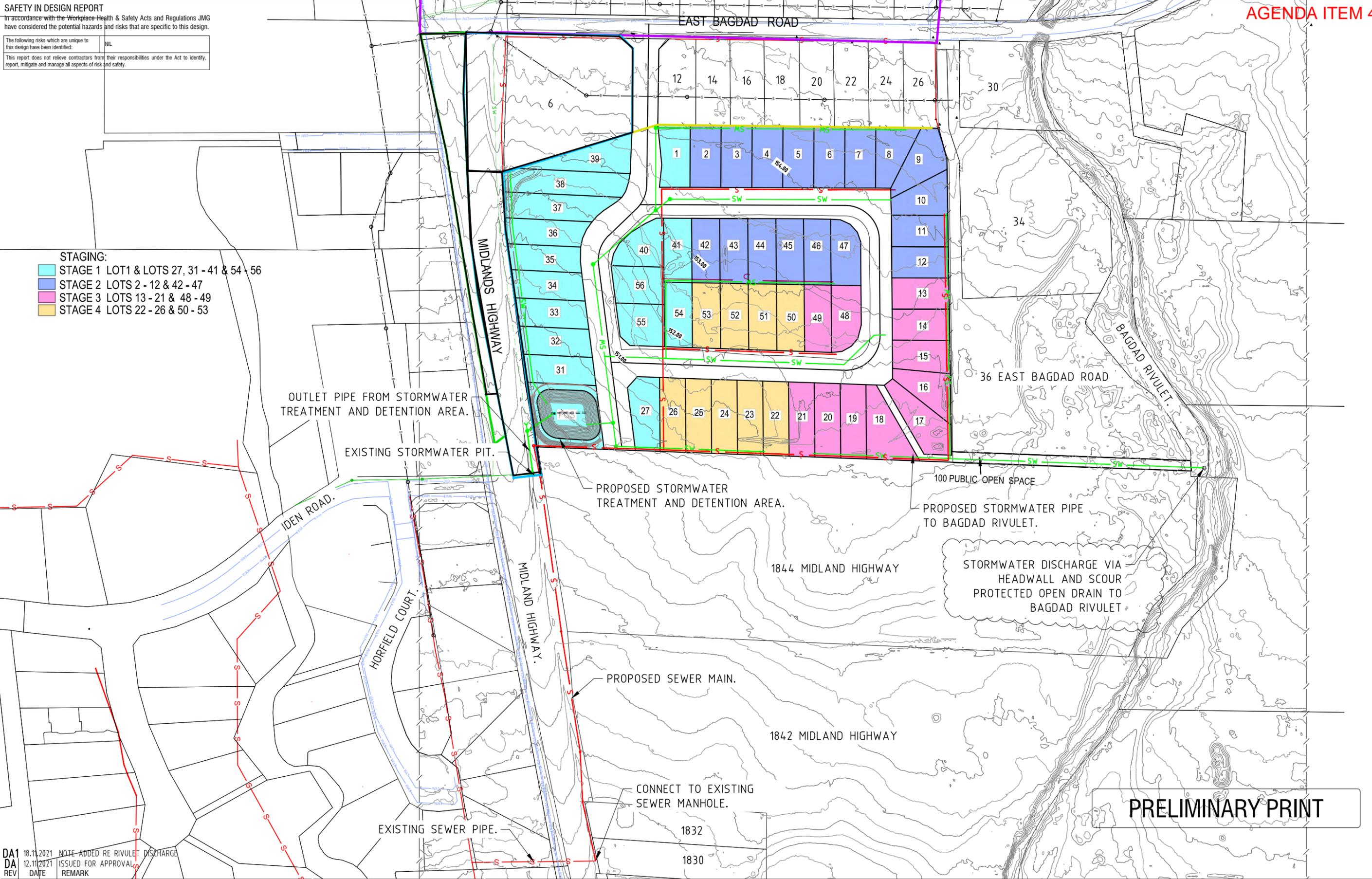
### Existing and Proposed Stormwater System

**SAFETY IN DESIGN REPORT**  
In accordance with the Workplace Health & Safety Acts and Regulations JMG have considered the potential hazards and risks that are specific to this design.

The following risks which are unique to this design have been identified:	NIL
This report does not relieve contractors from their responsibilities under the Act to identify, report, mitigate and manage all aspects of risk and safety.	

**STAGING:**

- STAGE 1 LOTS 1 & LOTS 27, 31 - 41 & 54 - 56
- STAGE 2 LOTS 2 - 12 & 42 - 47
- STAGE 3 LOTS 13 - 21 & 48 - 49
- STAGE 4 LOTS 22 - 26 & 50 - 53



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DA1	18.11.2021	NOTE ADDED RE RIVULET DISCHARGE
DA	12.11.2021	ISSUED FOR APPROVAL
REV	DATE	REMARK

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PROJECT  
**PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD**

TITLE  
**CONCEPT SERVICES  
OVERALL PLAN**

PROJECT NO.	<b>J213045PH</b>
DWG NO.	<b>P01</b>
REVISION	<b>DA1</b>
PLOT DETAILS	CONCEPT SERVICES PLANS.DWG

**SAFETY IN DESIGN REPORT**  
In accordance with the Workplace Health & Safety Acts and Regulations JMG have considered the potential hazards and risks that are specific to this design.

The following risks which are unique to this design have been identified:	NIL
---	-----

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Accepted Team Leader (Team Leader)	Date
Approved Principal (Principal)	Date

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PROJECT  
**PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD**

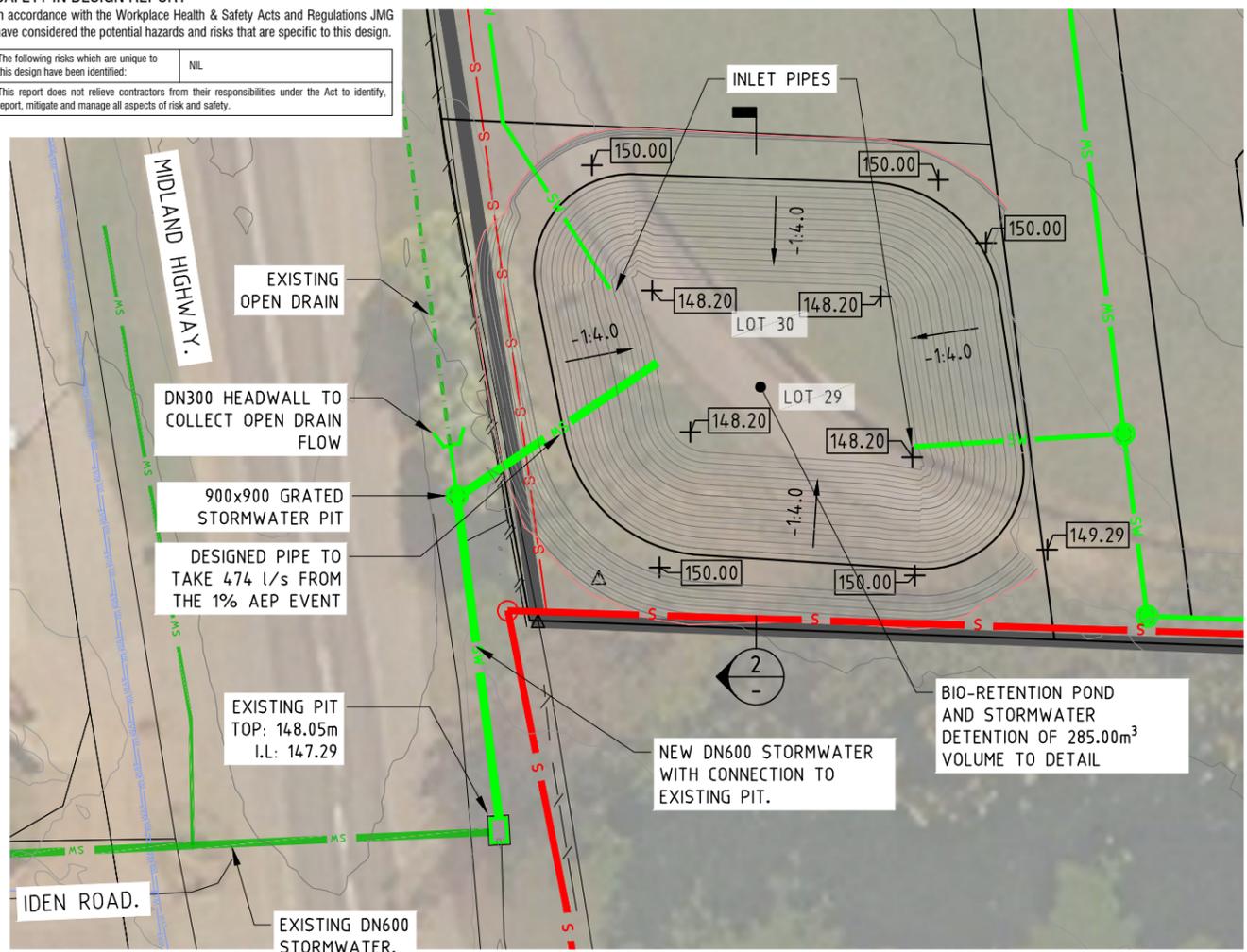
TITLE  
**CONCEPT SERVICES  
INTERNAL PLAN**

PROJECT NO.	<b>J213045PH</b>
DWG NO.	<b>P02</b>
REVISION	<b>P1</b>
PLOT DETAILS	CONCEPT SERVICES PLANS.DWG

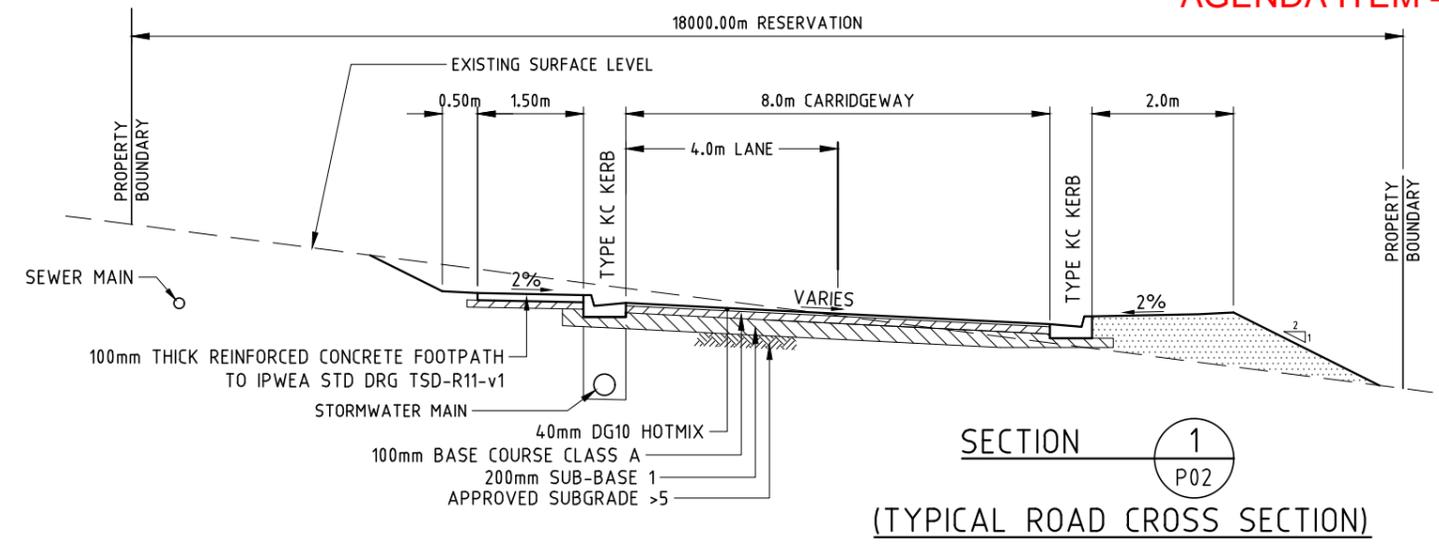
**SAFETY IN DESIGN REPORT**  
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The following risks which are unique to this design have been identified: NIL

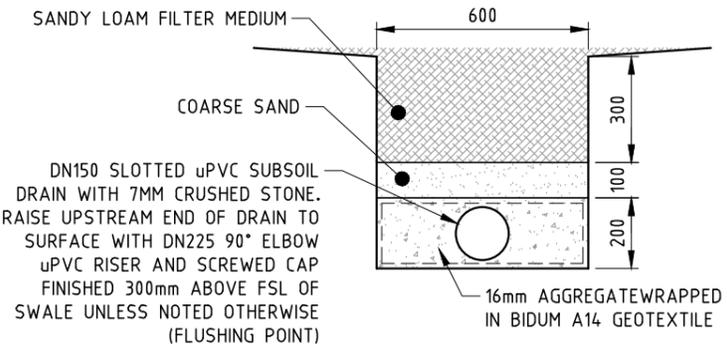
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DETAIL 1  
SCALE P02



SECTION 1  
P02  
(TYPICAL ROAD CROSS SECTION)



BIO-RETENTION SWALE DETAIL  
SCALE 1:20

**BIORETENTION FILTER**  
BACKFILL MATERIALS USED IN THE CONSTRUCTION OF THE BIORETENTION SWALES SHALL HAVE THE FOLLOWING CHARACTERISTICS:

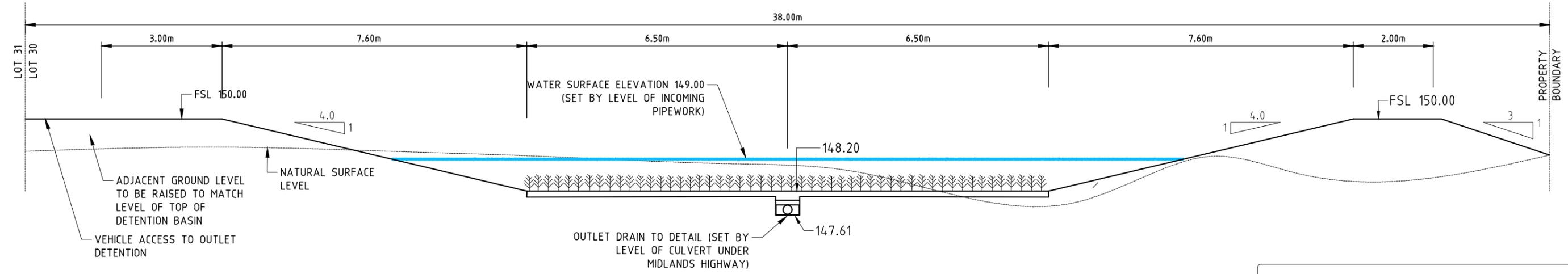
**FILTER MEDIA**  
THE FILTER IS TO BE A SANDY LOAM WITH THE FOLLOWING CRITERIA:  
THE MATERIAL SHALL MEET THE GEOTECHNICAL REQUIREMENTS SET OUT BELOW:

- HYDRAULIC CONDUCTIVITY BETWEEN 50-200 mm/hr
- PARTICLE SIZES OF BETWEEN: CLAY 5-15%, SILT <30%, SAND 50-70%
- BETWEEN 5% AND 10% ORGANIC CONTENT, MEASURED IN ACCORDANCE WITH AS1289 4.1.1.
- pH NEUTRAL

**TRANSITION LAYER**  
TRANSITION LAYER MATERIAL SHALL BE COARSE SAND WITH THE FOLLOWING TYPICAL SIZE DISTRIBUTION:

% PASSING	2.36 mm	93-100%
	1.18 mm	78-98%
	0.6 mm	55-57%
	0.3mm	30-42%
	0.15 mm	5-15%
	0.075mm	0-5%

**DRAINAGE LAYER**  
THE DRAINAGE LAYER IS TO BE 7 mm SINGLE SIZED AGGREGATE



SECTION 2  
(BIO-RETENTION SWALE TYPICAL SECTION)

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DA1	19.11.2021	DETENTION VOLUME UPDATED
DA	12.11.2021	ISSUED FOR APPROVAL
REV	DATE	REMARK

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Accepted Team Leader (Team Leader)	Date	AS SHOWN	LM	LM
Approved Principal (Principal)	Date	DO NOT SCALE. Use only figured dimensions. Locations of structure, fittings, services etc on this drawing are indicative only. CONTRACTOR to check Architects & other project drawings for co-ordination between structure, fabric, fixtures, fittings, services etc. CONTRACTOR to site check all dimensions and exact locations of all items. JMG accepts no responsibility for dimensional information scaled or digitally derived from this document.	PLOT DATE	22/11/2021



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PROJECT  
**PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD**

TITLE  
**TYPICAL SECTIONS AND  
DETAIL**

PROJECT NO.	<b>J213045PH</b>
DWG NO.	<b>P03</b>
REVISION	<b>DA1</b>
PLOT DETAILS	CONCEPT SERVICES PLANS.DWG

## APPENDIX D

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### Stormwater Calculations

Johnstone McGee & Gandy

incorporating Dale P Luck & Associates

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10 EAST BAGDAD ROAD



Engineers & Planners

IFD TABLE (AEP)

		Rainfall mm/hr						
		Annual Exceedance Probability (AEP) mm/hr						
Duration	Duration (min)	63.20%	50%	20%	10%	5%	2%	1%
1 min	1	59	67	93.9	114	135	164	189
2 min	2	50.9	57.5	78.8	93.9	109	127	141
3 min	3	44.9	50.8	70	83.6	97.5	115	128
4 min	4	40.4	45.8	63.4	76.2	89.2	106	120
5 min	5	36.9	41.9	58.3	70.3	82.7	99.6	113
10 min	10	26.8	30.5	42.9	52.2	62	76.3	88.4
15 min	15	21.8	24.8	34.9	42.5	50.5	62.4	72.5
20 min	20	18.7	21.2	29.9	36.3	43.2	53.2	61.6
25 min	25	16.5	18.8	26.4	32	38	46.6	53.8
30 min	30	14.9	17	23.8	28.8	34.1	41.6	47.9
45 min	45	11.9	13.5	18.8	22.6	26.6	32.1	36.5
1 hour	60	10.2	11.5	15.9	19.1	22.3	26.6	30
1.5 hour	90	8.1	9.17	12.6	14.9	17.3	20.4	22.8
2 hour	120	6.91	7.81	10.7	12.6	14.5	17	18.9
3 hour	180	5.53	6.25	8.47	9.96	11.4	13.2	14.6
4.5 hour	270	4.42	4.99	6.75	7.91	9.01	10.4	11.5
6 hour	360	3.76	4.26	5.75	6.73	7.65	8.9	9.83
9 hour	540	2.99	3.38	4.58	5.36	6.11	7.14	7.93
12 hour	720	2.52	2.86	3.88	4.56	5.2	6.12	6.83
18 hour	1080	1.97	2.23	3.05	3.6	4.14	4.91	5.53
24 hour	1440	1.63	1.85	2.55	3.02	3.49	4.17	4.72
30 hour	1800	1.4	1.59	2.2	2.62	3.04	3.65	4.14
36 hour	2160	1.24	1.4	1.94	2.32	2.71	3.26	3.7
48 hour	2880	1	1.14	1.58	1.9	2.23	2.68	3.05
72 hour	4320	0.734	0.832	1.16	1.4	1.65	1.98	2.25
96 hour	5760	0.582	0.658	0.914	1.1	1.3	1.56	1.77
120 hour	7200	0.483	0.546	0.755	0.908	1.07	1.28	1.44
144 hour	8640	0.414	0.467	0.642	0.769	0.901	1.07	1.21
168 hour	10080	0.363	0.409	0.559	0.666	0.775	0.923	1.04

Johnstone McGee & Gandy  
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Offices also in Launceston and Ballarat



10 EAST BAGDAD ROAD

STORMWATER CALCULATION - TIME OF CEONCENTRATION

Time of Concentration - Sheet, Channel and Pipe							
Section	Description	Method			Unit	Comment	
1	Sheet Flow	Hortons		H1	155.5	m	AHD at top of max flow path
				H2	154.5	m	AHD at bottom of max flow path
				dH	1.0	m	Change in height of flow path
				L	30	m	Max flow length
				Grade	3.17	%	Average grade of site
				Surface	Bare soil surface	-	Surface description
				N	0.028	-	Hortons surface roughness
				Time	7.25	min	$Tcs=107*N*(L^{.333})/(S\%^{.2})$
2	Channel Flow	Kirpich		H1	154.5	m	AHD at top of max flow path
				H2	147.8	m	AHD at bottom of max flow path
				dH	6.7	m	Change in height of flow path
				L	264	m	Max flow length
				Slope	0.0254	-	Average slope of channel
				Surface	Densely grassed surface	-	Surface description
				N	2.000	-	Surface roughness
				Time	11.75	min	$Tch = 0.0195 * Lc^{0.77} * Sc^{(-0.385)}$

Average Time of Concentration		
Total ToC	19	min
Adopt	20	min

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10 EAST BAGDAD ROAD

STORMWATER CALCULATION - PRE DEVELOPMENT

Time of Concentration			
C <sub>1,10</sub>	25	mm	10% AEP, 60min Rainfall
A=	47,657.00	m <sup>2</sup>	Insert Catchment Area
A=	0.04766	Km <sup>2</sup>	Calculated in Km <sup>2</sup>
T <sub>c</sub>	20	mins	Whole Number T <sub>c</sub>

Impervious Area		
Existing Hardstand Area=	22,868.25	m <sup>2</sup>
Total Area =	47,657.00	m <sup>2</sup>
Fraction Impervious =	0.48	

Runoff Coefficient		
Fraction impervious =	47.99%	Formula - Refer ARR Book VIII
C <sub>1,10</sub> =	0.10	
C <sub>10</sub> =	0.48	
		Runoff Coefficient

Frequency Conversion Factors -Refer AR&R 1987										
ARI (years)	1	2	5	10	20	40	60	80	50	100
Factor, F <sub>y</sub>	0.8	0.85	0.95	1	1.05	1.2	1.17	1.19	1.15	1.2

Peak Catchment Flows For Varied 5% AEP Storm Durations		
AEP	Duration (min)	Flow (m <sup>3</sup> /s)
5%	5	0.557
5%	10	0.417
5%	15	0.340
5%	20	0.291
5%	25	0.256
5%	30	0.230
5%	45	0.179
5%	60	0.150
5%	90	0.116
5%	120	0.098
5%	180	0.077
5%	270	0.061

Peak Catchment Flows For Given AEP at T.O.C.		
AEP	t <sub>tc,y</sub> (mm/h)	Flow (m <sup>3</sup> /s)
63.20%	18.7	0.0959
50.00%	21.2	0.1155
20.00%	29.9	0.1821
10.00%	36.3	0.2327
5.00%	43.2	0.2908
2.00%	53.2	0.3922
1.00%	61.6	0.4739

Pre Development Catchment 1 (40%)		
Total Area	42,674.00	m <sup>2</sup>
Impervious Area	17,069.60	m <sup>2</sup>

Upstream Catchment (65% Impervious)		
Total Area	8921	
Impervious Area	5798.65	m <sup>2</sup>

Johnstone McGee & Gandy  
incorporating Dale P Luck & Associates



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Offices also in Launceston and Ballarat

10 EAST BAGDAD ROAD

STORMWATER CALCULATION - 5 % AEP POST DEVELOPMENT

Time of Concentration			
C <sub>1,10</sub>	25	mm	10% AEP, 60min Rainfall
A=	47,657.00	m <sup>2</sup>	Insert Catchment Area
A=	0.04766	Km <sup>2</sup>	Calculated in Km2
Tc=	5	mins	Whole Number Tc

Impervious Area		
Existing Hardstand Area=	33,536.75	m <sup>2</sup>
Total Area =	47,657.00	m <sup>2</sup>
Fraction Impervious =	70%	

Runoff Coefficient		
Fraction impervious =	70%	
C <sub>1,10</sub> =	0.100	Formula - Refer ARR Book VIII
C <sub>10</sub> =	0.66	Runoff Coefficient

Frequency Conversion Factors -Refer AR&R 1987										
ARI (years)	1	2	5	10	20	40	60	80	50	100
Factor, F <sub>y</sub>	0.8	0.85	0.95	1	1.05	1.2	1.17	1.19	1.15	1.2

Peak Catchment Flows For Varied 5% AEP Storm Durations		
AEP	Duration (min)	Flow (m <sup>3</sup> /s)
5%	5	0.763
5%	10	0.572
5%	15	0.466
5%	20	0.398
5%	25	0.350
5%	30	0.314
5%	45	0.245
5%	60	0.206
5%	90	0.160
5%	120	0.134
5%	180	0.105
5%	270	0.083

Peak Catchment Flows For Given AEP at T.O.C.		
AEP	I <sub>tc,y</sub> (mm/h)	Flow (m <sup>3</sup> /s)
63.20%	36.9	0.2593
50.00%	41.9	0.3128
20.00%	58.3	0.4865
10.00%	70.3	0.6175
5.00%	82.7	0.7627
2.00%	99.6	1.0061
1.00%	113.0	1.1910

Pre Development Catchment 1 (65%)		
Total Area	42,674.00	m <sup>2</sup>
Impervious Area	27,738.10	m <sup>2</sup>

Upstream Catchment (65% Impervious)		
Total Area	8921	
Impervious Area	5798.65	m <sup>2</sup>

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**Engineers & Planners**

**STORMWATER CALCULATION - PRE DEVELOPMENT (1% AEP)**

Time of Concentration			
C <sub>1,10</sub>	25	mm	10% AEP, 60min Rainfall
A=	48,257.00	m <sup>2</sup>	Insert Catchment Area
A=	0.04826	Km <sup>2</sup>	Calculated in Km <sup>2</sup>
T <sub>c</sub>	20	mins	Whole Number T <sub>c</sub>

Impervious Area		
Existing Hardstand Area=	23,108.25	m <sup>2</sup>
Total Area =	48,257.00	m <sup>2</sup>
Fraction Impervious =	0.48	

Runoff Coefficient		
Fraction impervious =	47.89%	
C <sub>1,10</sub> =	0.10	Formula - Refer ARR Book VIII
C <sub>10</sub> =	0.48	Runoff Coefficient

Frequency Conversion Factors -Refer AR&R 1987										
ARI (years)	1	2	5	10	20	40	60	80	50	100
Factor, F <sub>y</sub>	0.8	0.85	0.95	1	1.05	1.2	1.17	1.19	1.15	1.2

Peak Catchment Flows For Varied 1% AEP Storm Durations		
AEP	Duration (min)	Flow (m <sup>3</sup> /s)
1%	5	0.769
1%	10	0.602
1%	15	0.493
1%	20	0.419
1%	25	0.366
1%	30	0.326
1%	45	0.248
1%	60	0.204
1%	90	0.155
1%	120	0.129
1%	180	0.099
1%	270	0.078

Peak Catchment Flows For Given AEP at T.O.C.				
AEP	I <sub>tc,y</sub> (mm/h)	I <sub>tc + (16.3%CC)</sub> (mm/h)	Flow <sub>(1% AEP)</sub> (m <sup>3</sup> /s)	Flow <sub>1%AEP + (16.3%CC)</sub> (m <sup>3</sup> /s)
63.20%	18.7	21.7	0.097	0.113
50.00%	21.2	24.7	0.110	0.136
20.00%	29.9	34.8	0.155	0.214
10.00%	36.3	42.2	0.188	0.274
5.00%	43.2	50.2	0.224	0.342
2.00%	53.2	61.9	0.276	0.461
1.00%	61.6	71.6	0.319	0.557

Pre Development Catchment 1 (40%)		
Total Area	43,274.00	m <sup>2</sup>
Impervious Area	17,309.60	m <sup>2</sup>

Upstream Catchment (65% Impervious)		
Total Area	8921	
Impervious Area	5798.65	m <sup>2</sup>

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Engineers & Planners

**STORMWATER CALCULATION - POST DEVELOPMENT (1% AEP)**

Time of Concentration			
C <sub>1,10</sub>	25	mm	10% AEP, 60min Rainfall
A=	47,636.00	m <sup>2</sup>	Insert Catchment Area
A=	0.04764	Km <sup>2</sup>	Calculated in Km2
Tc=	5	mins	Whole Number Tc

Impervious Area		
Existing Hardstand Area=	33,523.10	m <sup>2</sup>
Total Area =	47,636.00	m <sup>2</sup>
Fraction Impervious =	70%	

Runoff Coefficient		
Fraction impervious =	70%	
C <sub>1,10</sub> =	0.100	Formula - Refer ARR Book VIII
C <sub>10</sub> =	0.66	Runoff Coefficient

**Frequency Conversion Factors -Refer AR&R 1987**

ARI (years)	1	2	5	10	20	40	60	80	50	100
Factor, F <sub>y</sub>	0.8	0.85	0.95	1	1.05	1.2	1.17	1.19	1.15	1.2

**Peak Catchment Flows For Varied 1% AEP Storm Durations**

AEP	Duration (min)	Flow (m <sup>3</sup> /s)
1%	5	1.042
1%	10	0.815
1%	15	0.668
1%	20	0.568
1%	25	0.496
1%	30	0.442
1%	45	0.336
1%	60	0.277
1%	90	0.210
1%	120	0.174
1%	180	0.135
1%	270	0.106

**Peak Catchment Flows For Given AEP at T.O.C.**

AEP	I <sub>tc,Y</sub> (mm/h)	I <sub>tc + (16.3%CC)</sub> (mm/h)	Flow (1% AEP) (m <sup>3</sup> /s)	Flow 1%AEP + (16.3%CC) (m <sup>3</sup> /s)
63.20%	36.9	42.9	0.259	0.301
50.00%	41.9	48.7	0.294	0.364
20.00%	58.3	67.8	0.409	0.566
10.00%	70.3	81.8	0.494	0.718
5.00%	82.7	96.2	0.581	0.887
2.00%	99.6	115.8	0.700	1.170
1.00%	113.0	131.4	0.794	1.385

**Post Development Catchment 1 (65%)**

Total Area	42,653.00	m <sup>2</sup>
Impervious Area	27,724.45	m <sup>2</sup>

**Upstream Catchment (65% Impervious)**

Total Area	8921	
Impervious Area	5798.65	m <sup>2</sup>

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Engineers & Planners

**10 EAST BAGDAD ROAD**

**1% AEP STORMWATER DETENTION CALCULATION**

Catchment & Flow Details			Comments
Catchment Area =	4.77	Ha	
10 Year Runoff Coefficient =	0.66	-	
20 Year Effective Catchment Area =	3.32	Ha	
Restricted Outflow Requirement =	0.4740	m3/s	Site Runoff: pre development 1% AEP, 20min (ToC) storm duration.

Detention Calculation							8.5 RCP (16.3%)			
Storm Duration	1% AEP	1% AEP + 8.5RCP (CC)	lp	Qp	V1	Smax	lp	Qp	V1	Smax
(min)	Intensity (mm/hr)	Intensity (mm/hr)	(m3/s)	(m3/s)	(m3)	(m3)	(m3/s)	(m3/s)	(m3)	(m3)
1	189.00	219.8	1.742	0.474	104.50	76.06	2.026	0.474	121.53	93.09
2	141.00	164.0	1.299	0.474	155.92	99.04	1.511	0.474	181.34	124.46
3	128.00	148.9	1.180	0.474	212.32	127.00	1.372	0.474	246.93	161.61
4	120.00	139.6	1.106	0.474	265.40	151.64	1.286	0.474	308.66	194.90
5	113.00	131.4	1.041	0.474	312.40	170.20	1.211	0.474	363.32	221.12
10	88.40	102.81	0.815	0.474	488.78	204.38	0.947	0.474	568.45	284.05
15	72.50	84.3	0.668	0.474	601.29	174.69	0.777	0.474	699.31	272.71
20	61.60	71.6	0.568	0.474	681.19	112.39	0.660	0.474	792.22	223.42
25	53.80	62.6	0.496	0.474	743.67	32.67	0.577	0.474	864.89	153.89
30	47.90	55.7	0.441	0.474	794.54	-58.66	0.513	0.474	924.05	70.85
45	36.50	42.4	0.336	0.474	908.16	-371.64	0.391	0.474	1056.19	-223.61
60	30.00	34.9	0.276	0.474	995.25	-711.15	0.322	0.474	1157.47	-548.93
90	22.80	26.5	0.210	0.474	1134.58	-1425.02	0.244	0.474	1319.52	-1240.08
120	18.90	22.0	0.174	0.474	1254.01	-2158.79	0.203	0.474	1458.41	-1954.39
180	14.60	17.0	0.135	0.474	1453.06	-3666.14	0.156	0.474	1689.91	-3429.29
270	11.50	13.4	0.106	0.474	1716.80	-5962.00	0.123	0.474	1996.64	-5682.16
360	9.83	11.4	0.091	0.474	1956.65	-8281.75	0.105	0.474	2275.59	-7962.81
540	7.93	9.2	0.073	0.474	2367.69	-12989.91	0.085	0.474	2753.62	-12603.98
720	6.83	7.9	0.063	0.474	2719.01	-17757.79	0.073	0.474	3162.21	-17314.59
1080	5.53	6.4	0.051	0.474	3302.23	-27412.97	0.059	0.474	3840.49	-26874.71
1440	4.72	5.5	0.043	0.474	3758.05	-37195.55	0.051	0.474	4370.61	-36582.99
1800	4.14	4.8	0.038	0.474	4120.32	-47071.68	0.044	0.474	4791.93	-46400.07
2160	3.70	4.3	0.034	0.474	4418.89	-57011.51	0.040	0.474	5139.17	-56291.23
2880	3.05	3.5	0.028	0.474	4856.80	-77050.40	0.033	0.474	5648.46	-76258.74

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Engineers & Planners

**10 EAST BAGDAD ROAD  
1% AEP STORMWATER DETENTION CALCULATION**

Catchment & Flow Details			Comments
Catchment Area =	4.83	Ha	
10 Year Runoff Coefficient =	0.66	-	
20 Year Effective Catchment Area =	3.36	Ha	
Restricted Outflow Requirement =	0.5571	m3/s	Site Runoff: pre development 1% AEP, 20min (ToC) storm duration.

Detention Calculation							8.5 RCP (16.3%)			
Storm Duration	1% AEP	1% AEP + 8.5RCP (CC)	Ip	Qp	V1	Smax	Ip	Qp	V1	Smax
(min)	Intensity (mm/hr)	Intensity (mm/hr)	(m3/s)	(m3/s)	(m3)	(m3)	(m3/s)	(m3/s)	(m3)	(m3)
1	189.00	219.8	1.764	0.557	105.82	72.39	2.051	0.557	123.07	89.64
2	141.00	164.0	1.316	0.557	157.89	91.03	1.530	0.557	183.63	116.77
3	128.00	148.9	1.194	0.557	215.00	114.71	1.389	0.557	250.04	149.76
4	120.00	139.6	1.120	0.557	268.75	135.03	1.302	0.557	312.55	178.84
5	113.00	131.4	1.054	0.557	316.34	149.19	1.226	0.557	367.90	200.76
10	88.40	102.81	0.825	0.557	494.94	160.65	0.959	0.557	575.62	241.33
15	72.50	84.3	0.677	0.557	608.88	107.45	0.787	0.557	708.13	206.70
20	61.60	71.6	0.575	0.557	689.79	21.21	0.669	0.557	802.22	133.64
25	53.80	62.6	0.502	0.557	753.05	-82.67	0.584	0.557	875.80	40.08
30	47.90	55.7	0.447	0.557	804.56	-198.30	0.520	0.557	935.71	-67.16
45	36.50	42.4	0.341	0.557	919.62	-584.68	0.396	0.557	1069.52	-434.78
60	30.00	34.9	0.280	0.557	1007.80	-997.93	0.326	0.557	1172.08	-833.66
90	22.80	26.5	0.213	0.557	1148.90	-1859.71	0.247	0.557	1336.17	-1672.44
120	18.90	22.0	0.176	0.557	1269.83	-2741.64	0.205	0.557	1476.82	-2534.66
180	14.60	17.0	0.136	0.557	1471.39	-4545.82	0.158	0.557	1711.23	-4305.98
270	11.50	13.4	0.107	0.557	1738.46	-7287.36	0.125	0.557	2021.83	-7003.99
360	9.83	11.4	0.092	0.557	1981.34	-10053.08	0.107	0.557	2304.30	-9730.12
540	7.93	9.2	0.074	0.557	2397.57	-15654.07	0.086	0.557	2788.37	-15263.27
720	6.83	7.9	0.064	0.557	2753.32	-21315.53	0.074	0.557	3202.11	-20866.74
1080	5.53	6.4	0.052	0.557	3343.90	-32759.38	0.060	0.557	3888.95	-32214.32
1440	4.72	5.5	0.044	0.557	3805.47	-44332.23	0.051	0.557	4425.76	-43711.94
1800	4.14	4.8	0.039	0.557	4172.31	-55999.81	0.045	0.557	4852.40	-55319.73
2160	3.70	4.3	0.035	0.557	4474.65	-67731.90	0.040	0.557	5204.02	-67002.53
2880	3.05	3.5	0.028	0.557	4918.09	-91357.31	0.033	0.557	5719.73	-90555.67

## APPENDIX E

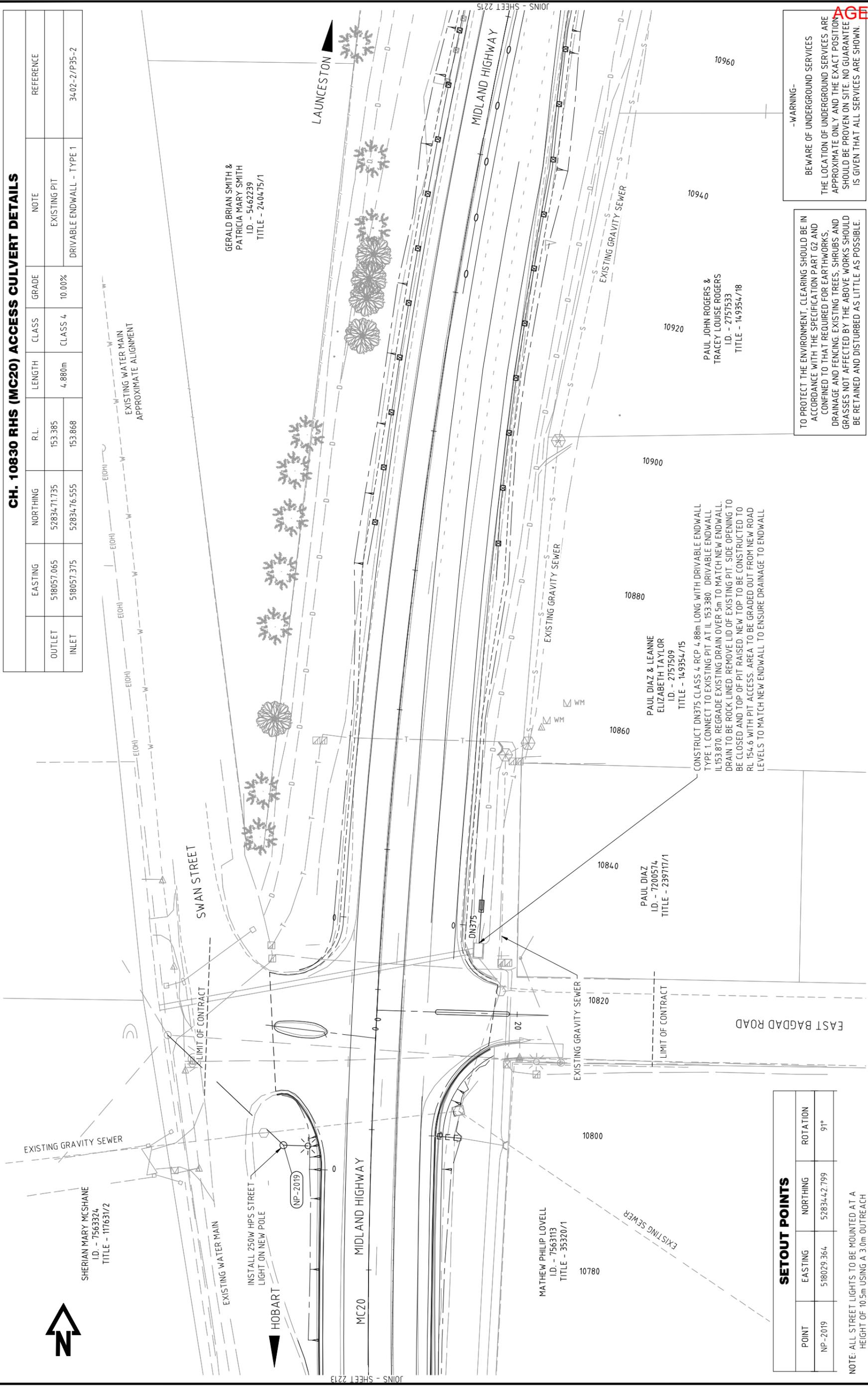
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### DSG Stormwater Drawings



**CH. 10830 RHS (MC20) ACCESS CULVERT DETAILS**

	EASTING	NORTHING	R.L.	LENGTH	CLASS	GRADE	NOTE	REFERENCE
OUTLET	518057.065	52834.71735	153.385	4.880m	CLASS 4	10.00%	EXISTING PIT	34.02-2/P35-2
INLET	518057.375	52834.76555	153.868					



**SETOUT POINTS**

POINT	EASTING	NORTHING	ROTATION
NP-2019	518029.364	52834.42.799	91°

NOTE: ALL STREET LIGHTS TO BE MOUNTED AT A HEIGHT OF 10.5m USING A 3.0m OUTREACH

TO PROTECT THE ENVIRONMENT, CLEARING SHOULD BE IN ACCORDANCE WITH THE SPECIFICATION PART G2 AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHOULD BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-  
BEWARE OF UNDERGROUND SERVICES  
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

CONSTRUCT DN375 CLASS 4 RCP 4.88m LONG WITH DRIVABLE ENDWALL  
TYPE 1. CONNECT TO EXISTING PIT AT IL 153.380. DRIVABLE ENDWALL  
IL153.870. REGRADE EXISTING DRAIN OVER 5m TO MATCH NEW ENDWALL.  
DRAIN TO BE ROCK LINED. REMOVE LID OF EXISTING PIT. SIDE OPENING TO  
BE CLOSED AND TOP OF PIT RAISED. NEW TOP TO BE CONSTRUCTED TO  
RL 154.6 WITH PIT ACCESS. AREA TO BE GRADED OUT FROM NEW ROAD  
LEVELS TO MATCH NEW ENDWALL TO ENSURE DRAINAGE TO ENDWALL

PAUL DIAZ & LEANNE  
ID. - 7200574  
TITLE - 239717/1

PAUL DIAZ & LEANNE  
ID. - 7200574  
TITLE - 239717/1

PAUL JOHN ROGERS &  
TRACEY LOUISE ROGERS  
ID. - 2757533  
TITLE - 149354/18

GERALD BRIAN SMITH &  
PATRICIA MARY SMITH  
ID. - 5462239  
TITLE - 240475/1

SHERIAN MARY MCSHANE  
ID. - 7563324  
TITLE - 117631/2

INSTALL 250W HPS STREET  
LIGHT ON NEW POLE  
(NP-2019)



Department of State Growth  
MIDLAND HIGHWAY (A0087)  
MANGALORE TO BAGDAD  
ROAD IMPROVEMENTS (STAGE 1)  
DRAINAGE & SERVICES - DRG 14 OF 19

DESIGNED: D. GREGG  
REVIEWED: R. MANNERING

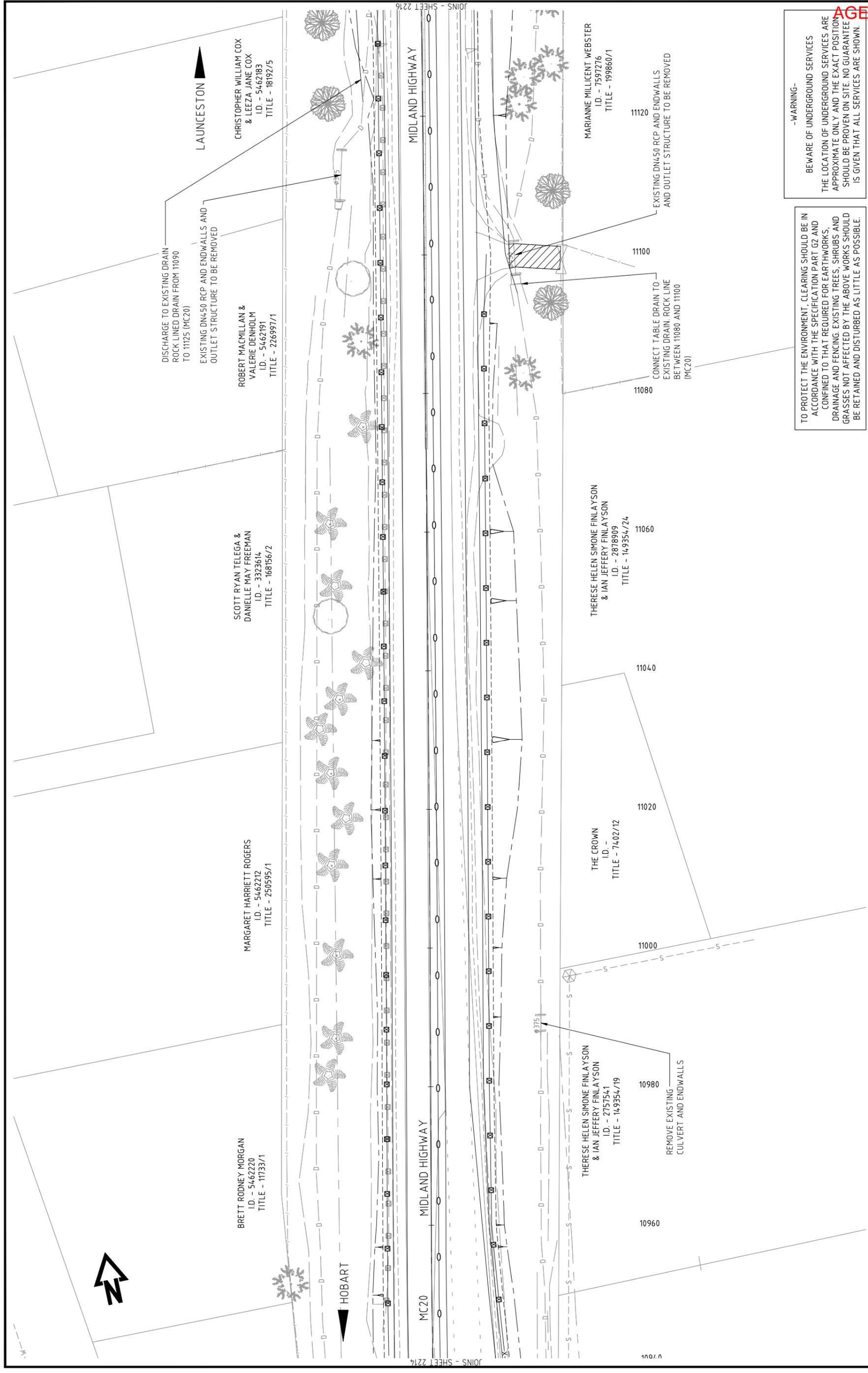
SCALES  
1:500 (A3)  
SCALE IN METRES - 1:500

Co-ordinate System: MGA ZONE 55  
Height Datum: A.H.D.

No.	Amendment Description	Initials	Date
0		R.M.	20/11/2015

This sheet may be prepared using colour and may be incomplete if copied

CONTRACT No. 2303  
DRAWING HB15050-C2214  
REGISTRATION NUMBER A0087.030  
PRINTED DATE 18-Nov-15, 5:01 PM  
SHEET No. 2214  
REVISION 0



TO PROTECT THE ENVIRONMENT, CLEARING SHOULD BE IN ACCORDANCE WITH THE SPECIFICATION PART G2 AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHOULD BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-  
BEWARE OF UNDERGROUND SERVICES  
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

Department of State Growth MIDLAND HIGHWAY (A0087) MANGALORE TO BAGDAD ROAD IMPROVEMENTS (STAGE 1)		SCALES 1:500 (A3) SCALE IN METRES - 1500	
CONTRACT No. 2303 DRAWING HB15050-C2215 REGISTRATION NUMBER <b>A0087.030</b>		DESIGNED: D.GREGG REVIEWED: R.MANNERING	
SHEET No. 2215 PRINTED DATE 18-Nov-15, 5:01 PM		Co-ordinate System: MGA_ZONE 55 Height Datum: A.H.D.	
TO PROTECT THE ENVIRONMENT, CLEARING SHOULD BE IN ACCORDANCE WITH THE SPECIFICATION PART G2 AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHOULD BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.		-WARNING- BEWARE OF UNDERGROUND SERVICES THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.	
DISCHARGE TO EXISTING DRAIN ROCK LINED DRAIN FROM 11090 TO 11125 (MC20) EXISTING DN450 RCP AND ENDWALLS AND OUTLET STRUCTURE TO BE REMOVED		REMOVE EXISTING CULVERT AND ENDWALLS	
SCOTT RYAN TELEGA & DANIELLE MAY FREEMAN ID. - 3323614 TITLE - 168156/2		THERESE HELEN SIMONE FINLAYSON & IAN JEFFERY FINLAYSON ID. - 2757541 TITLE - 149354/19	
MARGARET HARRIETT ROGERS ID. - 5462212 TITLE - 250595/1		THERESE HELEN SIMONE FINLAYSON & IAN JEFFERY FINLAYSON ID. - 2878909 TITLE - 149354/24	
ROBERT MACMILLAN & VALERIE DENHOLM ID. - 5462191 TITLE - 226997/1		CONNECT TABLE DRAIN TO EXISTING DRAIN ROCK LINE BETWEEN 11080 AND 11100 (MC20)	
CHRISTOPHER WILLIAM COX & LEEZA JANE COX ID. - 5462183 TITLE - 18192/5		EXISTING DN450 RCP AND ENDWALLS AND OUTLET STRUCTURE TO BE REMOVED	
BRET RODNEY MORGAN ID. - 5462220 TITLE - 11733/1		MARIANNE MILLICENT WEBSTER ID. - 7597276 TITLE - 199860/1	

19/11/2021

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## APPENDIX E

### Noise Assessment

JMG 6 September 2021  
Harrington Street  
Hobart, TAS

Ref: 1504-1 Traffic Noise

Attention: Mat Clarke

## 10 EAST BAGDAD RD — TRAFFIC NOISE ASSESSMENT

A residential sub division is proposed for 10 East Bagdad road that comprises some 41 lots. This letter presents a traffic noise assessment for the proposal to respond to clause E5.6.1 of the Southern Midlands Interim Planning Scheme (Scheme).

### 1. BACKGROUND

The proposed site is shown in Figure 1 by the red outline and is situated on relatively flat land with the Midlands Highway on its western boundary. The highway speed limit is 80 km/hr. The Utilities zone associated with the highway is indicated in yellow in the figure.



**FIGURE 1: SITE AND SURROUNDING AREA**

### 2. CRITERIA

Section E5.6 of the Scheme contains criteria for development adjacent road and railways. Regards noise, clause E5.6.1 is relevant which has the following Acceptable Solutions and Performance Criteria:

**A1** Except as provided in A1.2, the following development must be located at least 50m from the rail network, or a category 1 road or category 2 road, in an area subject to a speed limit of more than 60km/h:

- (a) New buildings;
- (b) Other road or earthworks, and
- (c) Building envelopes on new blocks

**P1** The location of development, from the rail network, or a category 1 road or category 2 road in an area subject to a speed limit of more than 60km/h, must be safe and not unreasonably impact on the efficiency of the road or amenity of sensitive uses, having regard to:

.....

- (j) any recommendations from a suitably qualified person for mitigation of noise; and

..... "

As the proposed development is within 50m of the Utilities zone (orange shaded area in Figure 1), the Acceptable Solution is not met and the permanence criteria must be addressed. Paragraph E5.6.1 P1(j) is then the relevant clause for noise.

Australian Standard AS3671:1989 *Road Traffic Noise Intrusion - Building Siting and Construction* provides a method to determine what building construction is appropriate to protect the indoor amenity of the dwelling. The output from the standard is the sound isolation performance requirements of various building elements stated as an Rw value.

Clause E5.6.1 P1(j) is considered to be satisfied if the sound isolation performance requirements determined by application of the Standard are incorporated into the building design.

In applying AS3671, the indoor background level must be specified and AS2107<sup>1</sup> is referred to for this. For houses or apartments near major roads, the recommended background levels are specified as:

- Living areas (day time) 35 – 45 dBA Leq
- Sleeping areas (night time) 35 – 40 dBA Leq

Indoor noise levels of 35 dBA are then deemed appropriate for both day and night time periods for the various internal spaces of the dwellings.

### 3. TRAFFIC NOISE LEVELS

Noise measurements are not available for the area and hence traffic noise levels have been predicted with the following information relevant:

- The CoRTN algorithms used for the prediction, implemented by the *Predictor* software package.
- Topographic contours at 1m intervals from the *ELVIS* database.
- The ground assumed as 20% absorptive everywhere.
- No fences or barriers.
- Traffic count data is taken from the DSG station A0087260 at Eddington Rd Bagdad for June 2021. This shows an average 18 hour traffic volume of 4200 vehicles in each of the two traffic lanes. Heavy vehicles (type class ≥4) are listed as 8% of the total.
- A speed limit of 80km/hr.
- The receiver (dwelling facade) is taken as 10m from the boundary.

In this manner the external noise level is an 18hr Leq of 65 dBA.

---

<sup>1</sup> AS/NZS 2107:2016 *Acoustics - Recommended design sound levels and reverberation times for building interiors*, Standards Australia, 2016.

#### 4. BUILDING CONSTRUCTION

The building construction required to provide acceptable indoor amenity is determined by application of Australian Standard AS3671:1989 *Road Traffic Noise Intrusion - Building Siting and Construction*. In applying the standard the following information has been used.

- Bedrooms are taken as 4(w)x4(d)x2.4(h) m<sup>3</sup> and have a window sized at 1.5\*1.2 m<sup>2</sup>.
- Living areas are taken as 5(w)x6(d)x2.4(h) m<sup>3</sup> and have a window sized at 2.2\*2 m<sup>2</sup>.
- Living and bedroom spaces have a reverberation time of 0.6 seconds.
- The required indoor level is 35 dBA
- The outdoor level is 65 dBA.

The results are most effected by window size, doubling the window size adding 3 points to the required performance, and not sensitive to the room dimensions (a factor of 2 or 0.5 changing the results by 1 point).

Based on these inputs the standard determines a construction category of 3 applies with a TNR 30 dBA, with the required sound reduction index's listed in Table 1.

**TABLE 1: REQUIRED BUILDING SOUND REDUCTION PERFORMANCE**

Sound reduction Index, Rw		
	Bedroom	Living
<b>Glazing</b>	33	34
<b>Base Wall</b>	39	37
<b>Ceiling / Roof</b>	43	43

Example constructions that meet these performance requirements are:

- A standard pitched roof with 13mm plasterboard ceiling and insulation overlay.
- External fibre cement wallboard, cavity insulation R2.5, 13mm plasterboard.
- Brick veneer construction.
- Laminated glass ≥ 6mm, dbl. glazing 6/12/6 float glass.

#### 5. RECOMMENDATIONS

Clause E5.6.1 P1(j) of the Scheme is considered satisfied if the sound isolation performance requirements determined by application of the standard AS3671 are met for the houses within 50m of the Utilities zone (orange shaded area in Figure 1). As such the following is recommended:

- The sound isolation performance of the building facade facing the highway should meet the values specified in Table 1.

Should you have any queries, please do not hesitate to contact me directly.

Kind regards,



**Bill Butler**

NOISE VIBRATION CONSULTING

19/11/2021

---

## APPENDIX F

### Notification Letter

19/11/2021

JMG Ref: J213045PH

7<sup>th</sup> September 2021

DFY INVESTMENT PTY LTD  
30 CLARKE AVE  
BATTERY POINT  
TAS 7004

To whom it may concern,

**10 EAST BAGDAD ROAD, BAGDAD - DEVELOPMENT APPLICATION NOTIFICATION**

We advise that JMG Engineers and Planners seeks to make a development application on behalf of DFY Investment Pty Ltd for development of land at 10 East Bagdad Road, Bagdad (CT 36069/1). The proposed development is for a 56 lot subdivision with one public open space. A stormwater connection will be installed on the Crown Road Reserve (CT 7095/14; CT 203439/1; CT 6785/15 and CT 8494/1).

Accordingly, we write to notify you of the application, in accordance with our statutory obligations under section 52(1) of the *Land Use Planning and Approvals Act 1993*.

More information will be available from Southern Midlands Council when the application is formally advertised.

Yours faithfully

JOHNSTONE MCGEE & GANDY PTY LTD



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Unit Trust

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## APPENDIX G

---

# Traffic Impact Statement



Keith Midson  
Midson Traffic Pty Ltd  
28 Seaview Avenue  
Taroona TAS 7053  
0437 366 040

29<sup>th</sup> October 2021

Matthew Clark  
Principal  
JMG Engineers and Planners  
117 Harrington Street  
Hobart TAS 7000

Dear Matthew,

## 10 EAST BAGDAD RD – TRAFFIC IMPACT STATEMENT

Further to our recent discussions, this letter provides a traffic impact statement for a proposed 56-lot subdivision at the abovementioned address.

### 1. Introduction

A traffic impact statement (TIS) is a reduced form of a traffic impact assessment, where only specific traffic and/or parking matters are required to be investigated. A TIS is often undertaken when the full traffic and transport impacts associated with a development are not considered necessary.

This TIS has generally been prepared in accordance with the Department of State Growth (DSG) publication, *A Framework for Undertaking Traffic Impact Assessments*, 2007. This TIS has also been prepared with reference to the Austroads publication, *Guide to Traffic Management, Part 12: Traffic Impacts of Developments*, 2019.

The TIS has also been prepared in accordance with the relevant requirements of E5.0, *Roads and Railway Assets Code* of the Southern Midlands Interim Planning Scheme, 2015.

### 2. Existing Conditions

East Bagdad Road connects between the Midland Highway at its western end and extends approximately 8-kilometres to the east providing access to rural and residential properties along its length. East Bagdad Road has a posted speed limit of 60-km/h and carries approximately 1,500 vehicles per day.

East Bagdad Road has a sealed pavement width of approximately 8.5 metres with wide road verges on both sides of the road.

**Midland Highway is classified as a Category 1 under the Department of State Growth's road hierarchy.** It carries 6,150 vehicles per day in Bagdad. The junction of Midland Highway/ East Bagdad Road is a four-way junction with the highway having priority. Opposite East Bagdad Road at the junction is a short connector road to Swan Street.

19/11/2021

Crash data was obtained from the Department of State Growth for a five+ year period between 2016 and 2021 for East Bagdad Road near the subject site. Two crashes were reported at the Midland Highway junction during this period. One crash involved a 'cross-traffic' collision; and the other involved a 'loss-of-control' single vehicle crash. Both crashes resulted in minor injury.

### 3. Development Proposal

The proposed subdivision layout is shown in Figure 1. Vehicular access is provided on East Bagdad Road as a new road junction approximately 95 metres east of the Midland Highway junction. The internal road layout consists of a circular loop with lots located on both sides of the internal road. Provision has been made for future extension of the road layout to adjacent land south of the subject site.

Figure 1 Proposed Development



### 4. Traffic Generation

Traffic generation rates were sourced from the Roads and Maritime Services publication, 'Guide to Traffic Generating Developments', 2002 (and 2013 traffic generation update). Residential developments typically generate 7.4 vehicles per day per dwelling, with a peak of 0.78 vehicles per hour.

This equates to a total traffic generation of 414 vehicles per day with a peak of 44 vehicles per hour.

The majority of traffic will access the site via right-turn entry and left-turn exit manoeuvres due to the accessibility of the Midland Highway.

### 5. Access Impacts

#### Number of Accesses

The Acceptable Solution A2 of Clause E5.6.2 of the Planning Scheme states "No more than one access providing both entry and exit, or two accesses providing separate entry and exit, to roads in an area subject to a speed limit of 60km/h or less". In this case the development provides a single access to the

19/11/2021

subdivision site, thereby complying with the requirements of Acceptable Solution A2 of Clause E5.6.2 of the Planning Scheme.

Sight Distance

**The Acceptable Solution A1 of Clause E5.6.4 of the Planning Scheme states “Sight distances at an access or junction must comply with the Safe Intersection Sight Distance shown in Table E5.1”.**

Table E5.1 requires 105 metres SISD for 60-km/h road frontage. The available sight distance exceeds this requirement in both directions along East Bagdad Road (noting that full sight distance is available through the Midland Highway junction from the access). The Acceptable Solution A1 of Clause E5.6.4 of the Planning Scheme is met.

Junction Design

The subdivision will create a new road junction on East Bagdad Road. The turning movements do not trigger any specific turn lane treatment, noting that the peak right turn entry volume is likely to be in the order of 20 vehicles per hour (on the assumption that PM peak will have 60% inward movements and 80% of these movements will originate from Midland Highway), with a corresponding peak flow on East Bagdad Road of approximately 150 vehicles per hour. The Austroads turn lane warrants are shown in Figure 2.

Impacts of Midland Highway/ East Bagdad Road Junction

The majority of traffic generation associated with the development will access the site via the Midland Highway/ East Bagdad Road junction.

The following assumptions have been assumed during the PM peak period:

- 60% of peak traffic generation will be inward to the site. 26 vph
- 80% of the inward trips will originate from Midland Hwy 21 vph
- 70% of the Midland Hwy movements will be right-turn entry 15 vph

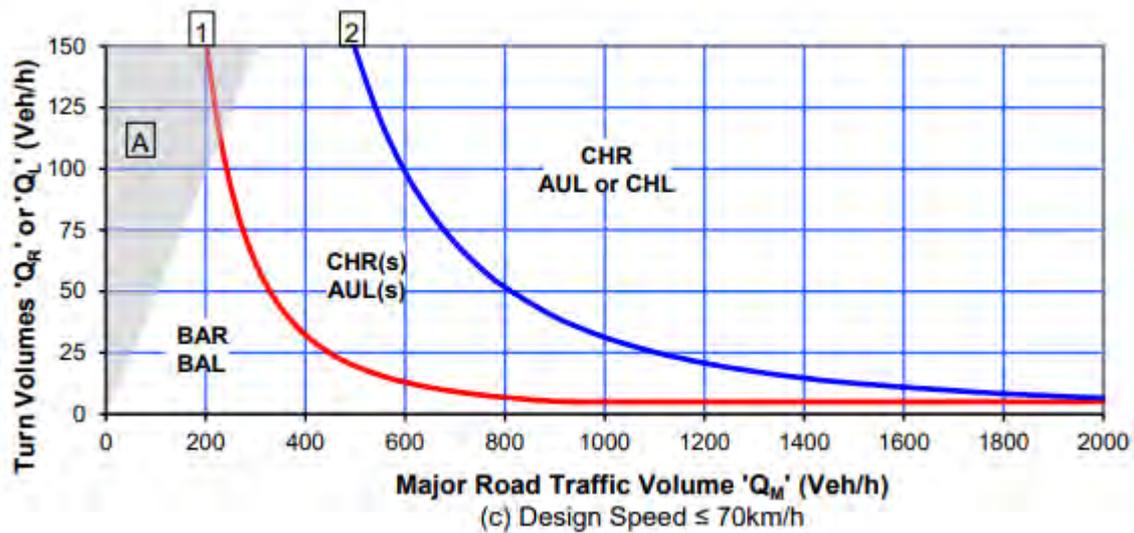
The corresponding traffic flow on the Midland Highway during the PM peak period is 650 vehicles per hour. The existing right turn movements at the junction (excluding the development traffic generation) is estimated to be 80 vehicles per hour. The traffic generation will therefore increase turning movements to approximately 100 vehicles per hour.

The Austroads turn lane warrants are shown in Figure 2. It can be seen that the junction falls into the Channelised Right Turn Lane (CHR) requirement, noting that the requirements fall close to the CHR(S)/CHR line, indicating that there is capacity for growth in the Midland Highway corridor.

The existing CHR lane is approximately 120 metres long and therefore provides storage for approximately 20 cars. This is more than sufficient to cater for the existing and forecast right turn lane storage requirements of the junction (which is currently around 2 to 3 cars). There is spare capacity for growth in both the Midland Highway and East Bagdad Road corridors.

19/11/2021

Figure 2 Austroads Turning Lane Warrants



Based on the above assessment, the proposed 56-lot subdivision at 10 East Bagdad Road is supported on traffic engineering grounds.

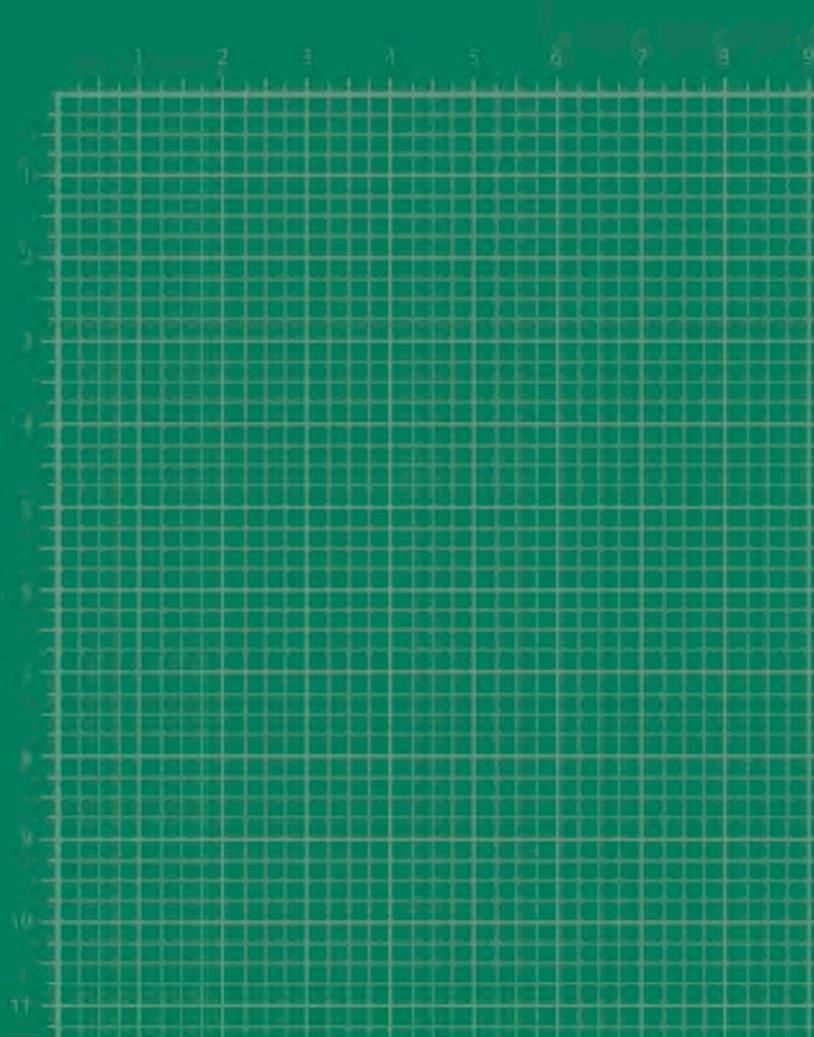
Please contact me on 0437 366 040 if you require any further information.

Yours sincerely,

Keith Midson BE MTraffic MTransport FIEAust CPEng EngExec NER

DIRECTOR

Midson Traffic Pty Ltd



**Johnstone McGee and Gandy Pty Ltd**

incorporating Dale P Luck & Associates  
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**Engineers & Planners**  
*Your Vision is Our Mission*

REPORT

# 10 East Bagdad Road Proposed Subdivision Stormwater Report

November 2021



**Johnstone McGee & Gandy Pty Ltd**

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Issuing Office: 117 Harrington Street, Hobart								
JMG Project No. J213045PH								
Document Issue Status								
Ver.	Issue Date	Description	Originator		Checked		Approved	
1	16.11.2021	Issued for Approval	CAG		CJM		GLA	
2	18.11.2021	SW Quality added	CAG		CJM		GLA	
3	19.11.2021	1% AEP FLOWS ADDED	CAG		CJM		GLA	
4	30.11.2021	Catchment 1 Area Updated & Overland Flow	CAG		CJM		GLA	

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2.4	Overland Flow Paths .....	9
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Appendix A - Lot Layout

Appendix B - Site Pre and Post Development Catchments

Appendix C - Existing and Proposed Stormwater System

Appendix D - Stormwater Calculations

Appendix E - DSG Stormwater Drawings

# 1. Introduction

A 54 lot residential subdivision is proposed for an existing rural lot located on the corner of the Midland Highway and East Bagdad Road, known as 10 East Bagdad Road.

This report aims to describe the main control and management characteristics for the proposed stormwater system as well defining the minimum volume of detention necessary to ensure the site stormwater discharge post development to the Midland Highway is limited to the sites pre development 1% Annual Exceedance Probability (AEP) flows



Image 1 - Development Site

## 2. Stormwater

The proposed development site is approximately 5.50Ha in size and is made up of predominantly grassland with some minor improvements including sheds, driveways and a pacing track. Along East Bagdad Road existing developed properties on the southern side of the road drain towards the site and contribute to stormwater flows from the development. The site typically falls northeast to southwest with an average grade of approximately 2.50%. A ridge positioned north/south through the site splits the eastern side of the site into a catchment of approximately 0.75Ha which drains to the east and into Bagdad Rivulet, the majority of the site west of the ridge, 4.8Ha, drains towards the Midland Highway via an existing water hole in the south western corner of the site before entering the roadside open drain located on the eastern side of the Midland Highway. Downstream, or south of the site, stormwater flows in the open drain before entering a grated pit located over a 600mm culvert opposite the Iden Road junction. This culvert passes under the highway and down Iden Road before entering Horfield Creek. See DSG drawings A0087.030 sheet 2213 to 2215 included in Appendix D for design drawings of the highway drainage.

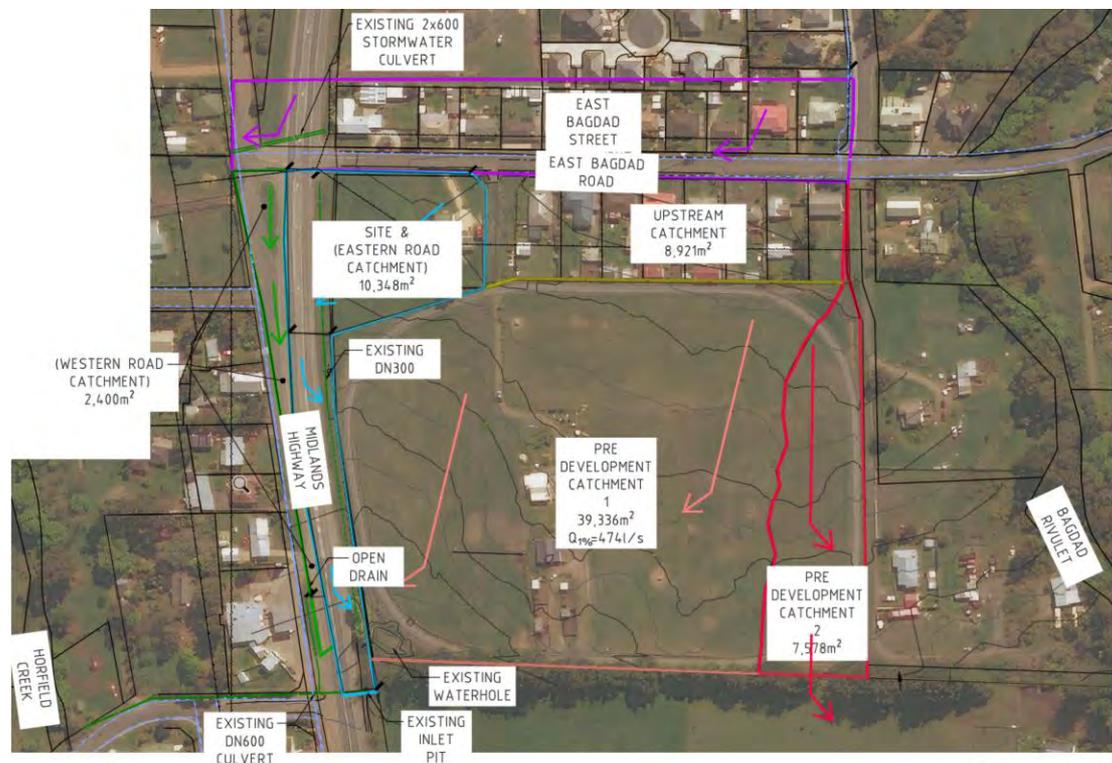


Image 2 - Existing Stormwater Catchments

Stormwater collected along the eastern side of the Midland Highway, immediately south of the East Bagdad Road junction, is collected in a DN300 piped system which discharges to an open drain parallel with the southern portion of the site. Just south of the southern site boundary, water is transferred under the Midland Highway in a DN600 culvert, this pipe flowing down Iden Road to where it discharges into Horfield Creek.

East Bagdad Road intersects flows from the north of the site and diverts these under the Midland Highway in twin DN600 pipes located immediately to the north of the junction.

## 2.1 Pre-Developed Flow Conditions

Analysis of stormwater capacity is divided into two parts:

- The site catchment, which considers the natural surface conditions.
- The developed area, which considers the detention volume required to limit post-development flow from site to pre-development levels and the internal drainage layout.

All flow analysis was conducted with the rational method, in accordance with AR&R 1987, and utilised 2019 Rainfall IFD data obtained from the Bureau of Meteorology analysis of the AR&R Climate Change scenario of a predicted 16.3% increase in rainfall intensities was also undertaken.

The 2019 AR&R IFD's utilise terminology that differs from that in the 1987 edition and as such the following assumptions have been made:

A 1:10 year ARI event was approximated to be equivalent to a 10% AEP (while the 1:20 and 1:100 year events match the 5% and 1% respectively).

### Subdivision Catchment Areas

The undeveloped subdivision catchment areas can be seen in drawing Appendix B - Drawing C02. Analysis of flow was determined as above, adopting 40% average permeability. The total discharge from the site for a 1% AEP event was calculated as 0.474m<sup>3</sup>/sec. The key catchment areas are shown in Table 1, including the point at which they discharge.

Table 1 - Undeveloped Catchment

Catchment	Area (m <sup>2</sup> )	T <sub>c</sub> (mins)	1% AEP Flow (m <sup>3</sup> /sec)	1% AEP Flow with Climate Change (m <sup>3</sup> /sec)	Discharge Point
Catchment 1 & Upstream Developed	48257	20	0.474	0.557	Southwestern corner via dam to drainage system along the Midland Highway
Catchment 2	7580	20	0.065	.075	South eastern property boundary - Bagdad Rivulet

## 2.2 Post Developed Flow Conditions

It is proposed that the new residential lots and roadways be serviced with a piped stormwater drainage system with capacity to convey rainfall events up to AEP 5% with flows above this being conveyed by the new road network to the Catchment 1 discharge point.

The Department of State Growth proposes a 1% AEP storm event analysis of the discharge to the State road reserve as the Midland Highway is considered a Category 1 road. Therefore, this condition requires a no net increase in discharge into the highway drainage system between Pre & Post development condition for the 1% AEP event.

For the post development flow conditions, the following assumptions have been made:

- The average water pipe velocity across the catchment is approximately 1.50 m/s.
- The impervious surface maintains the same value of roughness across the site.

The new stormwater system will convey water from the following catchments:

Catchment 1 - The western portion of the site, including all of the new roadways, drain to the south western corner of the site to a new stormwater bio retention basin

Catchment 2 - The lots located on the eastern and southern boundary of the site are to be drained along the new POS walkway to a new discharge point to Bagdad Rivulet.

The developed stormwater network plan can be seen in Appendix B - Drawing P03.



Image 3 - Proposed Stormwater Catchments

The post-development flow was calculated using the rational method, with house, footpath and roads spaces contributing an average 70% as impervious throughout the site.

Table 2 details the key values for a 1% AEP & 1%AEP with Climate Change pre and post development event and specifies the location at which this flow discharges.

Table 2 - Discharge Location & Volumes

	Undeveloped Discharge Rate (m3/sec)	Undeveloped Discharge Rate with Climate Change(m3/sec)	Peak Unretained Developed 5 min TOC Discharge Rate (m3/sec)	Peak Unretained Developed 5 min TOC Discharge Rate with Climate Change(m3/sec)
Catchment 1 - Midland Hwy DN600 culvert	0.474	0.557	1.042	1.384
Catchment 2 - Bagdad Rivulet	0.065	0.0760	0.177	0.206

The catchment 1 proposed stormwater network results in the collection and detention of flow, to the southwest corner of the site, so as it can be contained in a single stormwater detention facility before discharging from the site to the existing system on the Midland Highway. To limit the Developed Discharge Rate from site to Pre-development values a maximum allowable discharge rate for catchment 1 is to be adopted as 0.474m<sup>3</sup>/sec. The flow to the Midland Highways system will be managed with a suitably sized detention pond. The volume required to do so is discussed in Section 2.3.

For catchment 2 it is considered that the existing rivulet has sufficient capacity to accommodate the short time of concentration of the post development 1% peak flows, <10 min, and small increase in peak discharge of, 0.112m<sup>3</sup>/s. This compares to the significantly longer time of concentration and capacity of the existing rivulet.

### 2.3 Storage Requirements

Boyd's Formula, see equation 1 below, was used to calculate the storage volume required to detain rainfall events of duration less than or equal to the Time of Concentration, and determine an approximation of the total storage volume required.

$$S_{max} = V_1 \left( 1 - \frac{Q_p}{I_p} \right) \quad (1)$$

Where

$S_{max}$	Maximum Volume of Temporary Storage	(m <sup>3</sup> )
$V_1$	Volume of Inflow Flood	(m <sup>3</sup> )
$Q_p$	Peak of Outflow Hydrograph	$\left( \frac{m^3}{s} \right)$
$I_p$	Peak of Inflow Hydrograph	$\left( \frac{m^3}{s} \right)$

A summary of all tabulated data can be seen in Appendix D.

Analysis of the site with over a number of storm durations ranging from 5 minutes to 2 hours, with a restricted outflow rate of 0.474m<sup>3</sup>/s, concluded that a 10-minute duration storm required a maximum storage for a 1% AEP event of ≈284m<sup>3</sup>.

It is proposed a bio-retention basin be located at the southwestern corner of the site in the vicinity of the existing dam, as shown on the drawing below.

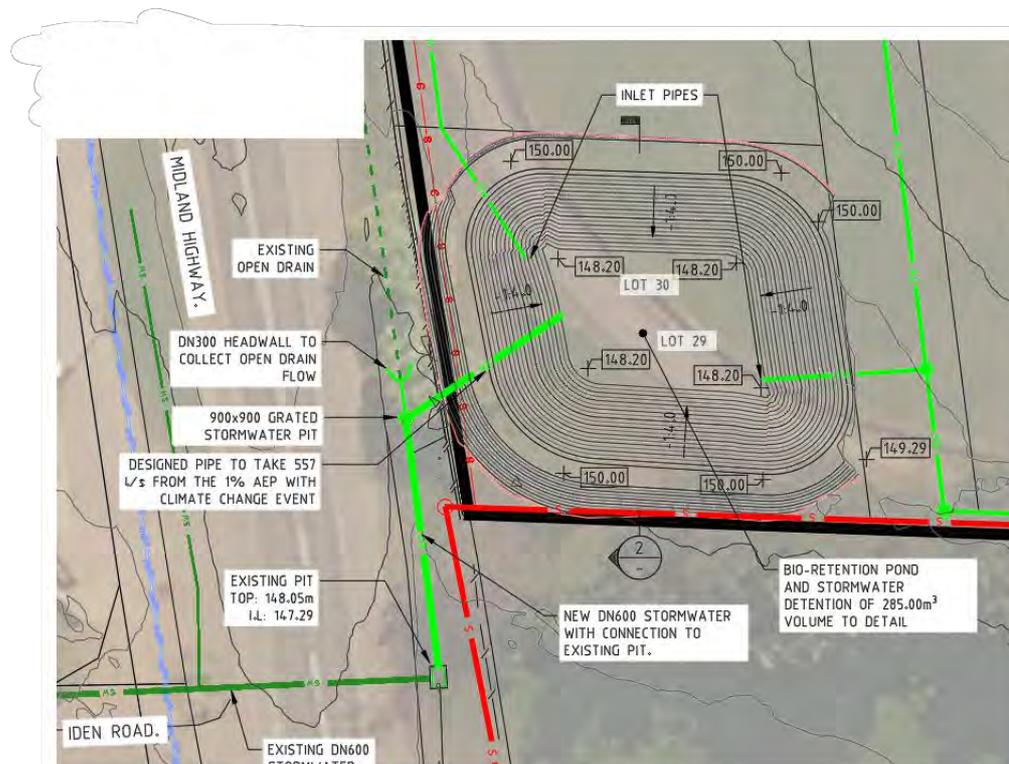


Image 4 - Bio-Detention Pond Location

The discharge from the detention pond will be via an orifice sized to limit flows to the pre development 1% AEP flow rate, this orifice will drain into a large grated outlet pit with a pipe connection into the highway road reservation and the existing pipe under the highway. In the event that the capacity of the downstream pipework was exceed grated inlets on the piped system would act as surcharge pits.

Analysis of the capacity of the highway pipe indicated that it has a HGL capacity of 561 l/s. See Image 6 below and discussion in section 2.4.

## 2.4 Overland Flow Paths

The proposed road layout within the subdivision provides 1% AEP flow paths from the northwest of the site through to the detention pond in the southeast corner of the site. Kerb and channel within the new road network will be used to containing flows to the new road pavement. A spillway from the road into the detention can be provided adjacent to the eastern side of the detention ensure all flows from catchment 1 are confined to the detention pond before exiting the site through the detention pond outlet pit and associated pipework.

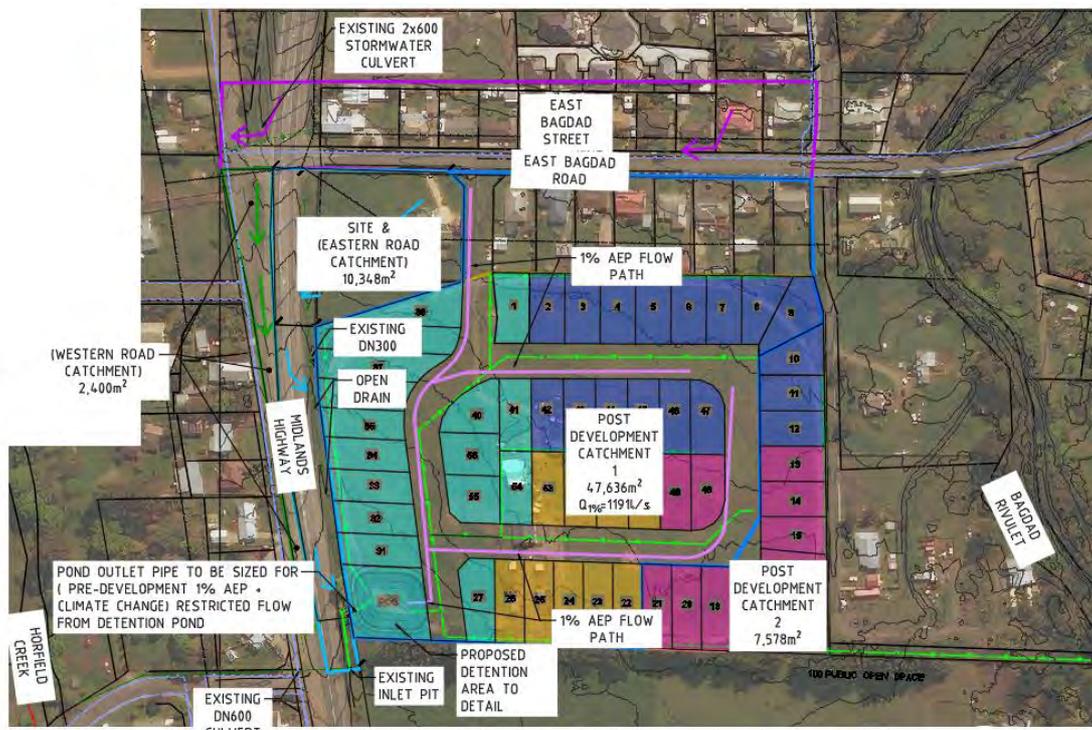


Image 5 - 1% AEP + C.C. Overland Flow Path

1% AEP detained flows from catchment 1 will be limited to predevelopment levels rates of  $0.474\text{m}^3/\text{s}$  or if climate change is considered this rate can be increased to  $0.557\text{m}^3/\text{s}$  as this would be the rate of discharge coming into the road reservation from the existing site if no development was to occur.

The water will be directed to the DN600 pipe under the Midland Highway which has a calculated HGL capacity of  $0.56\text{m}^3/\text{s}$

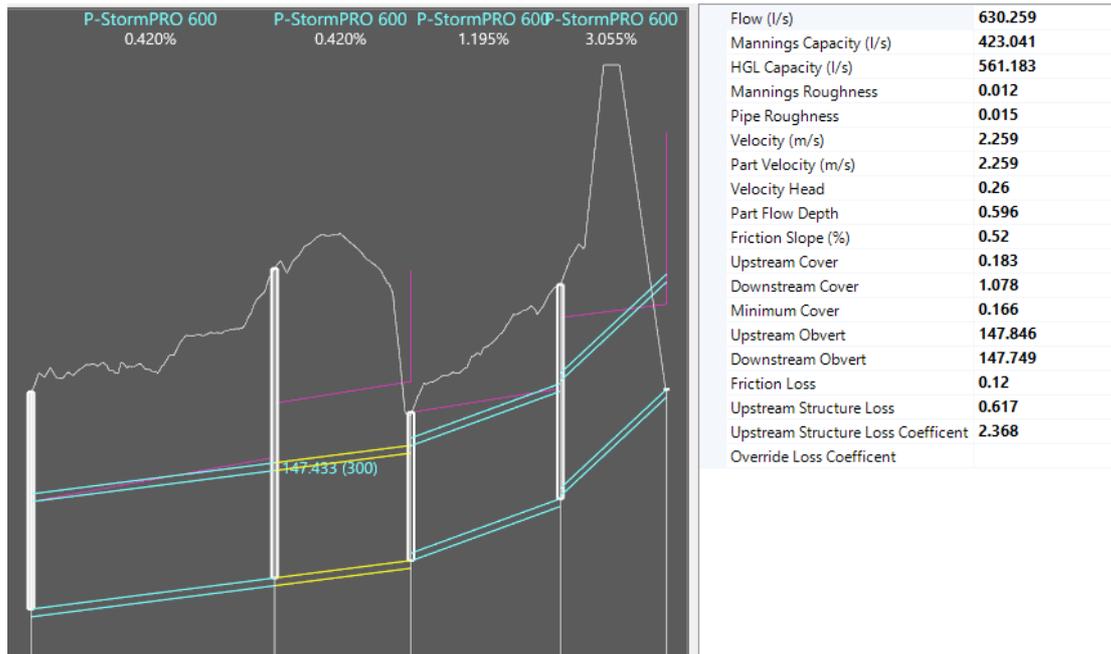


Image 6 - DN600 Highway Culvert Capacity

The current inlet on the DN600 pipe which consists of a nom. 900x600 grate would be prone to blockage and is unlikely, even when clean, to provide inlet capacity to take flows from the existing undeveloped site and road reservation. The construction of the new system will provide the opportunity to install additional inlet pits and a headwall to accept the upstream flows and better utilize the capacity of the existing pipe. In the event that the existing pipe is running at capacity flows will bypass the culvert inlet and flow south down the Midland Highway in the large table drain and adjacent road reserve, the highway through this section being above the level of the natural surface to the east.

As 1 % AEP discharge flows will not be increased as a result of the detention being provided the risk of flooding of the Midland Highway is not increased.



Image 7 - Existing Inlet Pit Midland Highway Table Drain



Image 8 -Midland Highway Table Drain South of DN600 Pipe

## 2.5 Stormwater Quality

MUSIC (Model for Urban Stormwater Improvement Conceptualisation) software was used to analyse the treatment efficiency of the proposed stormwater system. The model utilised input parameters defined in the 'Draft NSW MUSIC Modelling Guidelines: August 2010' and 6min interval rainfall data for Hobart for the period 1990 to 2010.

Catchment areas used in the analysis are shown in Image 7

### Catchment 1

Includes the existing lots along East Bagdad Road, New lots through the centre and western side of the site and all new roadways flow to the bio retention basin to be constructed in the south western corner of the site. Refer Appendix C, drawing J213045PH-P03 for basin typical section and dimensions.

### Catchment 2

Encompasses the new residential lots 10-21 on the eastern side of the site, this water flowing untreated to Bagdad Rivulet



Image 8 - Proposed Stormwater Catchments

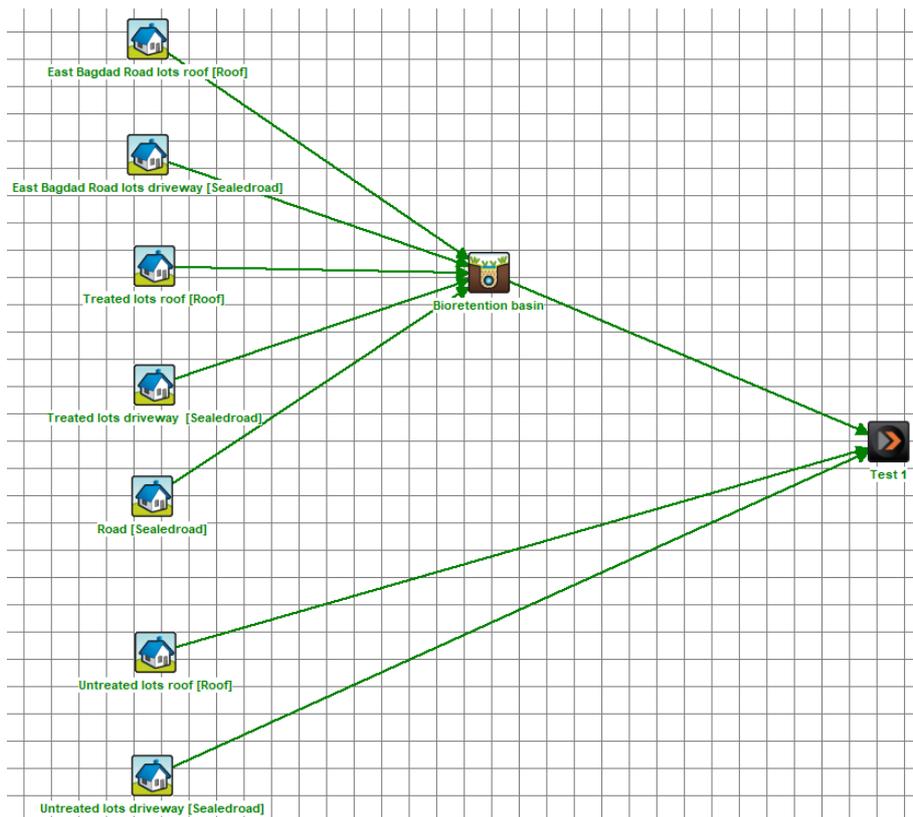


Image 9: Stormwater treatment MUSIC Model

The results from the MUSIC modelling are tabulated below.

Table 1 - Treatment Train Effectiveness

	Sources	Residual Load	% Reduction
Flow (ML/yr)	9.56	7.08	26
Total Suspended Solids (kg/yr)	1420	261	81.6
Total Phosphorus (kg/yr)	3.01	1.21	59.9
Total Nitrogen (kg/yr)	21.7	11.1	48.9
Gross Pollutants (kg/yr)	367	53.3	85.4

The proposal meets the acceptable solution A2 of the interim planning scheme which implies that a stormwater system for a new development must incorporate water sensitive urban design principles for the treatment and disposal of stormwater. The treatment system is seen to exceed the requirements of the water quality targets as detailed in the State Stormwater Strategy, 2010

- 80% reduction in the annual average load of total suspended solids
- 45% reduction in the annual average load of total phosphorus
- 45% reduction in the annual average load of total nitrogen

---

## APPENDIX A

### Lot Layout

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10 X 15 BUILDING  
STAGING:  
STAGE 1 LOT1, LOTS 40,41  
STAGE 2 LOTS 2 - 12 & 42 -  
STAGE 3 LOTS 13 - 21 & 48  
STAGE 4 LOTS 22 - 26 & 50  
STAGE 5 LOTS 27 & 31

AMENDMENTS		
No.	Revision/Issue	Date
6	REV 6	15-10-21
7	Stormwater Detention Lot Added	17-11-21

**LEARY COX & CRIPPS**  
LAND & ENGINEERING SURVEYORS

Unit G04 40 Molle Street,  
HOBART TAS 7000  
P 03 6118 2030  
E admin@lccsurvey.com

Project Name and Address  
**10 EAST BAGDAD ROAD  
EAST BAGDAD**

Drawing Title  
**PLAN OF SUBDIVISION**

Client  
DFY INVESTMENTS PTY LTD  
CT 36069 / 1

SCALE  
0 10 25 35  
1:1250 at A3

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## APPENDIX B

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### Site Pre and Post Development Catchments

**SAFETY IN DESIGN REPORT**  
In accordance with the Workplace Health & Safety Act and Regulations, JMG have considered the potential hazards and risks that are specific to this design.  
The design has been identified as:  
The design has been identified as:  
The design has been identified as:  
The design has been identified as:



REV	DATE	RESPONSE TO COUNCIL RFI	REMARK
DA	12.11.2021		

**JMG**  
Engineers & Planners  
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PROJECT  
PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD - 7030  
TITLE  
CATCHMENT PLAN  
PRE-DEVELOPMENT

Accepted Discipline Head (Discipline Head)	Date
Accepted Team Leader (Team Leader)	Date
Approved Principal (Principal)	Date

SCALES @ A1	DESIGNED BY	DRAWN BY
1:750	DESIGNED	DRAWN
	PLOT DATE	22/11/2021

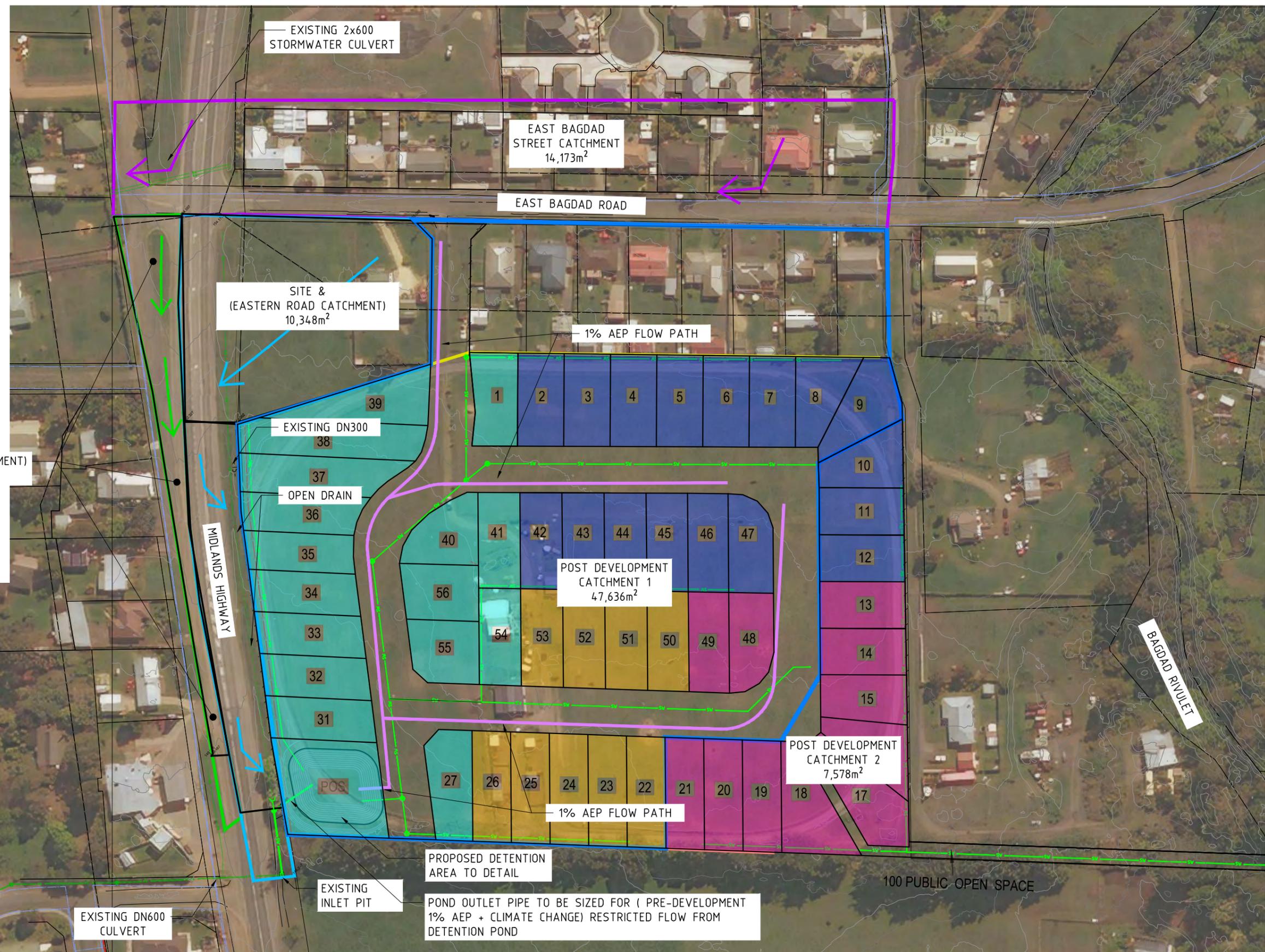
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PROJECT NO.	J213045PH
DWG NO.	P04
REVISION	DA

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**SAFETY IN DESIGN REPORT**  
In accordance with the Workplace Health & Safety Acts and Regulations JMG have considered the potential hazards and risks that are specific to this design.  
The following table shows an overview of the hazards and risks that are specific to this design.  
The report does not constitute a guarantee of the design or the safety of the project. It is the responsibility of the client to ensure that the design is safe and that the project is managed in accordance with the Act to identify, assess, manage and monitor aspects of risk and safety.



DA1	29.11.2021	POST DEVELOPMENT AREA REVISED
REV	DATE	REMARK
12.11.2021	12.11.2021	RESPONSE TO COUNCIL RFI

**SAFETY IN DESIGN REPORT**  
In accordance with the Workplace Health & Safety Acts and Regulations JMG have considered the potential hazards and risks that are specific to this design.  
The following table shows an overview of the hazards and risks that are specific to this design.  
The report does not constitute a guarantee of the design or the safety of the project. It is the responsibility of the client to ensure that the design is safe and that the project is managed in accordance with the Act to identify, assess, manage and monitor aspects of risk and safety.

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PROJECT  
**PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD - 7030**

TITLE  
**CATCHMENT PLAN  
POST-DEVELOPMENT  
(1% AEP)**

Accepted Discipline Head (Discipline Head)	Date
Accepted Team Leader (Team Leader)	Date
Approved Principal (Principal)	Date

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	PLOT DATE	30/11/2021

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PLOT DETAILS CATCHMENT PLAN.DWG  
PROJECT NO. **J213045PH**

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DWG NO.	REVISION
<b>P05</b>	<b>DA1</b>

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## APPENDIX C

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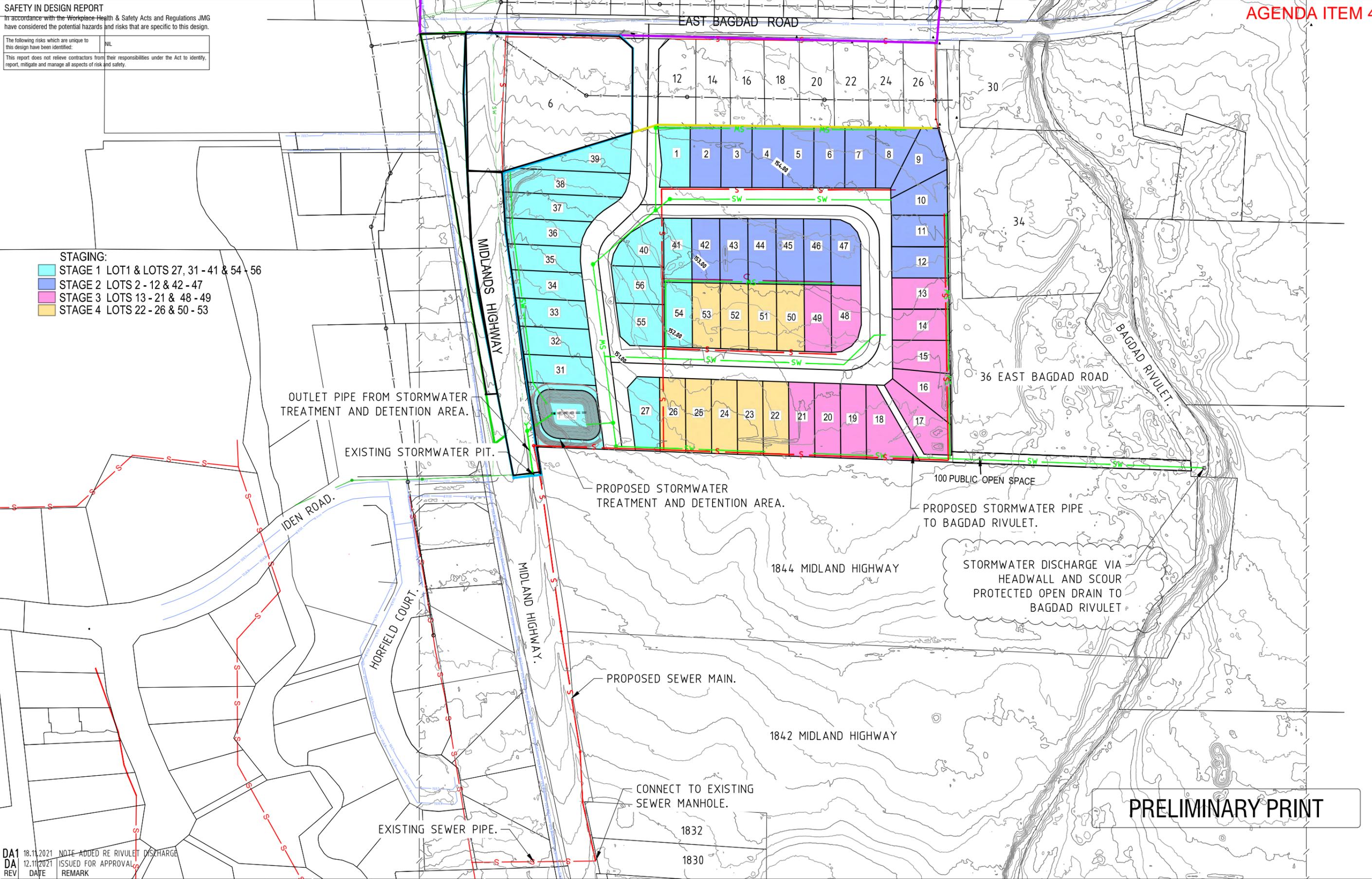
### Existing and Proposed Stormwater System

**SAFETY IN DESIGN REPORT**  
 In accordance with the Workplace Health & Safety Acts and Regulations JMG have considered the potential hazards and risks that are specific to this design.

The following risks which are unique to this design have been identified:	NIL
This report does not relieve contractors from their responsibilities under the Act to identify, report, mitigate and manage all aspects of risk and safety.	

**STAGING:**

- STAGE 1 LOTS 1 & LOTS 27, 31 - 41 & 54 - 56
- STAGE 2 LOTS 2 - 12 & 42 - 47
- STAGE 3 LOTS 13 - 21 & 48 - 49
- STAGE 4 LOTS 22 - 26 & 50 - 53



PRELIMINARY PRINT

DA1	18.11.2021	NOTE ADDED RE RIVULET DISCHARGE
DA	12.11.2021	ISSUED FOR APPROVAL
REV	DATE	REMARK

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PROJECT  
**PROPOSED SUBDIVISION  
 10 EAST BAGDAD ROAD  
 BAGDAD**

TITLE  
**CONCEPT SERVICES  
 OVERALL PLAN**

PROJECT NO.	<b>J213045PH</b>
DWG NO.	<b>P01</b>
REVISION	<b>DA1</b>
PLOT DETAILS	CONCEPT SERVICES PLANS.DWG

**SAFETY IN DESIGN REPORT**  
In accordance with the Workplace Health & Safety Acts and Regulations JMG have considered the potential hazards and risks that are specific to this design.

The following risks which are unique to this design have been identified:	NIL
---	-----

This report does not relieve contractors from their responsibilities under the Act to identify, report, mitigate and manage all aspects of risk and safety.



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Accepted Team Leader (Team Leader)	Date
Approved Principal (Principal)	Date

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PROJECT  
**PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD**

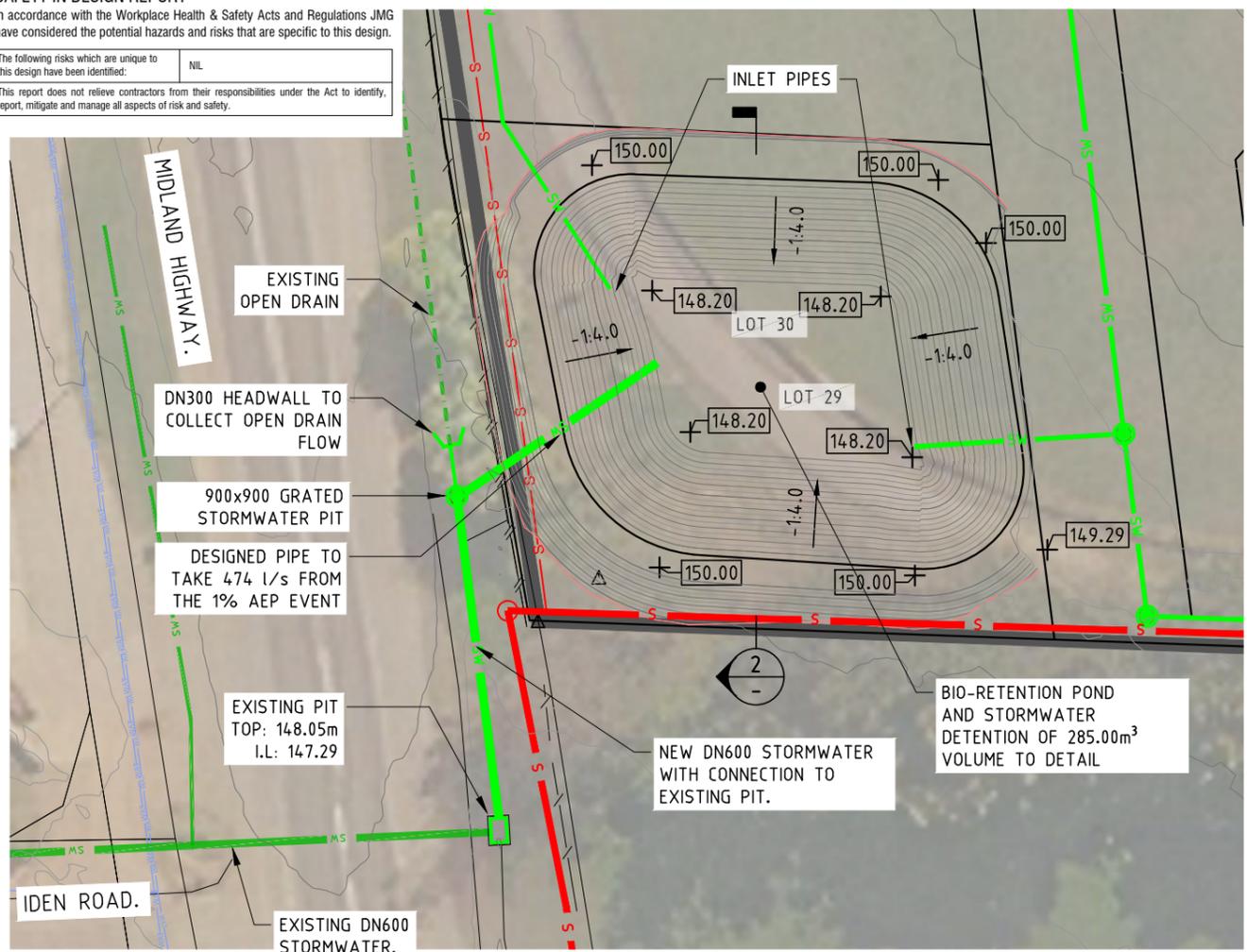
TITLE  
**CONCEPT SERVICES  
INTERNAL PLAN**

PROJECT NO.	<b>J213045PH</b>
DWG NO.	<b>P02</b>
REVISION	<b>P1</b>
PLOT DETAILS	CONCEPT SERVICES PLANS.DWG

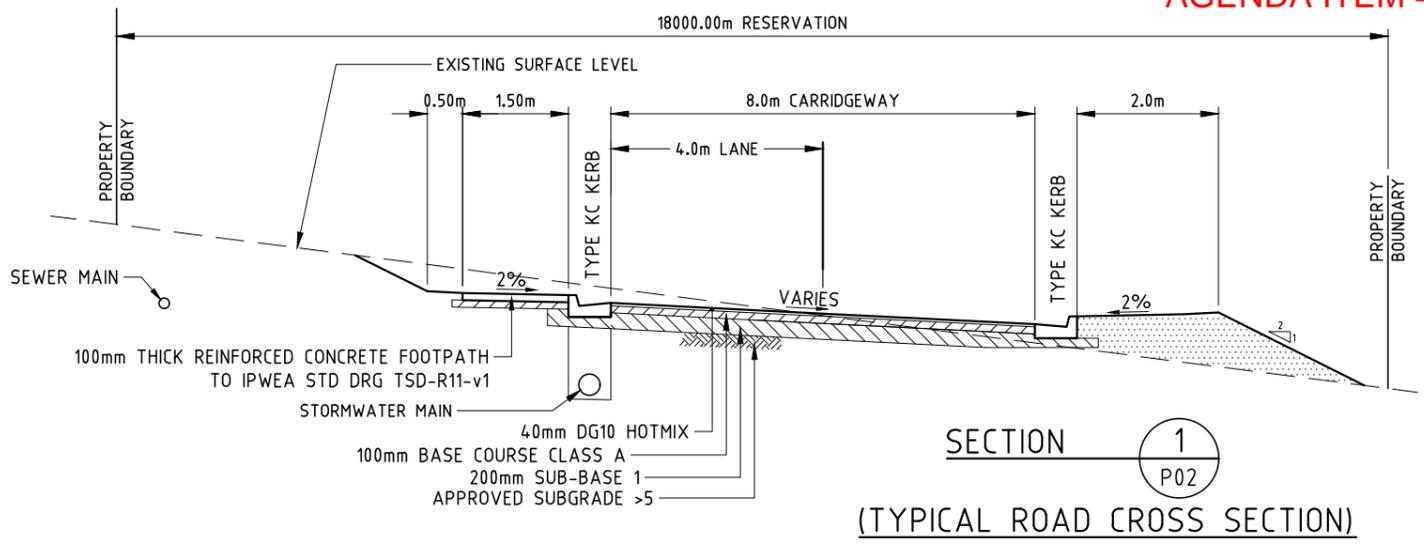
**SAFETY IN DESIGN REPORT**  
In accordance with the Workplace Health & Safety Acts and Regulations JMG have considered the potential hazards and risks that are specific to this design.

The following risks which are unique to this design have been identified: NIL

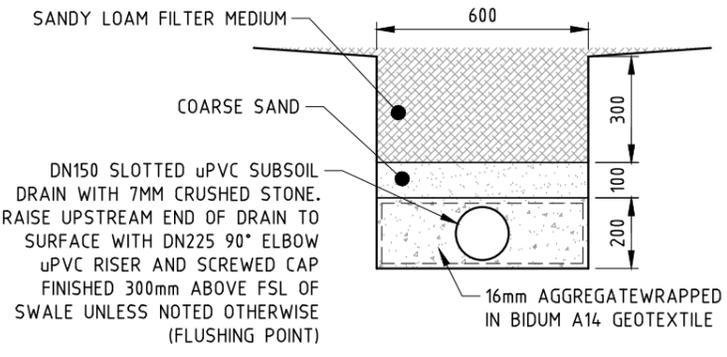
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DETAIL 1  
SCALE P02



SECTION 1  
P02  
(TYPICAL ROAD CROSS SECTION)



BIO-RETENTION SWALE DETAIL  
SCALE 1:20

**BIORETENTION FILTER**  
BACKFILL MATERIALS USED IN THE CONSTRUCTION OF THE BIORETENTION SWALES SHALL HAVE THE FOLLOWING CHARACTERISTICS:

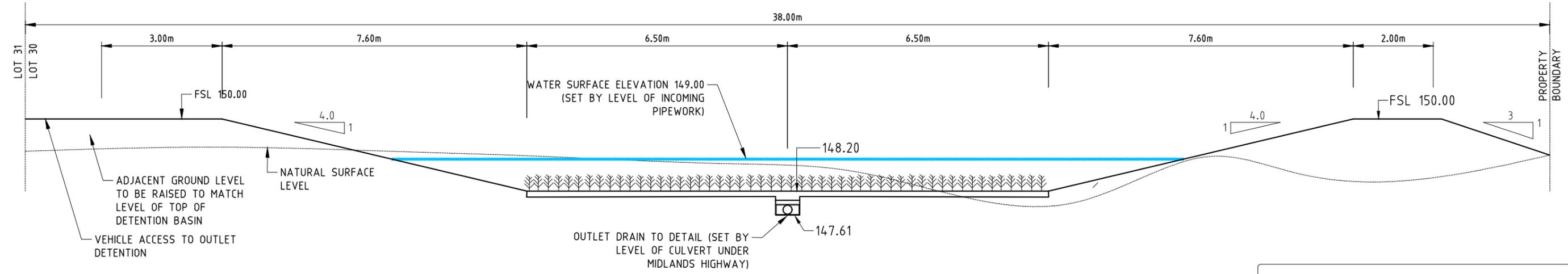
**FILTER MEDIA**  
THE FILTER IS TO BE A SANDY LOAM WITH THE FOLLOWING CRITERIA:  
THE MATERIAL SHALL MEET THE GEOTECHNICAL REQUIREMENTS SET OUT BELOW:

- HYDRAULIC CONDUCTIVITY BETWEEN 50-200 mm/hr
- PARTICLE SIZES OF BETWEEN: CLAY 5-15%, SILT <30%, SAND 50-70%
- BETWEEN 5% AND 10% ORGANIC CONTENT, MEASURED IN ACCORDANCE WITH AS1289 4.1.1.
- pH NEUTRAL

**TRANSITION LAYER**  
TRANSITION LAYER MATERIAL SHALL BE COARSE SAND WITH THE FOLLOWING TYPICAL SIZE DISTRIBUTION:

% PASSING	2.36 mm	93-100%
	1.18 mm	78-98%
	0.6 mm	55-57%
	0.3mm	30-42%
	0.15 mm	5-15%
	0.075mm	0-5%

**DRAINAGE LAYER**  
THE DRAINAGE LAYER IS TO BE 7 mm SINGLE SIZED AGGREGATE



SECTION 2  
(BIO-RETENTION SWALE TYPICAL SECTION)

PRELIMINARY PRINT

DA1	19.11.2021	DETENTION VOLUME UPDATED
DA	12.11.2021	ISSUED FOR APPROVAL
REV	DATE	REMARK

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PROJECT  
**PROPOSED SUBDIVISION  
10 EAST BAGDAD ROAD  
BAGDAD**

TITLE  
**TYPICAL SECTIONS AND  
DETAIL**

PROJECT NO.	<b>J213045PH</b>
DWG NO.	<b>P03</b>
REVISION	<b>DA1</b>
PLOT DETAILS	CONCEPT SERVICES PLANS.DWG

## APPENDIX D

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### Stormwater Calculations

Johnstone McGee & Gandy

incorporating Dale P Luck & Associates

10 EAST BAGDAD ROAD



Engineers & Planners

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IFD TABLE (AEP)

		Rainfall mm/hr						
		Annual Exceedance Probability (AEP) mm/hr						
Duration	Duration (min)	63.20%	50%	20%	10%	5%	2%	1%
1 min	1	59	67	93.9	114	135	164	189
2 min	2	50.9	57.5	78.8	93.9	109	127	141
3 min	3	44.9	50.8	70	83.6	97.5	115	128
4 min	4	40.4	45.8	63.4	76.2	89.2	106	120
5 min	5	36.9	41.9	58.3	70.3	82.7	99.6	113
10 min	10	26.8	30.5	42.9	52.2	62	76.3	88.4
15 min	15	21.8	24.8	34.9	42.5	50.5	62.4	72.5
20 min	20	18.7	21.2	29.9	36.3	43.2	53.2	61.6
25 min	25	16.5	18.8	26.4	32	38	46.6	53.8
30 min	30	14.9	17	23.8	28.8	34.1	41.6	47.9
45 min	45	11.9	13.5	18.8	22.6	26.6	32.1	36.5
1 hour	60	10.2	11.5	15.9	19.1	22.3	26.6	30
1.5 hour	90	8.1	9.17	12.6	14.9	17.3	20.4	22.8
2 hour	120	6.91	7.81	10.7	12.6	14.5	17	18.9
3 hour	180	5.53	6.25	8.47	9.96	11.4	13.2	14.6
4.5 hour	270	4.42	4.99	6.75	7.91	9.01	10.4	11.5
6 hour	360	3.76	4.26	5.75	6.73	7.65	8.9	9.83
9 hour	540	2.99	3.38	4.58	5.36	6.11	7.14	7.93
12 hour	720	2.52	2.86	3.88	4.56	5.2	6.12	6.83
18 hour	1080	1.97	2.23	3.05	3.6	4.14	4.91	5.53
24 hour	1440	1.63	1.85	2.55	3.02	3.49	4.17	4.72
30 hour	1800	1.4	1.59	2.2	2.62	3.04	3.65	4.14
36 hour	2160	1.24	1.4	1.94	2.32	2.71	3.26	3.7
48 hour	2880	1	1.14	1.58	1.9	2.23	2.68	3.05
72 hour	4320	0.734	0.832	1.16	1.4	1.65	1.98	2.25
96 hour	5760	0.582	0.658	0.914	1.1	1.3	1.56	1.77
120 hour	7200	0.483	0.546	0.755	0.908	1.07	1.28	1.44
144 hour	8640	0.414	0.467	0.642	0.769	0.901	1.07	1.21
168 hour	10080	0.363	0.409	0.559	0.666	0.775	0.923	1.04

Johnstone McGee & Gandy  
incorporating Dale P Luck & Associates

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Offices also in Launceston and Ballarat



10 EAST BAGDAD ROAD

STORMWATER CALCULATION - TIME OF CEONCENTRATION

Time of Concentration - Sheet, Channel and Pipe							
Section	Description	Method			Unit	Comment	
1	Sheet Flow	Hortons	H1	155.5	m	AHD at top of max flow path	
			H2	154.5	m	AHD at bottom of max flow path	
			dH	1.0	m	Change in height of flow path	
			L	30	m	Max flow length	
			Grade	3.17	%	Average grade of site	
			Surface	Bare soil surface	-	Surface description	
			N	0.028	-	Hortons surface roughness	
			Time	7.25	min	$Tcs=107*N*(L^{.333})/(S\%^{.2})$	
2	Channel Flow	Kirpich	H1	154.5	m	AHD at top of max flow path	
			H2	147.8	m	AHD at bottom of max flow path	
			dH	6.7	m	Change in height of flow path	
			L	264	m	Max flow length	
			Slope	0.0254	-	Average slope of channel	
			Surface	Densely grassed surface	-	Surface description	
			N	2.000	-	Surface roughness	
			Time	11.75	min	$Tch = 0.0195 * Lc^{0.77} * Sc^{(-0.385)}$	

Average Time of Concentration		
Total ToC	19	min
Adopt	20	min

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10 EAST BAGDAD ROAD

STORMWATER CALCULATION - PRE DEVELOPMENT

Time of Concentration			
C <sub>1,10</sub>	25	mm	10% AEP, 60min Rainfall
A=	47,657.00	m <sup>2</sup>	Insert Catchment Area
A=	0.04766	Km <sup>2</sup>	Calculated in Km <sup>2</sup>
T <sub>c</sub>	20	mins	Whole Number T <sub>c</sub>

Impervious Area		
Existing Hardstand Area=	22,868.25	m <sup>2</sup>
Total Area =	47,657.00	m <sup>2</sup>
Fraction Impervious =	0.48	

Runoff Coefficient		
Fraction impervious =	47.99%	Formula - Refer ARR Book VIII
C <sub>1,10</sub> =	0.10	
C <sub>10</sub> =	0.48	
		Runoff Coefficient

Frequency Conversion Factors -Refer AR&R 1987										
ARI (years)	1	2	5	10	20	40	60	80	50	100
Factor, F <sub>y</sub>	0.8	0.85	0.95	1	1.05	1.2	1.17	1.19	1.15	1.2

Peak Catchment Flows For Varied 5% AEP Storm Durations		
AEP	Duration (min)	Flow (m <sup>3</sup> /s)
5%	5	0.557
5%	10	0.417
5%	15	0.340
5%	20	0.291
5%	25	0.256
5%	30	0.230
5%	45	0.179
5%	60	0.150
5%	90	0.116
5%	120	0.098
5%	180	0.077
5%	270	0.061

Peak Catchment Flows For Given AEP at T.O.C.		
AEP	I <sub>tc,y</sub> (mm/h)	Flow (m <sup>3</sup> /s)
63.20%	18.7	0.0959
50.00%	21.2	0.1155
20.00%	29.9	0.1821
10.00%	36.3	0.2327
5.00%	43.2	0.2908
2.00%	53.2	0.3922
1.00%	61.6	0.4739

Pre Development Catchment 1 (40%)		
Total Area	42,674.00	m <sup>2</sup>
Impervious Area	17,069.60	m <sup>2</sup>

Upstream Catchment (65% Impervious)		
Total Area	8921	
Impervious Area	5798.65	m <sup>2</sup>

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10 EAST BAGDAD ROAD

STORMWATER CALCULATION - 5 % AEP POST DEVELOPMENT

Time of Concentration			
C <sub>1,10</sub>	25	mm	10% AEP, 60min Rainfall
A=	47,657.00	m <sup>2</sup>	Insert Catchment Area
A=	0.04766	Km <sup>2</sup>	Calculated in Km2
Tc=	5	mins	Whole Number Tc

Impervious Area		
Existing Hardstand Area=	33,536.75	m <sup>2</sup>
Total Area =	47,657.00	m <sup>2</sup>
Fraction Impervious =	70%	

Runoff Coefficient		
Fraction impervious =	70%	
C <sub>1,10</sub> =	0.100	Formula - Refer ARR Book VIII
C <sub>10</sub> =	0.66	Runoff Coefficient

Frequency Conversion Factors -Refer AR&R 1987										
ARI (years)	1	2	5	10	20	40	60	80	50	100
Factor, F <sub>y</sub>	0.8	0.85	0.95	1	1.05	1.2	1.17	1.19	1.15	1.2

Peak Catchment Flows For Varied 5% AEP Storm Durations		
AEP	Duration (min)	Flow (m <sup>3</sup> /s)
5%	5	0.763
5%	10	0.572
5%	15	0.466
5%	20	0.398
5%	25	0.350
5%	30	0.314
5%	45	0.245
5%	60	0.206
5%	90	0.160
5%	120	0.134
5%	180	0.105
5%	270	0.083

Peak Catchment Flows For Given AEP at T.O.C.		
AEP	I <sub>tc,y</sub> (mm/h)	Flow (m <sup>3</sup> /s)
63.20%	36.9	0.2593
50.00%	41.9	0.3128
20.00%	58.3	0.4865
10.00%	70.3	0.6175
5.00%	82.7	0.7627
2.00%	99.6	1.0061
1.00%	113.0	1.1910

Pre Development Catchment 1 (65%)		
Total Area	42,674.00	m <sup>2</sup>
Impervious Area	27,738.10	m <sup>2</sup>

Upstream Catchment (65% Impervious)		
Total Area	8921	
Impervious Area	5798.65	m <sup>2</sup>

**Johnstone McGee & Gandy**

incorporating Dale P Luck & Associates

**10 Bagdad Road - Bagdad**

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**Engineers & Planners**

**STORMWATER CALCULATION - PRE DEVELOPMENT (1% AEP)**

Time of Concentration			
C <sub>1,10</sub>	25	mm	10% AEP, 60min Rainfall
A=	48,257.00	m <sup>2</sup>	Insert Catchment Area
A=	0.04826	Km <sup>2</sup>	Calculated in Km <sup>2</sup>
T <sub>c</sub>	20	mins	Whole Number T <sub>c</sub>

Impervious Area		
Existing Hardstand Area=	23,108.25	m <sup>2</sup>
Total Area =	48,257.00	m <sup>2</sup>
Fraction Impervious =	0.48	

Runoff Coefficient		
Fraction impervious =	47.89%	
C <sub>1,10</sub> =	0.10	Formula - Refer ARR Book VIII
C <sub>10</sub> =	0.48	Runoff Coefficient

Frequency Conversion Factors -Refer AR&R 1987										
ARI (years)	1	2	5	10	20	40	60	80	50	100
Factor, F <sub>y</sub>	0.8	0.85	0.95	1	1.05	1.2	1.17	1.19	1.15	1.2

Peak Catchment Flows For Varied 1% AEP Storm Durations		
AEP	Duration (min)	Flow (m <sup>3</sup> /s)
1%	5	0.769
1%	10	0.602
1%	15	0.493
1%	20	0.419
1%	25	0.366
1%	30	0.326
1%	45	0.248
1%	60	0.204
1%	90	0.155
1%	120	0.129
1%	180	0.099
1%	270	0.078

Peak Catchment Flows For Given AEP at T.O.C.				
AEP	I <sub>tc,y</sub> (mm/h)	I <sub>tc + (16.3%CC)</sub> (mm/h)	Flow <sub>(1% AEP)</sub> (m <sup>3</sup> /s)	Flow <sub>1%AEP + (16.3%CC)</sub> (m <sup>3</sup> /s)
63.20%	18.7	21.7	0.097	0.113
50.00%	21.2	24.7	0.110	0.136
20.00%	29.9	34.8	0.155	0.214
10.00%	36.3	42.2	0.188	0.274
5.00%	43.2	50.2	0.224	0.342
2.00%	53.2	61.9	0.276	0.461
1.00%	61.6	71.6	0.319	0.557

Pre Development Catchment 1 (40%)		
Total Area	43,274.00	m <sup>2</sup>
Impervious Area	17,309.60	m <sup>2</sup>

Upstream Catchment (65% Impervious)		
Total Area	8921	
Impervious Area	5798.65	m <sup>2</sup>

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**STORMWATER CALCULATION - POST DEVELOPMENT (1% AEP)**

Time of Concentration			
C <sub>1,10</sub>	25	mm	10% AEP, 60min Rainfall
A=	47,636.00	m <sup>2</sup>	Insert Catchment Area
A=	0.04764	Km <sup>2</sup>	Calculated in Km2
Tc=	5	mins	Whole Number Tc

Impervious Area		
Existing Hardstand Area=	33,523.10	m <sup>2</sup>
Total Area =	47,636.00	m <sup>2</sup>
Fraction Impervious =	70%	

Runoff Coefficient		
Fraction impervious =	70%	
C <sub>1,10</sub> =	0.100	Formula - Refer ARR Book VIII
C <sub>10</sub> =	0.66	Runoff Coefficient

**Frequency Conversion Factors -Refer AR&R 1987**

ARI (years)	1	2	5	10	20	40	60	80	50	100
Factor, F <sub>y</sub>	0.8	0.85	0.95	1	1.05	1.2	1.17	1.19	1.15	1.2

**Peak Catchment Flows For Varied 1% AEP Storm Durations**

AEP	Duration (min)	Flow (m <sup>3</sup> /s)
1%	5	1.042
1%	10	0.815
1%	15	0.668
1%	20	0.568
1%	25	0.496
1%	30	0.442
1%	45	0.336
1%	60	0.277
1%	90	0.210
1%	120	0.174
1%	180	0.135
1%	270	0.106

**Peak Catchment Flows For Given AEP at T.O.C.**

AEP	I <sub>tc,Y</sub> (mm/h)	I <sub>tc + (16.3%CC)</sub> (mm/h)	Flow (1% AEP) (m <sup>3</sup> /s)	Flow 1%AEP + (16.3%CC) (m <sup>3</sup> /s)
63.20%	36.9	42.9	0.259	0.301
50.00%	41.9	48.7	0.294	0.364
20.00%	58.3	67.8	0.409	0.566
10.00%	70.3	81.8	0.494	0.718
5.00%	82.7	96.2	0.581	0.887
2.00%	99.6	115.8	0.700	1.170
1.00%	113.0	131.4	0.794	1.385

**Post Development Catchment 1 (65%)**

Total Area	42,653.00	m <sup>2</sup>
Impervious Area	27,724.45	m <sup>2</sup>

**Upstream Catchment (65% Impervious)**

Total Area	8921	
Impervious Area	5798.65	m <sup>2</sup>

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**10 EAST BAGDAD ROAD**

**1% AEP STORMWATER DETENTION CALCULATION**

Catchment & Flow Details			Comments
Catchment Area =	4.77	Ha	
10 Year Runoff Coefficient =	0.66	-	
20 Year Effective Catchment Area =	3.32	Ha	
Restricted Outflow Requirement =	0.4740	m3/s	Site Runoff: pre development 1% AEP, 20min (ToC) storm duration.

Detention Calculation							8.5 RCP (16.3%)			
Storm Duration	1% AEP	1% AEP + 8.5RCP (CC)	Ip	Qp	V1	Smax	Ip	Qp	V1	Smax
(min)	Intensity (mm/hr)	Intensity (mm/hr)	(m3/s)	(m3/s)	(m3)	(m3)	(m3/s)	(m3/s)	(m3)	(m3)
1	189.00	219.8	1.742	0.474	104.50	76.06	2.026	0.474	121.53	93.09
2	141.00	164.0	1.299	0.474	155.92	99.04	1.511	0.474	181.34	124.46
3	128.00	148.9	1.180	0.474	212.32	127.00	1.372	0.474	246.93	161.61
4	120.00	139.6	1.106	0.474	265.40	151.64	1.286	0.474	308.66	194.90
5	113.00	131.4	1.041	0.474	312.40	170.20	1.211	0.474	363.32	221.12
10	88.40	102.81	0.815	0.474	488.78	204.38	0.947	0.474	568.45	284.05
15	72.50	84.3	0.668	0.474	601.29	174.69	0.777	0.474	699.31	272.71
20	61.60	71.6	0.568	0.474	681.19	112.39	0.660	0.474	792.22	223.42
25	53.80	62.6	0.496	0.474	743.67	32.67	0.577	0.474	864.89	153.89
30	47.90	55.7	0.441	0.474	794.54	-58.66	0.513	0.474	924.05	70.85
45	36.50	42.4	0.336	0.474	908.16	-371.64	0.391	0.474	1056.19	-223.61
60	30.00	34.9	0.276	0.474	995.25	-711.15	0.322	0.474	1157.47	-548.93
90	22.80	26.5	0.210	0.474	1134.58	-1425.02	0.244	0.474	1319.52	-1240.08
120	18.90	22.0	0.174	0.474	1254.01	-2158.79	0.203	0.474	1458.41	-1954.39
180	14.60	17.0	0.135	0.474	1453.06	-3666.14	0.156	0.474	1689.91	-3429.29
270	11.50	13.4	0.106	0.474	1716.80	-5962.00	0.123	0.474	1996.64	-5682.16
360	9.83	11.4	0.091	0.474	1956.65	-8281.75	0.105	0.474	2275.59	-7962.81
540	7.93	9.2	0.073	0.474	2367.69	-12989.91	0.085	0.474	2753.62	-12603.98
720	6.83	7.9	0.063	0.474	2719.01	-17757.79	0.073	0.474	3162.21	-17314.59
1080	5.53	6.4	0.051	0.474	3302.23	-27412.97	0.059	0.474	3840.49	-26874.71
1440	4.72	5.5	0.043	0.474	3758.05	-37195.55	0.051	0.474	4370.61	-36582.99
1800	4.14	4.8	0.038	0.474	4120.32	-47071.68	0.044	0.474	4791.93	-46400.07
2160	3.70	4.3	0.034	0.474	4418.89	-57011.51	0.040	0.474	5139.17	-56291.23
2880	3.05	3.5	0.028	0.474	4856.80	-77050.40	0.033	0.474	5648.46	-76258.74

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Engineers & Planners

**10 EAST BAGDAD ROAD  
1% AEP STORMWATER DETENTION CALCULATION**

Catchment & Flow Details			Comments
Catchment Area =	4.83	Ha	
10 Year Runoff Coefficient =	0.66	-	
20 Year Effective Catchment Area =	3.36	Ha	
Restricted Outflow Requirement =	0.5571	m3/s	Site Runoff: pre development 1% AEP, 20min (ToC) storm duration.

Detention Calculation							8.5 RCP (16.3%)			
Storm Duration	1% AEP	1% AEP + 8.5RCP (CC)	Ip	Qp	V1	Smax	Ip	Qp	V1	Smax
(min)	Intensity (mm/hr)	Intensity (mm/hr)	(m3/s)	(m3/s)	(m3)	(m3)	(m3/s)	(m3/s)	(m3)	(m3)
1	189.00	219.8	1.764	0.557	105.82	72.39	2.051	0.557	123.07	89.64
2	141.00	164.0	1.316	0.557	157.89	91.03	1.530	0.557	183.63	116.77
3	128.00	148.9	1.194	0.557	215.00	114.71	1.389	0.557	250.04	149.76
4	120.00	139.6	1.120	0.557	268.75	135.03	1.302	0.557	312.55	178.84
5	113.00	131.4	1.054	0.557	316.34	149.19	1.226	0.557	367.90	200.76
10	88.40	102.81	0.825	0.557	494.94	160.65	0.959	0.557	575.62	241.33
15	72.50	84.3	0.677	0.557	608.88	107.45	0.787	0.557	708.13	206.70
20	61.60	71.6	0.575	0.557	689.79	21.21	0.669	0.557	802.22	133.64
25	53.80	62.6	0.502	0.557	753.05	-82.67	0.584	0.557	875.80	40.08
30	47.90	55.7	0.447	0.557	804.56	-198.30	0.520	0.557	935.71	-67.16
45	36.50	42.4	0.341	0.557	919.62	-584.68	0.396	0.557	1069.52	-434.78
60	30.00	34.9	0.280	0.557	1007.80	-997.93	0.326	0.557	1172.08	-833.66
90	22.80	26.5	0.213	0.557	1148.90	-1859.71	0.247	0.557	1336.17	-1672.44
120	18.90	22.0	0.176	0.557	1269.83	-2741.64	0.205	0.557	1476.82	-2534.66
180	14.60	17.0	0.136	0.557	1471.39	-4545.82	0.158	0.557	1711.23	-4305.98
270	11.50	13.4	0.107	0.557	1738.46	-7287.36	0.125	0.557	2021.83	-7003.99
360	9.83	11.4	0.092	0.557	1981.34	-10053.08	0.107	0.557	2304.30	-9730.12
540	7.93	9.2	0.074	0.557	2397.57	-15654.07	0.086	0.557	2788.37	-15263.27
720	6.83	7.9	0.064	0.557	2753.32	-21315.53	0.074	0.557	3202.11	-20866.74
1080	5.53	6.4	0.052	0.557	3343.90	-32759.38	0.060	0.557	3888.95	-32214.32
1440	4.72	5.5	0.044	0.557	3805.47	-44332.23	0.051	0.557	4425.76	-43711.94
1800	4.14	4.8	0.039	0.557	4172.31	-55999.81	0.045	0.557	4852.40	-55319.73
2160	3.70	4.3	0.035	0.557	4474.65	-67731.90	0.040	0.557	5204.02	-67002.53
2880	3.05	3.5	0.028	0.557	4918.09	-91357.31	0.033	0.557	5719.73	-90555.67

## APPENDIX E

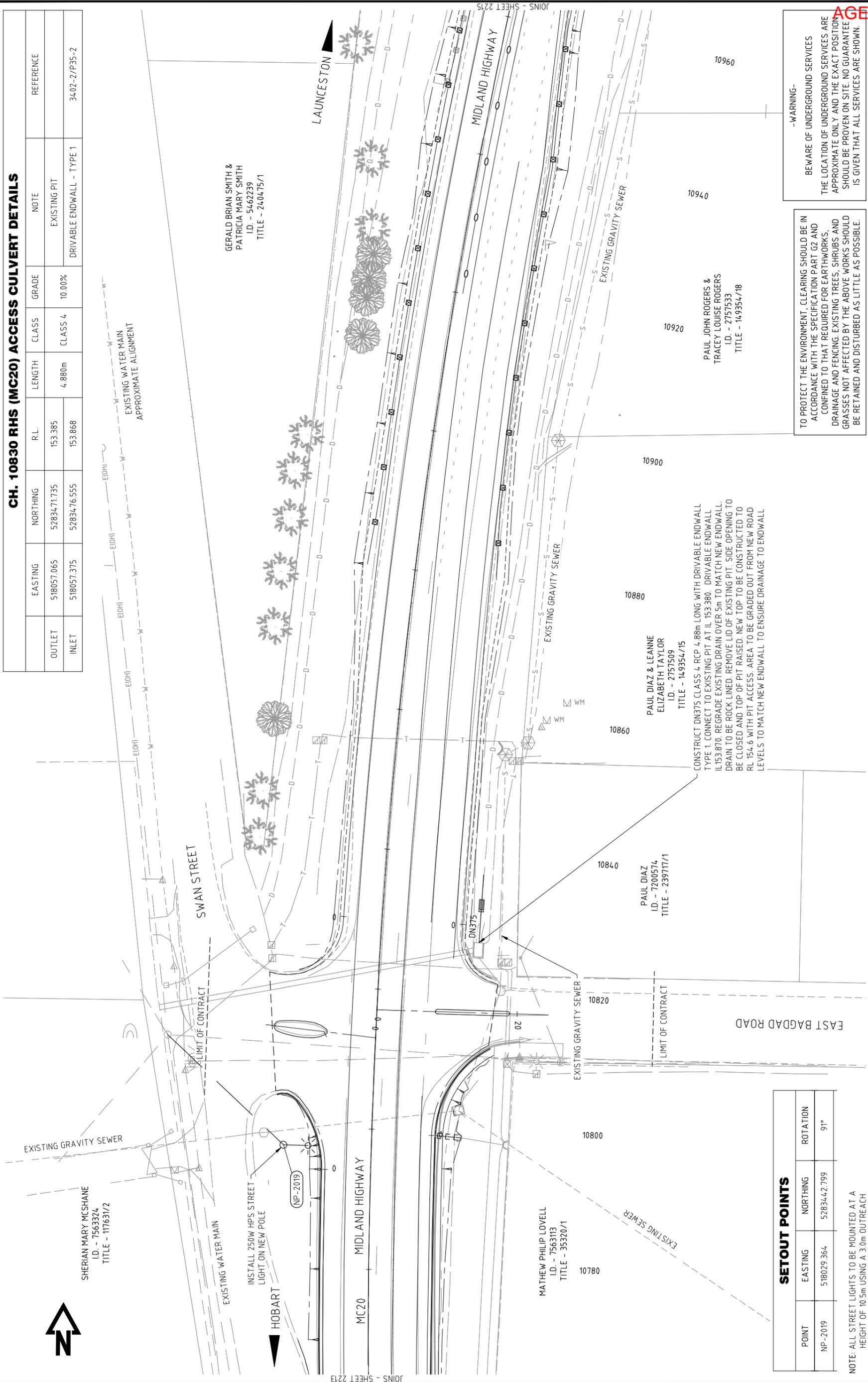
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### DSG Stormwater Drawings



**CH. 10830 RHS (MC20) ACCESS CULVERT DETAILS**

	EASTING	NORTHING	R.L.	LENGTH	CLASS	GRADE	NOTE	REFERENCE
OUTLET	518057.065	52834.71735	153.385	4.880m	CLASS 4	10.00%	EXISTING PIT	34.02-2/P35-2
INLET	518057.375	52834.76555	153.868					



**SETOUT POINTS**

POINT	EASTING	NORTHING	ROTATION
NP-2019	518029.364	52834.42.799	91°

NOTE: ALL STREET LIGHTS TO BE MOUNTED AT A HEIGHT OF 10.5m USING A 3.0m OUTREACH

TO PROTECT THE ENVIRONMENT, CLEARING SHOULD BE IN ACCORDANCE WITH THE SPECIFICATION PART G2 AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHOULD BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-  
BEWARE OF UNDERGROUND SERVICES  
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

CONSTRUCT DN375 CLASS 4 RCP 4.88m LONG WITH DRIVABLE ENDWALL  
TYPE 1. CONNECT TO EXISTING PIT AT IL 153.380. DRIVABLE ENDWALL  
IL153.870. REGRADE EXISTING DRAIN OVER 5m TO MATCH NEW ENDWALL.  
DRAIN TO BE ROCK LINED. REMOVE LID OF EXISTING PIT. SIDE OPENING TO  
BE CLOSED AND TOP OF PIT RAISED. NEW TOP TO BE CONSTRUCTED TO  
RL 154.6 WITH PIT ACCESS. AREA TO BE GRADED OUT FROM NEW ROAD  
LEVELS TO MATCH NEW ENDWALL TO ENSURE DRAINAGE TO ENDWALL

PAUL DIAZ & LEANNE  
ID. - 7200574  
TITLE - 239717/1

PAUL DIAZ  
ID. - 7200574  
TITLE - 239717/1

MATHW PHILIP LOVELL  
ID. - 7563113  
TITLE - 35320/1

PAUL JOHN ROGERS &  
TRACEY LOUISE ROGERS  
ID. - 2757533  
TITLE - 149354/18

GERALD BRIAN SMITH &  
PATRICIA MARY SMITH  
ID. - 5462239  
TITLE - 240475/1

SHERIAN MARY MCSHANE  
ID. - 7563324  
TITLE - 117631/2



Department of State Growth  
MIDLAND HIGHWAY (A0087)  
MANGALORE TO BAGDAD  
ROAD IMPROVEMENTS (STAGE 1)  
DRAINAGE & SERVICES - DRG 14 OF 19



DESIGNED D. GREGS  
REVIEWED R. MANNERING

**SCALES**

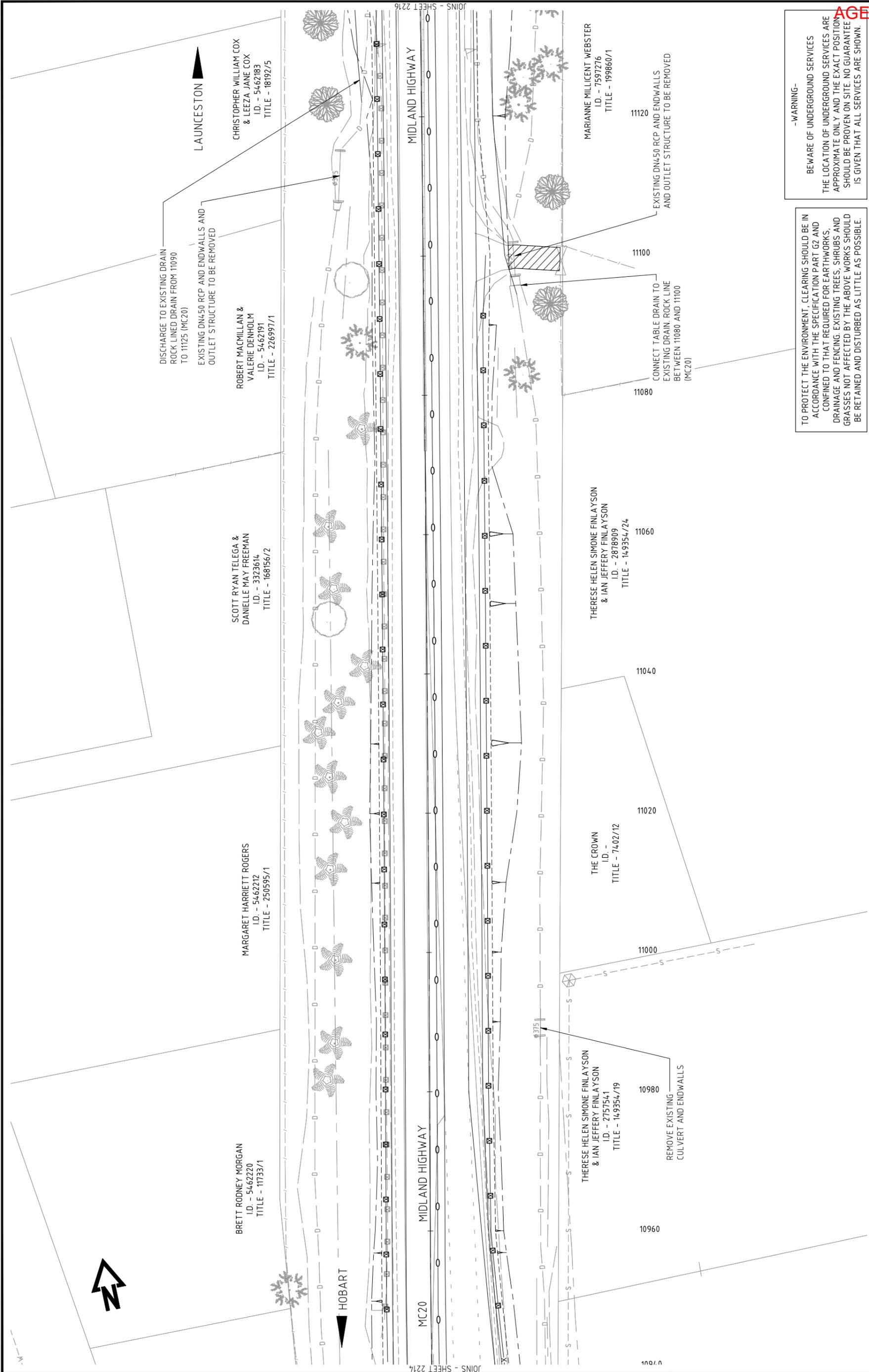
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SCALE IN METRES - 1:500

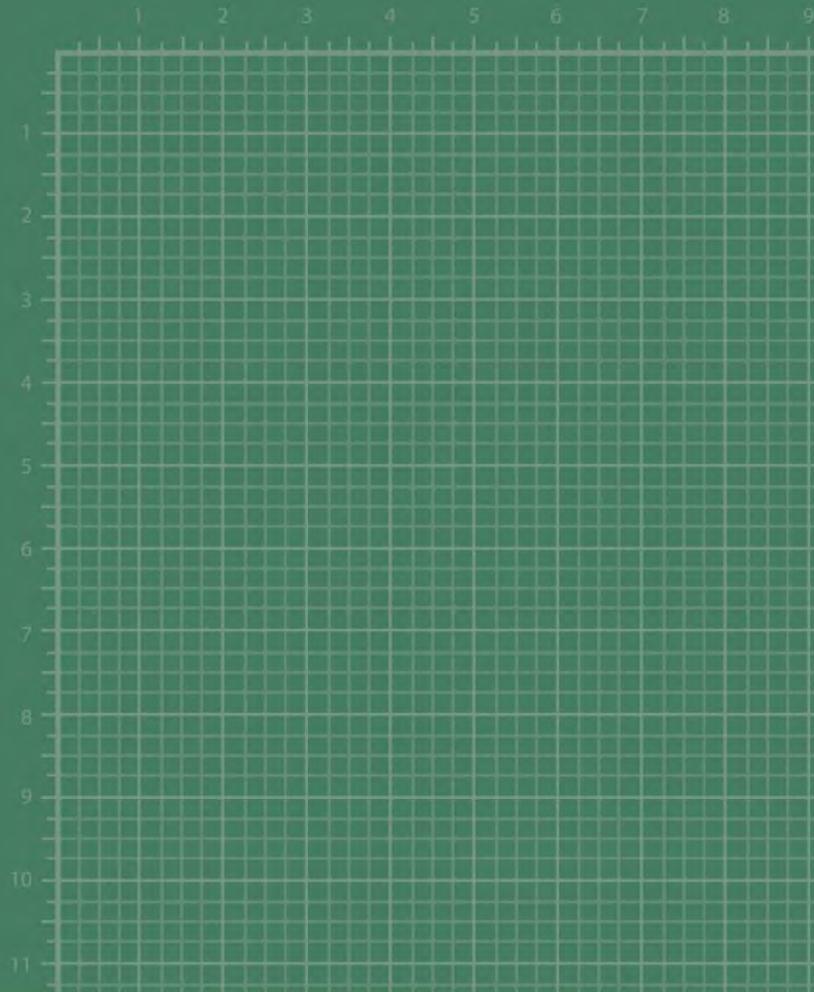
Co-ordinate System: MGA ZONE 55  
Height Datum: A.H.D.

No.	Amendment Description	Initials	Date
0		R.M.	20/11/2015

This sheet may be prepared using colour and may be incomplete if copied

SHEET No	2214	PRINTED DATE	18-Nov-15, 5:01 PM
DRAWING	HB15050-C2214	CONTRACT No.	2303
REGISTRATION NUMBER	A0087.030		





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**Engineers & Planners**  
*Your Vision is Our Mission*

# BUSHFIRE HAZARD REPORT

FOR DFY INVESTMENT PTY LTD

10 East Bagdad Road,  
Bagdad - Subdivision

September 2021



**Johnstone McGee & Gandy Pty Ltd**

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Issuing Office: 117 Harrington Street, Hobart 7000							
JMG Project No. J213045PH							
Document Issue Status							
Ver.	Issue Date	Description	Originator		Checked		Approved
1.0	August 2021	Issued for Review	DL		RM		
2.0	January 2022	Amended and reissued for review	DL		RM		

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4. This report presents information provided by others. JMG do not claim to have checked, and accept no responsibility for, the accuracy of such information.
5. The effectiveness of the measures and recommendations in this report are dependent on their implementation and maintenance for the life of the development. Should the site characteristics that this assessment has been measured from alter from those identified, the BAL classification may differ and cause this report to be void. No liability can be acceptable for actions by lot owners, Council or government agencies which compromise the effectiveness of this report.
6. Whilst compliance with the recommendations of this report will enhance the likelihood of the development surviving a bushfire hazard, no guarantee is made that the development will survive every bushfire hazard event.

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Appendix A - Proposed Subdivision Plan

Appendix B - Bushfire Hazard Management Plan

Appendix C - Site Photos

Appendix D - Certificate of Compliance

# 1 Introduction

JMG have been engaged by DDM Civil to prepare a bushfire hazard assessment for a subdivision. The address of the property is 10 East Bagdad Road Bagdad. The author, David Lyne, is an Accredited Person under Part 4A of the *Fire Service Act 1979*.

The proposed development involves the subdivision of land located within a bushfire-prone area necessitating an assessment against the Bushfire-Prone Areas Code of the *Southern Midland Interim Planning Scheme 2015*.

This report considers:

- Whether the site is within a bushfire-prone area;
- The characteristics of the site and surrounding land;
- The proposed use and development that may be threatened by bushfire hazard;
- The applicable Bushfire Attack Level (BAL) rating;
- Appropriate bushfire hazard mitigation measures; and
- Compliance with planning requirements pertaining to bushfire hazard.

In order to demonstrate compliance with the Bushfire-Prone Areas Code this report includes a Certificate of Compliance (for planning purposes).

# 2 Site Description

The proposed development site is a roughly rectangular shaped parcel of land within a residential village area to the Northern end of the Bagdad township. The subject site is identified by CT 36069/1 and PID 7563105. The property has an area of slightly less than 4.7ha and frontage to the Midland Highway, on its western boundary, and access points to East Bagdad Road on its Northern boundary.

There is a residential building associated with a horse training facility located centrally on site, with a training track running around the property boundaries. There are surrounding houses to the North, East and West that mainly single storey residential buildings. To the south of the site is a rural property with an open paddock that is used for grazing, the majority of properties within close proximity have been cleared of native vegetation although there are remnant areas of native forest present. There is an existing rivulet to the east of this property.



Figure 1: Aerial view of site (outlined in blue) and surrounding land (source: Google Maps accessed 1/9/2021).

#### Planning Context

The relevant planning instrument for the assessment of use and development on the site is the *Southern Midlands Interim Planning Scheme 2015* (“Planning Scheme”). The site is within the Planning Scheme’s Light Industrial Zone. The subject site is partially subject to the Planning Scheme’s Bushfire-Prone Areas overlay.

#### Natural Values

A Natural Values Assessment will not be provided for the proposal.

### 3 Proposed Use & Development

The proposal is to subdivide the subject property and demolish the existing dwelling and associated outbuildings. The proposed subdivision would create 56 lots with an internal public road way to service these lots, the new residential lots would range in size from 600m<sup>2</sup> to 997m<sup>2</sup>.

The proposed lots would have access to reticulated water services with proposed services forming part of the subdivision application, which will be completed in four separate stages.

### 4 Bushfire Hazard Assessment

The subject site is located within the Planning Scheme’s Bushfire-Prone Areas overlay. Therefore, the site is within a ‘bushfire prone area’ as defined in the Planning Scheme.

The key factors affecting bushfire behaviour are fuel, weather conditions and topography. This section of the report considers these factors in the context of the Australian Standard *AS3959-2018 - Construction of buildings in bushfire-prone areas*, which is required in order to determine compliance with planning and building requirements for bushfire protection.

#### 4.1 Vegetation & Effective Slope

AS 3959-2018 provides categories for classifying vegetation based on structural characteristics. ‘Effective Slope’ refers to the slope of land underneath bushfire-prone vegetation relative to the

subject site. Effective Slope affects a fire's rate of spread and flame length and is accordingly a critical aspect affecting bushfire behaviour. AS3959-2018 refers to five categories of Effective Slope and these have been used for the purpose of this analysis. Figure 2 shows land within 100m of the site. A site visit was conducted upon 3 August 2021.



Figure 2: Site Analysis (Google Maps base image accessed 1/9/2021).

#### *Vegetation*

The land to all directions of the site has been mostly cleared of native vegetation, with the south currently generally open paddocks. While there is a narrow band of trees on the boundary with the adjoining property to the south, the grassland extends beyond these trees for a distance of over 100m. Similarly, while there a limited number of remnant trees within the paddock to the east of the site and some introduced species near the dwellings to the west, the majority of this land is open paddock or developed allotments. Therefore, the vegetation to the south of the site is classified as Class G Grassland in accordance with Table 2.3 of AS 3959-2018.

#### *Effective Slope*

The site is on a rural property that was previously used as a training track, so is currently flat and level. The land to the south has a gentle slope to it moving to the south and south-east, whilst to the north, east and west the land rises away from the site. Therefore, the effective slope to the north, east and west is upslope, and 0° and level to the south.

### 4.2 Required Separation

This section sets out the required separation distances from bushfire-prone vegetation to achieve the required BAL.

Table 1 - Required Minimum Separation

Direction from site:	North	East	South	West
Vegetation Type:	Low-threat Clause 2.2.3.2(e)(f)	Low-threat Clause 2.2.3.2(e)(f)	Class G Grassland	Low-threat Clause 2.2.3.2(e)(f)
Relationship to site:	Upslope	Upslope	Upslope	Upslope
Effective Slope	0°	0°	0°	0°
Separation Distance:	>100m	>100m	10-14m Lots 29 & 18 16-50m Lots 17, 19-27, 30 & 31 >50m all remaining lots	>100m
Assessed BAL:	BAL-LOW	BAL-LOW	BAL-19 - Lots 29 & 18 BAL-12.5 - Lots 17, 19-27, 30 & 31 BAL-LOW - All remaining lots	BAL-LOW
Proposed BAL	Lowest achievable BAL - Variable - refer to schedule			
BAL-12.5 Separation distance to hazard/southern boundary:	N/A		As per separation distances above.	N/A
BAL-19 Separation distance to hazard/southern boundary:	N/A		As per separation distances above.	N/A

The required separation needed for Lots 16-17, 19-27 and 30-31 inclusively is 14-<50m from the southern boundary for a BAL-12.5 rating; for lots 18 and 29 the required separation is 10-<14m for BAL-19; all remaining lots will be a BAL-LOW rating.

**BAL Rating Lot Schedule** - Based upon nominated building areas-building footprints may vary from the nominated building areas, however the Subdivision Bushfire Hazard Management Plan indicates BAL rating zones. Individual lot developments are to be assessed against this approved Bushfire Hazard Management Plan for Compliance.

Lot Number	Achievable BAL Rating
18 & 29	BAL-19
16-17; 19-27, & 30-31	BAL-12.5
All other lots	BAL-LOW

## 5 Bushfire Protection Measures

During a bushfire event, a number of bushfire attack mechanisms may threaten buildings and occupants, including:

- Radiant heat;
- Direct flame contact;
- Ember attack; and
- Wind.

A range of bushfire protection measures are recommended to improve the resilience of the proposed development and achieve a tolerable level of residual risk for occupants. The protection measures outlined in this section have been consolidated in a Bushfire Hazard Management Plan (BHMP - see Appendix B).

Additional measures to reduce improve resilience are also recommended but are at the discretion of the developer and future developers within the subdivision.

### 5.1 Hazard Management Areas

The Hazard Management Area ('HMA') refers to land that is managed in a minimum fuel condition so as to reduce the potential exposure of habitable buildings and occupants to radiant heat and flames and to provide defensible space. The effectiveness of the hazard management areas is reliant on ongoing maintenance by landowners. HMA's need to be implemented prior to sealing titles and it is recommended that a suitable instrument, such as a restrictive covenant that requires land owners to not allow for fuel to accumulate and create a fire hazard be placed on each title. The main purpose of this covenant being each lot will be relying on the maintenance of the adjoining lot to achieve required separation distances in order to achieve the specified BAL rating. The developer will be responsible for the management of vegetation on each lot until such time as the lots are sold. The developer is also responsible for maintaining unsold lots and the undeveloped balance of each stage and that management involves maintain the vegetation as low threat as described in AS3959 part 2.2.3.2.

The minimum extents of the Hazard Management Area (HMA) are demonstrated on the BHMP. As the proposed HMAs rely upon one another for mutual protection, they must be established prior to the sealing of titles and maintained in perpetuity by the respective owners. Management prescriptions for the proposed HMA are provided in Table 2.

Table 2 - Bushfire Hazard Management Plan - Vegetation Management Requirement

Zone Name	Ongoing Maintenance Requirements
Within the entirety of the approved lots and nominated Hazard management Area (HMA)	Vegetation is to be continually managed to a low threat in accordance with AS3959-2018. In this case low threat vegetation can be a combination of : <ul style="list-style-type: none"> <li>• Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops; and</li> </ul>

	<ul style="list-style-type: none"> <li>• Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns and cultivated gardens.</li> </ul> <p>NOTE: Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short - cropped grass for example, to a nominal height of 100 mm). Maintenance shall include (but is not limited to):</p> <ul style="list-style-type: none"> <li>Removal of fallen limbs, leaf and bark litter;</li> <li>•Cut grasses short (less than 100mm) and maintain;</li> <li>•Remove vegetation debris;</li> <li>•Complete under-brushing and thin out the under storey;</li> <li>•Cut tree limbs within 2 metres of the ground;</li> <li>•Maintain horizontal and vertical canopy separation;</li> <li>•Prevent encroachment of Bushfire Prone Vegetation into the HMA.</li> </ul>
--	--

NOTE: All lots within the subdivision (including the BAL-LOW lots) to be maintained to a Low Threat Level for ongoing hazard management for the benefit of all the newly created lots.

The proposal complies with A1(b)(i) of E1.6.1 Subdivision: Provision of hazard management areas of the planning scheme as the attached proposed plan of subdivision includes all of the lots that are proposed within a bushfire prone area as well as those that are not. The proposed subdivision would be staged. The proposal complies with A1(b)(ii) and (iii) as the plan of subdivision shows building areas for each lot and hazard management areas between the building areas and bushfire prone vegetation greater than the separation distances required for BAL-19 in AS3959:2018.

A1(b)(iv) is also met as the attached BHMP also shows hazard management areas between the building areas and bushfire prone vegetation equal to or greater than the separation distances required for BAL-19 in AS3959:2018 and is certified by an accredited person. A1(c) is not relevant as hazard management areas would not be located on land external to the proposed subdivision.

Throughout staging and construction and until lots are sold and settled all vegetation within the approval development area must be maintained to a Low Threat Level in accordance with AS3959-2018.

## 5.2 Construction Standards

Future habitable buildings located within the specified building areas and provided with the requisite hazard management areas are to be designed and constructed to a minimum of BAL19 under AS3959-2018. Refer to section 4.2 above for specific BAL ratings for the subdivision lots. The building areas for each lot are shown on the attached BHMP. The minimum setbacks from bushfire-prone vegetation are demonstrated on the BHMP.

### 5.3 Access

Roads are to be developed in accordance with Table 3 of the Bushfire-Prone Areas Code. The current road layout is 18.0 m in width with an internal road that runs through the subdivision of the same width. The primary hardstand for fire appliance connection to the municipal hydrants would therefore be the newly formed public roads.

All building areas are within 30.0 m of the public road, and as there is no requirement for access to a water connection point, there are no design or construction requirements for property access. Alteration to the layout of building envelopes or the provision of a static water supply for fire fighting would require a reassessment of the access requirements for lots.



Figure 3: view of existing access into the horse training facility and track.

The proposed access arrangements for the subdivision must comply with E1.6.2 Subdivision: Public and firefighting and access. The proposal complies with the acceptable solution for this standard because the layout of accesses is included in the attached plan of subdivision and BHMP. The proposal includes a new public road and property access, so Table E1 and E2 are addressed in the attached subdivision plan. A fire trail is not proposed nor considered necessary, so the standards contained within Table E3 are not relevant.

The implementation of the access will need to occur prior to receiving a certificate of occupancy or final certificate for any buildings on the relevant allotment.

Where new roads terminate at the end of a stage and where they do not connect to a formed road, a temporary turning area is to be established in compliance with Table E1.

Table E1 Standards for roads

Table E1: Standards for Roads		
Element		Requirement
<u>A.</u>	<u>Roads</u>	Unless the development standards in the zone require a higher standard, the following apply: (a) two-wheel drive, all-weather construction;

		<p>(b) load capacity of at least 20t, including for bridges and culverts;</p> <p>(c) minimum carriageway width is 7m for a through road, or 5.5m for a dead-end or cul-de-sac road;</p> <p>(d) minimum vertical clearance of 4m;</p> <p>(e) minimum horizontal clearance of 2m from the edge of the carriageway;</p> <p>(f) cross falls of less than 3 degrees (1:20 or 5%);</p> <p>(g) maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed roads;</p> <p>(h) curves have a minimum inner radius of 10m;</p> <p>(i) dead-end or cul-de-sac roads are not more than 200m in length unless the carriageway is 7 metres in width;</p> <p>(j) dead-end or cul-de-sac roads have a turning circle with a minimum 12m outer radius; and</p> <p>(k) carriageways less than 7m wide have 'No Parking' zones on one side, indicated by a road sign that complies with Australian Standard AS1743-2001 Road signs-Specifications.</p>
--	--	--

Table E2: Standards for Property Access

<u>A.</u>	Property access length is less than 30m; or access is not required for a fire appliance to access a fire fighting water point.	There are no specified design and construction requirements.
<u>B.</u>	Property access length is 30m or greater; or access is required for a fire appliance to a fire fighting water point.	Not applicable to this development.
<u>C.</u>	Property access length is 200m or greater.	Not applicable to this development.
<u>D.</u>	Property access length is greater than 30m, and access is provided to 3 or more properties.	Not applicable to this development.

## 5.4 Water

Arrangements for fire-fighting water supply for the proposed lots must comply with Table E4 of the Bushfire Prone Areas Code. A reticulated water supply would be available to all proposed lots and all parts of the proposed building areas would be within a 120m hose lay of a proposed fire hydrant. All parts of the building areas proposed for each of the 56 lots would be within a 120m hose-lay of fire hydrants to be installed.

Either East Bagdad Road, the Midland Highway or proposed paved areas within the new subdivision would provide a hardstand area for fire-fighting appliances within the required

distance from the fire-fighting water points but greater than the minimum distance specified from building areas.

Water supplies for the purpose of firefighting must be implemented in conjunction with services to the new allotments once titles have been sealed and civil works undertaken.

Titles are not to be sealed unless they are served by a fire hydrant compliant with E1.6.3 of the Code as specified below.

Acceptable Solutions	Performance Criteria
<p><b>A1</b>  <i>In areas serviced with reticulated water by the water corporation:</i>                      (a) TFS or an accredited person certifies that there is an insufficient increase in risk from bushfire to warrant the provision of a water supply for fire fighting purposes;                      (b) A proposed plan of subdivision showing the layout of fire hydrants, and building areas, is included in a bushfire hazard management plan approved by the TFS or accredited person as being compliant with Table E4; or                      (c) A bushfire hazard management plan certified by the TFS or an accredited person demonstrates that the provision of water supply for firefighting purposes is sufficient to manage the risks to property and lives in the event of a bushfire.</p>	<p><b>P1</b>  <i>No Performance Criterion.</i></p>

The proposal complies with A1(b) as the attached proposed plan of subdivision shows the layout of fire hydrants and building areas and is compliant with the standards contained within Table E4.

Table E4 Reticulated water supply for fire fighting

Table E4: Reticulated water supply for fire fighting		
Element	Requirement	
<b>A.</b>	Distance between building area to be protected and water supply.	The following requirements apply: (a) the building area to be protected must be located within 120m of a fire hydrant; and (b) the distance must be measured as a hose lay, between the fire fighting water point and the furthest part of the building area.
<b>B.</b>	Design criteria for fire hydrants	The following requirements apply: (a) fire hydrant system must be designed and constructed in accordance with TasWater Supplement to Water Supply Code of Australia WSA 03 - 2011-3.1 MRWA 2nd Edition; and (b) fire hydrants are not installed in parking areas.
<b>C.</b>	Hardstand	A hardstand area for fire appliances must be: (a) no more than 3m from the hydrant, measured as a hose lay; (b) no closer than 6m from the building area to be protected;

		(c) a minimum width of 3m constructed to the same standard as the carriageway; and (d) connected to the property access by a carriageway equivalent to the standard of the property access
--	--	---

The hydrant network connection points are to be located so that the distance between each building area to be protected and the water supply point provided by existing and proposed fire hydrants, would be less than 120m and would therefore comply with Element A of this Table. All parts of the proposed building areas must be within a 120m hose-lay of a fire hydrant. The proposed fire hydrant must be installed in accordance with the *TasWater Supplement to Water Supply Code of Australia WSA 03 - 2019-3.1 MRWA 2nd Edition*, to ensure compliance with Element B of the Table. The proposed and existing hydrants would not be within parking areas.

A Certificate of Compliance confirming compliance with the above provisions is attached as Appendix D.

### 5.5 Optional Protection Measures

The following recommendations are not specifically regulated under any planning or building standards at present hence do not form part of the Bushfire Hazard Management Plan. If implemented however, they will improve bushfire protection for future occupants.

#### Electrical Infrastructure

Overhead power lines are a common source of unplanned fires, particularly during high wind conditions. Where practicable, electricity connections to properties should be provided underground to remove this potential fire source.

#### Building Design

Building configuration can be used to improve building resilience. It is recommended that future developers of buildings within the subdivision consider adopting the following design features:

- Simple roof shapes with roof pitch at 18° or greater, to reduce the potential for ember accumulation. This measure ought to be combined with non-combustible gutter guards to prevent accumulation within guttering;
- Simple building shapes are preferable, as they reduce opportunity for embers and debris to be trapped against the building within re-entrant corners;
- Keep walls as low as possible. Large expansive walls present greater surface area to wind turbulence and to radiant heat;
- Slab-on-ground construction is generally more resilient than suspended slab construction.

## 6 Conclusion & Recommendations

The proposed subdivision site is located in a bushfire-prone area. The attached Bushfire Hazard Management Plan prepared for the subdivision outlines the required protection measures for the proposed lots including hazard management areas, building siting and construction, access, and water supply standards. Protection measures will reduce bushfire risk to future residents, developments and to firefighters, as outlined in this report and the associated bushfire hazard management plan. As the proposed Hazard Management Areas on the BHMP rely upon one another for mutual protection, they must be established prior to the sealing of titles and maintained in perpetuity by the respective owners. HMA's are to be implemented prior to sealing titles and it

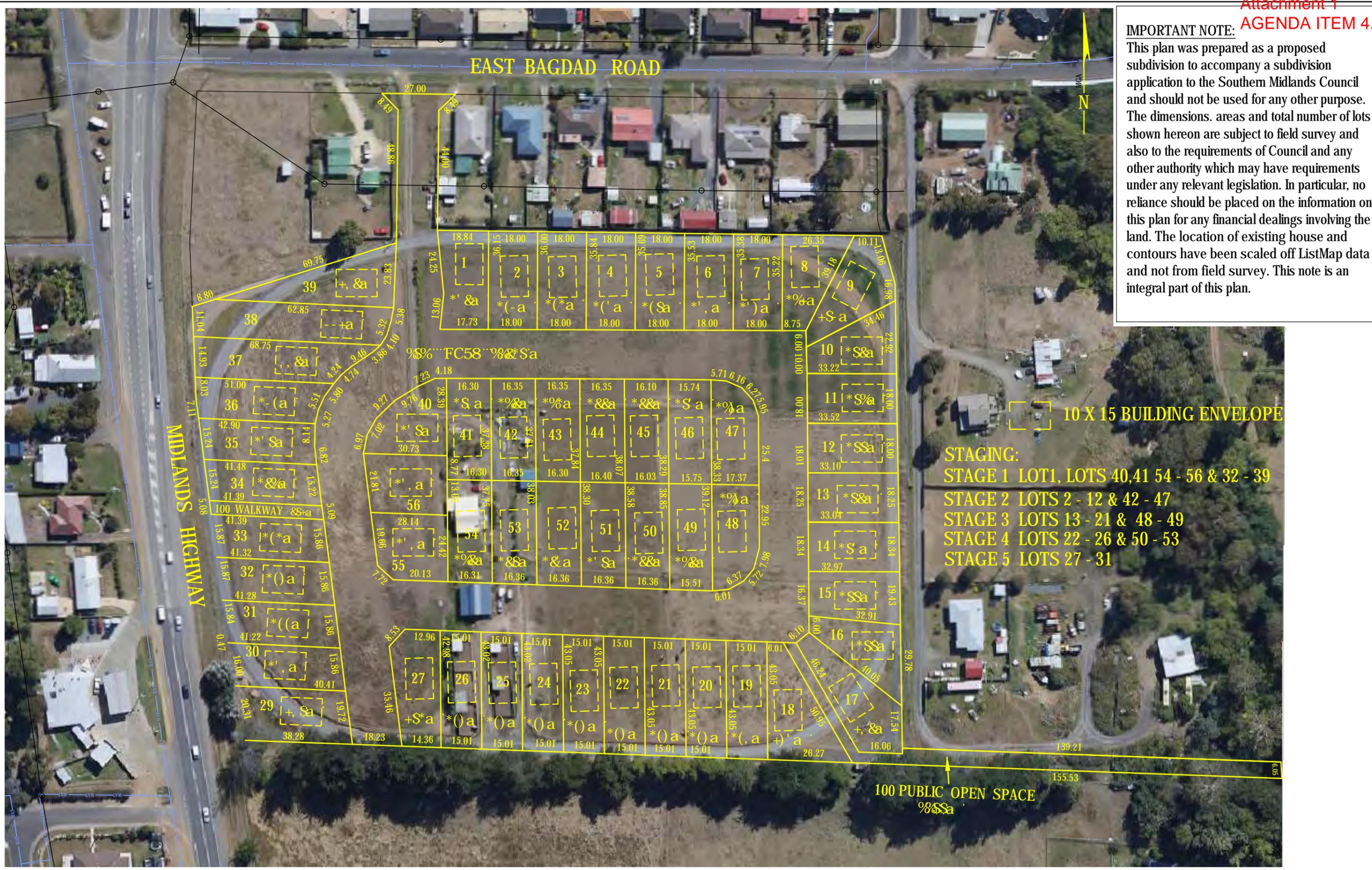
is recommended that a suitable instrument, such as a restrictive covenant, that requires landowners to not allow for fuel to accumulate and create a fire hazard be placed on each title. The purpose of this covenant being that each lot will be relying on the maintenance of the adjoining lot to achieve required separation distances to achieve the specified BAL ratings.

The Bushfire Hazard Management Plan is certified as being compliant with the Bushfire-Prone Areas Code E1.0 of the applicable planning scheme.

---

**APPENDIX A**  
Subdivision Plan

**IMPORTANT NOTE:** This plan was prepared as a proposed subdivision to accompany a subdivision application to the Southern Midlands Council and should not be used for any other purpose. The dimensions, areas and total number of lots shown hereon are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be placed on the information on this plan for any financial dealings involving the land. The location of existing house and contours have been scaled off ListMap data and not from field survey. This note is an integral part of this plan.



10 X 15 BUILDING ENVELOPE

**STAGING:**  
 STAGE 1 LOTS 1, 40, 41, 54 - 56 & 32 - 39  
 STAGE 2 LOTS 2 - 12 & 42 - 47  
 STAGE 3 LOTS 13 - 21 & 48 - 49  
 STAGE 4 LOTS 22 - 26 & 50 - 53  
 STAGE 5 LOTS 27 - 31

100 PUBLIC OPEN SPACE

AMENDMENTS		
No.	Revision/Issue	Date
	REV 6	15-10-21

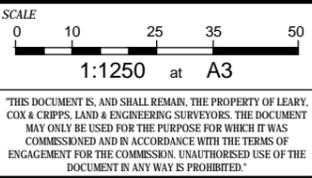


Unit G04 40 Mollie Street,  
 HOBART TAS 7000  
 P 03 6118 2030  
 E admin@lccsurvey.com

Project Name and Address  
**10 EAST BAGDAD ROAD  
 EAST BAGDAD**

Drawing Title  
**PLAN OF SUBDIVISION**

Client  
 DFY INVESTMENTS PTY LTD  
 CT 36069 / 1



Contour Interval  
**0.50 m**

Date  
 15 / 10 / 21

SHEET  
 1 of 1

DRAWN  
 NL

CHKD  
 XX

FILE REF:  
**12213**

Geochil Ref  
 2213

AutoCAD Ref  
 12213

DATUM  
 GDA AHD

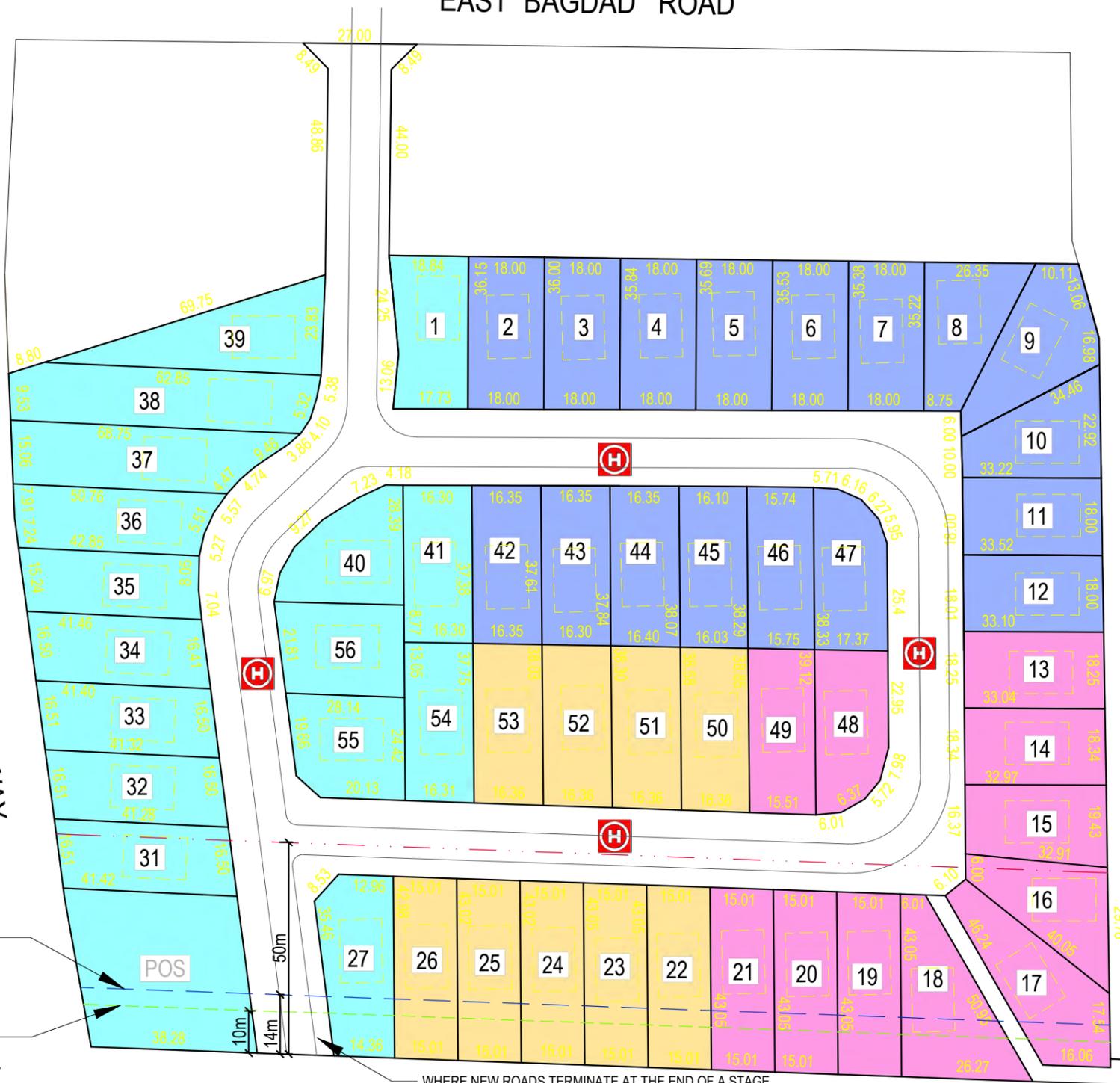
## APPENDIX B

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### Bushfire Hazard Management Plan

EAST BAGDAD ROAD

MIDLANDS HIGHWAY



INDICATIVE FIRE HYDRANT LOCATION

INDICATIVE BUILDING AREA - 10 x 15

STAGING:

- STAGE 1 LOT1 & LOTS 27, 31 - 41 & 54 - 56
- STAGE 2 LOTS 2 - 12 & 42 - 47
- STAGE 3 LOTS 13 - 21 & 48 - 49
- STAGE 4 LOTS 22 - 26 & 50 - 53

2.3	13.01.2022	FOR ISSUING
REV	DATE	REMARK

**JMG**  
**Johnstone McGee & Gandy Pty. Ltd.**  
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PROJECT  
 10 EAST BAGDAD ROAD  
 BAGDAD

TITLE  
 BUSHFIRE HAZARD  
 MANAGEMENT PLAN

Accepted M.CLARK (Discipline Head)	Date
Accepted D.LYNE (Team Leader)	Date
Approved M.CLARK (Group Manager)	Date

This document must be signed "Approved" by JMG to authorise it for use. JMG accept no liability whatsoever for unauthorised or unlicensed use.

SCALES @ A3	DESIGNED BY	DRAWN BY
1:2000	D.LYNE	D.LYNE
	PLOT DATE	10/08/2021

DO NOT SCALE. Use only figured dimensions. Locations of structure, fittings, services etc on this drawing are indicative only. CONTRACTOR to check Architects & other project drawings for co-ordination between structures, fabric, fixtures, fittings, services etc. CONTRACTOR to site check all dimensions and exact locations of all items. JMG accepts no responsibility for dimensional information scaled or digitally derived from this document.

PLOT DETAILS BHMP.DWG

PROJECT NO. **J213045PH**

DWG NO. **B01** REVISION **2.3**

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HAZARD MANAGEMENT AREA FOR BAL-12.5 DEVELOPMENT - 14 to 50m FROM SOUTHERN SUBDIVISION BOUNDARY

HAZARD MANAGEMENT AREA FOR BAL-19 DEVELOPMENT - 10 to 14m FROM SOUTHERN SUBDIVISION BOUNDARY

- BHMP Notes:**
- The subject property is 10 East Bagdad Road Bagdad (CT 36069/1 and PID 7563105).
  - This plan has been prepared by Bushfire Hazard Practitioner, David Lyne (BFP-144, scope 1, 2 and 3a) for certification Rhys Menadue (BFP-106, scope 1, 2, 3a, 3b, 3c).
  - This plan demonstrates compliance with Code E1.0 Bushfire Prone Areas Code (BPAC) in the *Southern Midlands Interim Planning Scheme 2015*.
  - The Hazard Management Areas (HMA) indicated on this plan must be established and maintained as per the plan and setback distances. All lots throughout the subdivision comprise the Hazard Management Areas (HMA) & must be maintained to a Low Threat Level in accordance with AS3959-2018.
  - Property access arrangements must comply with Code E1.6.2 Table E1 and Table E2 of the *Southern Midlands Interim Planning Scheme 2015*. For design and compliance specifications refer to sections 4 & 5 of the Bushfire Hazard Management Plan Report - Subdivision - 10 East Bagdad Road, Bagdad for DFY Investment Pty Ltd dated September 2021.
  - Fire fighting water supply complies with AS3959 and Code E1.6.3 Table E4 of the *Southern Midlands Interim Planning Scheme 2015*.

WHERE NEW ROADS TERMINATE AT THE END OF A STAGE AND DO NOT CONNECT TO A FORMED ROAD, A TEMPORARY TURNING AREA IS TO BE ESTABLISHED IN COMPLIANCE WITH CODE E1.6.2 TABLE E.1

This plan has been prepared only for the purpose of obtaining preliminary subdivisional approval from the local authority and is subject to that approval.

All measurements and areas are subject to the final survey.  
 Base survey by Leary & Cox Surveyors - 12213 dated 2 June 2021  
 Base data from the LIST (www.thelist.tas.gov.au), © State of Tasmania

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**APPENDIX C**  
Site Photos



Photo 1: view to south-west from north-east corner of site.



Photo 2: view to south from north-east corner of site.



Photo 3: view to west from eastern boundary of site.



Photo 4: view to north from south-west corner of site.



Photo 5: view of neighbouring block to the south, looking east from west boundary.



Photo 6: view of neighbouring block to the south, looking south from west boundary.



Photo 7: view of neighbouring block to the south, looking north from south boundary.



Photo 8. View to the south-east from northern corner of property.

## APPENDIX D

---

### Certificate of Compliance

**CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE  
ITEM**

**Section 321**

To:  Owner /Agent  
 Address  
 Suburb/postcode

Form **55**

**Qualified person details:**

Qualified person:   
 Address:  Phone No:   
  Fax No:   
 Licence No:  Email address:

Qualifications and Insurance details:  *(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)*

Speciality area of expertise:  *(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)*

**Details of work:**

Address:  Lot No:   
  Certificate of title No:

The assessable item related to this certificate:  *(description of the assessable item being certified)*  
 Assessable item includes –  
 - a material;  
 - a design  
 - a form of construction  
 - a document  
 - testing of a component, building system or plumbing system  
 - an inspection, or assessment, performed

**Certificate details:**

Certificate type:  *(description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)*

This certificate is in relation to the above assessable items, at any stage, as part of – *(tick one)*

building work, plumbing work or plumbing installation or demolition work

OR

a building, temporary structure or plumbing installation

In issuing this certificate the following matters are relevant –

Documents:	Bushfire Hazard Report – 10 East Bagdad Road, Bagdad – Subdivision by David Lyne, JMG Engineers and Planners dated September 2021 – Revision 2.0
Relevant calculations:	<ul style="list-style-type: none"> <li>• In Accordance with AS3959-2018; and</li> <li>• the Building Regulations (TAS).</li> </ul>
References:	<ul style="list-style-type: none"> <li>• AS3959-2018;</li> <li>• the Building Regulations (TAS); and</li> <li>• Building Code of Australia (BCA).</li> </ul>

*Substance of Certificate: (what it is that is being certified)*

BAL Ratings

*Scope and/or Limitations*

The assessment has been conducted according to information provided by the designer/client and freely available historical data and does not take into account the possibility of altered site conditions from the data relied upon.

It should be noted compliance with the recommendations contained in the certified documents does not mean that there is no residual risk to life safety and property as a result of bushfire. The limitation is expressed in the following extract from AS3959-2018, which states:

*It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions.*

The level of residual risk is inherent in all bushfire standards and also applies to this certification.

The assessment has been undertaken and certification provided on the understanding that; -

1. The certificate only deals with the potential bushfire risk all other statutory assessments are outside the scope of this report.
2. The report only identifies the size, volume and status of vegetation at the time the site inspection was undertaken and cannot be relied upon for any future development. Impacts of future development and vegetation growth have not been considered.

**I certify the matters described in this certificate.**

Qualified person:	Signed: 	Certificate No: J213045PH	Date: 13/01/2022
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## BUSHFIRE-PRONE AREAS CODE

### CERTIFICATE<sup>1</sup> UNDER S51(2)(d) LAND USE PLANNING AND APPROVALS ACT 1993

#### 1. Land to which certificate applies

The subject site includes property that is proposed for use and development and includes all properties upon which works are proposed for bushfire protection purposes.

**Street address:**

10 East Bagdad Road, Bagdad

**Certificate of Title / PID:**

36069/1 7563105

#### 2. Proposed Use or Development

**Description of proposed Use and Development:**

Subdivision

**Applicable Planning Scheme:**

Southern Midlands Interim Planning Scheme

#### 3. Documents relied upon

This certificate relates to the following documents:

Title	Author	Date	Version
Bushfire Hazard Report – 10 East Bagdad Road, Bagdad – Subdivision and all Appendices	Rhys Menadue	September 2021	2.0
Bushfire Hazard Management Plan, Project: 10 Easy Bagdad Road, Bagdad, Project Number: J213045PH, DWG No: B01, Revision 2.3	David Lyne	13/01/2022	2.3

<sup>1</sup> This document is the approved form of certification for this purpose and must not be altered from its original form.

#### 4. Nature of Certificate

The following requirements are applicable to the proposed use and development:

<input type="checkbox"/> <b>E1.4 / C13.4 – Use or development exempt from this Code</b>	
Compliance test	Compliance Requirement
<input type="checkbox"/> E1.4(a) / C13.4.1(a)	Insufficient increase in risk

<input type="checkbox"/> <b>E1.5.1 / C13.5.1 – Vulnerable Uses</b>	
Acceptable Solution	Compliance Requirement
<input type="checkbox"/> E1.5.1 P1 / C13.5.1 P1	<b><i>Planning authority discretion required. A proposal cannot be certified as compliant with P1.</i></b>
<input type="checkbox"/> E1.5.1 A2 / C13.5.1 A2	Emergency management strategy
<input type="checkbox"/> E1.5.1 A3 / C13.5.1 A2	Bushfire hazard management plan

<input type="checkbox"/> <b>E1.5.2 / C13.5.2 – Hazardous Uses</b>	
Acceptable Solution	Compliance Requirement
<input type="checkbox"/> E1.5.2 P1 / C13.5.2 P1	<b><i>Planning authority discretion required. A proposal cannot be certified as compliant with P1.</i></b>
<input type="checkbox"/> E1.5.2 A2 / C13.5.2 A2	Emergency management strategy
<input type="checkbox"/> E1.5.2 A3 / C13.5.2 A3	Bushfire hazard management plan

<input checked="" type="checkbox"/> <b>E1.6.1 / C13.6.1 Subdivision: Provision of hazard management areas</b>	
Acceptable Solution	Compliance Requirement
<input type="checkbox"/> E1.6.1 P1 / C13.6.1 P1	<b><i>Planning authority discretion required. A proposal cannot be certified as compliant with P1.</i></b>
<input type="checkbox"/> E1.6.1 A1 (a) / C13.6.1 A1(a)	Insufficient increase in risk
<input checked="" type="checkbox"/> E1.6.1 A1 (b) / C13.6.1 A1(b)	Provides BAL-19 for all lots (including any lot designated as 'balance')
<input type="checkbox"/> E1.6.1 A1(c) / C13.6.1 A1(c)	Consent for Part 5 Agreement

<input type="checkbox"/>	<b>E1.6.2 / C13.6.2 Subdivision: Public and fire fighting access</b>	
<input type="checkbox"/>	<b>Acceptable Solution</b>	<b>Compliance Requirement</b>
<input type="checkbox"/>	E1.6.2 P1 / C13.6.2 P1	<b><i>Planning authority discretion required. A proposal cannot be certified as compliant with P1.</i></b>
<input type="checkbox"/>	E1.6.2 A1 (a) / C13.6.2 A1 (a)	Insufficient increase in risk
<input checked="" type="checkbox"/>	E1.6.2 A1 (b) / C13.6.2 A1 (b)	Access complies with relevant Tables

<input checked="" type="checkbox"/>	<b>E1.6.3 / C13.1.6.3 Subdivision: Provision of water supply for fire fighting purposes</b>	
<input checked="" type="checkbox"/>	<b>Acceptable Solution</b>	<b>Compliance Requirement</b>
<input type="checkbox"/>	E1.6.3 A1 (a) / C13.6.3 A1 (a)	Insufficient increase in risk
<input checked="" type="checkbox"/>	E1.6.3 A1 (b) / C13.6.3 A1 (b)	Reticulated water supply complies with relevant Table
<input checked="" type="checkbox"/>	E1.6.3 A1 (c) / C13.6.3 A1 (c)	Water supply consistent with the objective
<input type="checkbox"/>	E1.6.3 A2 (a) / C13.6.3 A2 (a)	Insufficient increase in risk
<input type="checkbox"/>	E1.6.3 A2 (b) / C13.6.3 A2 (b)	Static water supply complies with relevant Table
<input type="checkbox"/>	E1.6.3 A2 (c) / C13.6.3 A2 (c)	Static water supply consistent with the objective

## 5. Bushfire Hazard Practitioner

<b>Name:</b>	Rhys Menadue	<b>Phone No:</b>	0407 595 317
<b>Postal Address:</b>	14 Reynolds Court Dynnyrne TAS 7005	<b>Email Address:</b>	rhmenadue@gmail.com
<b>Accreditation No:</b>	BFP – 106	<b>Scope:</b>	1, 2, 3a, 3b, 3c

## 6. Certification

I certify that in accordance with the authority given under Part 4A of the *Fire Service Act 1979* that the proposed use and development:

- Is exempt from the requirement Bushfire-Prone Areas Code because, having regard to the objective of all applicable standards in the Code, there is considered to be an insufficient increase in risk to the use or development from bushfire to warrant any specific bushfire protection measures, or
- The Bushfire Hazard Management Plan/s identified in Section 3 of this certificate is/are in accordance with the Chief Officer's requirements and compliant with the relevant **Acceptable Solutions** identified in Section 4 of this Certificate.

**Signed:**  
certifier



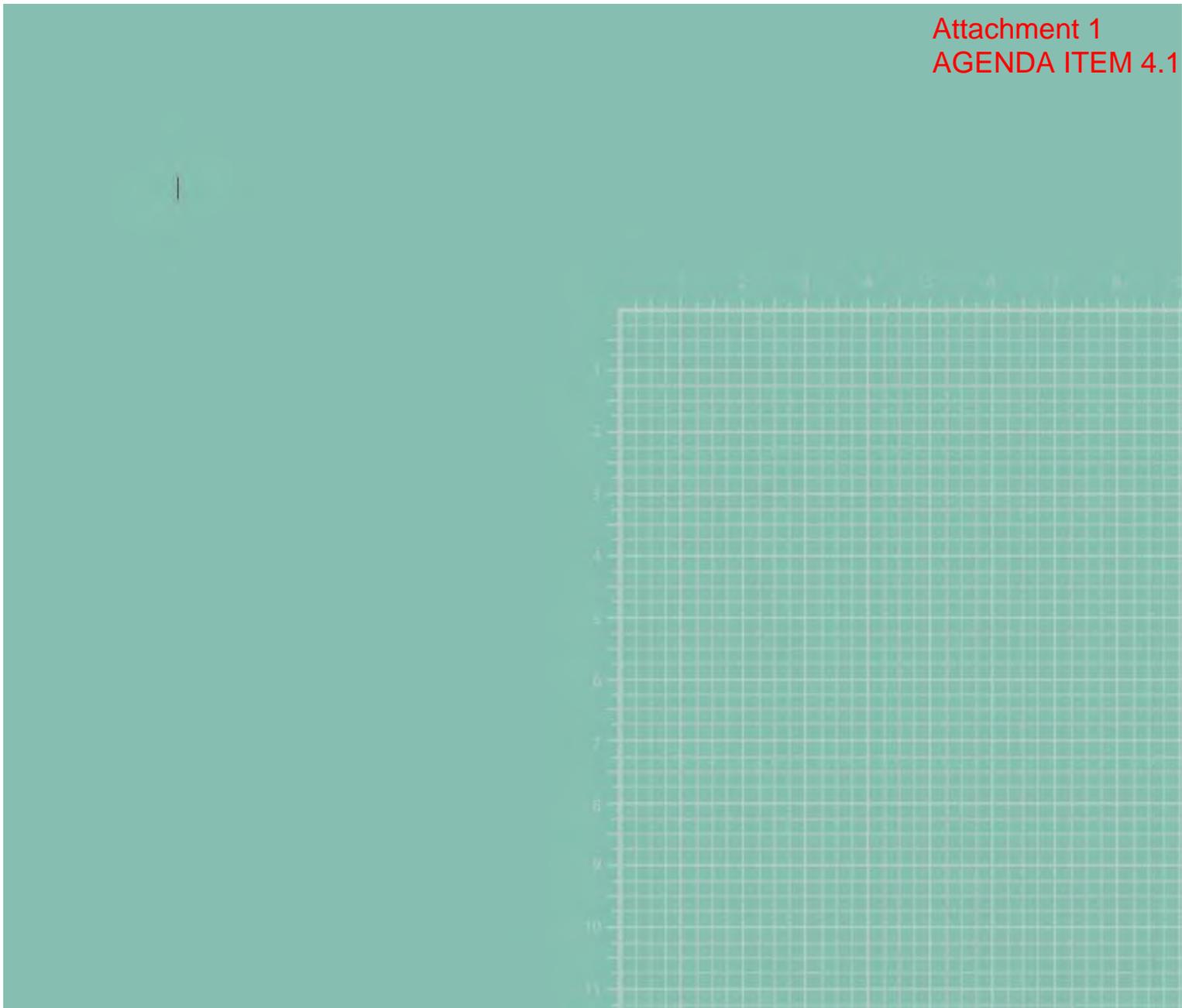
**Name:**

Rhys Menadue

**Date:** 13/01/2022

**Certificate Number:** J213045PH

(for Practitioner Use only)



**Johnstone McGee & Gandy Pty Ltd**

ABN 76 473 834 852 ACN 009 547 139

**[www.jmg.net.au](http://www.jmg.net.au)**

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## Submission to Planning Authority Notice

<b>Council Planning Permit No.</b>	SA2021/13	<b>Council notice date</b>	7/10/2021
<b>TasWater details</b>			
<b>TasWater Reference No.</b>	TWDA 2021/01720-STM	<b>Date of response</b>	28/01/2022
<b>TasWater Contact</b>	Anthony Cengia	<b>Phone No.</b>	0474 933 293
<b>Response issued to</b>			
<b>Council name</b>	SOUTHERN MIDLANDS COUNCIL		
<b>Contact details</b>	mail@southernmidlands.tas.gov.au		
<b>Development details</b>			
<b>Address</b>	10 EAST BAGDAD RD, BAGDAD	<b>Property ID (PID)</b>	7563105
<b>Description of development</b>	Subdivision - 56 Lots		
<b>Schedule of drawings/documents</b>			
<b>Prepared by</b>	<b>Drawing/document No.</b>	<b>Revision No.</b>	<b>Date of Issue</b>
JMG	Planning report	1	03/09/2021
Leary, Cox & Cripps	12213 Plan of Subdivision	7	17/11/2021
JMG	J213045PH Sheet P01 Concept Services Overall Plan	DA1	18/11/2021
<b>Conditions</b>			
<b>SUBMISSION TO PLANNING AUTHORITY NOTICE OF PLANNING APPLICATION REFERRAL</b>			
Pursuant to the <i>Water and Sewerage Industry Act 2008 (TAS)</i> Section 56P(1) TasWater imposes the following conditions on the permit for this application:			
<b>CONNECTIONS, METERING &amp; BACKFLOW</b>			
<ol style="list-style-type: none"> <li>1. A suitably sized water supply with metered connection and sewerage connection to each lot of the development, apart from the public open space lots, must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.</li> <li>2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.</li> <li>3. Prior to commencing construction of the subdivision/use of the development, any water connection utilised for construction/the development must have a backflow prevention device and water meter installed, to the satisfaction of TasWater.</li> </ol>			
<b>ASSET CREATION &amp; INFRASTRUCTURE WORKS</b>			
<ol style="list-style-type: none"> <li>4. Plans submitted with the application for Engineering Design Approval must, to the satisfaction of TasWater show, all existing, redundant and/or proposed property services and mains.</li> <li>5. Prior to applying for a Permit to Construct new infrastructure the developer must obtain from TasWater Engineering Design Approval for new TasWater infrastructure. The application for Engineering Design Approval must include engineering design plans prepared by a suitably qualified person showing the hydraulic servicing requirements for water and sewerage to TasWater's satisfaction.</li> <li>6. Prior to works commencing, a Permit to Construct must be applied for and issued by TasWater. All</li> </ol>			

infrastructure works must be inspected by TasWater and be to TasWater's satisfaction.

7. In addition to any other conditions in this permit, all works must be constructed under the supervision of a suitably qualified person in accordance with TasWater's requirements.
8. Prior to the issue of the title for the 21<sup>st</sup> lot, the developer must design and construct the up sizing of the existing DN150mm Cast Iron outlet main (asset A192738 ) from TasWater's Lower Dysart reservoirs to minimum DN200mm for a suitable length as determined by a water modelling analysis (that complies with TasWater's supplement to the Water Supply Code of Australia Melbourne Retail Water Agencies Integrated Code). Initial modelling indicates that upsizing to DN200mm the first 400 metres of pipe from the reservoir will ensure adequate capacity to enable the development to proceed. Upgrading to DN250mm instead would, of course, require a smaller length to be upgraded.

NOTE: Postponing the up grade of asset A192738 prior to the issue of the 21<sup>st</sup> lot may mean that lots developed may not receive adequate fire flows from TasWater's fire hydrants. For example, these hydrants may not deliver 10 litres a second at 200kPa.

Advice:

*In accordance with TasWater's 'Developer Charges Policy' for developments located within Serviced Land where insufficient capacity is available within an existing system, the developer pays the costs of Expansion of the system to the level of capacity required to service the development.*

9. Prior to the issue of a Consent to Register a Legal Document all additions, extensions, alterations, or upgrades to TasWater's water and sewerage infrastructure required to service the development, are to be completed generally as shown on, and in accordance with, the plans listed in the schedule of drawings/documents are to be constructed at the expense of the developer to the satisfaction of TasWater, with live connections performed by TasWater.
10. After testing/disinfection, to TasWater's requirements, of newly created works, the developer must apply to TasWater for connection of these works to existing TasWater infrastructure, at the developer's cost.
11. At practical completion of the water and sewerage works and prior to TasWater issuing a Consent to a Register Legal Document the developer must obtain a Certificate of Practical Completion from TasWater for the works that will be transferred to TasWater. To obtain a Certificate of Practical Completion:
  - a. Written confirmation from the supervising suitably qualified person certifying that the works have been constructed in accordance with the TasWater approved plans and specifications and that the appropriate level of workmanship has been achieved.
  - b. A request for a joint on-site inspection with TasWater's authorised representative must be made.
  - c. Security for the twelve (12) month defects liability period to the value of 10% of the works must be lodged with TasWater. This security must be in the form of a bank guarantee.
  - d. Work As Constructed drawings and documentation must be prepared by a suitably qualified person to TasWater's satisfaction and forwarded to TasWater.
12. After the Certificate of Practical Completion has been issued, a 12 month defects liability period applies to this infrastructure. During this period all defects must be rectified at the developer's cost and to the satisfaction of TasWater. A further 12 month defects liability period may be applied to defects after rectification. TasWater may, at its discretion, undertake rectification of any defects at the developer's cost. Upon completion, of the defects liability period the developer must request TasWater to issue a "Certificate of Final Acceptance". The newly constructed infrastructure will be transferred to TasWater upon issue of this certificate and TasWater will release any security held for

the defect's liability period.

13. The developer must take all precautions to protect existing TasWater infrastructure. Any damage caused to existing TasWater infrastructure during the construction period must be promptly reported to TasWater and repaired by TasWater at the developer's cost.
14. Ground levels over the TasWater assets and/or easements must not be altered without the written approval of TasWater.
15. A construction management plan must be submitted with the application for TasWater Engineering Design Approval. The construction management plan must detail how the new TasWater infrastructure will be constructed while maintaining current levels of services provided by TasWater to the community. The construction plan must also include a risk assessment and contingency plans covering major risks to TasWater during any works. The construction plan must be to the satisfaction of TasWater prior to TasWater's Engineering Design Approval being issued.
16. The developer must apply to TasWater for reimbursement for costs for design and construction of eligible works. To be eligible for reimbursement, costs for which reimbursement is claimed must be determined from a competitive public tender process, with process and reimbursements determined prior to construction, and to the written approval of TasWater. Applicable reimbursements for eligible works are the marginal additional cost between constructing the water main up-grades for a distance required by the developer and that required by TasWater to make the existing network compliant – to be determined and agreed upon under the modelling analysis as condition 8 outlines.

#### **FINAL PLANS, EASEMENTS & ENDORSEMENTS**

17. Prior to the Sealing of the Final Plan of Survey, a Consent to Register a Legal Document must be obtained from TasWater as evidence of compliance with these conditions when application for sealing is made.  
*Advice: Council will refer the Final Plan of Survey to TasWater requesting Consent to Register a Legal Document be issued directly to them on behalf of the applicant.*
18. Pipeline easements to TasWater's satisfaction, must be created over any existing or proposed TasWater infrastructure and be in accordance with TasWater's standard pipeline easement conditions.
19. In the event that the property sewer connection for affected lots cannot control the lot for a gravity connection, the Plan of Subdivision Council Endorsement Page for those affected lots is to note, pursuant to Section 83 of the Local Government (Building and Miscellaneous Provisions) Act 1993, that TasWater cannot guarantee sanitary drains will be able to discharge via gravity into TasWater's sewerage system.  
*Advice: See WSA 02—2014-3.1 MRWA Version 2 section 5.6.5.3 Calculating the level of the connection point*

#### **DEVELOPMENT ASSESSMENT FEES**

20. The applicant or landowner as the case may be, must pay a development assessment fee of \$1,179.68 and a Consent to Register a Legal Document fee of \$154.42 to TasWater, as approved by the Economic Regulator and the fees will be indexed, until the date paid to TasWater.  
  
The payment is required within 30 days of the issue of an invoice by TasWater.
21. In the event Council approves a staging plan, a Consent to Register a Legal Document fee for each stage, must be paid commensurate with the number of Equivalent Tenements in each stage, as approved by Council.

**Advice**

**General**

For information on TasWater development standards, please visit <https://www.taswater.com.au/building-and-development/technical-standards>

For application forms please visit <https://www.taswater.com.au/building-and-development/development-application-form>

**Service Locations**

Please note that the developer is responsible for arranging to locate the existing TasWater infrastructure and clearly showing it on the drawings. Existing TasWater infrastructure may be located by a surveyor and/or a private contractor engaged at the developers cost to locate the infrastructure.

- (a) A permit is required to work within TasWater’s easements or in the vicinity of its infrastructure. Further information can be obtained from TasWater
- (b) TasWater has listed a number of service providers who can provide asset detection and location services should you require it. Visit [www.taswater.com.au/Development/Service-location](http://www.taswater.com.au/Development/Service-location) for a list of companies
- (c) TasWater will locate residential water stop taps free of charge
- (d) Sewer drainage plans or Inspection Openings (IO) for residential properties are available from your local council.

**Advice to Planning Authority (Council) and developer on fire coverage**

TasWater may not be able to provide a supply of water for the purposes of firefighting to the first 20 lots on the plan. If the developer undertakes the up grades as described in condition 8, then this issue may be resolved.

**Declaration**

The drawings/documents and conditions stated above constitute TasWater’s Submission to Planning Authority Notice.

**Authorised by**



**Jason Taylor**  
Development Assessment Manager

**TasWater Contact Details**

Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

8/1/2022



General Manager  
PO BOX 21  
OATLANDS TAS 7120

**Subdivision (56 lots) 10 East Bagdad road Bagdad, owned by DFY Investments PTY LTD  
Title Certificate: 36069/1**

Dear General Manager,

On behalf of my partner and myself we are writing to you in regards to the proposed subdivision of 10 East Bagdad road.

We are new to the neighborhood and community of Bagdad. We purchased our first home after careful considerations last year. We are a small family of four with two young children ( 2&4) we chose the area for the quiet, peaceful, relaxing surrounds for our children and family to enjoy and grow.

The impacts of the subdivision will bring much challenge to our peaceful home. Firstly the initial site works just over our back fence, as a shift worker this can cause disturbance and can affect areas of my employment. Once the development is complete its then the next few years of building and construction. If you have seen our boundary fence you would understand that this would have to be replaced and risen to create some sort of privacy retained at the cost of the proposed.

56 lots = average single house on block family of 4 (units not inc) is approx 224 people living over my back fence, that's approx 448 cars. I understand this will have some positive impacts on our community. However what does the council plan on doing to support such growth in this area; better transport options; daycare options; small supermarkets; schools and support for our community.

I would encourage the southern midlands council to consider our letter when making decisions on our community and children's future.

We look forward to your response.

