ADVICE AGENCY'S RESPONSE

Sections 291 and 292 of the *Sustainable Planning Act 2009*

RESPONSE TO DEVELOPMENT APPLICATION

Powerlink Queensland, acting as an advice agency under the *Sustainable Planning Act 2009* provides its response to the above Development Application.

The assessment manager is to treat the response as a properly made submission.

The advice agency's response is that:

☐ this application should be refused; or

☒ this application should be approved **subject to the following conditions**:

1. Compliance with the terms and conditions of easement dealing no's. 709012260 & 601363708.
2. Compliance with the generic requirements in respect to proposed works in the vicinity of Powerlink Queensland infrastructure as detailed in the enclosed Annexure "A".
3. Any variation to the lot reconfiguration as detailed in the enclosed copy of the submitted Drawing No. SD 1001 issue C dated 11 October 2011 and Unregistered Survey Plan 243799 dated 26 August 2011 shall require resubmission (copy attached).
4. This advice is valid for a period of 2 years from the date of this response, should the development not be initiated within that period, the applicant should resubmit the application for re-consideration.
5. This response does not constitute an approval to commence any works within the easement. Prior written approval is required from Powerlink Queensland before any work is undertaken within the easement areas. All works on easement (including but not limited to earthworks, drainage and detention basins; road construction; underground and overhead service installation) require detailed submissions, assessments and consent (or otherwise) by Powerlink.

ADDITIONAL ADVICE ABOUT THE APPLICATION

Powerlink, as the Advice Agency, offers the following advice to the Assessment Manager about the application:

6. Enclosed is a copy of the Draft State Transmission Code which recommends guidelines for the development of land near high voltage electricity transmission easements. It is Powerlink Queensland's recommendation that the principle of prudent avoidance be exercised wherever possible and setback distances of buildings, as detailed in the Code, be adopted.

Enclosures:-
* Annexure "A"
* Draft State Transmission Code
* Drawing No. SD 1001 issue C dated 11 October 2011
* Unregistered Survey Plan 243799 dated 26 August 2011

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

ATTACHMENT 1 Total of 3 Pages

ANNEXURE A – GENERIC REQUIREMENTS

The conditions contained in this Annexure have been compiled to assist persons (the applicant) intending to undertake work within the vicinity of high-voltage electrical installations and infrastructure owned or operated by Powerlink. The conditions are supplementary to the provisions of the Electrical Safety Act 2002, Electrical Safety Regulations 2002 and the Terms and Conditions of Registered Easements and other forms of Occupational Agreements hereinafter collectively referred to as the "Easement". Where any inconsistency exists between this Annexure and the Easement, the Easement shall take precedence.

1. **POWERLINK INFRASTRUCTURE**
   You may not do any act or thing which jeopardises the foundations, ground anchorages, supports, towers or poles, including (without limitation) inundate or place, excavate or remove any soil, sand or gravel within a distance of twenty (20) metres surrounding the base of any tower, pole, foundation, ground anchorage or support.

2. **STRUCTURES**
   No structures should be placed within twenty (20) metres of any part of a tower or structure foundation or within 5m of the conductor shadow area. Any structures on the easement require prior written consent from Powerlink.

3. **EXCLUSION ZONES**
   Exclusion zones for operating plant are defined in Schedule 2 of the Electrical Safety Regulation 2002 for Untrained Persons. All Powerlink infrastructure should be regarded as "electrically live" and therefore potentially dangerous at all times.

   In particular your attention is drawn to Schedule 2 of the Electrical Safety Regulation 2002 which defines exclusion zones for untrained persons in charge of operating plant or equipment in the vicinity of electrical facilities. If any doubt exists in meeting the prescribed clearance distances from the conductors, the applicant is obliged under this Act to seek advice from Powerlink.

4. **ACCESS AND EGRESS**
   Powerlink shall at all times retain the right to unobstructed access to and egress from its infrastructure. Typically, access shall be by 4WD vehicle.

5. **APPROVALS (ADDITIONAL)**
   Powerlink's consent to the proposal does not relieve the applicant from obtaining statutory, landowner or shire/local authority approvals.

6. **MACHINERY**
   All mechanical equipment proposed for use within the easement must not infringe the exclusion zones prescribed in Schedule 2 of the Electrical Safety Regulation 2002. All operators of machinery, plant or equipment within the easement must be made aware of the presence of live high-voltage overhead wires. It is recommended that all persons entering the Easement be advised of the presence of the conductors as part of on site workplace safety inductions. The use of warning signs is also recommended.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

7. EASEMENTS

All terms and conditions of the easement are to be observed. Note that the easement takes precedence over all subsequent registered easement documents. Copies of the easement together with the plan of the Easement can be purchased from the Department of Environment & Resource Management.

8. EXPENDITURE AND COST RECOVERY

Should Powerlink incur costs as a result of the applicant's proposal, all costs shall be recovered from the applicant.

Where Powerlink expects such costs to be in excess of $10 000.00, advanced payments may be requested.

9. EXPLOSIVES

Blasting within the vicinity (500 metres) of Powerlink infrastructure must comply with AS 2187. Proposed blasting within 100 metres of Powerlink infrastructure must be referred to Powerlink for a detailed assessment.

10. BURNING OFF OR THE LIGHTING OF FIRES

We strongly recommend that fires not be lit or permitted to burn within the transmission line corridor and in the vicinity of any electrical infrastructure placed on the land. Due to safety risks Powerlink's written approval should be sort.

11. GROUND LEVEL VARIATIONS

Overhead Conductors

Changes in ground level must not reduce statutory ground to conductor clearance distances as prescribed by the Electrical Safety Act 2002 and the Electrical Safety Regulations 2002.

Underground Cables

Any change to the ground level above installed underground cable is not permitted without express written agreement of Powerlink.

12. VEGETATION

Vegetation planted within an easement must not exceed 3.5 metres in height when fully matured. Powerlink reserves the right to remove vegetation to ensure the safe operation of the transmission line and, where necessary, to maintain access to infrastructure.

13. INDEMNITY

Any use of the Easement by the applicant in a way which is not permitted under the easement and which is not strictly in accordance with Powerlink's prior written approval is an unauthorised use. Powerlink is not liable for personal injury or death or for property loss or damage resulting from unauthorized use. If other parties make damage claims against Powerlink as a result of unauthorized use then Powerlink reserves the right to recover those damages from the applicant.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

14. INTERFERENCE

The applicant's attention is drawn to s.230 of the Electricity Act 1994 (the "Act"), which provides that a person must not wilfully, and unlawfully interfere with an electricity entity's works. "Works" are defined in s.12 (1) of the Act. The maximum penalty for breach of s.230 of the Act is a fine equal to 40 penalty units or up to 6 months imprisonment.

15. REMEDIAL ACTION

Should remedial action be necessary by Powerlink as a result of the proposal, the applicant will be liable for all costs incurred.

16. OWNERS USE OF LAND

The owner may use the easement land for any lawful purpose consistent with the terms of the registered easement; the conditions contained herein, the Electrical Safety Act 2002 and the Electrical Safety Regulations 2002.

17. ELECTRIC AND MAGNETIC FIELDS

Electric and Magnetic Fields (EMF) occur everywhere electricity is used (e.g. in homes and offices) as well as where electricity is transported (electricity networks).

Powerlink recognises that there is community interest about Electric and Magnetic Fields. We rely on expert advice on this matter from recognised health authorities in Australia and around the world. In Australia, the Federal Government agency charged with responsibility for regulation of EMFs is the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). ARPANSA's *Fact Sheet – Magnetic and Electric Fields from Power Lines*, concludes:

"On balance, the scientific evidence does not indicate that exposure to 50Hz EMF's found around the home, the office or near powerlines is a hazard to human health."

Whilst there is no scientifically proven causal link between EMF and human health, Powerlink nevertheless follows an approach of "*prudent avoidance*" in the design and siting of new powerlines. This includes seeking to locate new powerline easements away from houses, schools and other buildings, where it is practical to do so and the added cost is modest.

The level of EMF decreases rapidly with distance from the source. EMF readings at the edge of a typical Powerlink easement are generally similar to those encountered by people in their daily activities at home or at work. And in the case of most Powerlink lines, at about 100 metres from the line, the EMF level is so small that it cannot be measured.

Powerlink is a member of the ENA's EMF Committee that monitors and compiles up-to-date information about EMF on behalf of all electricity network businesses in Australia. This includes subscribing to an international monitoring service that keeps the industry informed about any new developments regarding EMF such as new research studies, literature and research reviews, publications, and conferences.

We encourage community members with an interest in EMF to visit ARPANSA's website: www.arpansa.gov.au Information on EMF is also available on the ENA's website: www.ena.asn.au

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

DRAFT STATE TRANSMISSION CODE

[Note: It is intended that this Code be implemented as a Regulation under the Electricity Act[1]]

INTRODUCTION

1. This Code is identified as a code for IDAS[2].

2. This Code cannot be changed under a local planning instrument or a local law[3].

PURPOSE OF THE CODE

3. The purpose of this Code is to:

   (1) minimise any potential risk to public safety caused by Vegetation related damage to Transmission Lines and Transmission Structures; and

   (2) minimise the risk of Vegetation related disruptions to electricity supply; and

   (3) provide for the development of land within or nearby to an Electricity Transmission Line Easement that achieves appropriate environmental amenity; and

   (4) provide for the development of land nearby to an Electricity Transmission Line Easement consistent with the principle of prudent avoidance [4]in respect of electric and magnetic fields.

APPLICATION OF THE CODE

4. Table 1 of this Code applies to the assessment of a development application under the *Integrated Planning Act 1997* for a material change of use and/or building work of premises that is:

   (1) assessable development; and

   (2) proposed to be carried out in a Rural Zone, Area or Precinct; and

   where any part of the premises is subject to an Electricity Transmission Line Easement or any part of the premises is within 40 metres of an Electricity Transmission Line Easement.

5. Table 2 of this Code applies to the assessment of a development application under the *Integrated Planning Act* 1997 for a material change of use and/or building work of premises that is:

   (1) assessable development; and

---

1 Note that s.264 of the *Electricity Act* prescribes the power to make a regulation under the *Electricity Act*.
2 See IPA, Schedule 10 (Dictionary), definition of "Code".
3 S.3.1.3(4) IPA.
4 *"Prudent avoidance"* has been defined in an Australian context by the former Chief Justice of the High Court of Australia, Sir Harry Gibbs, in a Report to the New South Wales Minister for Minerals and Energy dated 28 February 1991 ("the Gibbs Report") as follows "It may be prudent to do whatever can be done without undue inconvenience and at modest expense to avert the possible risk".

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

(2) proposed to be carried out in an Urban Zone, Area or Precinct; and

where any part of the premises is subject to an Electricity Transmission Line Easement or any part of the premises is within 40 metres of an Electricity Transmission Line Easement.

6. Tables 1 and 2 of this Code also apply to self assessable development where any part of the premises is subject to an Electricity Transmission Line Easement or any part of the premises is within 40 metres of an Electricity Transmission Line Easement.

7. Table 3A and 3B of this code applies to the assessment of a development application under the *Integrated Planning Act 1997* for any reconfiguration of a lot that is assessable development and any part of the lot proposed to be subdivided is subject to an Electricity Transmission Line Easement or any part of the lot is within 40 metres of an Electricity Transmission Line Easement.

DEFINITIONS FOR TERMS USED IN THE CODE

8. The following definitions apply to terms used in this Code:

'Child-Related Use' means any building excluding a Habitable Building in which children, who are 13 years old or less, would be expected to occupy on a regular and extended basis, including:

(1) child care facilities providing day care, occasional care, kindergarten and crèche services;

(2) educational establishments providing for preschool and primary school students; and

(3) before or after school care and vacation care.

'Electricity Transmission Line Easement' means an easement over land in favour of an electricity entity, which is intended to be used or is currently used for the transmission of electricity.

'Habitable Building' means any building, part of a building or structure that is used for or able to be lawfully used for a residence.

'Premises' means:-

(1) a building or other structure; or

(2) land (whether or not a building or other structure is situated on the land).

'Rural Zone, Area or Precinct' means an area other than an Urban Zone Area or Precinct.

'Transmission Line' means an electric line and associated equipment used to provide connection of electricity between generation facilities and supply networks or customers not supplied through supply networks operated by the Queensland Electricity Transmission Corporation Limited (trading as Powerlink).

'Transmission Structure' means a tower or pole or any other structure supporting a transmission line.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

'Urban Zone, Area or Precinct' means an area in a city or town identified on a map in a planning scheme as an area for urban purposes including residential, industrial, sporting, recreation and commercial purposes but excluding rural residential purposes and future urban purposes.

'Rural Residential Purposes' means a purpose which is predominantly a residential purpose involving a single dwelling on a lot greater than $2000m^2$

'Vegetation' means:

(1) native or non-native trees;

(2) native or non-native plants,

whether part of the development or otherwise .

9. Where any term used in this Code is defined in either the *Integrated Planning Act* 1997 or the *Electricity Act* 1994, that term shall have the same meaning as in the relevant Act.

HOW TO COMPLY WITH THIS CODE

10. This Code is complied with if each performance criterion in Column 1 of the relevant Table is complied with.

11. For assessable development, a performance criterion of the relevant table is complied with if:

(1) the acceptable solution to the performance criterion as set out in Column 2 opposite the criterion is complied with; or

(2) the criterion is complied with in another way.

12. For self assessable development a performance criterion of the relevant table is complied with if the acceptable solution to the performance criterion as set out in Column 2 opposite the criterion is complied with.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

Table 1 – Rural Zones, Areas or Precincts

Column 1 - Performance Criteria	Column 2 - Acceptable Solutions
PC1 Transmission Lines and Transmission Structures within an Electricity Transmission Line Easement are protected from risks to safety and electricity supply from overgrowth or potential impact from nearby Vegetation.	**AS1.1** Any Vegetation planted within an Electricity Transmission Line Easement will not exceed a maximum mature height of 3.5 metres. Refer to *Diagram 1*. **AS1.2** Vegetation is not to be planted within 20 metres of a Transmission Structure. Refer to *Diagram 5*.
PC2 Vegetation buffers adjoining an Electricity Transmission Line Easement is to be maintained to provide an adequate separation distance and visual buffer between the Transmission Line and nearby land uses.	**AS2** Existing Vegetation is to be retained within a distance of 20 metres from the boundary of the Electricity Transmission Line Easement. Refer to *Diagram 2*.
PC3 Habitable Buildings and Child-Related Uses are located consistent with the principle of prudent avoidance.	**AS3** A separation distance (determined in accordance with Table 4) is to be established between the Habitable Building or the Child-Related Use and the closest boundary of the Electricity Transmission Line Easement. Refer to *Diagram 3*.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Table 2 – Urban Zones, Areas or Precinct

Column 1 - Performance Criteria	Column 2 - Acceptable Solutions
PC4 Transmission Lines and Transmission Structures within an Electricity Transmission Line Easement are protected from risks to safety and reliability of electricity supply from overgrowth of nearby Vegetation.	**AS4** Any Vegetation planted within an Electricity Transmission Line Easement is not to exceed a maximum mature height of 3.5 metres. Refer to *Diagram 1*.
PC5 Child-Related Uses are located consistent with the principle of prudent avoidance.	**AS5** A separation distance (determined in accordance with Table 4) is established between the Child-Related Use and the closest boundary of the Electricity Transmission Line Easement if practicable in the context of the size and location of the premises. Refer to *Diagram 3*.

Table 3A – Reconfiguring a lot in Rural Zones, Areas or Precincts

Column 1 - Performance Criteria	Column 2 - Acceptable Solutions
PC6 Lots are designed and orientated so as to facilitate adequate vegetation buffer areas adjoining Electricity Transmission Line Easements.	**AS6** Lots are designed and oriented in accordance with *Diagram 4*.
PC7 Lots are designed and oriented so as not to prejudice the adequate separation of Habitable Buildings or Child-Related Uses from an Electricity Transmission Line Easement.	**AS7** Lots are designed and oriented to ensure that a Habitable Building or Child-Related Use on each lot can comply with the separation distances set out in Table 4.
PC8 Lots are designed and oriented to facilitate the use of land within and/or adjoining Electricity Transmission Line Easements for park and/or outdoor recreation purposes.	**AS8** No Acceptable Solution is prescribed.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Column 1 - Performance Criteria	Column 2 - Acceptable Solutions
PC9 Lots are designed and oriented to utilise topographical features to minimise the visual exposure of Electricity Transmission Lines from Habitable Buildings.	**AS9** Lots are designed and oriented in accordance with *Diagram 4.*

Table 3B – Reconfiguring a lot in Urban Zones, Areas or Precincts

Column 1 – Performance Criteria	Column 2 - Acceptable Solutions
PC10 Lots are designed and orientated so as to facilitate adequate vegetation buffer areas adjoining Electricity Transmission Line Easements.	**AS10** Lots are designed and oriented in accordance with *Diagram 4.*
PC11 Lots are designed and oriented so as not to prejudice the adequate separation of Child-Related Uses from an Electricity Transmission Line Easement.	**AS11** Lots are designed and oriented to ensure that a Child-Related Use and the closest boundary of the Electricity Transmission Line Easement comply with the separation distances set out in Table 4.
PC12 Lots are designed and oriented to facilitate the use of land within and/or adjoining Electricity Transmission Line Easements for park and/or outdoor recreation purposes.	**AS12** No Acceptable Solution is prescribed.
PC13 Lots are designed and oriented to utilise topographical features to minimise the visual exposure of Electricity Transmission Lines from Habitable Buildings.	**AS13** Lots are designed and oriented in accordance with *Diagram 4.*

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

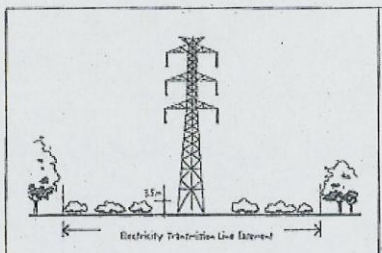
Table 4 – Separation Distances

Column 1 - Nominal Operating Voltage[5] of the Transmission Line	Column 2 - Separation Distance – measured from the edge of the Easement[6]
110 kV and 132 kV	20 metres
275 kV and 330 kV	30 metres
500kV	40 metres

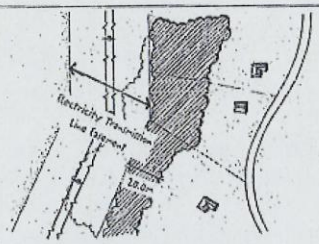
[5] Select the highest nominal operating voltage for the easement

[6] To meet the purposes of the Code, basic separations are established from the centreline of the transmission line. These separations for a standard width easement are 40m, 60m, and 75 m respectively for each of the voltage groups listed. The distance from the centreline of the transmission line to the edge of easement will vary depending on the number of lines planned for the easement. For convenience the separation distances given in the Table are reference distances measured from the nearest edge of the easement and are conservative.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



(a) Diagram No. 1
"Electricity transmission line easement"
Vegetation



(b) Diagram No. 2
"Electricity transmission line easement"
Vegetated Buffer

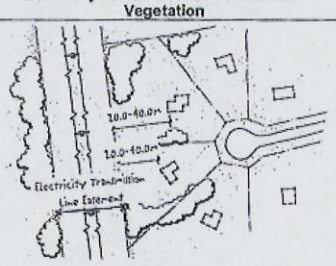
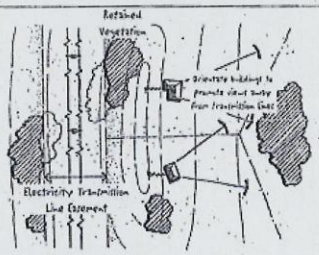


Diagram No. 3
"Electricity transmission line easement"
Separation Distances



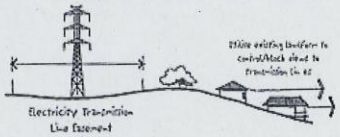
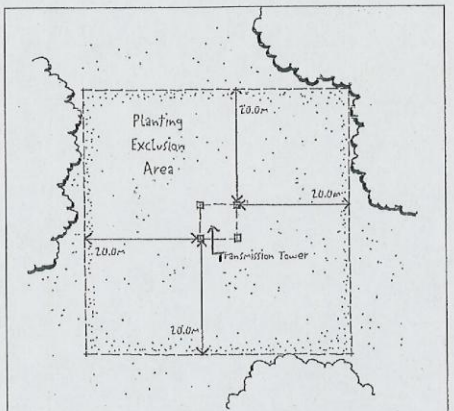


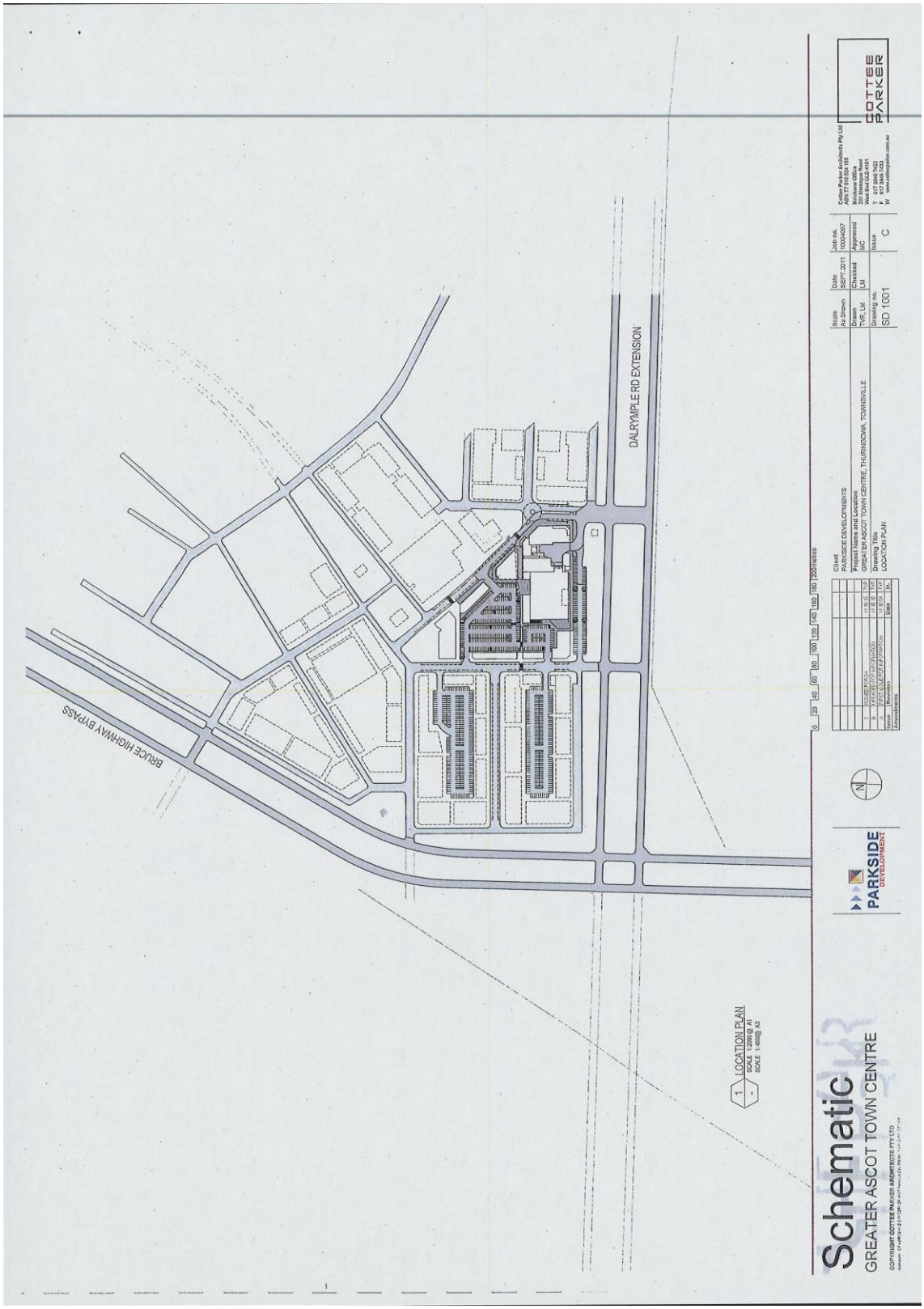
Diagram No. 4
"Electricity transmission line easement"
Lot Design

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

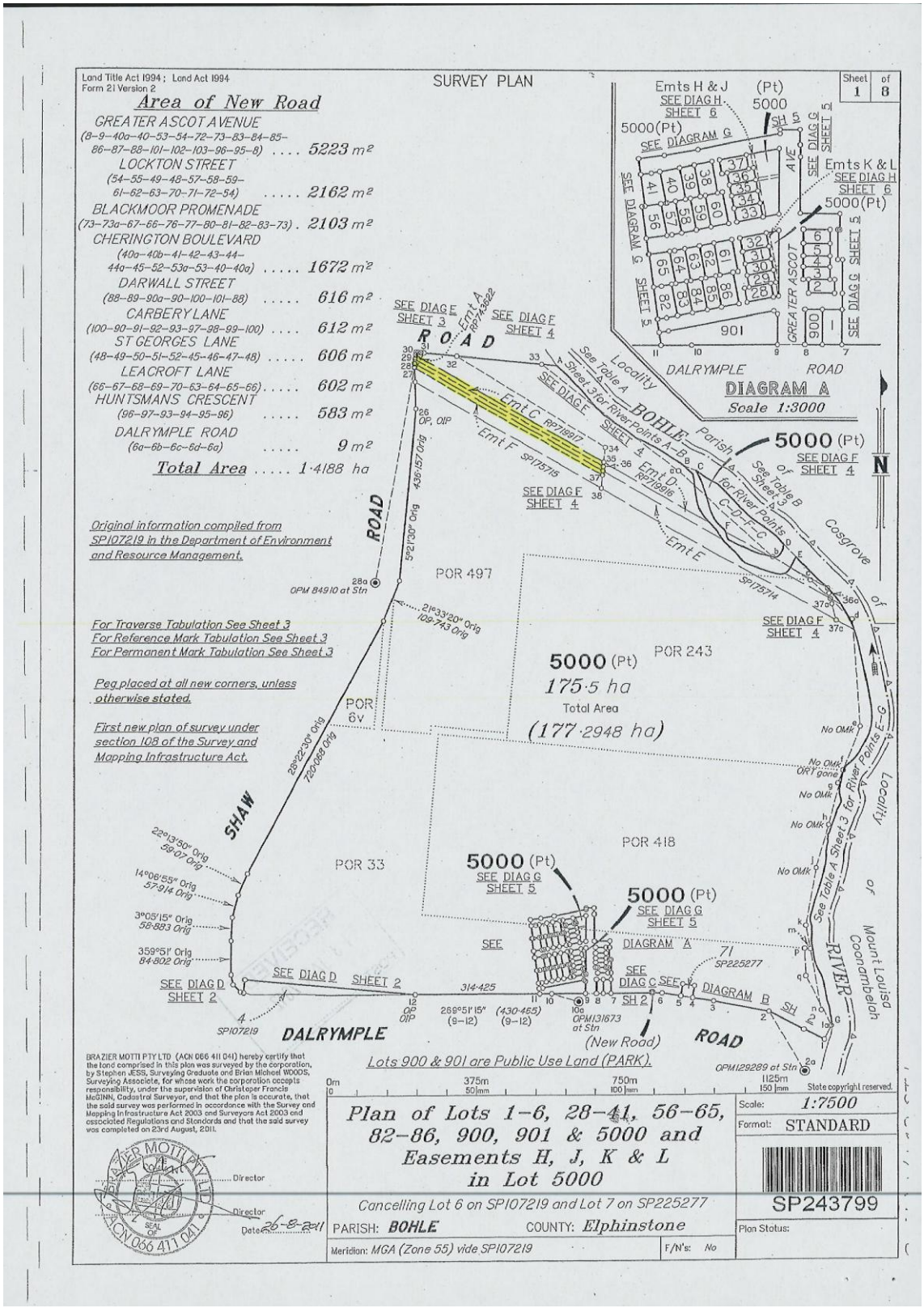


(c) Diagram No. 5
Planting Exclusion Area

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

ADOPTED INFRASTRUCTURE CHARGES NOTICE
Issued by Townsville City Council

To: Parkside Development Pty Ltd
C/- Brazier Motti
595 Flinders Street
TOWNSVILLE QLD 4810

Date of Issue: 04 June 2013
Charge Notice No: 10926899
Application No: MI11/0064
Decision Type: Material Change of Use (Impact) – Neighbourhood Centre

LAND TO WHICH THE INFRASTRUCTURE CHARGE APPLIES:

Planning Scheme: City of Thuringowa Planning Scheme
Property Description: Lot 6 SP 107219
Property Address: 890 Dalrymple Road SHAW QLD 4818

TRUNK INFRASTRUCTURE FOR WHICH THE INFRASTRUCTURE CHARGE NOTICE APPLIES

Infrastructure	Charge Payable ($)	Receipt code
SEWER	7,077	
- Trunk sewers & pump systems	(3,036)	CON65
- Treatment plants & outfalls	(4,041)	CON70
WATER SUPPLY	213,359	
- Source works	(71,835)	CON90
- Reservoirs	(16,606)	CON95
- Delivery mains	(114,656)	CON100
- Distribution mains	(10,262)	CON100
PARK	0	P0100
TRANSPORT (PATHWAYS)	0	CON60
TRANSPORT(ROADS)		
- TCC Works	181,405	CON1100b
- TCC Land	1,881	CON1100b
STORMWATER	25,002	CON25
Total Charge Amount	**$428,724**	

NOTE:

- **At the time of payment these amounts may be adjusted for inflation in accordance with the annual financial year movements of the Australian Bureau of Statistics Queensland Road and Bridge Construction Index, as applied to the relevant State Planning Regulatory Provision (being a three year moving average basis).**
- **Please contact Townsville City Council, Planning and Development Division, prior to making payment.**
- **Compounded interest at 11% calculated daily will be applied on all overdue charges.**
- **Should a valid Infrastructure Agreement be in place for this development, the Infrastructure Agreement may prevail over the charges listed on this notice.**
- **These adopted infrastructure charges may be offset or refunded depending on the approved extent and value of trunk infrastructure provided by the development**

The Adopted Infrastructure Charge has been calculated in accordance with the relevant Adopted Infrastructure Charges resolutions.

TO WHOM THE CHARGE MUST BE PAID

Payment of the charge must be made payable to TOWNSVILLE CITY COUNCIL via the Planning Liaison Unit, Planning and Development, 2nd Floor at the City Administration Building, 103-141 Walker Street, Townsville, Telephone (07) 4727 9001 or PO Box 1268 Townsville Qld 4810

PAYMENT DUE BY:

The Adopted Infrastructure Charge is issued in accordance with the *Sustainable Planning Act 2009*.
The applicable development permit triggering the charges refers to: Material Change of Use (Impact)
Payment is due by: **Prior to the issuing of a Building Permit**

Notice is hereby given that the abovementioned adopted infrastructure charges are levied by Townsville City Council in compliance with the *Sustainable Planning Act 2009*, on land described for the period prescribed, and such charges are DUE AND PAYABLE BY THE TIME STIPULATED IN THIS NOTICE. These charges plus any arrears and interest thereon may be recovered by legal process without further notice if unpaid after the time stipulated in this notice.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

IMPORTANT INFORMATION

1. **PAYMENT:**

   This notice is due and payable by the due time shown. Cheques, money orders or postal notes should be made payable to TOWNSVILLE CITY COUNCIL and crossed "Not Negotiable". Change cannot be given on cheque payments. Payees will be liable for any dishonour fees. Payments via credit card transactions will attract a surcharge. Charges can be placed on account with prior approval from Council.

2. **ADOPTED INFRASTRUCTURE CHARGES TAKEN TO BE A RATE:**

   An adopted infrastructure charge fixed by a local government is, for the purposes of recovery, taken to be a rate within the meaning of the *Local Government Act 2009*. This means:

   a) Charges may be recovered by court action for debt;
   b) Charges may be recovered from the person for the time being owning the relevant land, regardless of who was the owner or other person upon whom the charges was imposed;
   c) Interest is payable on overdue payments; and
   d) If charges are unpaid for 3 years, the land can be sold to recover the outstanding charges.

3. **INTEREST:**

   Compound interest at the rate of 11% per annum is payable on all infrastructure charges outstanding after the due date shown on this charge notice.

4. **OVERSEAS PAYEES:**

   Please forward your adopted infrastructure charges payment by way of a bank draft for the required amount in Australian dollars.

5. **GOODS AND SERVICES TAX:**

   The federal government has determined that rates and utility charges levied by local government will be GST free. Accordingly, no GST is included in this infrastructure charge notice.

6. **ADOPTED INFRASTRUCTURE CHARGE IS SUBJECT TO PRICE VARIATION:**

   At the time of payment these amounts may be adjusted for inflation in accordance with the annual financial year movements of the Australian Bureau of Statistics Queensland Road and Bridge Construction Index, as applied to the relevant State Planning Regulatory Provision (being a three year moving average basis).

   PLEASE CONTACT PLANNING AND DEVELOPMENT BEFORE MAKING PAYMENT.

7. **INFRASTRUCTURE CHARGES ENQUIRIES:**

   Please direct any enquiries regarding this adopted infrastructure charge notice to council's Planning and Development Division, Level 2, 103-141 Walker Street, Townsville. Phone (07) 4727 9001, during office hours, 8:30am to 5:00pm, Monday to Friday.

8. **RIGHTS OF APPEAL:**

   Appeals about particular charges for infrastructure

   A person who has been given, and is dissatisfied with an Adopted Infrastructure Charges Notice or a Negotiated Adopted Infrastructure Charges Notice has, under s.478 (1) of the *Sustainable Planning Act 2009*, the right to lodge an appeal to the Planning and Environment Court.

   The timeframes for starting an appeal in the Planning and Environment Court are set out in s.478 (3) of the *Sustainable Planning Act 2009*.

   Sections 478 (4) and (5) of the *Sustainable Planning Act 2009* state the grounds for appealing an Adopted Infrastructure Charges Notice or a Negotiated Adopted Infrastructure Charges Notice.

METHOD OF PAYMENT

PAYMENT BY MAIL	PAYMENT AT COUNCIL OFFICES	PAYMENT MADE BY CREDIT CARD
Confirm the current Adopted Infrastructure Charges applicable and obtain an updated payment advice from Council's Planning and Development Division. Mail this updated payment advice notice immediately with your payment to: PLANNING AND DEVELOPMENT, TOWNSVILLE CITY COUNCIL, PO Box 1268, Townsville Qld 4810. A receipt will be issued. **NOTE:** Cheques, money orders and postal notes must be made payable to TOWNSVILLE CITY COUNCIL	Confirm the current Adopted Infrastructure Charges applicable and obtain an updated payment advice from Council's Planning and Development Division. Present this updated payment advice notice with your payment to Townsville City Council at the Planning and Development Division Counter. **NOTE:** Cheques, money orders and postal notes must be made payable to TOWNSVILLE CITY COUNCIL	Payments via credit card transactions will attract a surcharge.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

RIGHTS OF APPEAL

Chapter 7, Part 1, Division 8 Appeals to court relating to development applications and approvals

461 Appeals by applicants

(1) An applicant for a development application may appeal to the court against any of the following—
- (a) the refusal, or the refusal in part, of the development application;
- (b) any condition of a development approval, another matter stated in a development approval and the identification or inclusion of a code under section 242;
- (c) the decision to give a preliminary approval when a development permit was applied for;
- (d) the length of a period mentioned in section 341;
- (e) a deemed refusal of the development application.

(2) An appeal under subsection (1)(a), (b), (c) or (d) must be started within 20 business days (the ***applicant's appeal period***) after—
- (a) if a decision notice or negotiated decision notice is given—the day the decision notice or negotiated decision notice is given to the applicant; or
- (b) otherwise—the day a decision notice was required to be given to the applicant.

(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

462 Appeals by submitters—general

(1) A submitter for a development application may appeal to the court only against—
- (a) the part of the approval relating to the assessment manager's decision about any part of the application requiring impact assessment under section 314; or
- (b) the part of the approval relating to the assessment manager's decision under section 327.

(2) To the extent an appeal may be made under subsection (1), the appeal may be against 1 or more of the following—
- (a) the giving of a development approval;
- (b) any provision of the approval including—
  - (i) a condition of, or lack of condition for, the approval; or
  - (ii) the length of a period mentioned in section 341 for the approval.

(3) However, a submitter may not appeal if the submitter—
- (a) withdraws the submission before the application is decided; or
- (b) has given the assessment manager a notice under section339(1)(b)(ii).

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

(4) The appeal must be started within 20 business days (the ***submitter's appeal period***) after the decision notice or negotiated decision notice is given to the submitter.

Chapter 7, Part 1, Division 11 making an appeal to court

481 How appeals to the court are started

(1) An appeal is started by lodging written notice of appeal with the registrar of the court.

(2) The notice of appeal must state the grounds of the appeal.

(3) The person starting the appeal must also comply with the rules of the court applying to the appeal.

(4) However, the court may hear and decide an appeal even if the person has not complied with subsection (3).

482 Notice of appeal to other parties—development applications and approvals

(1) An appellant under division 8 must give written notice of the appeal to—
- (a) if the appellant is an applicant—
  - (i) the chief executive; and
  - (ii) the assessment manager; and
  - (iii) any concurrence agency; and
  - (iv) any principal submitter whose submission has not been withdrawn; and
  - (v) any advice agency treated as a submitter whose submission has not been withdrawn; or
- (b) if the appellant is a submitter or an advice agency whose response to the development application is treated as a submission for an appeal—
  - (i) the chief executive; and
  - (ii) the assessment manager; and
  - (iii) any referral agency; and
  - (iv) the applicant; or
- (c) if the appellant is a person to whom a notice mentioned in section 465(1) has been given—
  - (i) the chief executive; and
  - (ii) the assessment manager for the development application to which the notice relates; and
  - (iii) any entity that was a concurrence agency for the development application to which the notice relates; and
  - (iv) the person who made the request under section 383 to which the notice relates, if the person is not the appellant; or
- (d) if the appellant is a person mentioned in section 466(1)—
  - (i) the chief executive; and
  - (ii) the responsible entity for making the change to which the appeal relates; and

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

(iii) the person who made the request to which the appeal relates under section 369, if the person is not the appellant; and
(iv) if the responsible entity is the assessment manager—any entity that was a concurrence agency for the development application to which the notice of the decision on the request relates; or

(e) if the appellant is a person to whom a notice mentioned in section 467 has been given—the entity that gave the notice.

(2) The notice must be given within—
(a) if the appellant is a submitter or advice agency whose response to the development application is treated as a submission for an appeal—2 business days after the appeal is started; or
(b) otherwise—10 business days after the appeal is started.

(3) The notice must state—
(a) the grounds of the appeal; and
(b) if the person given the notice is not the respondent or a co-respondent under section 485—that the person may, within 10 business days after the notice is given, elect to become a co-respondent to the appeal by filing in the court a notice of election in the approved form.

485 Respondent and co-respondents for appeals under division 8

(1) Subsections (2) to (8) apply for appeals under sections 461 to 464.

(2) The assessment manager is the respondent for the appeal.

(3) If the appeal is started by a submitter, the applicant is a co-respondent for the appeal.

(4) Any submitter may elect to become a co-respondent for the appeal.

(5) If the appeal is about a concurrence agency's response, the concurrence agency is a co-respondent for the appeal.

(6) If the appeal is only about a concurrence agency's response, the assessment manager may apply to the court to withdraw from the appeal.

(7) The respondent and any co-respondents for an appeal are entitled to be heard in the appeal as a party to the appeal.

(8) A person to whom a notice of appeal is required to be given under section 482 and who is not the respondent or a co-respondent for the appeal may elect to be a co-respondent.

(9) For an appeal under section 465—
(a) the assessment manager is the respondent; and

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

(b) if the appeal is started by a concurrence agency that gave the assessment manager a notice under section 385—the person asking for the extension the subject of the appeal is a co-respondent; and
(c) any other person given notice of the appeal may elect to become a co-respondent.

(10) For an appeal under section 466—
(a) the responsible entity for making the change to which the appeal relates is the respondent; and
(b) if the responsible entity is the assessment manager—
(i) if the appeal is started by a person who gave a notice under section 373 or a pre-request response notice—the person who made the request for the change is a co-respondent; and
(ii) any other person given notice of the appeal may elect to become a co-respondent.

(11) For an appeal under section 467, the respondent is the entity given notice of the appeal.

488 How an entity may elect to be a co-respondent

An entity that is entitled to elect to be a co-respondent to an appeal may do so, within 10 business days after notice of the appeal is given to the entity, by following the rules of court for the election.

490 Lodging appeal stops particular actions

(1) If an appeal, other than an appeal under section 465, 466 or 467, is started under division 8, the development must not be started until the appeal is decided or withdrawn.

(2) If an appeal is about a condition imposed on a compliance permit, the development must not be started until the appeal is decided or withdrawn.

(3) Despite subsections (1) and (2), if the court is satisfied the outcome of the appeal would not be affected if the development or part of the development is started before the appeal is decided, the court may allow the development or part of the development to start before the appeal is decided.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

APPENDIX B

SARA Advice Notice (2411-43630 SRA)

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Queensland Government

SARA reference: 2411-43630 SRA
Applicant reference: 26700-342-01
Council reference: MCU24/0117 and RAL24/0075

3 January 2025

Parkside Development Pty Ltd
C/- Brazier Motti
595 Flinders Street
TOWNSVILLE QLD 4810
Emma.Staines@braziermotti.com.au

Attention: Ms Emma Staines

Dear Ms Staines

SARA advice notice - 182 Shaw Road and 26 Lockton Street, Shaw

(Advice notice given under section 35 of the Development Assessment Rules)

The State Assessment and Referral Agency (SARA) advises that your development application has not adequately demonstrated compliance with the State Development Assessment Provisions.

In addition to the information request issued on 19 December 2024, the following issue with the proposed development have been identified:

Traffic Impact Assessment	
1.	**Issue:** Your application, specifically Traffic Impact Assessment (TIA), prepared by Premise, dated 7 November 2024, Report No P001406/RO1, Rev B provided in support of the proposed development does not demonstrate the proposed development's compliance with Performance outcomes (PO) PO19, PO20, PO25 and PO26 of State code 1: Development in a state-controlled road environment (State code 1) as well as State code 6: Protection of state transport networks (State code 6). SARA's review of the TIA has identified several issues that need to be resolved, namely: • There are inconsistencies in the Stage 1 development land uses and yields shown on the architectural plans prepared by Cottee Parker and that assessed within the TIA. • The TIA applies an arbitrary 25% discount to Stage 1 traffic for 'internal trips' (and 15% for stage 2). If these trips are from the residential component of the wider development, it is suggested that these 'internal trips' should be considered as part of 'drop in trips', and that

North and North West regional office
Level 11, 445 Flinders Street, Townsville
PO Box 5666, Townsville QLD 4810

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

	the traffic movement figures are expanded to show where these trips are going to/from. • There are no details of how the adopted external traffic distribution was derived. • There are discrepancies between the Stage 1 (and stage 2) traffic demand detailed within *Table 1* and the Stage 1 traffic movements as per *Figure 6*, even accounting for the adopted 25% discount for 'internal trips'. It is assumed that some portion of trips (i.e. 'drop-in' or 'diverted' trips) have been removed from the site access volumes. This is erroneous, noting that traffic volumes can be reassigned from background traffic movements to site access traffic movements, but not removed all together. Traffic movement figures should be expanded to show where these traffic movements are being reassigned from. • The current traffic analysis is based on signal loop data, which is insufficient for the purposes of detailed operational analysis. • The assessed SIDRA layout of the Shaw Road/Dalrymple Road is inconsistent with the existing intersection form. Notably the intersection has been modelled as having dual full-length southbound through lanes to the north and south of the intersection, whereas these are currently short lanes. • The proposed left-in/left out access to Dalrymple Road is inconsistent with the previous State approval (i.e. greater separation distance is required to Shaw Road and requires further justification). **Action:** You are advised to demonstrate compliance with State code 1 and State code 6 by providing a revised TIA addressing the issues identified above. At a minimum, the following should be undertaken: • Review and confirm the proposed development yields and update the TIA accordingly. • Provide empirical evidence for the arbitrary 25% discount to Stage 1 traffic for 'internal trips' (and 15% for stage 2), to support this assumption • Provide further justification for the adopted external traffic distribution and how it has been derived. Ideally this would be based on economic analysis of trade catchments. • Expand the traffic movement figures within the TIA and show where these traffic movements are being reassigned from. • Conduct traffic surveys of the intersection for the Thursday PM and Saturday midday peak periods (i.e. typical retail peaks) and revise baseline assessment traffic volumes, and any related assumptions accordingly. • Review the SIDRA coding of the intersection and undertake an updated analysis. • Undertake a revised intersection delay assessment following correction of the above SIDRA coding. **Please note:** Although the TIA makes provision for traffic generated by Stage 2 of the shopping centre and residential precincts, the proposed application is only for Stage 1 and no access arrangements outside of the Stage 1 have been considered and assessed. SARA notes that the future left-in and left-out access on Dalrymple Road is in proximity of the Shaw Rd intersection and would likely present safety concerns that will need to be addressed in any future proposal.

Please note that unlike an information request, assessment timeframes do not stop when advice is provided by SARA.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

How to respond

It is recommended that you address these issues promptly and provide a response to SARA by **19 March 2025**. If you decide not to respond, your application will be assessed and decided based on the information provided to date.

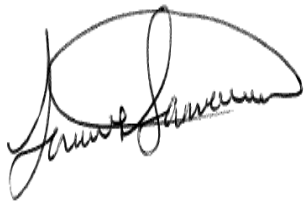
Under the Development Assessment Rules (DA Rules), the issuing of advice does not stop the assessment timeframes. If you intend to provide additional information, it should be provided in a timely manner to allow sufficient time for the information to be considered. As such, you are strongly encouraged to consider using the 'stop the clock' provisions under s32 of the DA rules, to allow sufficient time for you to consider and respond to SARA's advice; and for SARA to consider any new or changed material provided.

If you wish to utilise the 'stop the clock' provisions, you should give notice to the assessing authority (assessment manager or referral agency) whose current period you wish to stop. This can be done through MyDAS2 or via correspondence.

You are requested to upload your response using the 'manage documents' function in MyDAS2.

If you require further information or have any questions about the above, please contact Helena Xu, Senior Planning Officer, on (07) 3452 6724 or via email NQSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely



Javier Samanes
A/ Manager (Planning)

cc Townsville City Council, developmentassessment@townsville.qld.gov.au

Development details		
Description:	Development permit	Reconfiguring a Lot - Two Lots into Five Lots, New Road and Easements Material Change of Use - Child Care Centre (120 Children), Service Station, Car Wash, Low Impact Industry and Food & Drink Outlets (Stage 1 of the Greater Ascot District Centre)
SARA role:	Referral agency	
SARA trigger:	• Schedule10, Part 9, Division 1, Table 1, Item 1—Development on premises that are subject of a Ministerial designation • Schedule10, Part 9, Division 4, Subdivision 1, Table 1, Item 1—Development impacting on state transport infrastructure • Schedule10, Part 9, Division 4, Subdivision 2, Table 1, Item 1—Reconfiguring a lot near a state transport corridor • Schedule10, Part 9, Division 4, Subdivision 2, Table 3, Item 1—Reconfiguring a lot within 100m of a state-controlled road intersection • Schedule10, Part 9, Division 4, Subdivision 2, Table 4, Item 1—Material Change of Use of premises within 25m of a state-controlled road (Planning Regulation 2017)	
SARA reference:	2411-43630 SRA	
Assessment criteria:	State code 1: Development in a state-controlled road environment	

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Development details	
	State code 6: Protection of state transport networks

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

APPENDIX C

TCC Information Request (MCU24/0117)

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Date >> 18 December 2024

PO BOX 1268, Townsville
Queensland 4810

13 48 10

enquiries@townsville.qld.gov.au
townsville.qld.gov.au

ABN: 44 741 992 072

Parkside Development Pty Ltd
C/- Brazier Motti
595 Flinders Street
TOWNSVILLE QLD 4810

Email >> emma.staines@braziermotti.com.au

Dear Sir/Madam

Information Request

Planning Act 2016

As per our telephone conversation on 18/12/24 please be advised that, upon review of the below mentioned development application, further information is required to undertake a comprehensive assessment. In accordance with section 12 of Development Assessment Rules under the *Planning Act 2016* the following information is requested.

Application Details

Application no:	MCU24/0117
Assessment no:	13901024
Proposal:	Child care centre (120 Children), Service Station, Car Wash, Food and drink outlet and Low impact industry combined with RAL24/0075 - Greater Ascot (Neighbour Centre)
Street address:	182 Shaw Road SHAW QLD 4818
Real property description:	Part Lot 5000 SP 334260 Part Lot 5001 SP 349172 Part Lot 5001 SP 349172
Applicant's reference:	26700-342-01

The information requested is set out below >>

Request Item 1 – Flood Impact Assessment (FIA)

The applicant is requested to provide a Flood Impact Assessment demonstrating that the that development does not increase the potential for flood damage on-site or to other property.

Reason

To demonstrate compliance with Performance Outcomes of the Flood hazard overlay code of the Townsville City Plan.

Advice

The applicant is advised that FIA must be prepared using the most recent flood model data and in accordance with SC6.7.4 Attachment 1 – Guidelines for preparation of flood studies and reports for Townsville City Plan.

Document Set ID: 26983695
Version: 1, Version Date: 18/12/2024

Request Item 2 – Masterplan – Active Transport and Public Transport

The applicant is requested to provide a Masterplan for the active transport and public transport networks with consideration towards the following:

a) pathway for future connection going north along Shaw Road;
b) pathway along Shaw Rd and Dalrymple Rd must connect to the Shaw Rd signalised intersection for both pedestrians and cyclists;
c) connectivity to public transport bus stops;
d) pedestrian connectivity, specifically east/west;
e) taxi/drop zone;
f) active transport and/or public transport user access to and from the site;
g) bicycle and motorbike parking;
h) sight visibility between pedestrians and vehicles at the roundabouts.

Reason

To demonstrate compliance with Performance Outcome PO3 of the Transport impact, access and parking code of the Townsville City Plan.

Advice

The applicant is advised that Traffic Impact Assessment (TIA) must be amended to include the items above, as required.

Request Item 3 – Amended Traffic Impact Assessment (TIA)

The applicant is requested to provide an amended Traffic Impact Assessment to include the following:

a) expected time frames for commencement and completion of works, and commencement of use.
b) for major arterial road, a traffic growth rate of 2% must be adopted.
c) swept path analysis including advice on the largest vehicle accessing each lot, including waste storage area and loading area.
d) confirmation that the central island radius for proposed roundabouts are able to meet the requirements as outlined in the Austroads Guide to Road Design: Part 4B.

Reason

To demonstrate compliance with Performance Outcome PO1 of the Transport impact, access and parking code of the Townsville City Plan.

Advice

Pathway along full frontage of the proposed childcare centre must be 2.5m.

Request Item 4 – Waste Management Plan/Facilities

The applicant is requested to provide the following for each use/lot:

a) details on the proposed on-site waste management facilities for the storage of waste and recyclable material.
b) plans must clearly identify the bin storage area.
c) swept path analysis demonstrating accessibility for waste collection.

Reason

To demonstrate compliance with Performance Outcome PO33 of the Works code of the Townsville City Plan.

Request Item 5 – Stormwater Management Plan

The applicant is requested to provide a Stormwater Management Plan prepared in accordnace with SC6.4.9 Stormwater quantity and SC6.4.10 Stormwater quality of the Townsville City Plan.

Document Set ID: 26983695
Version: 1, Version Date: 08/04/2025

Reason
To demonstrate compliance with Performance Outcomes of the Healthy waters code.

Advice
Townsville City Council currently does not have a catchment-based stormwater quality management system and therefore there is no adopted policy on monetary contributions towards such a system.

The applicant is advised that Engineering Report must be amended to include the items above, as required.

ADVICE
The applicant is advised that stormwater and water reticulation within private property including easement(s) remain privately owned and maintained.

Request Item 6 – Car Park Amenity
The applicant is requested to provide shade over car parking areas at Pad Site 5, 6, 7 and the car wash.

Reason
To demonstrate compliance with Performance Outcomes of the Transport impact, access and parking code.

Advice
Preference is for trees to be used, however if this is not practical, then details of shade structures such as 'shade sails' or solid structures must be provided.

Request Item 7 – Pedestrian Connection to Child Care Centre
The applicant is requested to demonstrate how pedestrians, who may be residents of Greater Ascot, could walk to the proposed child care centre.

Reason
To demonstrate compliance with Performance Outcomes of the Transport impact, access and parking code.

Advice
If appropriate connection is not available though the current design, a temporary pedestrian access may be proposed.

Request Item 8 – Landscape Plan
The applicant is requested to provide a Landscape Plan to address all requirements of the Landscape code, however specific attention should be given to:

a) large trees along the Dalrymple Road frontage
b) soft landscaping to separate the drive through lanes from adjacent roads
c) shade in the car parking areas to reduce the heat island effect

Reason
To demonstrate compliance with Performance Outcomes of the Landscape code.

Document Set ID: 26983695
Version: 1, Version Date: 08/04/2025

Advice

The applicant is advised that well designed soft landscape separating the drive-through lanes from adjacent roads, particularly Dalrymple Rd must be provided. The main reason for this is to block headlight glare and minimise confusion between vehicle movements. Plantings in this location should be designed to minimise maintenance interventions by selecting species that are suited to the garden area and that only grow to a height of around 1m – 1.2m, therefore reducing any hedging maintenance. This will also address the streetscape enhancement sought by the planning scheme.

Request Item 9 – Bicycle parking

The applicant is requested to provide additional bicycle parking facilities at QSR4 and the service station.

Reason

To demonstrate compliance with Performance Outcomes of the Transport impact, access and parking code.

Advice

Currently bicycle parking is only indicated at QSR5.

End of Information Request >>

Under the provisions of the Development Assessment Rules under the *Planning Act 2016*, you have three options available in response to this Information Request. You may give the assessment manager (in this instance Council):

(a) all of the information requested; or
(b) part of the information requested; or
(c) a notice that none of the information will be provided.

For any response given in accordance with items (b) and (c) above, you may also advise Council that it must proceed with its assessment of the development application.

Please be aware that under the Development Assessment Rules under the *Planning Act 2016*, the applicant is to respond to any Information Request within 3 months of the request. If you do not respond to the Information Request within this time period, or, within a further period agreed between the applicant and Council, it will be taken that you have decided not to provide a response. In the event of no response being received, Council will continue with the assessment of the application without the information requested.

Council prefers that all of the information requested be submitted as one package. If any additional matters arise as a result of the information submitted, or, as a result of public notification (where applicable), you will be advised accordingly.

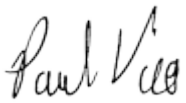
Should any referral agency make an information request, you are reminded of your obligation to provide council with a copy of the information response provided to that referral agency.

You may wish to follow the progress of this application using PD Online on Council's website www.townsville.qld.gov.au

If you have any further queries in relation to the above, please do not hesitate to contact Estelle Trueman on telephone 07 47278303, or email developmentassessment@townsville.qld.gov.au.

Document Set ID: 26983695
Version: 1, Version Date: 08/04/2025

Yours faithfully



For Assessment Manager
Planning and Development

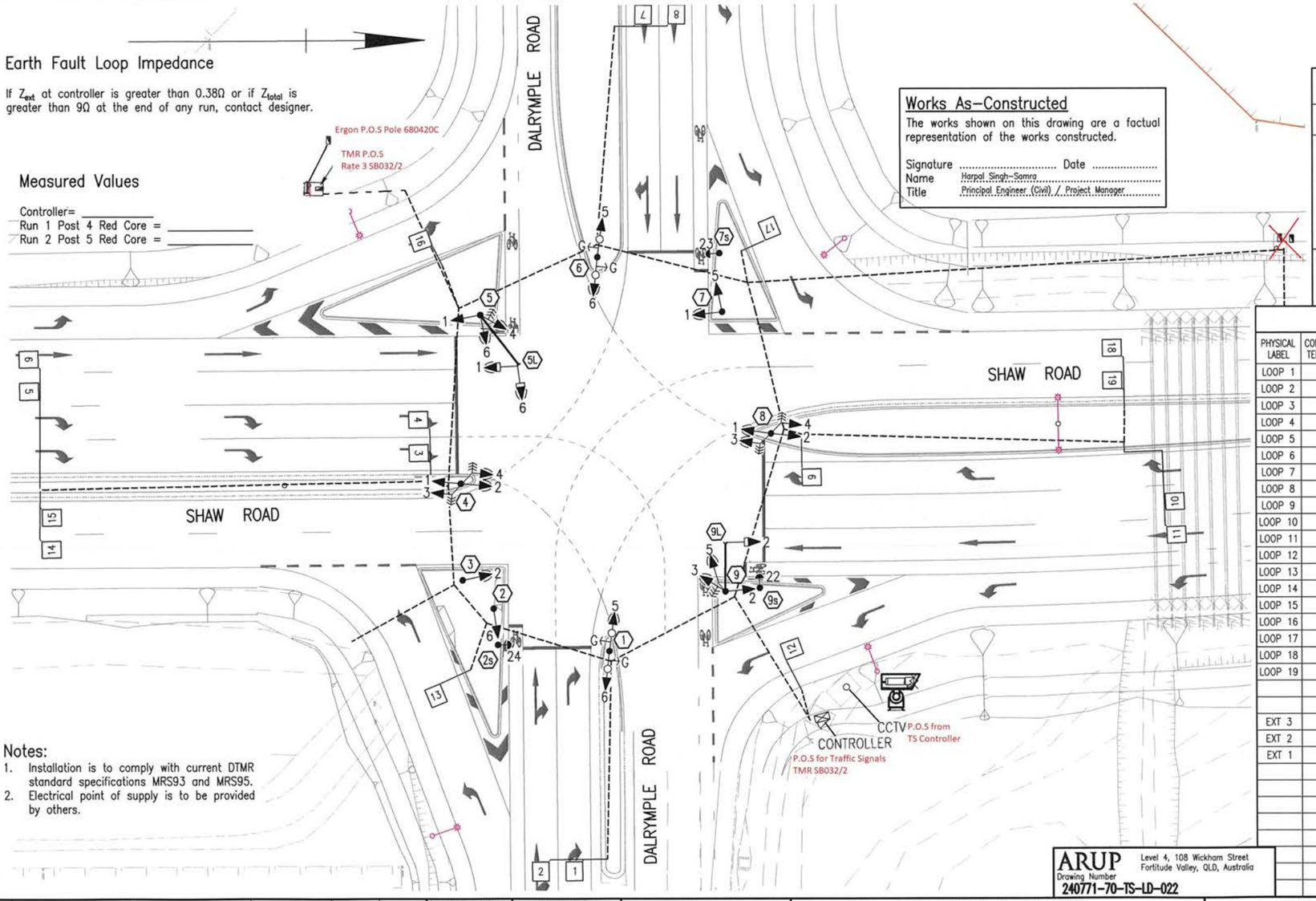
Document Set ID: 26983695
Version: 1, Version Date: 08/12/2025

APPENDIX D

Shaw Road / Dalrymple Road Signalised Crossroads

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

PHASE DIAGRAMS	A PHASE	B PHASE	C PHASE	D PHASE	E PHASE	F PHASE	F1 PHASE	F2 PHASE
SIGNAL GROUPS	1 | 2	1 | 3	2 | 4	5	6	3 | 4	1 | 3	2 | 4
VEHICLE/PED GROUPS	VG1 | VG2	VG1 | VG3	VG2 | VG4	VG5	VG6	VG3 | VG4	VG1 | VG3	VG2 | VG4
LOGICAL INPUT	5,6 | 10,11 | 22	3,4	9	7,8 | 23	1,2 | 24	3,4 | 9	3,4	9
CALL	X | X | X			X | X	X | X	X | X		
EXTEND	X | X	X	X	X	X	X | X	X	X
INCREMENT	X | X							
SPECIAL CONDITIONS		INTRODUCE B PHASE ON STREAMS REQUEST	INTRODUCE C PHASE ON STREAMS REQUEST			F PHASE TO F1 OR F2 PHASES PERMITTED. F1 PHASE TO F2 PHASE OR F2 PHASE TO F1 PHASE NOT PERMITTED.		



CONFLICT TABLE (X – INDICATES CONFLICT)

		VEHICLE GROUPS 1	2	3	4	5	6	7	8	PED GROUPS 1	2	3	4
VEHICLE GROUPS	1				X	X	X						
	2			X		X	X						
	3		X			X	X						
	4	X				X	X						
	5	X	X	X	X		X						
	6	X	X	X	X	X							
	7												
	8												
PED GROUPS	1												
	2												
	3												
	4												

PD216 DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	ADVANCE	24m
LOOP 2	P2	2	ADVANCE	24m
LOOP 3	P3	3	STOP LINE	4m
LOOP 4	P4	4	STOP LINE	4m
LOOP 5	P5	5	ADVANCE	45m
LOOP 6	P6	6	ADVANCE	45m
LOOP 7	P7	7	ADVANCE	24m
LOOP 8	P8	8	ADVANCE	24m
LOOP 9	Q9	9	STOP LINE	4m
LOOP 10	Q10	10	ADVANCE	45m
LOOP 11	Q11	11	ADVANCE	45m
LOOP 12	Q12	12	COUNTING	–
LOOP 13	Q13	13	COUNTING	–
LOOP 14	Q14	14	COUNTING	–
LOOP 15	Q15	15	COUNTING	–
LOOP 16	Q16	16	COUNTING	–
LOOP 17	R17	17	COUNTING	–
LOOP 18	R18	18	COUNTING	–
LOOP 19	R19	19	COUNTING	–
		20		
		21		
EXT 3	A7	22	Pb3 – BIKE	
EXT 2	A6	23	Pb2 – BIKE	
EXT 1	A5	24	Pb1 – BIKE	
		25		
		26		
		27		
		28		
		29		
		30		
		31		
		32		

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 CONNECTIONS FINAL TERMINALS	RUN 1 CONNECTS CORES	RUN 1 CONNECTS USED	RUN 2 CONNECTIONS FINAL TERMINALS	RUN 2 CONNECTS CORES	RUN 2 CONNECTS USED	RUN 3 CONNECTIONS FINAL TERMINALS	RUN 3 CONNECTS CORES	RUN 3 CONNECTS USED
1	RED	A5	1	1	1	1	1				
	YELLOW	A4	2	2	2	2	2				
	GREEN	A3	3	3	3	3	3				
2	RED	A8	4	4		4	4	4			
	YELLOW	A7	5	5		5	5	5			
	GREEN	A6	6	6		6	6	6			
3	RED	A11	7	7		7	7				
	YELLOW	A10	8	8		8	8				
	GREEN	A9	9	9		9	9				
4	RED	A14	10	10		10	10				
	YELLOW	A13	11	11		11	11				
	GREEN	A12	12	12		12	12				
5	RED	B5	13	13		13	13				
	YELLOW	B4	14	14		14	14				
	GREEN	B3	15	15		15	15				
6	RED	B8	16	16	4	16	16				
	YELLOW	B7	17	17	5	17	17				
	GREEN	B6	18	18	6	18	18				
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
	EXT 3 DET 22	A7				P3	P3				
	EXT 2 DET 23	A6				P2	P2				
	EXT 1 DET 24	A5	P1	P1							
	230V	A2	A	RD		A	RD				
	DET COMMON	E3	PR	GY		PR	GY				
	NEUTRAL	A1,B1 C1,D1	NL	BK	BK	NL	BK	BK			
	SPARE CORES TO EARTH			19–27, P2–P4, OR.	7–16, GY.	19–27, P1,P4, OR.		1–3, 7–16, GY.			
	CABLE SIZE			36	19		36	19			

CONTROLLER TYPE: Tyco Eclipse EC1-62-16 LANTERN TYPE: LED

ARUP Level 4, 108 Wickham Street Fortitude Valley, QLD, Australia
Drawing Number 240771-70-TS-LD-022

B	As Constructed	RE/S.JONES	4/7/16
A	Issued For Construction		
	Revisions/Descriptions	Certification	Date

Microfiled

CAD FILES C:\projectwise\bne_projects\jarren.lennox\dms68000\240771-70-TS-LD-022.dwg

Associated Job Nos

Auxiliary Drg Nos 680009 to 680012 Excluding Bridges

Survey Data	
Datum	GDA94
Horiz. Grid	MGA94 (Z55)
Height Origin	AHD DERIVED
Survey Books	10M–92891

Scales A1 / A3 1:250 / 1:500 0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

TOWNSVILLE CITY COUNCIL
BRUCE HIGHWAY (TOWNSVILLE – INGHAM)
CTL CHGE 18010.000 – 29506.326

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
10M/4A	0.959	11.476	9.510	10M/7

Through Chainage from 10M/10L/14A/841 Ch. 18.03–29.51

TOWNSVILLE RING ROAD SECTION 4
TRAFFIC SIGNALS DALRYMPLE RD AND SHAW ROAD
ITS WORKS

Site Number 3311

Drawn L.Chalmers
Designed Z.Chakich

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
Traffic	Steven Jones		8549	24/11/15
Electrical	Roy Everett		5190	24/11/15

Queensland Government

Job No.	268/10M/5
Contract. No.	NTHD 1284
Drawing No.	680476 | B
Series Number	TS–06 of 11

MRT_Detail (02/14)

Last Modified :- Jul 06, 2017 - 9:31am XREFS :- X-DR0A-12D.dwg ; X-DR0A-120-MN.dwg ; X-DR0A-120-MC.dwg ; X-DR0A-CAD.dwg ; X-DR0A-CTRL.dwg ; X-DR0A-HATCH.dwg ; X-SCAD.dwg ; X-SDRA.dwg ; X-SDTM.dwg ; X-DR0A-CAD-MN.dwg ; X-DR0A-CAD-MC.dwg ; X-DR0A-120-MN.dwg ; X-DR0A-120-MC.dwg ; X-DR0A-120-MS.dwg ; X-DR0A-CAD-MS.dwg ; MRT_DETAIL_A1_Ref.dwg ; X-DR

Document Sealed ID: 26953055
Version: 1, Version Date: 03/04/2025

APPENDIX E

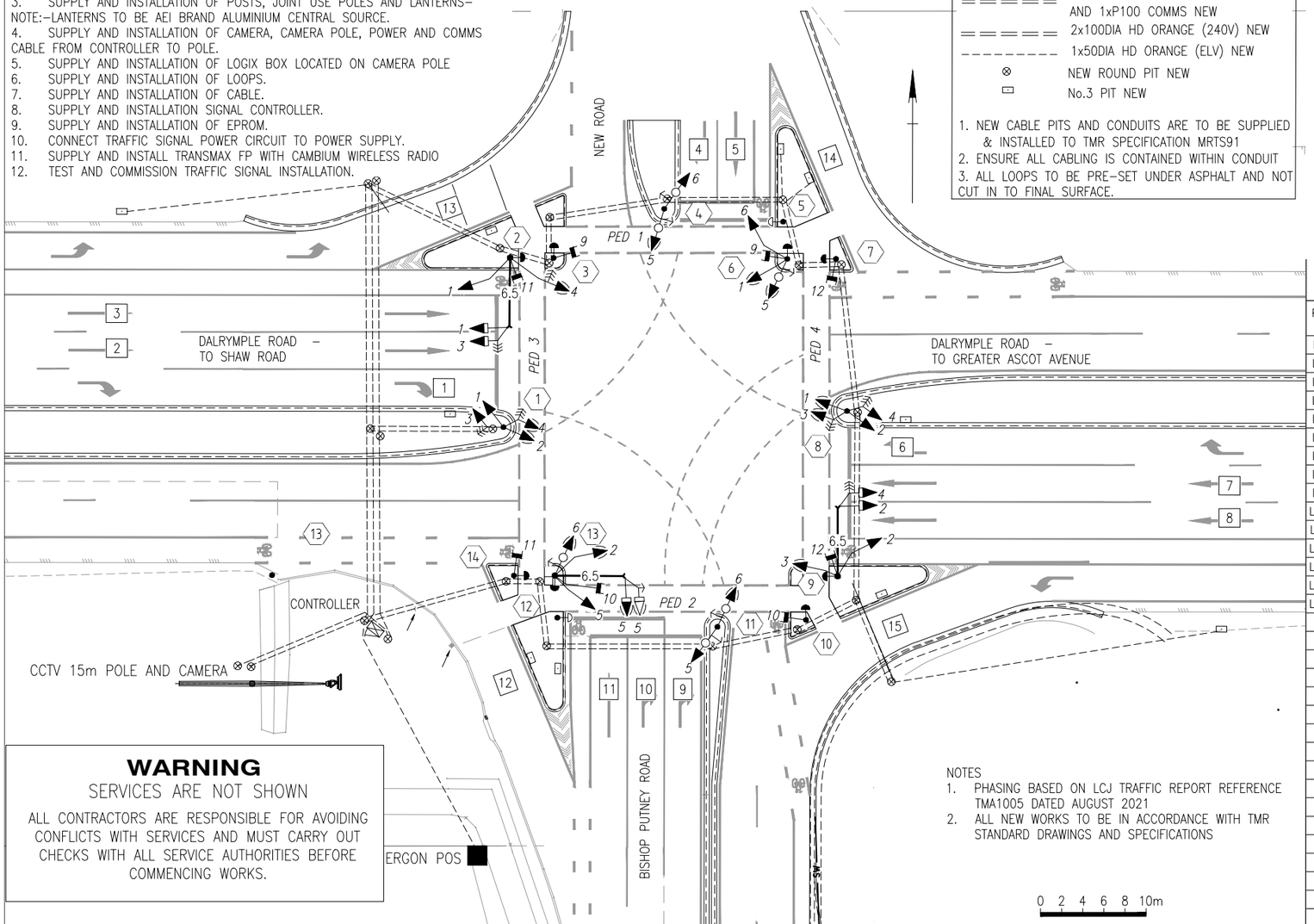
Dalrymple Road / Bishop Putney Avenue Signalised Crossroads

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

PHASE DIAGRAMS	A PHASE				B PHASE				C PHASE				D PHASE				E PHASE				F PHASE				F1 PHASE				F2 PHASE			
SIGNAL GROUPS	1	2	9	10	1	3	9		2	4	10		5	11			6	12			3	4			1	3	9		2	4	10	
VEHICLE/PED	VG1	VG2	PG1	PG2	VG1	VG3	PG1		VG2	VG4	PG2		VG5	PG3			VG6	PG4			VG3	VG4			VG1	VG3	PG1		VG2	VG4	PG2	
LOGICAL INPUT	2,3	7,8	24	23		1	24			6	23		9,10,11,19	22			4,5,20	21			1	6				1	24			6	23	
CALL	X	X	PED 1	PED 2		X	PED 1			X	PED 2		X	PED 3			X	PED 4			X	X				X	PED 1			X	PED 2	
EXTEND	X	X				X				X			X				X				X	X				X				X		
INCREMENT	X	X																														
SPECIAL CONDITIONS					INTRODUCE B PHASE ON STREAMS REQUEST				INTRODUCE C PHASE ON STREAMS REQUEST												DIAMOND OVERLAP CONDITIONS. IF F1 VG1 MAY OVERLAP TO A PHASE IF F2 VG2 MAY OVERLAP TO A PHASE															

SCOPE OF WORKS

1. SUPPLY AND INSTALLATION OF PITS AND DUCTS.
2. SUPPLY AND INSTALLATION OF FOOTINGS FOR POSTS AND JOINT USE POLES.
3. SUPPLY AND INSTALLATION OF POSTS, JOINT USE POLES AND LANTERNS– NOTE:–LANTERNS TO BE AEI BRAND ALUMINIUM CENTRAL SOURCE.
4. SUPPLY AND INSTALLATION OF CAMERA, CAMERA POLE, POWER AND COMMS CABLE FROM CONTROLLER TO POLE.
5. SUPPLY AND INSTALLATION OF LOGIX BOX LOCATED ON CAMERA POLE
6. SUPPLY AND INSTALLATION OF LOOPS.
7. SUPPLY AND INSTALLATION OF CABLE.
8. SUPPLY AND INSTALLATION SIGNAL CONTROLLER.
9. SUPPLY AND INSTALLATION OF EPROM.
10. CONNECT TRAFFIC SIGNAL POWER CIRCUIT TO POWER SUPPLY.
11. SUPPLY AND INSTALL TRANSMAX FP WITH CAMBIUM WIRELESS RADIO
12. TEST AND COMMISSION TRAFFIC SIGNAL INSTALLATION.



LEGEND

***** UNLESS OTHERWISE STATED *****

- 2x100DIA HD ORANGE (240V) NEW AND 1xP100 COMMS NEW
- 2x100DIA HD ORANGE (240V) NEW
- 1x50DIA HD ORANGE (ELV) NEW
- NEW ROUND PIT NEW
- No.3 PIT NEW

1. NEW CABLE PITS AND CONDUITS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91
2. ENSURE ALL CABLING IS CONTAINED WITHIN CONDUIT
3. ALL LOOPS TO BE PRE–SET UNDER ASPHALT AND NOT CUT IN TO FINAL SURFACE.

WARNING

SERVICES ARE NOT SHOWN

ALL CONTRACTORS ARE RESPONSIBLE FOR AVOIDING CONFLICTS WITH SERVICES AND MUST CARRY OUT CHECKS WITH ALL SERVICE AUTHORITIES BEFORE COMMENCING WORKS.

NOTES

1. PHASING BASED ON LCJ TRAFFIC REPORT REFERENCE TMA1005 DATED AUGUST 2021
2. ALL NEW WORKS TO BE IN ACCORDANCE WITH TMR STANDARD DRAWINGS AND SPECIFICATIONS

CONFLICT TABLE (X INDICATES CONFLICT)

VEHICLE GROUPS	1	2	3	4	5	6	7	8	9	10	11	12	PED GROUPS 1	2	3	4
1					X	X									X	X
2					X	X									X	X
3					X								X	X		
4						X							X			X
5	X	X	X													
6	X	X		X												
7																
8																
9																
10																
11																
12																
PED GROUPS 1			X													
2		X														
3	X	X	X													
4	X	X		X												

DETECTOR TABLE

PHYSICAL LABEL	TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	STOP LINE	4m
LOOP 2	P2	2	ADVANCE	35m
LOOP 3	P3	3	ADVANCE	35m
LOOP 4	P4	4	STOP LINE	4m
LOOP 5	P5	5	STOP LINE	4m
LOOP 6	P6	6	STOP LINE	4m
LOOP 7	P7	7	ADVANCE	35m
LOOP 8	P8	8	ADVANCE	35m
LOOP 9	Q9	9	STOP LINE	4m
LOOP 10	Q10	10	STOP LINE	4m
LOOP 11	Q11	11	STOP LINE	4m
LOOP 12	Q12	12	COUNT	—
LOOP 13	Q13	13	COUNT	—
LOOP 14	Q14	14	COUNT	—
LOOP 15	Q15	15	COUNT	—
EXT6	E10	19	Pb4–BIKE	—
EXT5	E9	20	Pb4–BIKE	—
EXT4	E8	21	Pb4–AUDIO	—
EXT3	E7	22	Pb3–AUDIO	—
EXT2	E6	23	Pb2–AUDIO	—
EXT1	E5	24	Pb1–AUDIO	—

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINIAL TERMINALS	RUN 1 CONNECTS CORES USED	RUN 2 FINIAL TERMINALS	RUN 2 CONNECTS CORES USED	RUN 3 FINIAL TERMINALS	RUN 3 CONNECTS CORES USED	RUN 3 FINIAL TERMINALS	RUN 3 CONNECTS CORES USED
1	RED	A5	1	1 1	1	1				
	YELLOW	A4	2	2 2	2	2				
	GREEN	A3	3	3 3	3	3				
2	RED	A8	4	4	4	4 1	1	1		
	YELLOW	A7	5	5	5	5 2	2	2		
	GREEN	A6	6	6	6	6 3	3	3		
3	RED	A11	7	7 4	7	7				
	YELLOW	A10	8	8 5	8	8				
	GREEN	A9	9	9 6	9	9				
4	RED	A14	10	10	10	10 4				
	YELLOW	A13	11	11	11	11 5				
	GREEN	A12	12	12	12	12 6				
5	RED	B5	13	13	13	13	4	4 1		
	YELLOW	B4	14	14	14	14	5	5 2		
	GREEN	B3	15	15	15	15	6	6 3		
6	RED	B8	16	16	16	16	7	7		
	YELLOW	B7	17	17	17	17	8	8		
	GREEN	B6	18	18	18	18	9	9		
7		B11								
		B10								
		B9								
8		B14								
		B13								
		B12								
9	RED DW	C5	19	19	19	19				
	PED 1	C4								
	GREEN W	C3	20	20	20	20				
10	RED DW	C8			21	21	10	10		
	PED 2	C7								
	GREEN W	C6			22	22	11	11		
11	RED DW	C11	21	21			12	12		
	PED 3	C10								
	GREEN W	C9	22	22			13	13		
12	RED DW	C14			23	23				
	PED 4	C13								
	GREEN W	C12			24	24				
	EXT6 DET 19	E10					P4	P4		
	EXT5 DET 20	E9	P4	P4						
	EXT4 DET 21	E8			P4	P4				
	EXT3 DET 22	E7	P3	P3			P3	P3		
	EXT2 DET 23	E6			P3	P3	P2	P2		
	EXT1 DET 24	E5	P2	P2	P2	P2				
	230V	A2	A	R	A	R	A	R		
	DET COMMON	E3	PR	GY	PR	GY	PR	GY		
	NEUTRAL	A1,B1 C1,D1	N	BK BK	N	BK BK	N	BK BK		
	SPARE CORES TO EARTH		24–27, P1, OG	7–16,GR	25–27, P1, OG	7–16,GR	14–27, P1, OG	4–16,GR		
	CABLE SIZE		36	19	36	19	36	19		

CONTROLLER TYPE TYCO ECLIPSE EC1–62–16 WITH TOP HAT ID No 3397

Code	Date	Description	Auth
C	24/04/23	FURTHER TCC COMMENTS AND ID NUMBER ADDED	JE
B	5/04/23	TCC COMMENTS INCLUDED	JE
A	2/03/23	FOR CONSTRUCTION	JE

Client Tony Madden Architects Pty Ltd

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Project Description
SHAW CATHOLIC COLLEGE
INTERSECTION SIGNALS

Drawing Title
TRAFFIC SIGNALS
OPERATIONS AND ELECTRICAL

Date	MAR 2022
Scale	1:250@A3
Drawn	JE
Approved	J ERREY 6863
Drawing Number	3529-SIG01
Revision	C

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Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

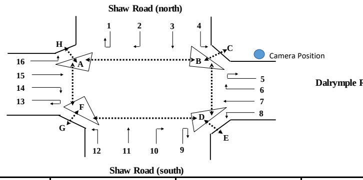
APPENDIX F

Intersection Traffic Survey Data

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 1 **Weather:** Fine
Location: Shaw Road/Dalrymple Road, Ascot Town Centre (Townsville)
Day/Date: Thursday, 30 January 2025
PM Peak: *Hour ending - 5:00 PM*



TIME (1/4 hr end)	Movement 1				Movement 2				Movement 3				Movement 4				Movement 5				Movement 6				Movement 7				Movement 8			
	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists
3:15 PM	0	0	**0**	0	19	1	**20**	0	113	11	**124**	0	97	2	**99**	0	0	0	**0**	0	74	2	**76**	0	70	1	**71**	0	52	0	**52**	0
3:30 PM	0	0	**0**	0	16	0	**16**	0	104	10	**114**	0	60	1	**61**	0	0	0	**0**	0	105	1	**106**	0	85	0	**85**	0	43	0	**43**	0
3:45 PM	0	0	**0**	0	11	1	**12**	0	94	3	**97**	0	62	1	**63**	0	0	0	**0**	0	85	2	**87**	0	56	0	**56**	0	32	2	**34**	0
4:00 PM	0	0	**0**	0	13	0	**13**	0	84	4	**88**	0	44	1	**45**	0	0	0	**0**	0	72	1	**73**	0	65	1	**66**	1	46	0	**46**	0
4:15 PM	0	0	**0**	0	16	1	**17**	0	114	3	**117**	0	68	0	**68**	0	0	0	**0**	0	73	5	**78**	0	64	0	**64**	0	43	0	**43**	0
4:30 PM	0	0	**0**	0	16	1	**17**	0	97	8	**105**	0	58	1	**59**	0	0	0	**0**	0	77	1	**78**	0	65	2	**67**	0	35	0	**35**	0
4:45 PM	0	0	**0**	0	15	0	**15**	0	113	12	**125**	0	65	1	**66**	0	1	0	**1**	0	71	0	**71**	0	74	1	**75**	0	44	0	**44**	0
5:00 PM	0	0	**0**	0	15	0	**15**	0	112	1	**113**	0	54	0	**54**	0	0	0	**0**	0	80	0	**80**	0	70	0	**70**	0	41	0	**41**	0
5:15 PM	0	0	**0**	0	9	0	**9**	0	85	4	**89**	0	52	0	**52**	0	0	0	**0**	0	71	1	**72**	0	74	0	**74**	0	51	0	**51**	0
5:30 PM	0	0	**0**	0	15	0	**15**	0	82	3	**85**	0	50	0	**50**	0	0	0	**0**	0	68	0	**68**	0	70	1	**71**	0	46	0	**46**	0
5:45 PM	0	0	**0**	0	12	0	**12**	0	66	1	**67**	0	46	0	**46**	0	0	0	**0**	0	52	0	**52**	0	53	0	**53**	0	33	0	**33**	0
6:00 PM	0	0	**0**	0	6	0	**6**	0	61	2	**63**	0	52	2	**54**	0	0	0	**0**	0	65	0	**65**	0	66	0	**66**	0	27	0	**27**	0
3 hr Total	**0**	**0**	**0**	**0**	**163**	**4**	**167**	**0**	**1125**	**62**	**1187**	**0**	**708**	**9**	**717**	**0**	**1**	**0**	**1**	**0**	**893**	**13**	**906**	**0**	**812**	**6**	**818**	**1**	**493**	**2**	**495**	**0**
PM Peak	**0**	**0**	**0**	**0**	**62**	**2**	**64**	**0**	**436**	**24**	**460**	**0**	**245**	**2**	**247**	**0**	**1**	**0**	**1**	**0**	**301**	**6**	**307**	**0**	**273**	**3**	**276**	**0**	**163**	**0**	**163**	**0**

TIME (1/4 hr end)	Movement 9				Movement 10				Movement 11				Movement 12				Movement 13				Movement 14				Movement 15				Movement 16			
	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists	Light Vehicles	Heavy Vehicles	**Total**	Cyclists
3:15 PM	0	0	**0**	0	27	0	**27**	0	85	10	**95**	0	1	0	**1**	0	0	0	**0**	0	2	0	**2**	0	43	1	**44**	0	10	1	**11**	0
3:30 PM	0	0	**0**	0	26	0	**26**	0	105	3	**108**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	0	38	0	**38**	0	10	0	**10**	0
3:45 PM	0	0	**0**	0	28	1	**29**	0	121	13	**134**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	0	38	1	**39**	0	10	0	**10**	0
4:00 PM	0	0	**0**	0	29	0	**29**	0	104	1	**105**	0	2	0	**2**	0	0	0	**0**	0	0	0	**0**	0	37	1	**38**	0	7	2	**9**	0
4:15 PM	0	0	**0**	0	34	0	**34**	0	103	7	**110**	0	1	0	**1**	0	0	0	**0**	0	1	0	**1**	0	27	1	**28**	0	10	0	**10**	0
4:30 PM	0	0	**0**	0	31	0	**31**	0	141	10	**151**	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	0	34	0	**34**	0	12	0	**12**	0
4:45 PM	0	0	**0**	0	23	1	**24**	0	123	5	**128**	0	2	0	**2**	0	0	0	**0**	0	1	0	**1**	0	46	1	**47**	0	10	1	**11**	0
5:00 PM	0	0	**0**	0	29	2	**31**	0	85	8	**93**	0	2	0	**2**	0	0	0	**0**	0	0	0	**0**	0	33	0	**33**	0	7	1	**8**	0
5:15 PM	0	0	**0**	0	28	0	**28**	0	87	3	**90**	0	1	0	**1**	0	0	0	**0**	0	1	0	**1**	0	29	1	**30**	0	8	0	**8**	0
5:30 PM	0	0	**0**	0	29	0	**29**	0	95	3	**98**	0	2	0	**2**	0	0	0	**0**	0	0	0	**0**	0	26	0	**26**	0	14	0	**14**	0
5:45 PM	0	0	**0**	0	18	0	**18**	0	52	2	**54**	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	0	32	0	**32**	0	9	0	**9**	0
6:00 PM	0	0	**0**	0	13	0	**13**	0	63	3	**66**	0	2	0	**2**	0	0	0	**0**	0	0	0	**0**	0	24	0	**24**	0	7	0	**7**	0
3 hr Total	**0**	**0**	**0**	**0**	**315**	**4**	**319**	**0**	**1164**	**68**	**1232**	**0**	**16**	**0**	**16**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**6**	**0**	**407**	**6**	**413**	**0**	**114**	**5**	**119**	**0**
PM Peak	**0**	**0**	**0**	**0**	**117**	**3**	**120**	**0**	**452**	**30**	**482**	**0**	**6**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**140**	**2**	**142**	**0**	**39**	**2**	**41**	**0**

TIME (1/4 hr end)	Pedestrian Movements																															
	A - B		B - A		B - C		C - B		B - D		D - B		D - E		E - D		D - F		F - D		F - G		G - F		F - A		A - F		A - H		H - A	
	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 hr Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PM Peak	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 1 **Weather:** Fine

Location: Shaw Road/Dalrymple Road, Ascot Town Centre (Townsville)

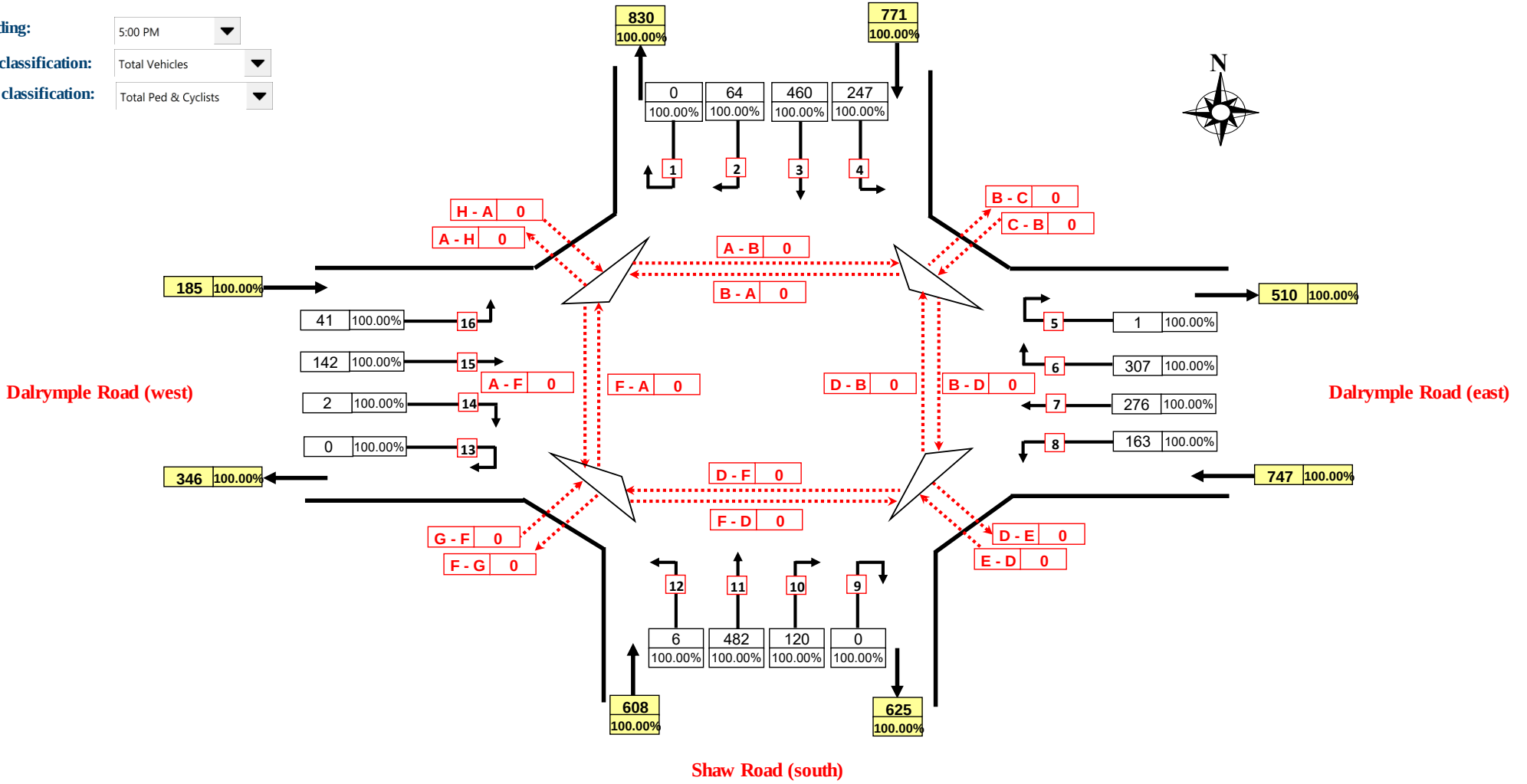
Day/Date: Thursday, 30 January 2025

Summary: PM Peak : *Hour ending - 5:00 PM*

Hour Ending: 5:00 PM

On-road classification: Total Vehicles

Off-road classification: Total Ped & Cyclists

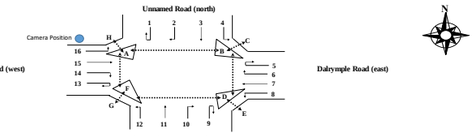


Note: 3.28% = proportion of selected vehicle classification as a percentage of total vehicles

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 2 **Weather:** Fine
Location: Bishop Putney Avenue/Dalrymple Road, Ascot Town Centre (Townsville)
Day/Date: Thursday, 30 January 2025
PM Peak: *Hour ending - 4:00 PM*



TIME (1/4 hr end)	Movement 1				Movement 2				Movement 3				Movement 4				Movement 5				Movement 6				Movement 7				Movement 8			
	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists
3:15 PM	0	0	0	0	5	0	5	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	0	130	3	133	0	27	1	28	0
3:30 PM	0	0	0	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	210	2	212	0	11	1	12	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	3	166	0	6	0	6	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169	2	171	1	8	0	8	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	166	5	171	0	6	0	6	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	164	3	167	0	6	0	6	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	199	1	200	0	13	0	13	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	158	0	158	0	2	0	2	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	202	1	203	0	5	0	5	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	1	163	0	4	0	4	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140	0	140	0	2	0	2	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	161	0	161	0	0	0	0	0
3 hr Total	0	0	0	0	7	0	7	0	1	0	1	0	5	0	5	0	0	0	0	0	0	0	0	0	2624	21	2645	1	90	2	92	0
PM Peak	0	0	0	0	7	0	7	0	1	0	1	0	4	0	4	0	0	0	0	0	0	0	0	0	672	10	682	1	52	2	54	0

TIME (1/4 hr end)	Movement 9				Movement 10				Movement 11				Movement 12				Movement 13				Movement 14				Movement 15				Movement 16			
	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists
3:15 PM	0	0	0	0	64	0	64	0	0	0	0	0	49	0	49	0	0	0	0	0	21	0	21	0	160	2	162	0	4	0	4	0
3:30 PM	0	0	0	0	36	2	38	0	0	0	0	0	32	0	32	0	0	0	0	0	8	0	8	0	118	2	120	0	0	0	0	0
3:45 PM	0	0	0	0	4	0	4	0	0	0	0	0	11	0	11	0	1	0	1	0	3	0	3	0	124	3	127	0	0	0	0	0
4:00 PM	0	0	0	0	7	0	7	0	0	0	0	0	6	0	6	0	0	0	0	0	2	0	2	0	105	2	107	0	0	0	0	0
4:15 PM	0	0	0	0	5	0	5	0	0	0	0	0	9	0	9	0	0	0	0	0	7	0	7	0	121	1	122	0	0	0	0	0
4:30 PM	0	0	0	0	3	0	3	0	0	0	0	0	15	0	15	0	0	0	0	0	9	0	9	0	120	1	121	0	0	0	0	0
4:45 PM	0	0	0	0	12	0	12	0	0	0	0	0	13	0	13	0	1	0	1	0	9	0	9	0	118	3	121	0	0	0	0	0
5:00 PM	0	0	0	0	7	0	7	0	0	0	0	0	9	0	9	0	0	0	0	0	4	0	4	0	117	2	119	0	1	0	1	0
5:15 PM	0	0	0	0	5	0	5	0	0	0	0	0	10	0	10	0	0	0	0	0	2	0	2	0	100	1	101	0	0	0	0	0
5:30 PM	0	0	0	0	2	0	2	0	0	0	0	0	15	0	15	0	0	0	0	0	1	0	1	0	111	0	111	0	0	0	0	0
5:45 PM	0	0	0	0	5	0	5	0	0	0	0	0	3	0	3	0	0	0	0	0	5	0	5	0	87	0	87	0	0	0	0	0
6:00 PM	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	90	1	91	0	0	0	0	0
3 hr Total	0	0	0	0	152	2	154	0	0	0	0	0	173	0	173	0	2	0	2	0	72	0	72	0	1371	28	1399	0	5	0	5	0
PM Peak	0	0	0	0	111	2	113	0	0	0	0	0	86	0	86	0	1	0	1	0	34	0	34	0	907	9	916	0	4	0	4	0

TIME (1/4 hr end)	Pedestrian Movements																															
	A - B		B - A		B - C		C - B		B - D		D - B		D - E		E - D		D - F		F - D		F - G		G - F		F - A		A - F		A - H		H - A	
	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists	Pedestrians	Cyclists
3:15 PM	4	0	1	0	9	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	13	0	15	0	3	0	11	0	2	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9	0	0	0	9	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 hr Total	4	0	1	0	9	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	22	0	24	0	3	0	20	0	2	0
PM Peak	4	0	1	0	9	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	22	0	24	0	3	0	20	0	2	0

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 2 **Weather:** Fine

Location: Bishop Putney Avenue/Dalrymple Road, Ascot Town Centre (Townsville)

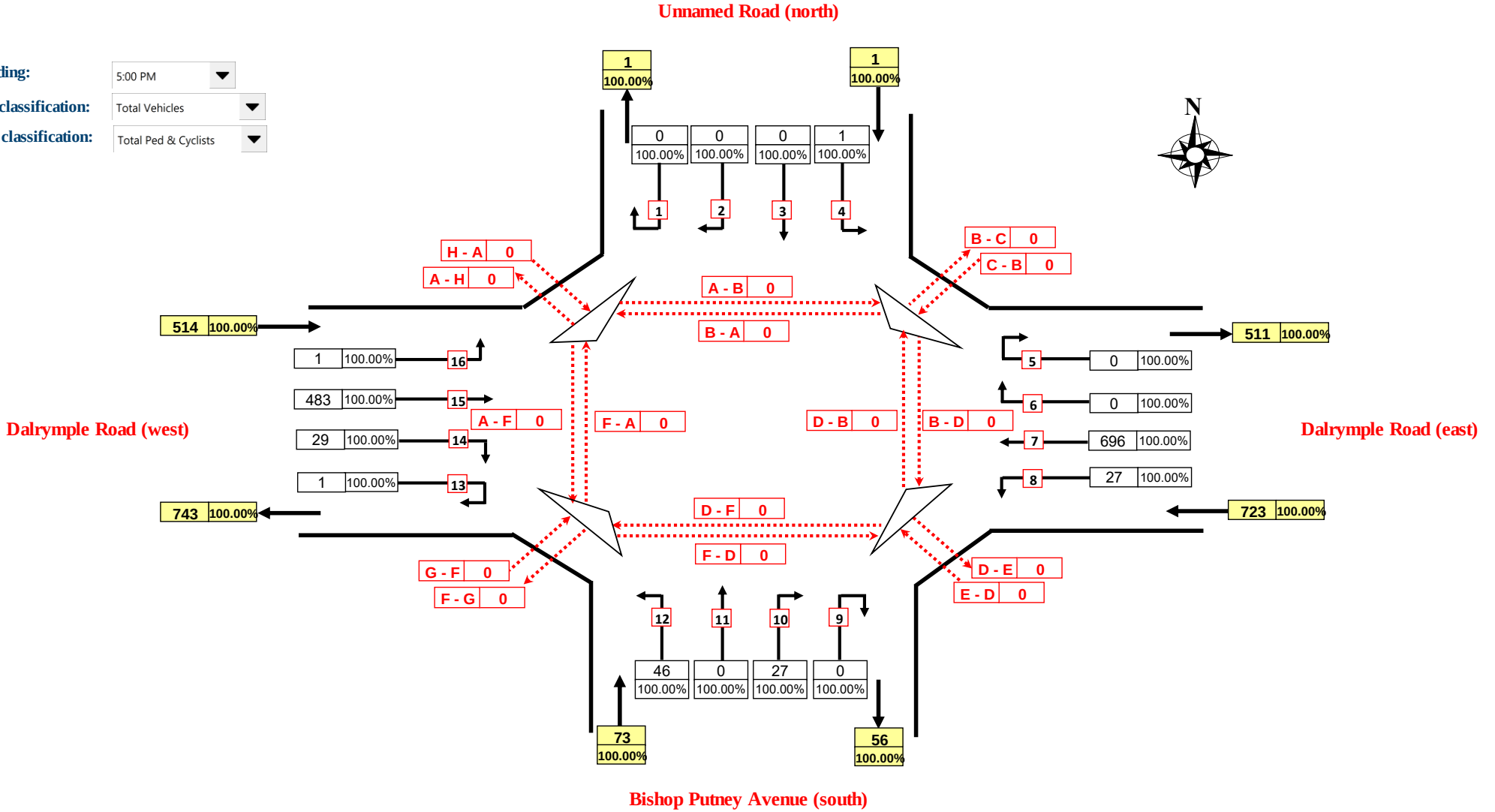
Day/Date: Thursday, 30 January 2025

Summary: PM Peak : *Hour ending - 4:00 PM*

Hour Ending: 5:00 PM

On-road classification: Total Vehicles

Off-road classification: Total Ped & Cyclists



Note: 3.28% = proportion of selected vehicle classification as a percentage of total vehicles

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

APPENDIX G

Crash Data

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Reported road traffic crashes along Dalrymple Rd, Townsville LGA
Fatal crashes: 1 January 2007 to 31 January 2024
Non-fatal casualty (hospitalisation, medical treatment and minor injury) crashes: 1 January 2007 to 31 August 2023
Property damage only crashes: 1 January 2007 to 31 December 2010

CRAS	CRASH_SEVERITY	CRASH_YEAR	CRASH_TYPE	CRASH_NATURE	CRASH_STREET	CRASH_STREET_INTERSECTING	CRASH_ROADWAY_TYPE	CRASH_LIC	CRASH_DCA_CODE	CRASH_DCA_DESCRIPTION
1	Medical treatment	2011	Multi-vehicle	Angle	Bruce Hwy	Dalrymple Rd (1/04)	Intersection	Darkness -	202	Vehs Opposite Approach: Thru-Right
2	Property damage only	2009	Multi-vehicle	Rear-end	Bruce Hwy	Dalrymple Rd (1/04)	Intersection	Daylight	301	Vehs Same Direction: Rear End
3	Medical treatment	2010	Multi-vehicle	Rear-end	Bruce Hwy	Dalrymple Rd (1/04)	Intersection	Daylight	301	Vehs Same Direction: Rear End
4	Hospitalisation	2010	Multi-vehicle	Rear-end	Bruce Hwy	Dalrymple Rd (1/04)	Intersection	Daylight	301	Vehs Same Direction: Rear End
5	Property damage only	2010	Single vehicle	Hit object	Bruce Hwy	Dalrymple Rd (1/04)	Intersection	Daylight	708	Off Path-Straight: Mounts Traffic Island
6	Medical treatment	2018	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	303	Vehs Same Direction: Right Rear
7	Property damage only	2009	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	301	Vehs Same Direction: Rear End
8	Property damage only	2007	Multi-vehicle	Angle	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	106	Vehs Adjacent Approach: Left-Right
9	Medical treatment	2008	Single vehicle	Fall from vehicle	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	802	Off Path-Curve: Off Cway Left Bend
10	Hospitalisation	2014	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	301	Vehs Same Direction: Rear End
11	Hospitalisation	2017	Multi-vehicle	Angle	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	101	Vehs Adjacent Approach: Thru-Thru
12	Medical treatment	2019	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	302	Vehs Same Direction: Left Rear
13	Hospitalisation	2016	Single vehicle	Hit object	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	708	Off Path-Straight: Mounts Traffic Island
14	Medical treatment	2020	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Daylight	301	Vehs Same Direction: Rear End
15	Hospitalisation	2020	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)	Shaw Rd	Intersection	Darkness -	301	Vehs Same Direction: Rear End
16	Hospitalisation	2018	Multi-vehicle	Angle	Dalrymple Rd (1/04)	Greater Ascot Ave	Intersection	Daylight	408	Vehs Manoeuvring: Entering From Footway
17	Hospitalisation	2022	Multi-vehicle	Sideswipe	Dalrymple Rd (1/04)	Greater Ascot Ave	Intersection	Daylight	107	Vehs Adjacent Approach: Thru-Left
18	Minor injury	2017	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Daylight	301	Vehs Same Direction: Rear End
19	Medical treatment	2015	Single vehicle	Fall from vehicle	Dalrymple Rd (1/04)		Midblock	Dawn/Dusl	802	Off Path-Curve: Off Cway Left Bend
20	Hospitalisation	2018	Single vehicle	Overturned	Dalrymple Rd (1/04)		Midblock	Darkness -	701	Off Path-Straight: Left Off Cway
21	Hospitalisation	2021	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Daylight	301	Vehs Same Direction: Rear End
22	Medical treatment	2021	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Darkness -	301	Vehs Same Direction: Rear End
23	Hospitalisation	2020	Single vehicle	Hit object	Dalrymple Rd (1/04)		Midblock	Darkness -	808	Off Path-Curve: Mounts Traffic Island
24	Hospitalisation	2016	Single vehicle	Hit object	Dalrymple Rd (1/04)	Greater Ascot Ave	Midblock	Daylight	708	Off Path-Straight: Mounts Traffic Island
25	Medical treatment	2007	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Daylight	301	Vehs Same Direction: Rear End
26	Hospitalisation	2007	Single vehicle	Fall from vehicle	Dalrymple Rd (1/04)		Midblock	Daylight	705	Off Path-Straight: Out Of Control On Cway
27	Property damage only	2008	Single vehicle	Hit object	Dalrymple Rd (1/04)		Midblock	Darkness -	703	Off Path-Straight: Left Off Cway Hit Obj
28	Hospitalisation	2008	Single vehicle	Hit object	Dalrymple Rd (1/04)		Midblock	Daylight	803	Off Path-Curve: Off Cway Rt Bend Hit Obj
29	Hospitalisation	2015	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Daylight	303	Vehs Same Direction: Right Rear
30	Property damage only	2009	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Dawn/Dusl	304	Vehs Same Direction: U-Turn
31	Medical treatment	2008	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Daylight	301	Vehs Same Direction: Rear End
32	Medical treatment	2014	Multi-vehicle	Sideswipe	Dalrymple Rd (1/04)		Midblock	Daylight	306	Vehs Same Direction: Lane Change Right
33	Hospitalisation	2014	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Daylight	303	Vehs Same Direction: Right Rear
34	Medical treatment	2017	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Daylight	301	Vehs Same Direction: Rear End
35	Property damage only	2008	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Darkness -	301	Vehs Same Direction: Rear End
36	Medical treatment	2012	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Intersection	Daylight	303	Vehs Same Direction: Right Rear
37	Hospitalisation	2015	Single vehicle	Fall from vehicle	Dalrymple Rd (1/04)		Midblock	Daylight	805	Off Path-Curve: Out Of Control On Cway
38	Property damage only	2010	Single vehicle	Hit object	Dalrymple Rd (1/04)		Midblock	Darkness -	607	Vehs On Path: Temporary Object On Cway
39	Medical treatment	2011	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Daylight	301	Vehs Same Direction: Rear End
40	Property damage only	2010	Multi-vehicle	Rear-end	Dalrymple Rd (1/04)		Midblock	Darkness -	301	Vehs Same Direction: Rear End

Reported road traffic crashes along Shaw Rd, Townsville LGA

Fatal crashes: 1 January 2007 to 31 January 2024
Non-fatal casualty (hospitalisation, medical treatment and minor injury) crashes: 1 January 2007 to 31 August 2023
Property damage only crashes: 1 January 2007 to 31 December 2010

CRAS	CRASH_SEVERITY	CRASH_YEAR	CRASH_TYPE	CRASH_NATURE	CRASH_STREET		CRASH_STREET_INTERSECTING	CRASH_ROADWAY_TYPE	CRASH_LIC	CRASH_DCA_CODE	CRASH_DCA_DESCRIPTION
1	Medical treatment	2018	Multi-vehicle	Rear-end	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	303	Vehs Same Direction: Right Rear
2	Hospitalisation	2014	Multi-vehicle	Rear-end	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	301	Vehs Same Direction: Rear End
3	Hospitalisation	2020	Multi-vehicle	Rear-end	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Darkness -	301	Vehs Same Direction: Rear End
4	Medical treatment	2019	Multi-vehicle	Rear-end	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	302	Vehs Same Direction: Left Rear
5	Medical treatment	2020	Multi-vehicle	Rear-end	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	301	Vehs Same Direction: Rear End
6	Hospitalisation	2017	Multi-vehicle	Angle	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	101	Vehs Adjacent Approach: Thru-Thru
7	Hospitalisation	2016	Single vehicle	Hit object	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	708	Off Path-Straight: Mounts Traffic Island
8	Hospitalisation	2015	Multi-vehicle	Rear-end	Kalynda Pde		Shaw Rd	Intersection	Daylight	301	Vehs Same Direction: Rear End
9	Property damage only	2009	Multi-vehicle	Rear-end	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	301	Vehs Same Direction: Rear End
10	Property damage only	2007	Multi-vehicle	Angle	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	106	Vehs Adjacent Approach: Left-Right
11	Medical treatment	2008	Single vehicle	Fall from vehicle	Dalrymple Rd	(1/04)	Shaw Rd	Intersection	Daylight	802	Off Path-Curve: Off Cway Left Bend
12	Medical treatment	2021	Multi-vehicle	Rear-end	Shaw Rd		The Ring Rd (Code To 10740) 01/09	Midblock	Daylight	300	Vehs Same Direction: Other
13	Hospitalisation	2018	Multi-vehicle	Sideswipe	Shaw Rd			Midblock	Daylight	408	Vehs Manoeuvring: Entering From Footway
14	Hospitalisation	2020	Single vehicle	Hit object	Shaw Rd			Midblock	Dawn/Dusl	708	Off Path-Straight: Mounts Traffic Island
15	Medical treatment	2021	Single vehicle	Hit object	Shaw Rd			Midblock	Daylight	803	Off Path-Curve: Off Cway Rt Bend Hit Obj
16	Hospitalisation	2020	Single vehicle	Overturned	Shaw Rd			Midblock	Daylight	803	Off Path-Curve: Off Cway Rt Bend Hit Obj
17	Medical treatment	2012	Multi-vehicle	Rear-end	Shaw Rd			Midblock	Daylight	301	Vehs Same Direction: Rear End
18	Hospitalisation	2014	Multi-vehicle	Rear-end	Shaw Rd			Midblock	Daylight	301	Vehs Same Direction: Rear End
19	Medical treatment	2013	Multi-vehicle	Rear-end	Shaw Rd			Midblock	Daylight	301	Vehs Same Direction: Rear End
20	Hospitalisation	2016	Single vehicle	Fall from vehicle	Shaw Rd			Midblock	Darkness -	805	Off Path-Curve: Out Of Control On Cway
21	Hospitalisation	2015	Single vehicle	Hit object	Shaw Rd			Midblock	Darkness -	804	Off Path-Curve: Off Cway Lt Bend Hit Obj
22	Hospitalisation	2016	Single vehicle	Overturned	Shaw Rd			Midblock	Daylight	801	Off Path-Curve: Off Cway Right Bend
23	Hospitalisation	2023	Hit pedestrian	Hit pedestrian	Shaw Rd			Midblock	Darkness -	0	Pedn: Hit Other
24	Hospitalisation	2015	Multi-vehicle	Sideswipe	Shaw Rd			Midblock	Daylight	201	Vehs Opposite Approach: Head On
25	Medical treatment	2007	Multi-vehicle	Rear-end	Shaw Rd			Midblock	Daylight	303	Vehs Same Direction: Right Rear
26	Hospitalisation	2007	Multi-vehicle	Rear-end	Shaw Rd			Midblock	Daylight	303	Vehs Same Direction: Right Rear
27	Medical treatment	2016	Multi-vehicle	Rear-end	Shaw Rd			Midblock	Daylight	301	Vehs Same Direction: Rear End
28	Hospitalisation	2011	Multi-vehicle	Rear-end	Shaw Rd			Midblock	Daylight	301	Vehs Same Direction: Rear End

APPENDIX H

Site Development Plan

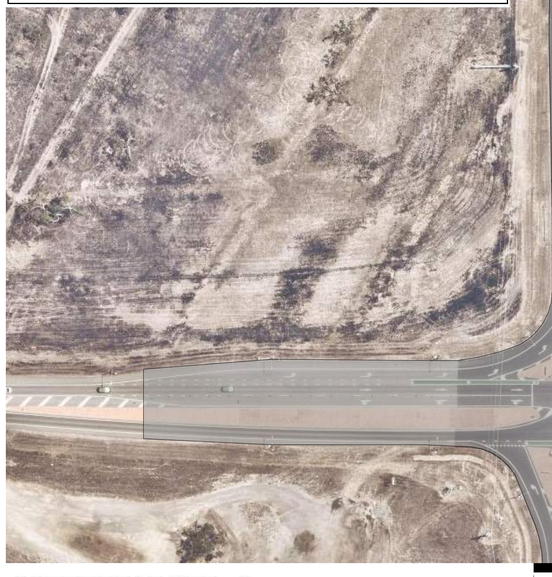
Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

AREAS & CARPARK SUMMARY

USE	AREA(m^2)	RATIO	CARS REQUIRED	CARS PROVIDED
STAGE 1				
CHILDCARE	954	REFER TO BELOW	42	28
QSR4	240	1/20m^2	12	20
QSR5	270	1/20m^2	13.5	20
SERVICE STATION	385	1/25m^2	15.4	19
TYRE AND AUTO CENTRE	367	1/40m^2	9	12
CARWASH	190	-		12
				111 CARS ON SITE
SUBTOTAL	**2406**		**92**	**111**
STAGE 2A				
KIOSK	25	1/20m^2 *	1.3	-
RETAIL	787	1/20m^2 *	39.4	-
SUPERMARKET	3759	1/20m^2 *	188	-
				232 CARS ON SITE
				18 CARS STREET PARKING
				6 CARS DIRECT TO BOOT
SUBTOTAL	**4571**		**228**	**256**
CUMULATIVE TOTAL	**6977**		**320**	**367**
STAGE 2B				
COMMERCIAL	330	1/30m^2	11	-
COMMERCIAL	1064	1/30m^2	35	-
				88 CARS ON SITE
SUBTOTAL	**1394**		**46**	**88**
CUMULATIVE TOTAL	**8371**		**367**	**455**
STAGE 2C				
GROCERIES	1533	1/20m^2*	76.7	-
MINI MAJOR	600	1/20m^2*	30	-
RETAIL	342	1/20m^2*	17.1	-
				70 CARS ON SITE
SUBTOTAL	**2475**		**124**	**70**
CUMULATIVE TOTAL	**10846**		**491**	**525**
STAGE 2D				
LIBRARY	287	1/30m^2	9.6	-
SWIM SCHOOL	602	1/30m^2	20.1	-
				24 CARS ON SITE
SUBTOTAL	**889**		**30**	**24**
CUMULATIVE TOTAL	**11735**		**520**	**549**
STAGE 3A				
LFR	1223	1/40m^2	30.6	-
LIQUOR	800	1/40m^2	20	-
TAVERN	557	1/20m^2	27.9	-
				65 CARS ON SITE
SUBTOTAL	**2580**		**79**	**65**
CUMULATIVE TOTAL	**14315**		**599**	**614**
STAGE 3B				
LFR	14898	1/40m^2	372.5	-
RETAIL	188	1/25m^2	7.5	-
				384 CARS ON SITE
SUBTOTAL	**15086**		**380**	**384**
CUMULATIVE TOTAL	**29401**		**979**	**998**
STAGE 4				
LFR	1246	1/40m^2	31.2	36
QSR1	533	1/20m^2	26.7	31
QSR2	277	1/20m^2	13.9	20
QSR3	271	1/20m^2	13.6	21
				108 CARS ON SITE
				5 CARS STREET PARKING
SUBTOTAL	**2327**		**86**	**113**
OVERALL TOTAL	**31728**		**1065**	**1111**

PARKING RATE FOR CHILDCARE: 1 SPACE PER 6 CHILDREN AND 1 SPACE PER EMPLOYEE
PARKING RATE FOR FOOD AND DRINK OUTLET: 1/10m2 FOR PUBLIC AREA, 1/50m2 FOR FOOD PREPARATION, 1/100m2 FOR STORAGE
*REQUIRED BY MAJOR TENANT, COUNCIL RATE IS 1/25m2

INDICATIVE FUTURE ROAD ACCESS TO RESIDENTIAL DEVELOPMENT
INDICATIVE FUTURE ROAD ACCESS TO RESIDENTIAL DEVELOPMENT
INDICATIVE FUTURE PEDESTRIAN ACCESS TO RESIDENTIAL DEVELOPMENT
INDICATIVE FUTURE RESIDENTIAL DEVELOPMENT BY OTHERS
SHAW RD
DALRYMPLE RD
PUTNEY ROAD
ST. BENEDICT'S CATHOLIC SCHOOL
AMENITIES
FIRE TANK
LFR 3,902m²
LFR 2,064m²
LFR 4,002m²
SUPERMARKET 3,759m²
GROCERIES 1,533m²
MINI MAJOR 600m²
SWIM SCHOOL 602m²
LIBRARY 287m²
TOWN SQUARE
RETAIL 188m²
RETAIL 457m²
MALL
RETAIL 330m²
RETAIL 342m²
KIOSK 25 m²
URBAN COMMON
LFR 320m²
LFR 340m²
LFR 484m²
LFR 1,438m²
LFR 1,223m²
COMMERCIAL 370m²
COMMERCIAL 367m²
COMMERCIAL 327m²
COMMERCIAL 330m²
CHILDCARE SITE AREA 3,247m² GFA 954m²
LFR 1,140m²
LFR 1,208m²
LIQUOR 800m²
TAVERN 557m²
BEER GARDEN
LFR 1,246m²
PAD SITE 1 2,572m² 28 CARS
PAD SITE 2 1,903m² 20 CARS
PAD SITE 3 1,958m² 21 CARS
PAD SITE 4 3,475m² 36 CARS
PAD SITE 5 2,041m² 20 CARS
PAD SITE 6 1,848m² 20 CARS
PAD SITE 7 1,389m² 12 CARS
PAD SITE 8 4,296m² 19 CARS
QSR1 533m²
QSR2 277m²
QSR3 271m²
QSR4 GFA 240m²
QSR 5 GFA 270m²
TYRE AND AUTO CENTRE GFA 367m²
CAR WASH 135m²
SERVICE STATION GFA 385m²
CAR WASH 55m²
AUTOMATIC WASH BAY
AIR/WATER
BOWSERS
WAITING BAY
STACKING
PYLON 01
PYLON 02
PYLON 03
PYLON 04
PYLON 05
PYLON 06
PYLON 07
PYLON 08
PYLON 09



COTTEEPARKER

BRISBANE
T 61 7 3846 7422

COTTEE PARKER ARCHITECTS PTY LTD
ABN 77 010 924 106

COTTEEPARKER.COM.AU

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SCALE 1: 2000 @ A3

N

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12	STAGE 1 ISSUE	7/11/24	CPA	EB	MC
11	STAGE 2 ISSUE	28/10/24	CPA	EB	MC
10	PROGRESS ISSUE	23/10/24	CPA	EB	MC
09	MASTERPLAN PROGRESS ISSUE	21/10/24	CPA	EB	MC
08	MASTERPLAN PROGRESS ISSUE	27/09/24	CPA	EB	EB
07	MASTERPLAN PROGRESS ISSUE	25/09/24	EB	MC	MC
06	FOR INFOMATION	19/09/24	CPA	EB	MC
05	STAGE 2 PROGRESS ISSUE	05/09/24	EB	MC	MC
04	PROGRESS ISSUE	23/08/24	CPA	MC	MC
03	FOR INFORMATION	23/07/24	EB	MC	MC
02	FOR INFORMATION	15/07/24	JG	EB	MC

ISSUE PURPOSE: SD

PARKSIDE GREATER ASCOT

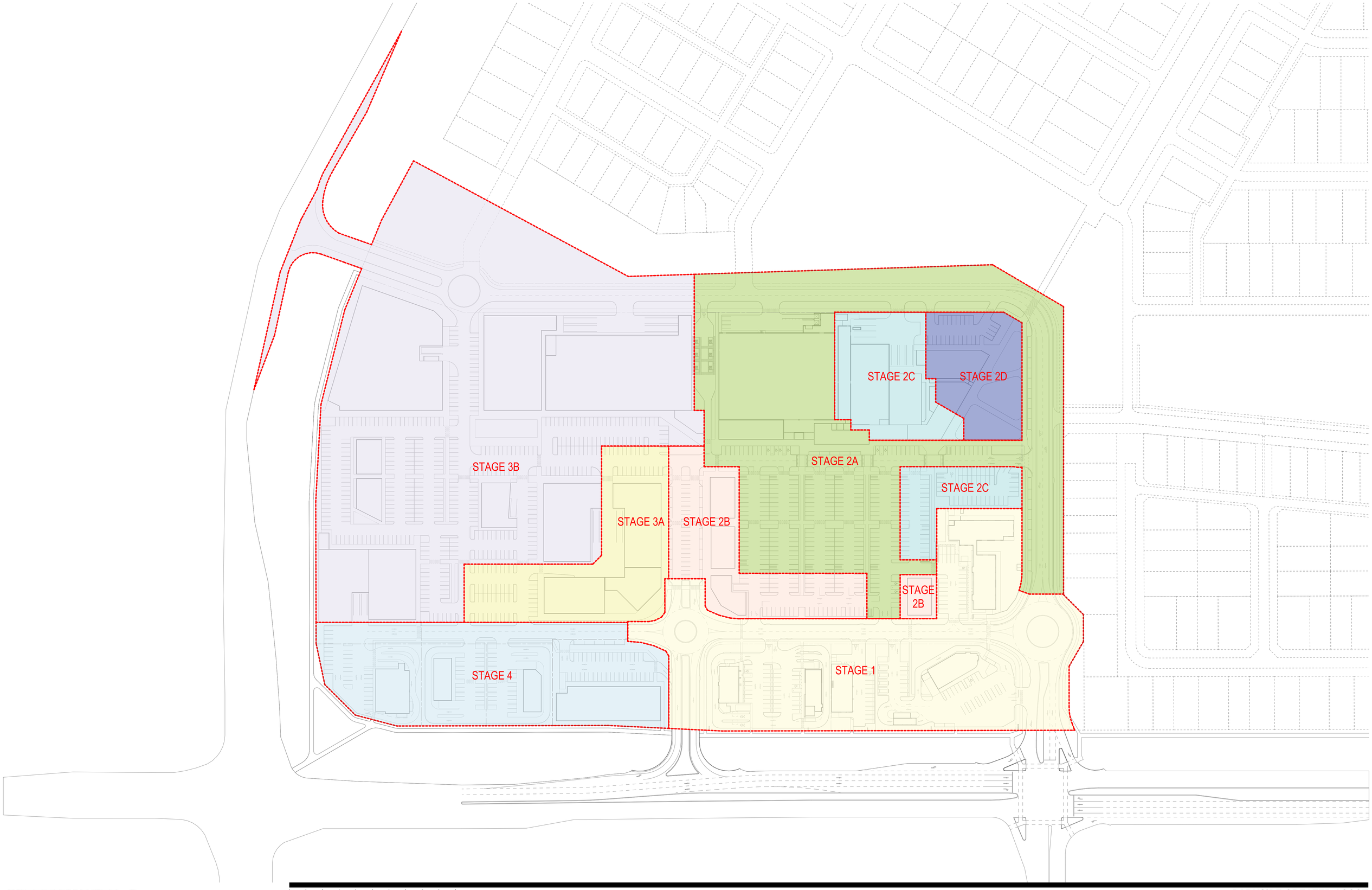
DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
MASTERPLAN

JOB No 6570
DRAWING No SD1003
ISSUE 12

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



COTTEEPARKER

BRISBANE
T 61 7 3846 7422

COTTEE PARKER ARCHITECTS PTY LTD
ABN 77 010 924 106

COTTEEPARKER.COM.AU

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04	STAGE 2 ISSUE	28/10/24	CPA	EB	MC
03	PROGRESS ISSUE	23/10/24	CPA	EB	MC
02	MASTERPLAN PROGRESS ISSUE	21/10/24	CPA	EB	MC
01	MASTERPLAN PROGRESS ISSUE	25/09/24	EB	MC	MC

SD

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

STAGING PLAN

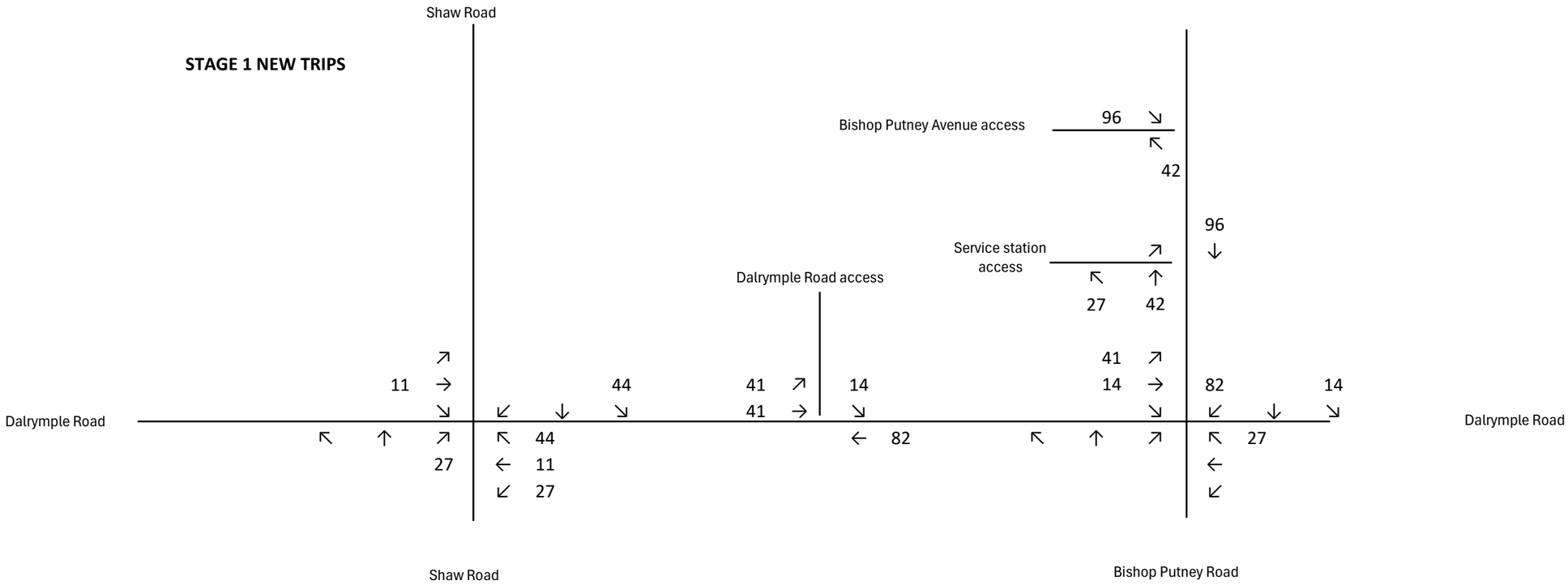
JOB No	DRAWING No	ISSUE
6570	SD2801	05

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

APPENDIX I

Development Traffic Models

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



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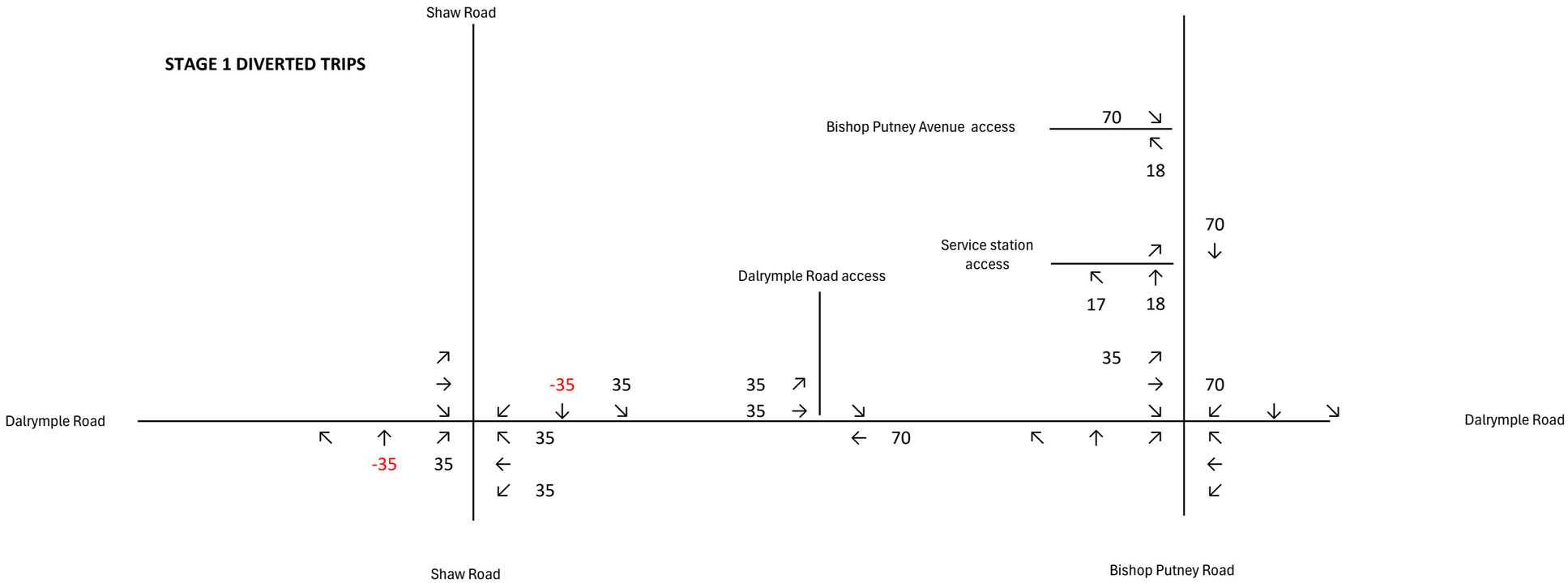

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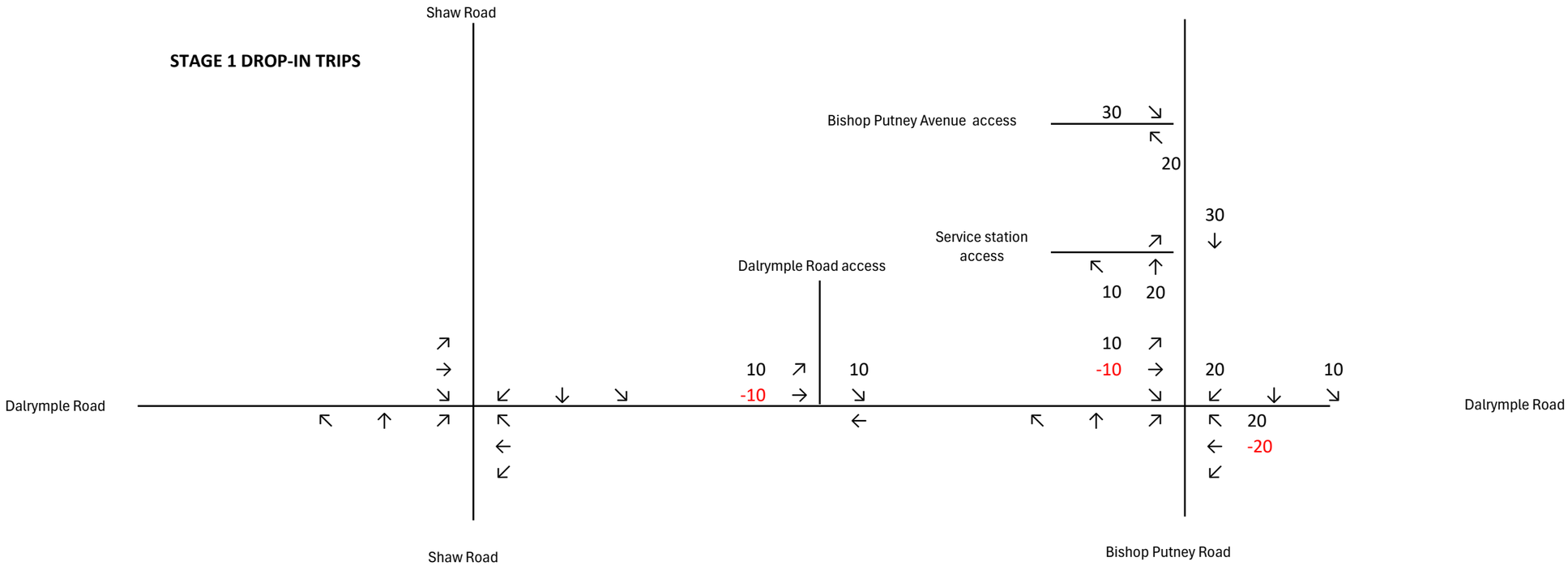

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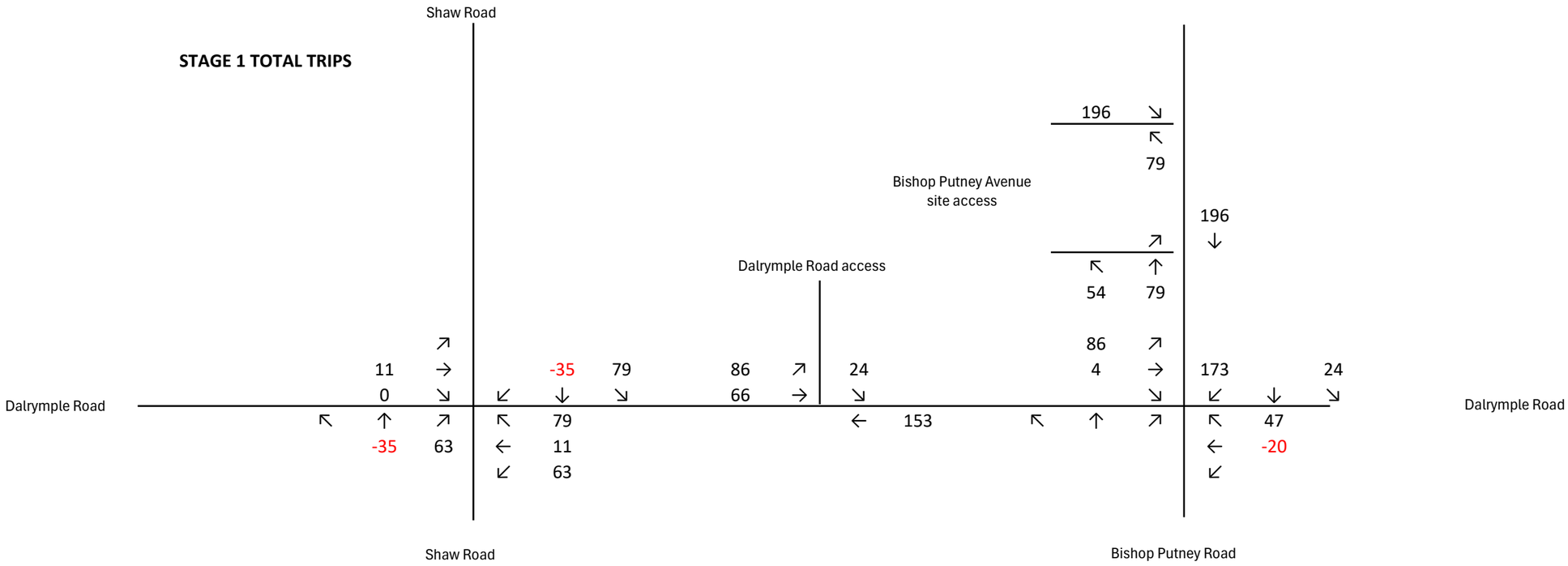

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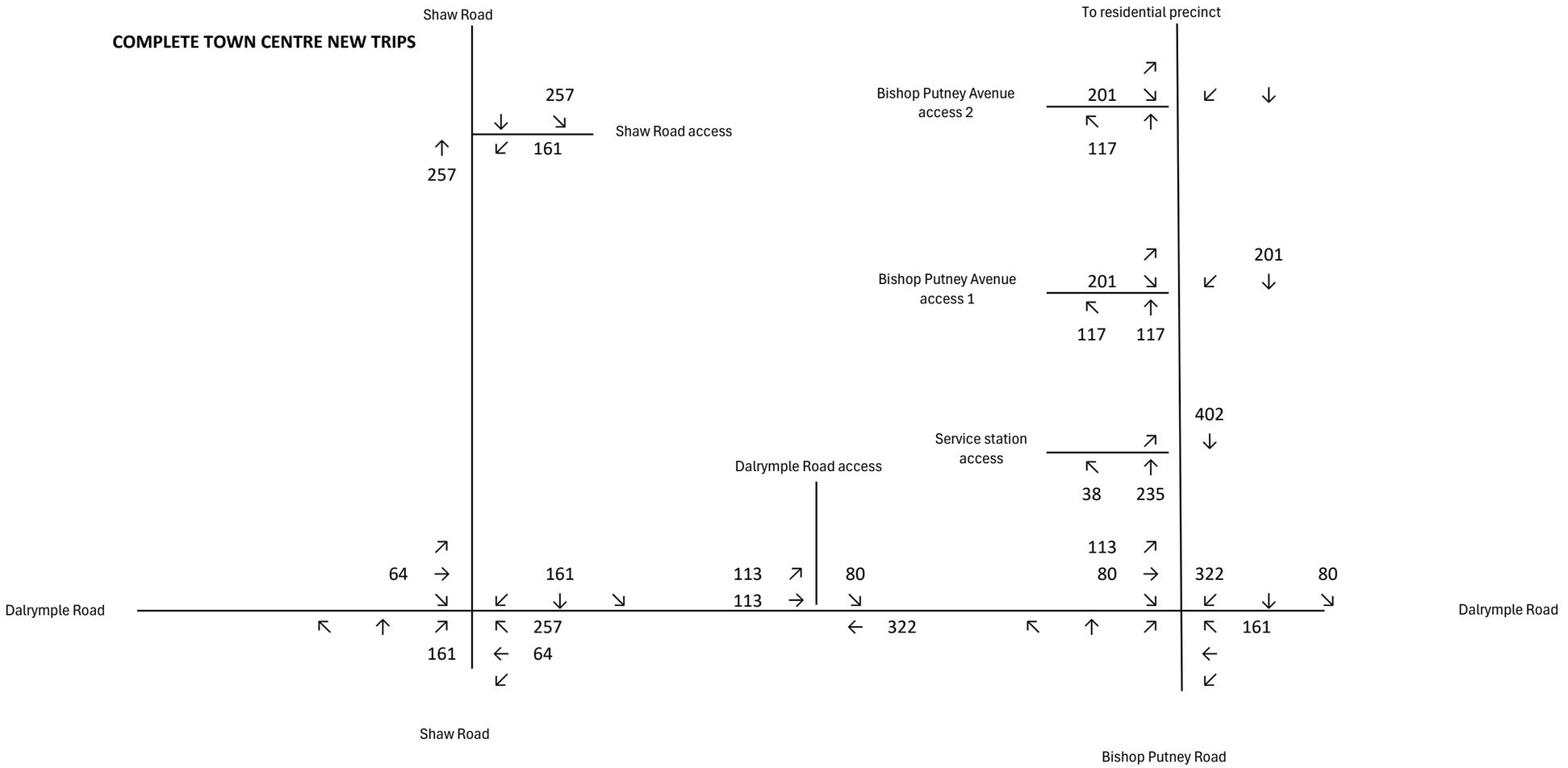

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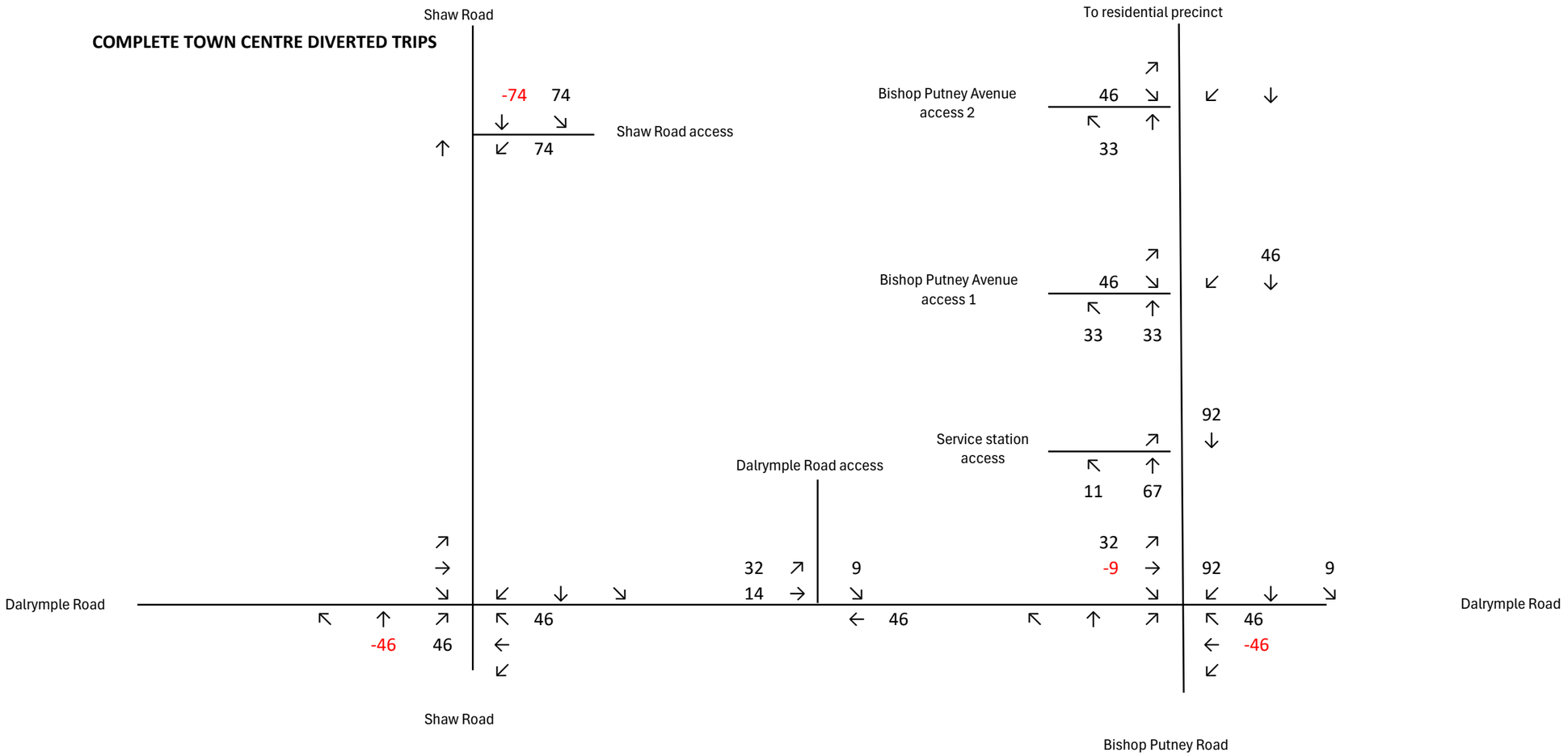

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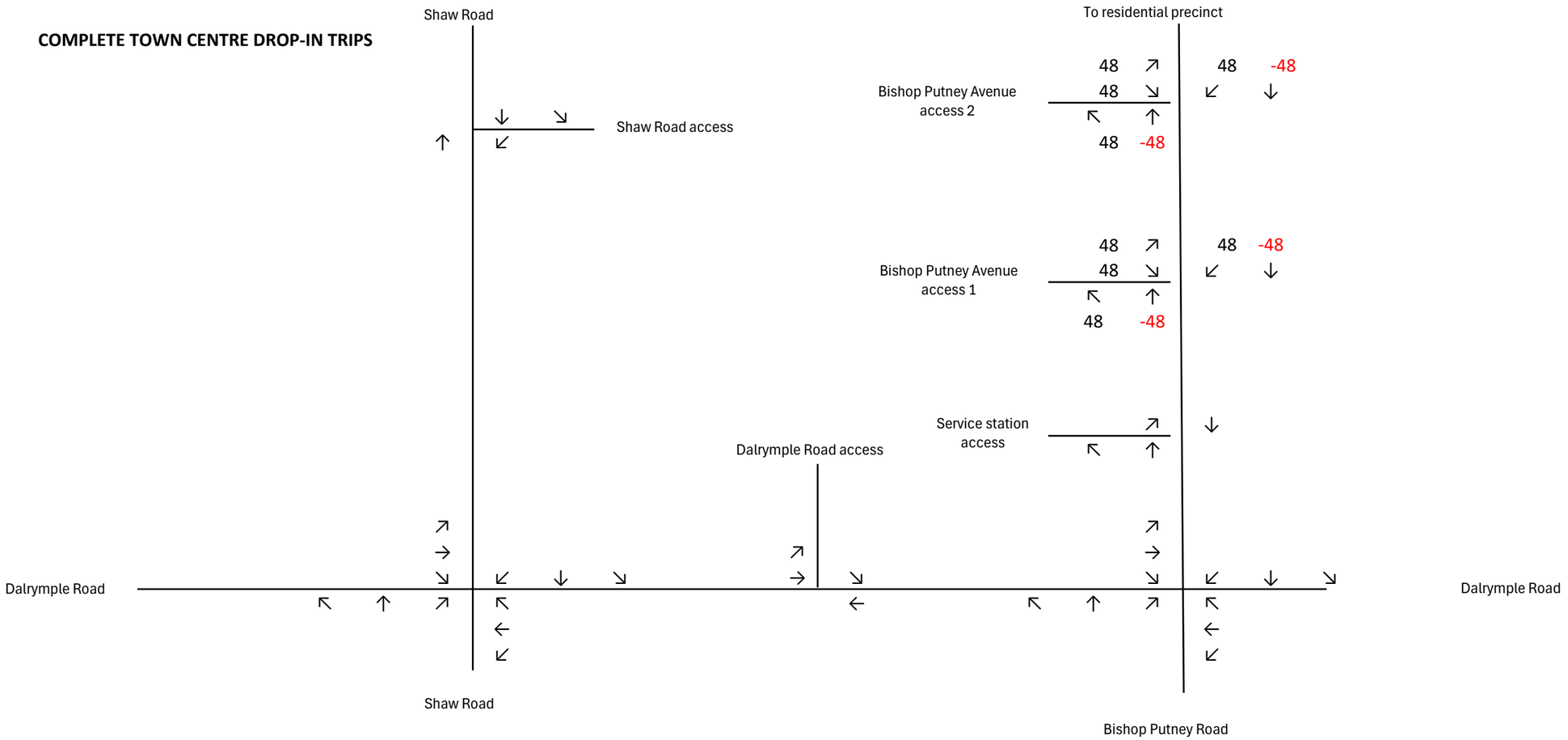
Version: 1, Version Date: 03/04/2025

COMPLETE TOWN CENTRE DROP-IN TRIPS



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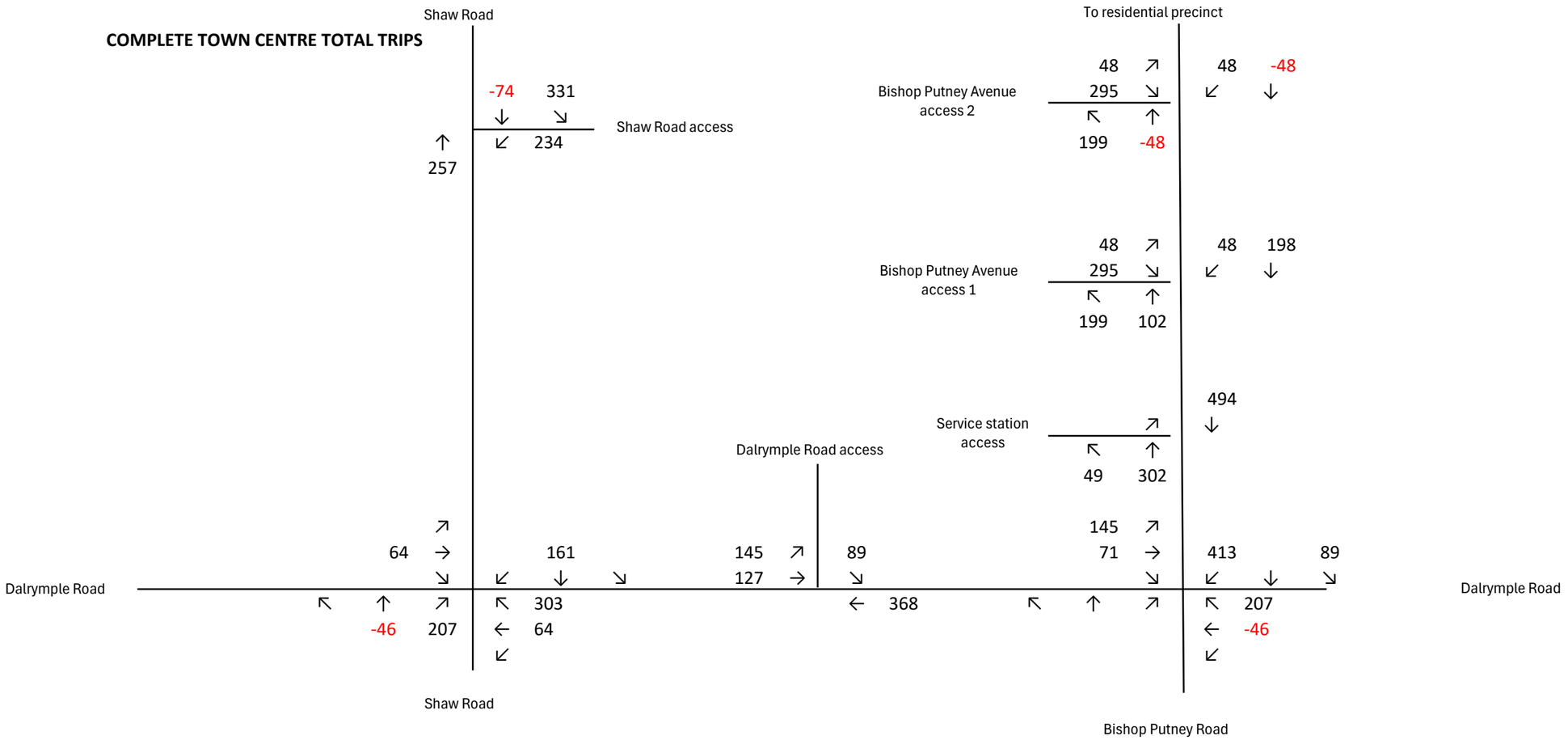


Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

APPENDIX J

SIDRA Outputs – Dalrymple Road / Bishop Putney Avenue Signalised Crossroads

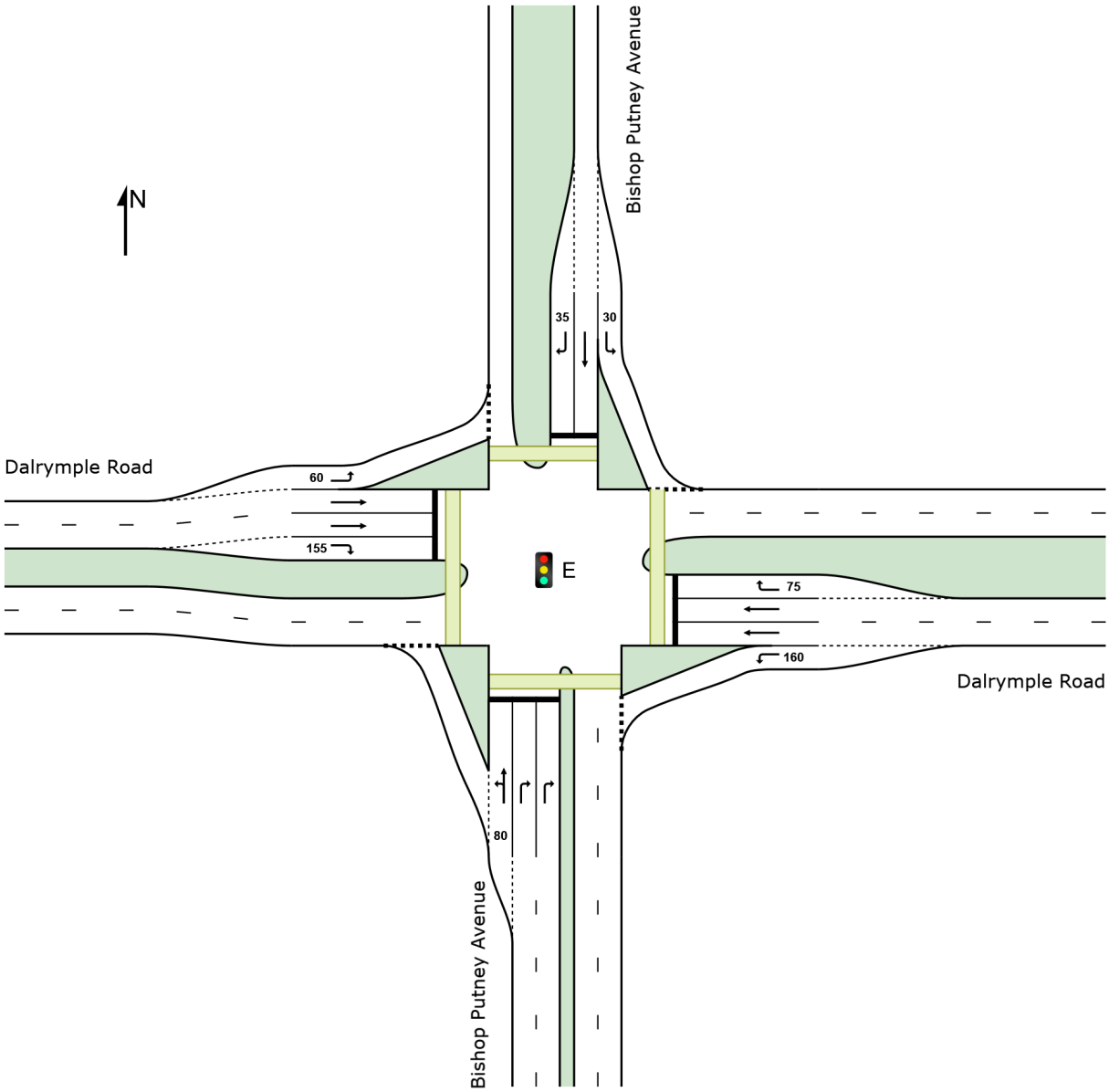
Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

SITE LAYOUT

Site: E [EXO1 (Site Folder: BJ)]

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: PREMISE GROUP SERVICES PTY LTD | Licence: NETWORK / 1PC | Created: Tuesday, 4 March 2025 2:09:39 PM
Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

PHASING SUMMARY

Site: E [EXO1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: STREAMS
Input Phase Sequence: A, D, E, F, F2*, F1*
Output Phase Sequence: A, D, E, F
Reference Phase: Phase A
(* Variable Phase)

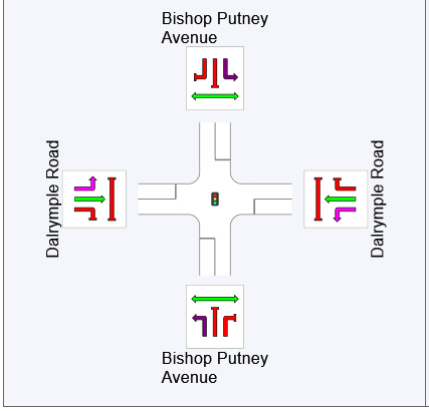
Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	35	56	78
Green Time (sec)	29	15	16	6
Phase Time (sec)	35	21	22	12
Phase Split	39%	23%	24%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0

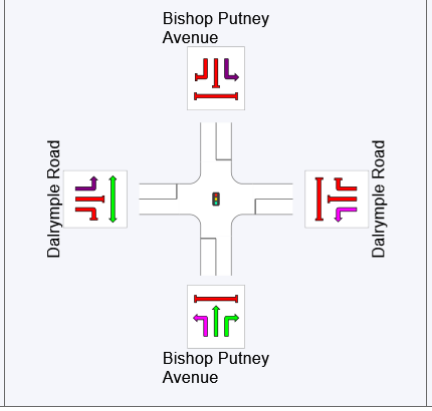
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

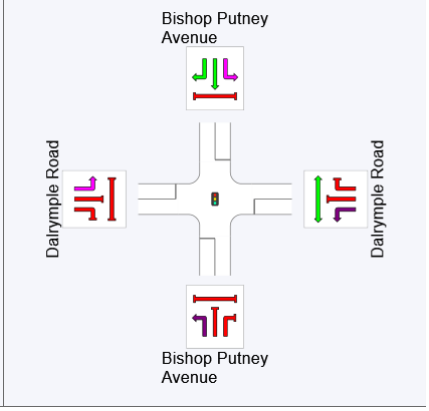
Phase A **REF**

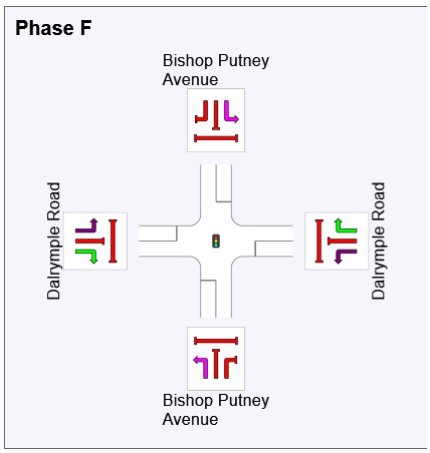


Phase D

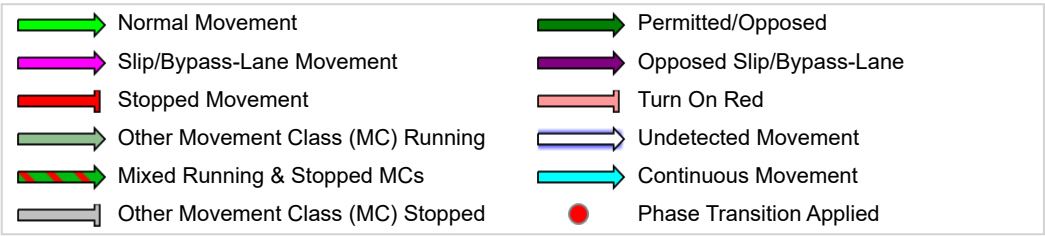


Phase E





REF: Reference Phase
VAR: Variable Phase



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LANE SUMMARY

Site: E [EXO1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Bishop Putney Avenue															
Lane 1	49	5.0	49	5.0	922	0.054	100	10.5	LOS B	0.7	5.1	Short	80	0.0	NA
Lane 2	14	5.0	14	5.0	299	0.048	100	40.0	LOS D	0.5	3.9	Full	120	0.0	0.0
Lane 3	14	5.0	14	5.0	299	0.048	100	40.0	LOS D	0.5	3.9	Full	120	0.0	0.0
Approach	78	5.0	78	5.0		0.054		21.3	LOS C	0.7	5.1				
East: Dalrymple Road															
Lane 1	28	5.0	28	5.0	1496	0.019	100	6.2	LOS A	0.1	0.7	Short	160	0.0	NA
Lane 2	356	5.0	356	5.0	609	0.585	100	27.7	LOS C	13.2	96.2	Full	430	0.0	0.0
Lane 3	356	5.0	356	5.0	609	0.585	100	27.7	LOS C	13.2	96.2	Full	430	0.0	0.0
Lane 4	49	5.0	49	5.0	120	0.414	100	52.5	LOS D	2.3	16.4	Short	75	0.0	NA
Approach	789	5.0	789	5.0		0.585		28.5	LOS C	13.2	96.2				
North: Bishop Putney Avenue															
Lane 1	25	5.0	25	5.0	1155	0.022	100	6.2	LOS A	0.2	1.5	Short	30	0.0	NA
Lane 2	1	5.0	1	5.0	336	0.003	100	32.4	LOS C	0.0	0.3	Full	60	0.0	0.0
Lane 3	182	5.0	182	5.0	319	0.571	100	42.1	LOS D	7.6	55.2	Short	35	0.0	NA
Approach	208	5.0	208	5.0		0.571		37.7	LOS D	7.6	55.2				
West: Dalrymple Road															
Lane 1	91	5.0	91	5.0	1483	0.061	100	6.3	LOS A	0.4	2.7	Short	60	0.0	NA
Lane 2	256	5.0	256	5.0	609	0.421	100	25.9	LOS C	8.9	64.9	Full	440	0.0	0.0
Lane 3	256	5.0	256	5.0	609	0.421	100	25.9	LOS C	8.9	64.9	Full	440	0.0	0.0
Lane 4	31	5.0	31	5.0	120	0.255	100	51.7	LOS D	1.4	10.0	Short	155	0.0	NA
Approach	634	5.0	634	5.0		0.421		24.4	LOS C	8.9	64.9				
All Vehicles	1709	5.0	1709	5.0		0.585		27.7	LOS C	13.2	96.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Bishop Putney Avenue

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	48	1	-	49	5.0	922	0.054	100	0.0	2
Lane 2	-	-	14	14	5.0	299	0.048	100	NA	NA
Lane 3	-	-	14	14	5.0	299	0.048	100	NA	NA
Approach	48	1	28	78	5.0		0.054			

East: Dalrymple Road

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	28	-	-	28	5.0	1496	0.019	100	0.0	2
Lane 2	-	356	-	356	5.0	609	0.585	100	NA	NA
Lane 3	-	356	-	356	5.0	609	0.585	100	NA	NA
Lane 4	-	-	49	49	5.0	120	0.414	100	0.0	3
Approach	28	712	49	789	5.0		0.585			

North: Bishop Putney Avenue

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	-	-	25	5.0	1155	0.022	100	0.0	2
Lane 2	-	1	-	1	5.0	336	0.003	100	NA	NA
Lane 3	-	-	182	182	5.0	319	0.571	100	46.8	2
Approach	25	1	182	208	5.0		0.571			

West: Dalrymple Road

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	91	-	-	91	5.0	1483	0.061	100	0.0	2
Lane 2	-	256	-	256	5.0	609	0.421	100	NA	NA
Lane 3	-	256	-	256	5.0	609	0.421	100	NA	NA
Lane 4	-	-	31	31	5.0	120	0.255	100	0.0	3
Approach	91	513	31	634	5.0		0.421			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1709	5.0	0.585

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Bishop Putney Avenue				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
North: Bishop Putney Avenue				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

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Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

MOVEMENT SUMMARY

Site: E [EXO1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bishop Putney Avenue															
1	L2	All MCs	48	5.0	48	5.0	0.054	10.1	LOS B	0.7	5.1	0.40	0.63	0.40	43.6
2	T1	All MCs	1	5.0	1	5.0	* 0.054	30.6	LOS C	0.7	5.1	0.40	0.63	0.40	32.1
3	R2	All MCs	28	5.0	28	5.0	0.048	40.0	LOS D	0.5	3.9	0.87	0.68	0.87	27.0
Approach			78	5.0	78	5.0	0.054	21.3	LOS C	0.7	5.1	0.57	0.65	0.57	35.6
East: Dalrymple Road															
4	L2	All MCs	28	5.0	28	5.0	0.019	6.2	LOS A	0.1	0.7	0.15	0.58	0.15	47.7
5	T1	All MCs	712	5.0	712	5.0	* 0.585	27.7	LOS C	13.2	96.2	0.89	0.77	0.89	39.5
6	R2	All MCs	49	5.0	49	5.0	* 0.414	52.5	LOS D	2.3	16.4	1.00	0.74	1.00	21.7
Approach			789	5.0	789	5.0	0.585	28.5	LOS C	13.2	96.2	0.87	0.76	0.87	38.5
North: Bishop Putney Avenue															
7	L2	All MCs	25	5.0	25	5.0	0.022	6.2	LOS A	0.2	1.5	0.26	0.59	0.26	46.7
8	T1	All MCs	1	5.0	1	5.0	0.003	32.4	LOS C	0.0	0.3	0.84	0.50	0.84	16.7
9	R2	All MCs	182	5.0	182	5.0	* 0.571	42.1	LOS D	7.6	55.2	0.97	0.81	0.97	25.0
Approach			208	5.0	208	5.0	0.571	37.7	LOS D	7.6	55.2	0.88	0.78	0.88	26.4
West: Dalrymple Road															
10	L2	All MCs	91	5.0	91	5.0	0.061	6.3	LOS A	0.4	2.7	0.17	0.59	0.17	47.1
11	T1	All MCs	513	5.0	513	5.0	0.421	25.9	LOS C	8.9	64.9	0.83	0.70	0.83	40.4
12	R2	All MCs	31	5.0	31	5.0	0.255	51.7	LOS D	1.4	10.0	0.98	0.72	0.98	23.6
Approach			634	5.0	634	5.0	0.421	24.4	LOS C	8.9	64.9	0.75	0.69	0.75	40.0
All Vehicles			1709	5.0	1709	5.0	0.585	27.7	LOS C	13.2	96.2	0.81	0.73	0.81	37.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bishop Putney Avenue												

P1	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
East: Dalrymple Road												
P2	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
North: Bishop Putney Avenue												
P3	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
West: Dalrymple Road												
P4	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
All Pedestrians		120	126	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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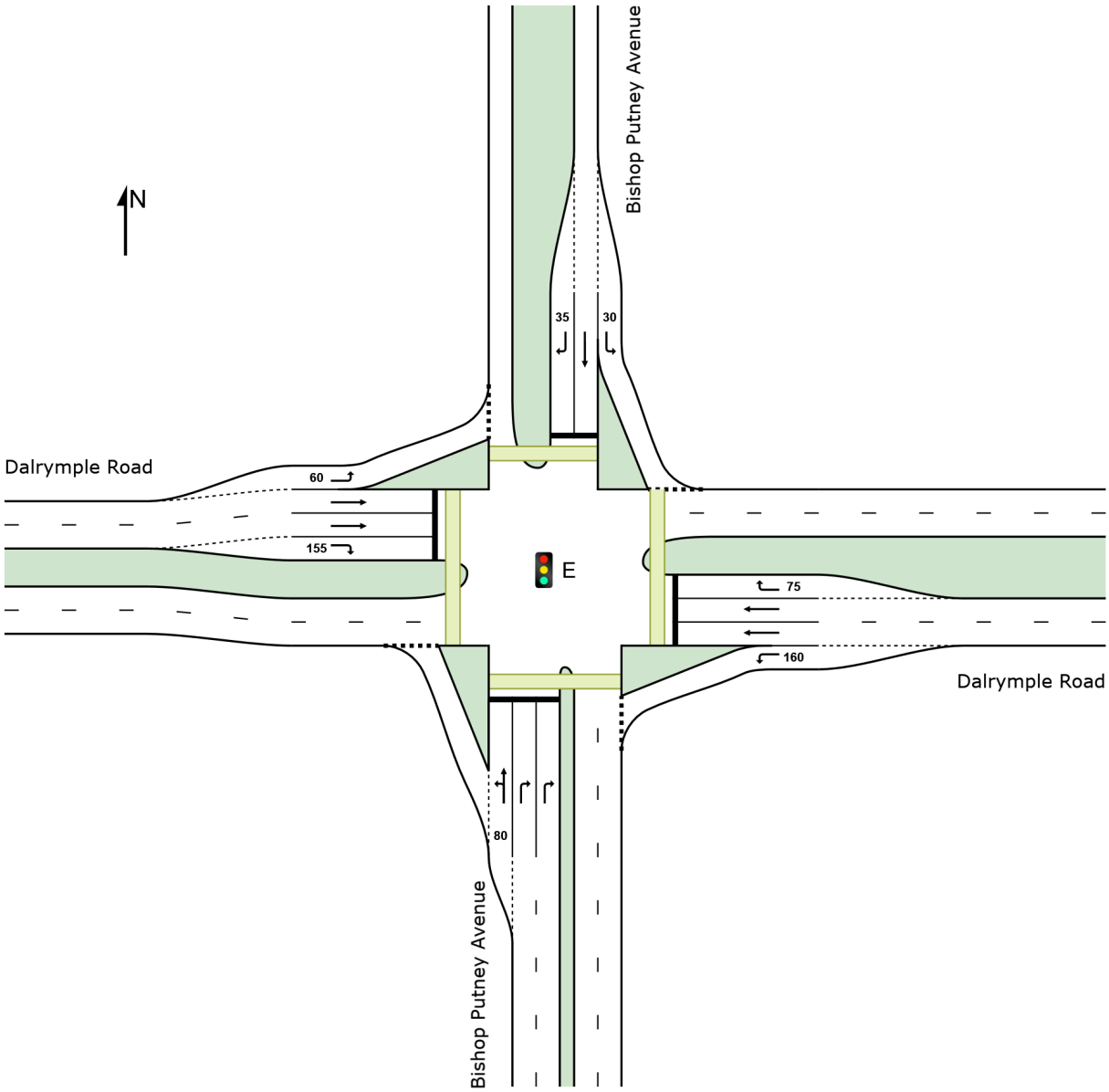
SITE LAYOUT

Site: E [EXD1 (Site Folder: BJ)]

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement
Forecast design year (2038) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

PHASING SUMMARY

Site: E [EXD1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement
Forecast design year (2038) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: STREAMS
Input Phase Sequence: A, D, E, F, F2*, F1*
Output Phase Sequence: A, D, E, F
Reference Phase: Phase A
(* Variable Phase)

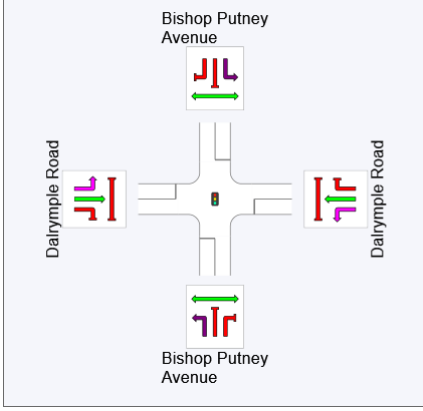
Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	33	54	76
Green Time (sec)	27	15	16	8
Phase Time (sec)	33	21	22	14
Phase Split	37%	23%	24%	16%
Phase Frequency (%)	100.0	100.0	100.0	100.0

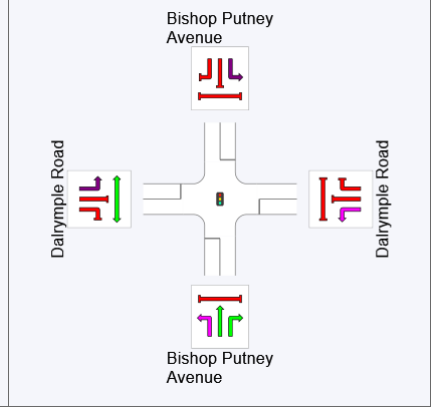
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

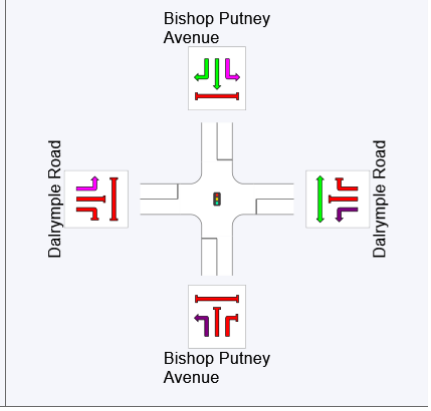
Phase A **REF**

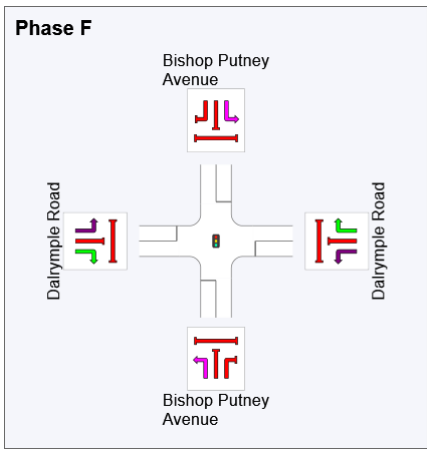


Phase D

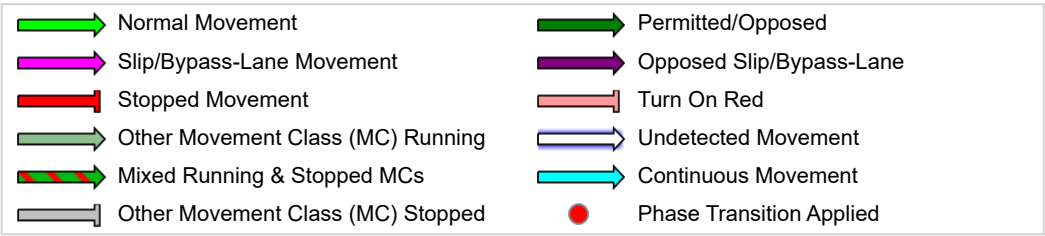


Phase E





REF: Reference Phase
VAR: Variable Phase



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LANE SUMMARY

Site: E [EXD1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement
Forecast design year (2038) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Bishop Putney Avenue															
Lane 1	59	5.0	59	5.0	889	0.066	100	12.5	LOS B	1.0	7.2	Short	80	0.0	NA
Lane 2	17	5.0	17	5.0	299	0.056	100	40.1	LOS D	0.6	4.6	Full	120	0.0	0.0
Lane 3	17	5.0	17	5.0	299	0.056	100	40.1	LOS D	0.6	4.6	Full	120	0.0	0.0
Approach	93	5.0	93	5.0		0.066		22.5	LOS C	1.0	7.2				
East: Dalrymple Road															
Lane 1	34	5.0	34	5.0	1483	0.023	100	6.2	LOS A	0.1	0.9	Short	160	0.0	NA
Lane 2	401	5.0	401	5.0	567	0.708	100	31.1	LOS C	16.1	117.2	Full	430	0.0	0.0
Lane 3	401	5.0	401	5.0	567	0.708	100	31.1	LOS C	16.1	117.2	Full	430	0.0	0.0
Lane 4	105	5.0	105	5.0	159	0.660	100	52.1	LOS D	4.9	35.4	Short	75	0.0	NA
Approach	941	5.0	941	5.0		0.708		32.5	LOS C	16.1	117.2				
North: Bishop Putney Avenue															
Lane 1	63	5.0	63	5.0	1150	0.055	100	6.5	LOS A	0.6	4.0	Short	30	0.0	NA
Lane 2	1	5.0	1	5.0	336	0.003	100	34.8	LOS C	0.0	0.3	Full	60	0.0	18.8[8]
Lane 3	220	5.0	220	5.0	319[1]	0.690	100	46.5	LOS D	9.6	69.9	Short	35	0.0	NA
Approach	284	5.0	284	5.0		0.690		37.6	LOS D	9.6	69.9				
West: Dalrymple Road															
Lane 1	146	5.0	146	5.0	1431	0.102	100	6.7	LOS A	0.8	6.2	Short	60	0.0	NA
Lane 2	279	5.0	279	5.0	567	0.492	100	28.1	LOS C	10.2	74.2	Full	440	0.0	0.0
Lane 3	279	5.0	279	5.0	567	0.492	100	28.1	LOS C	10.2	74.2	Full	440	0.0	0.0
Lane 4	37	5.0	37	5.0	159	0.231	100	49.0	LOS D	1.6	11.6	Short	155	0.0	NA
Approach	741	5.0	741	5.0		0.492		24.9	LOS C	10.2	74.2				
All Vehicles	2059	5.0	2059	5.0		0.708		30.0	LOS C	16.1	117.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)

South: Bishop Putney Avenue

Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From S To Exit:	W	N	E			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	58	1	-	59	5.0	889	0.066	100	0.0	2
Lane 2	-	-	17	17	5.0	299	0.056	100	NA	NA
Lane 3	-	-	17	17	5.0	299	0.056	100	NA	NA
Approach	58	1	34	93	5.0		0.066			

East: Dalrymple Road

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	34	-	-	34	5.0	1483	0.023	100	0.0	2
Lane 2	-	401	-	401	5.0	567	0.708	100	NA	NA
Lane 3	-	401	-	401	5.0	567	0.708	100	NA	NA
Lane 4	-	-	105	105	5.0	159	0.660	100	0.0	3
Approach	34	802	105	941	5.0		0.708			

North: Bishop Putney Avenue

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	-	-	63	5.0	1150	0.055	100	0.0	2
Lane 2	-	1	-	1	5.0	336	0.003	100	NA	NA
Lane 3	-	-	220	220	5.0	319[1]	0.690	100	69.1	2
Approach	63	1	220	284	5.0		0.690			

West: Dalrymple Road

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	146	-	-	146	5.0	1431	0.102	100	0.0	2
Lane 2	-	279	-	279	5.0	567	0.492	100	NA	NA
Lane 3	-	279	-	279	5.0	567	0.492	100	NA	NA
Lane 4	-	-	37	37	5.0	159	0.231	100	0.0	3
Approach	146	558	37	741	5.0		0.492			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2059	5.0	0.708

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Bishop Putney Avenue				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

Lane 3	0.0	0.0	0.0	0.0
East: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
North: Bishop Putney Avenue				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

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Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

MOVEMENT SUMMARY

Site: E [EXD1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement
Forecast design year (2038) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bishop Putney Avenue															
1	L2	All MCs	58	5.0	58	5.0	0.066	12.1	LOS B	1.0	7.2	0.46	0.65	0.46	41.9
2	T1	All MCs	1	5.0	1	5.0	* 0.066	32.4	LOS C	1.0	7.2	0.46	0.65	0.46	29.6
3	R2	All MCs	34	5.0	34	5.0	0.056	40.1	LOS D	0.6	4.6	0.87	0.69	0.87	27.0
Approach			93	5.0	93	5.0	0.066	22.5	LOS C	1.0	7.2	0.61	0.66	0.61	34.9
East: Dalrymple Road															
4	L2	All MCs	34	5.0	34	5.0	0.023	6.2	LOS A	0.1	0.9	0.15	0.58	0.15	47.7
5	T1	All MCs	802	5.0	802	5.0	* 0.708	31.1	LOS C	16.1	117.2	0.95	0.83	0.97	38.0
6	R2	All MCs	105	5.0	105	5.0	* 0.660	52.1	LOS D	4.9	35.4	1.00	0.84	1.11	21.8
Approach			941	5.0	941	5.0	0.708	32.5	LOS C	16.1	117.2	0.93	0.82	0.95	36.3
North: Bishop Putney Avenue															
7	L2	All MCs	63	5.0	63	5.0	0.055	6.5	LOS A	0.6	4.0	0.28	0.60	0.28	46.4
8	T1	All MCs	1	5.0	1	5.0	0.003	34.8	LOS C	0.0	0.3	0.84	0.50	0.84	16.7
9	R2	All MCs	220	5.0	220	5.0	* 0.690	46.5	LOS D	9.6	69.9	0.99	0.86	1.05	24.3
Approach			284	5.0	284	5.0	0.690	37.6	LOS D	9.6	69.9	0.83	0.80	0.88	26.4
West: Dalrymple Road															
10	L2	All MCs	146	5.0	146	5.0	0.102	6.7	LOS A	0.8	6.2	0.22	0.61	0.22	46.7
11	T1	All MCs	558	5.0	558	5.0	0.492	28.1	LOS C	10.2	74.2	0.87	0.74	0.87	39.3
12	R2	All MCs	37	5.0	37	5.0	0.231	49.0	LOS D	1.6	11.6	0.96	0.73	0.96	24.3
Approach			741	5.0	741	5.0	0.492	24.9	LOS C	10.2	74.2	0.75	0.71	0.75	39.2
All Vehicles			2059	5.0	2059	5.0	0.708	30.0	LOS C	16.1	117.2	0.83	0.77	0.85	36.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bishop Putney Avenue												

P1	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
East: Dalrymple Road												
P2	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
North: Bishop Putney Avenue												
P3	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
West: Dalrymple Road												
P4	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
All Pedestrians		120	126	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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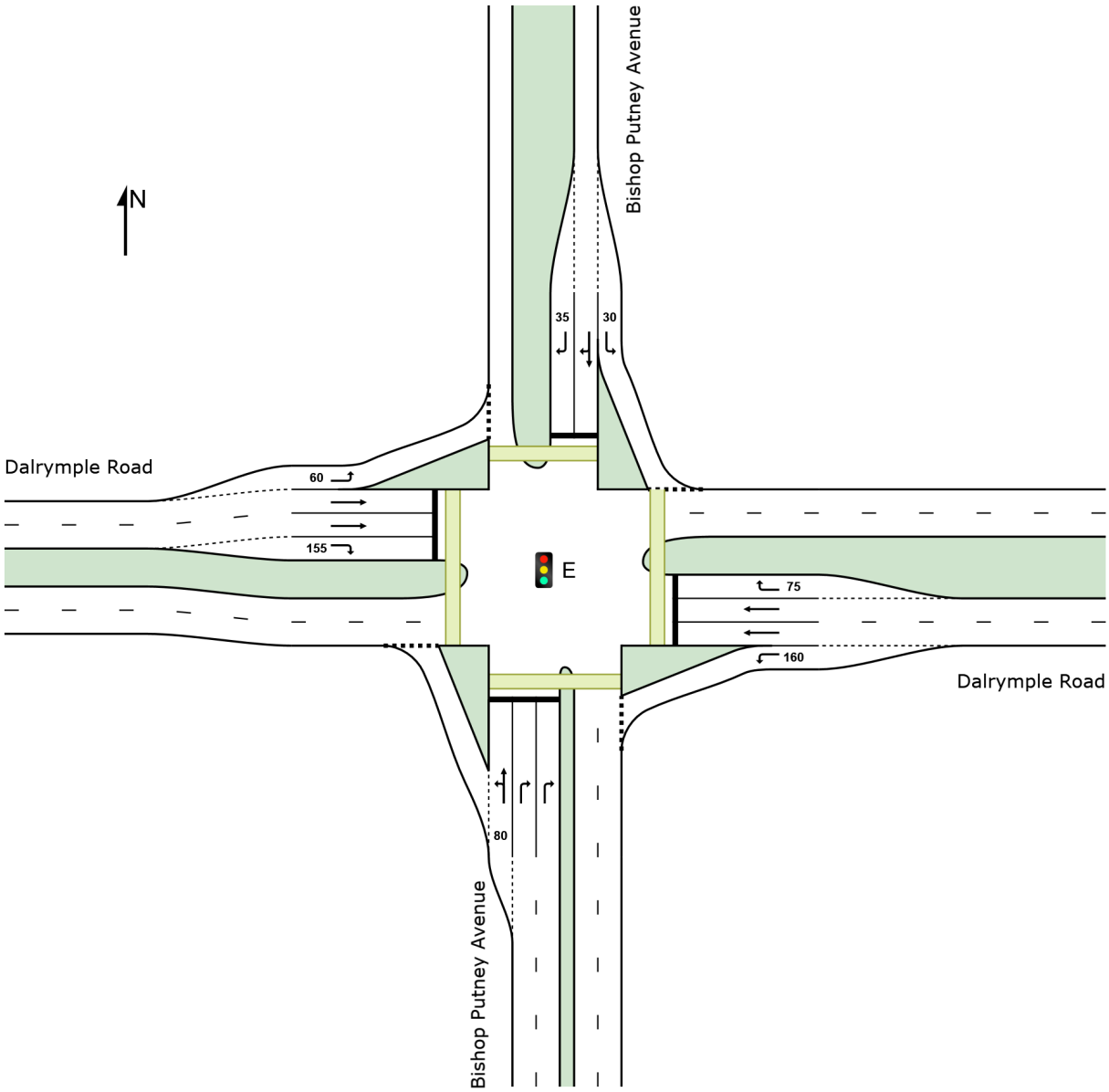
Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

SITE LAYOUT

Site: E [ERD1 (Site Folder: BJ)]

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement with southbound through lane converted to shared through-and-right lane
Forecast design year (2038) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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PHASING SUMMARY

Site: E [ERD1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement with southbound through lane converted to shared through-and-right lane
Forecast design year (2038) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

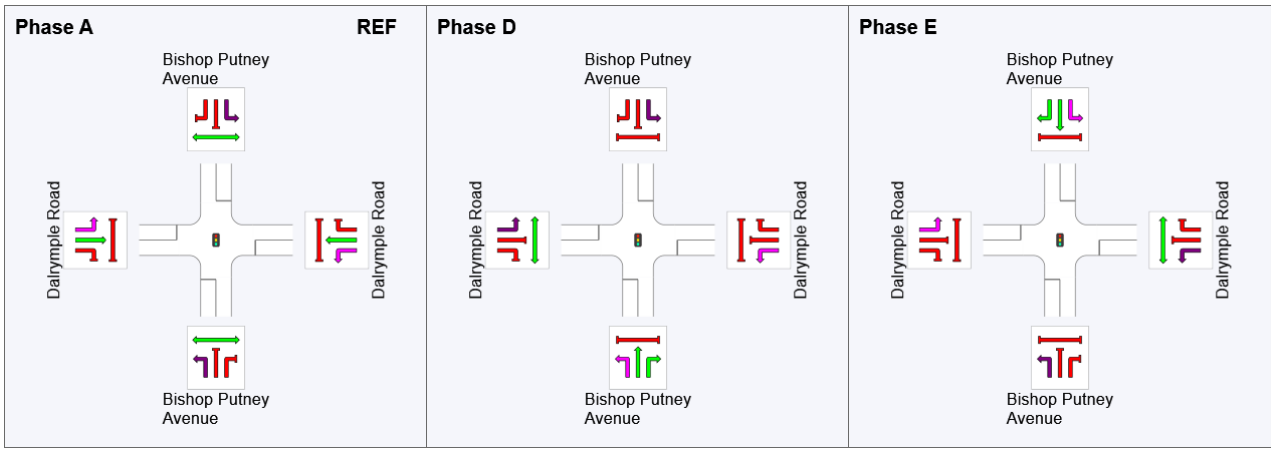
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: STREAMS
Input Phase Sequence: A, D, E, F, F2*, F1*
Output Phase Sequence: A, D, E, F
Reference Phase: Phase A
(* Variable Phase)

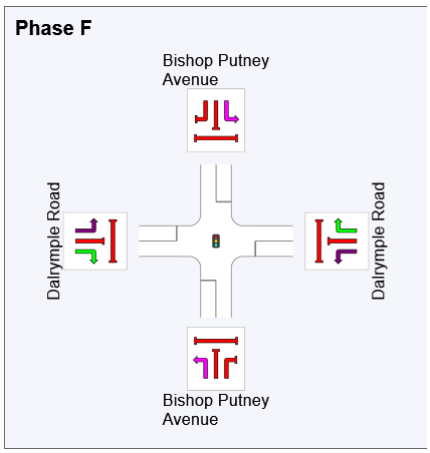
Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	34	55	76
Green Time (sec)	28	15	15	8
Phase Time (sec)	34	21	21	14
Phase Split	38%	23%	23%	16%
Phase Frequency (%)	100.0	100.0	100.0	100.0

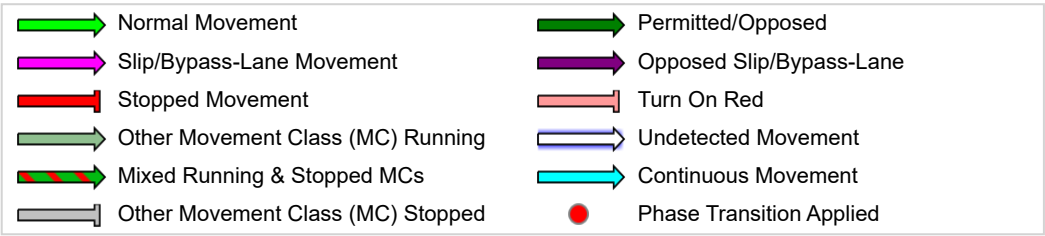
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence





REF: Reference Phase
VAR: Variable Phase



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LANE SUMMARY

Site: E [ERD1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement with southbound through lane converted to shared through-and-right lane
Forecast design year (2038) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Bishop Putney Avenue															
Lane 1	59	5.0	59	5.0	908	0.065	100	10.3	LOS B	0.8	5.9	Short	80	0.0	NA
Lane 2	17	5.0	17	5.0	299	0.056	100	40.1	LOS D	0.6	4.6	Full	120	0.0	0.0
Lane 3	17	5.0	17	5.0	299	0.056	100	40.1	LOS D	0.6	4.6	Full	120	0.0	0.0
Approach	93	5.0	93	5.0		0.065		21.1	LOS C	0.8	5.9				
East: Dalrymple Road															
Lane 1	34	5.0	34	5.0	1487	0.023	100	6.2	LOS A	0.1	0.9	Short	160	0.0	NA
Lane 2	401	5.0	401	5.0	588	0.683	100	29.5	LOS C	15.6	113.8	Full	430	0.0	0.0
Lane 3	401	5.0	401	5.0	588	0.683	100	29.5	LOS C	15.6	113.8	Full	430	0.0	0.0
Lane 4	105	5.0	105	5.0	159	0.660	100	52.1	LOS D	4.9	35.4	Short	75	0.0	NA
Approach	941	5.0	941	5.0		0.683		31.2	LOS C	15.6	113.8				
North: Bishop Putney Avenue															
Lane 1	63	5.0	63	5.0	1142	0.055	100	6.5	LOS A	0.6	4.0	Short	30	0.0	NA
Lane 2	111	5.0	111	5.0	299	0.370	100	41.4	LOS D	4.4	32.5	Full	60	0.0	0.0
Lane 3	110	5.0	110	5.0	299	0.370	100	41.4	LOS D	4.4	32.5	Short	35	0.0	NA
Approach	284	5.0	284	5.0		0.370		33.7	LOS C	4.4	32.5				
West: Dalrymple Road															
Lane 1	146	5.0	146	5.0	1429	0.102	100	6.7	LOS A	0.8	6.2	Short	60	0.0	NA
Lane 2	279	5.0	279	5.0	588	0.475	100	27.2	LOS C	10.0	72.9	Full	440	0.0	0.0
Lane 3	279	5.0	279	5.0	588	0.475	100	27.2	LOS C	10.0	72.9	Full	440	0.0	0.0
Lane 4	37	5.0	37	5.0	159	0.231	100	49.0	LOS D	1.6	11.6	Short	155	0.0	NA
Approach	741	5.0	741	5.0		0.475		24.2	LOS C	10.0	72.9				
All Vehicles	2059	5.0	2059	5.0		0.683		28.6	LOS C	15.6	113.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Bishop Putney Avenue

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	58	1	-	59	5.0	908	0.065	100	0.0	2
Lane 2	-	-	17	17	5.0	299	0.056	100	NA	NA
Lane 3	-	-	17	17	5.0	299	0.056	100	NA	NA
Approach	58	1	34	93	5.0		0.065			

East: Dalrymple Road

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	34	-	-	34	5.0	1487	0.023	100	0.0	2
Lane 2	-	401	-	401	5.0	588	0.683	100	NA	NA
Lane 3	-	401	-	401	5.0	588	0.683	100	NA	NA
Lane 4	-	-	105	105	5.0	159	0.660	100	0.0	3
Approach	34	802	105	941	5.0		0.683			

North: Bishop Putney Avenue

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	-	-	63	5.0	1142	0.055	100	0.0	2
Lane 2	-	1	110	111	5.0	299	0.370	100	NA	NA
Lane 3	-	-	110	110	5.0	299	0.370	100	0.0	2
Approach	63	1	220	284	5.0		0.370			

West: Dalrymple Road

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	146	-	-	146	5.0	1429	0.102	100	0.0	2
Lane 2	-	279	-	279	5.0	588	0.475	100	NA	NA
Lane 3	-	279	-	279	5.0	588	0.475	100	NA	NA
Lane 4	-	-	37	37	5.0	159	0.231	100	0.0	3
Approach	146	558	37	741	5.0		0.475			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2059	5.0	0.683

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Bishop Putney Avenue				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
North: Bishop Putney Avenue				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

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Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

MOVEMENT SUMMARY

Site: E [ERD1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement with southbound through lane converted to shared through-and-right lane
Forecast design year (2038) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bishop Putney Avenue															
1	L2	All MCs	58	5.0	58	5.0	0.065	9.9	LOS A	0.8	5.9	0.39	0.63	0.39	43.9
2	T1	All MCs	1	5.0	1	5.0	* 0.065	31.2	LOS C	0.8	5.9	0.39	0.63	0.39	32.5
3	R2	All MCs	34	5.0	34	5.0	0.056	40.1	LOS D	0.6	4.6	0.87	0.69	0.87	27.0
Approach			93	5.0	93	5.0	0.065	21.1	LOS C	0.8	5.9	0.56	0.65	0.56	35.7
East: Dalrymple Road															
4	L2	All MCs	34	5.0	34	5.0	0.023	6.2	LOS A	0.1	0.9	0.15	0.58	0.15	47.7
5	T1	All MCs	802	5.0	802	5.0	* 0.683	29.5	LOS C	15.6	113.8	0.93	0.81	0.93	38.7
6	R2	All MCs	105	5.0	105	5.0	* 0.660	52.1	LOS D	4.9	35.4	1.00	0.84	1.11	21.8
Approach			941	5.0	941	5.0	0.683	31.2	LOS C	15.6	113.8	0.91	0.80	0.92	36.9
North: Bishop Putney Avenue															
7	L2	All MCs	63	5.0	63	5.0	0.055	6.5	LOS A	0.6	4.0	0.28	0.60	0.28	46.4
8	T1	All MCs	1	5.0	1	5.0	* 0.370	37.0	LOS D	4.4	32.5	0.93	0.77	0.93	13.9
9	R2	All MCs	220	5.0	220	5.0	0.370	41.4	LOS D	4.4	32.5	0.93	0.77	0.93	25.2
Approach			284	5.0	284	5.0	0.370	33.7	LOS C	4.4	32.5	0.79	0.74	0.79	27.9
West: Dalrymple Road															
10	L2	All MCs	146	5.0	146	5.0	0.102	6.7	LOS A	0.8	6.2	0.22	0.61	0.22	46.7
11	T1	All MCs	558	5.0	558	5.0	0.475	27.2	LOS C	10.0	72.9	0.86	0.73	0.86	39.8
12	R2	All MCs	37	5.0	37	5.0	0.231	49.0	LOS D	1.6	11.6	0.96	0.73	0.96	24.3
Approach			741	5.0	741	5.0	0.475	24.2	LOS C	10.0	72.9	0.74	0.70	0.74	39.6
All Vehicles			2059	5.0	2059	5.0	0.683	28.6	LOS C	15.6	113.8	0.82	0.75	0.82	36.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bishop Putney Avenue												

P1	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
East: Dalrymple Road												
P2	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
North: Bishop Putney Avenue												
P3	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
West: Dalrymple Road												
P4	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
All Pedestrians		120	126	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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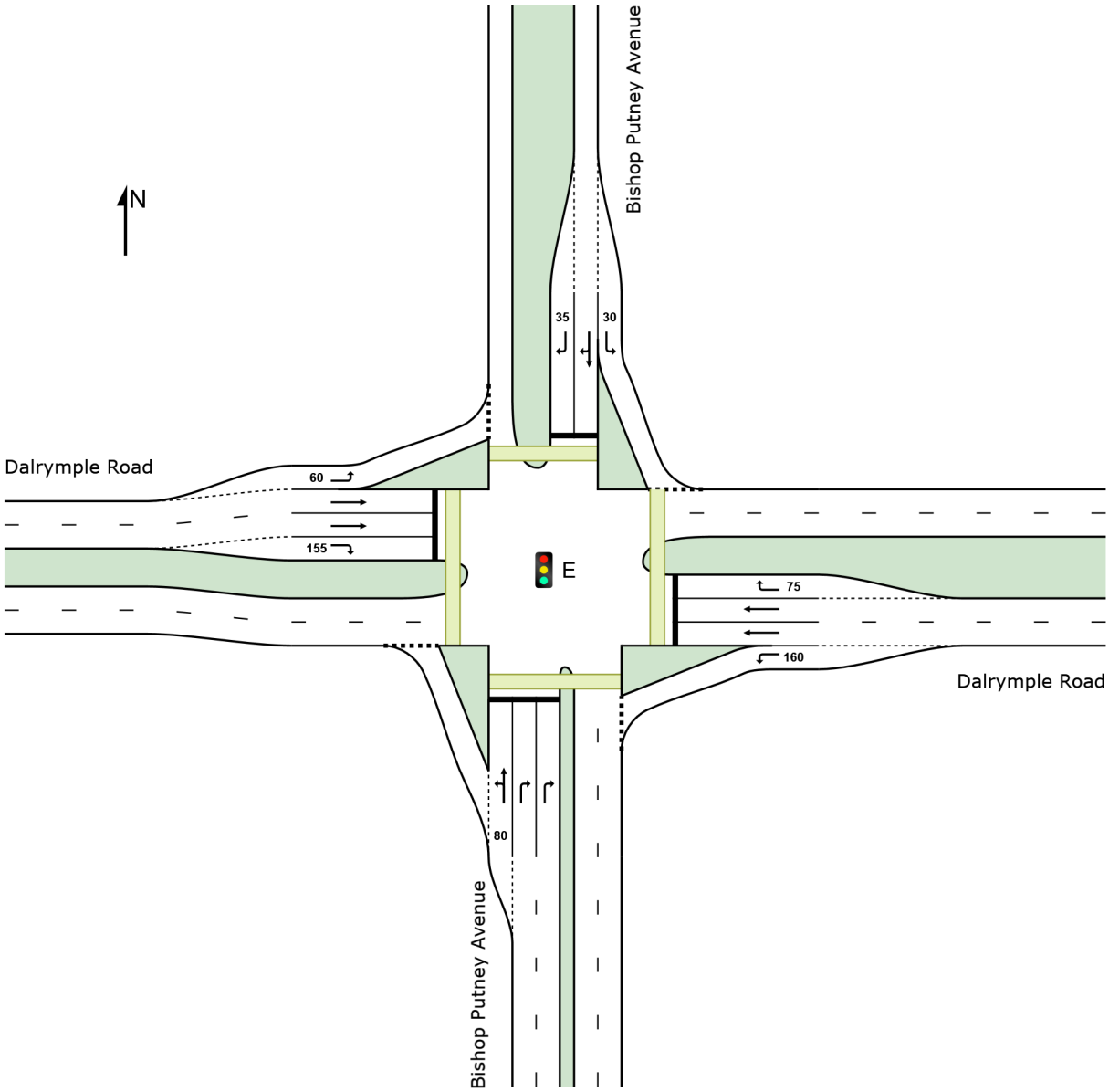
SITE LAYOUT

Site: E [ERD2 (Site Folder: BJ)]

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement with southbound through lane converted to shared through-and-right lane
Forecast design year (2038) Thursday evening peak hour traffic with complete development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

PHASING SUMMARY

Site: E [ERD2 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement with southbound through lane converted to shared through-and-right lane
Forecast design year (2038) Thursday evening peak hour traffic with complete development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: STREAMS
Input Phase Sequence: A, D, E, F, F2*, F1*
Output Phase Sequence: A, D, E, F, F2*
Reference Phase: Phase A
(* Variable Phase)

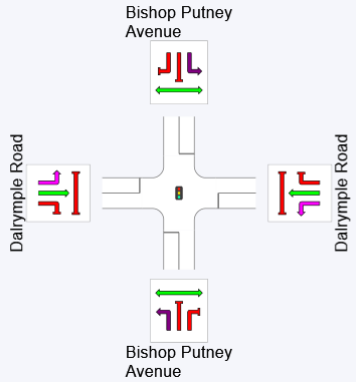
Phase Timing Summary

Phase	A	D	E	F	F2
Phase Change Time (sec)	0	24	45	68	80
Green Time (sec)	18	15	17	6	4
Phase Time (sec)	24	21	23	12	10
Phase Split	27%	23%	26%	13%	11%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

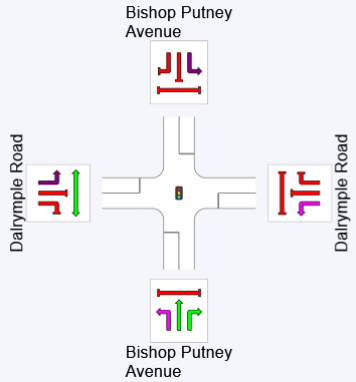
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

Phase A **REF**



Phase D



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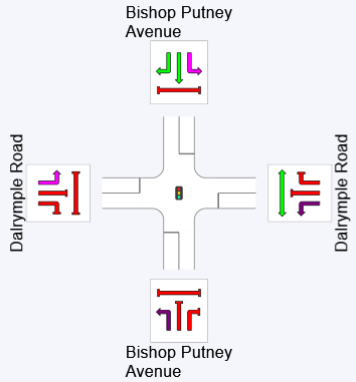
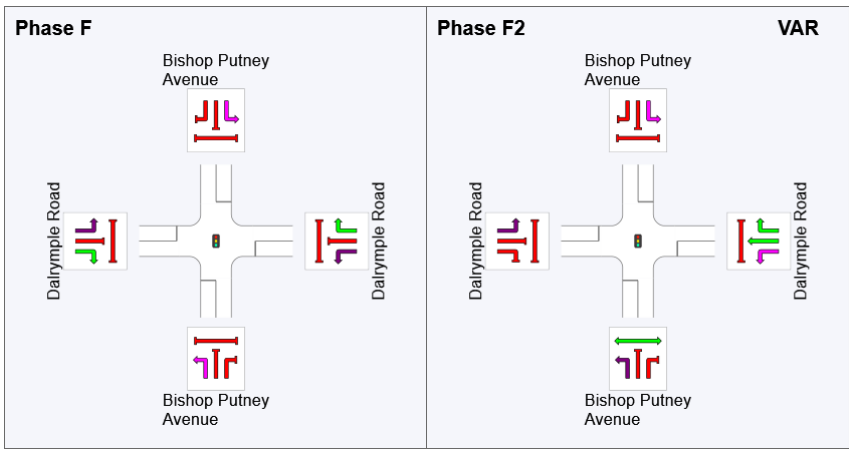
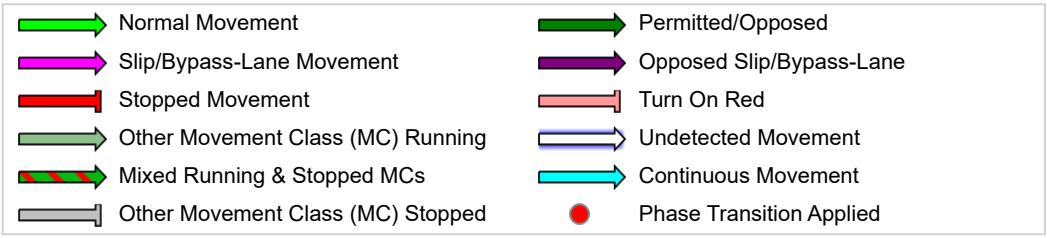




REF: Reference Phase
VAR: Variable Phase



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Organisation: PREMISE GROUP SERVICES PTY LTD | Licence: NETWORK / 1PC | Processed: Monday, 3 March 2025 1:44:03 PM
Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

LANE SUMMARY

Site: E [ERD2 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement with southbound through lane converted to shared through-and-right lane
Forecast design year (2038) Thursday evening peak hour traffic with complete development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Bishop Putney Avenue															
Lane 1	59	5.0	59	5.0	835	0.071	100	13.4	LOS B	1.1	7.7	Short	80	0.0	NA
Lane 2	17	5.0	17	5.0	299	0.056	100	40.1	LOS D	0.6	4.6	Full	120	0.0	0.0
Lane 3	17	5.0	17	5.0	299	0.056	100	40.1	LOS D	0.6	4.6	Full	120	0.0	0.0
Approach	93	5.0	93	5.0		0.071		23.1	LOS C	1.1	7.7				
East: Dalrymple Road															
Lane 1	34	5.0	34	5.0	1487	0.023	100	6.2	LOS A	0.1	0.9	Short	160	0.0	NA
Lane 2	387	5.0	387	5.0	588	0.659	100	29.3	LOS C	14.9	108.9	Full	430	0.0	0.0
Lane 3	387	5.0	387	5.0	588	0.659	100	29.3	LOS C	14.9	108.9	Full	430	0.0	0.0
Lane 4	274	5.0	274	5.0	319	0.858	100	53.1	LOS D	13.5	98.7	Short	75	0.0	NA
Approach	1082	5.0	1082	5.0		0.858		34.6	LOS C	14.9	108.9				
North: Bishop Putney Avenue															
Lane 1	132	5.0	132	5.0	1205	0.109	100	16.4	LOS B	1.5	10.9	Short	30	0.0	NA
Lane 2	235	5.0	235	5.0	287[1]	0.818	100	57.6	LOS E	11.2	81.4	Full	60	0.0	34.3[8]
Lane 3	239	5.0	239	5.0	292[1]	0.818	100	53.7	LOS D	11.3	82.7	Short	35	0.0	NA
Approach	605	5.0	605	5.0		0.818		47.1	LOS D	11.3	82.7				
West: Dalrymple Road															
Lane 1	208	5.0	208	5.0	1261	0.165	100	8.3	LOS A	2.2	15.9	Short	60	0.0	NA
Lane 2	315	5.0	315	5.0	378	0.833	100	43.8	LOS D	14.9	109.1	Full	440	0.0	0.0
Lane 3	315	5.0	315	5.0	378	0.833	100	43.8	LOS D	14.9	109.1	Full	440	0.0	0.0
Lane 4	37	5.0	37	5.0	120	0.308	100	52.0	LOS D	1.7	12.1	Short	155	0.0	NA
Approach	875	5.0	875	5.0		0.833		35.7	LOS D	14.9	109.1				
All Vehicles	2655	5.0	2655	5.0		0.858		37.4	LOS D	14.9	109.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)

South: Bishop Putney Avenue

Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From S To Exit:	W	N	E			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	58	1	-	59	5.0	835	0.071	100	0.0	2
Lane 2	-	-	17	17	5.0	299	0.056	100	NA	NA
Lane 3	-	-	17	17	5.0	299	0.056	100	NA	NA
Approach	58	1	34	93	5.0		0.071			

East: Dalrymple Road

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	34	-	-	34	5.0	1487	0.023	100	0.0	2
Lane 2	-	387	-	387	5.0	588	0.659	100	NA	NA
Lane 3	-	387	-	387	5.0	588	0.659	100	NA	NA
Lane 4	-	-	274	274	5.0	319	0.858	100	30.0	3
Approach	34	775	274	1082	5.0		0.858			

North: Bishop Putney Avenue

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	132	-	-	132	5.0	1205	0.109	100	0.0	2
Lane 2	-	1	234	235	5.0	287[1]	0.818	100	NA	NA
Lane 3	-	-	239	239	5.0	292[1]	0.818	100	85.6	2
Approach	132	1	473	605	5.0		0.818			

West: Dalrymple Road

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	208	-	-	208	5.0	1261	0.165	100	0.0	2
Lane 2	-	315	-	315	5.0	378	0.833	100	NA	NA
Lane 3	-	315	-	315	5.0	378	0.833	100	NA	NA
Lane 4	-	-	37	37	5.0	120	0.308	100	0.0	3
Approach	208	629	37	875	5.0		0.833			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2655	5.0	0.858

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Bishop Putney Avenue				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

Lane 3	0.0	0.0	0.0	0.0
East: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
North: Bishop Putney Avenue				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

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Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

MOVEMENT SUMMARY

Site: E [ERD2 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Dalrymple Road / Bishop Putney Avenue signalised crossroads
Existing traffic signal arrangement with southbound through lane converted to shared through-and-right lane
Forecast design year (2038) Thursday evening peak hour traffic with complete development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bishop Putney Avenue															
1	L2	All MCs	58	5.0	58	5.0	0.071	13.0	LOS B	1.1	7.7	0.49	0.66	0.49	41.2
2	T1	All MCs	1	5.0	1	5.0	* 0.071	32.9	LOS C	1.1	7.7	0.49	0.66	0.49	28.6
3	R2	All MCs	34	5.0	34	5.0	0.056	40.1	LOS D	0.6	4.6	0.87	0.69	0.87	27.0
Approach			93	5.0	93	5.0	0.071	23.1	LOS C	1.1	7.7	0.63	0.67	0.63	34.5
East: Dalrymple Road															
4	L2	All MCs	34	5.0	34	5.0	0.023	6.2	LOS A	0.1	0.9	0.15	0.58	0.15	47.7
5	T1	All MCs	775	5.0	775	5.0	0.659	29.3	LOS C	14.9	108.9	0.92	0.80	0.92	38.8
6	R2	All MCs	274	5.0	274	5.0	* 0.858	53.1	LOS D	13.5	98.7	1.00	1.00	1.29	21.6
Approach			1082	5.0	1082	5.0	0.858	34.6	LOS C	14.9	108.9	0.92	0.84	0.99	34.4
North: Bishop Putney Avenue															
7	L2	All MCs	132	5.0	132	5.0	0.109	16.4	LOS B	1.5	10.9	0.34	0.63	0.34	45.1
8	T1	All MCs	1	5.0	1	5.0	* 0.818	53.1	LOS D	11.2	81.4	1.00	0.96	1.23	12.2
9	R2	All MCs	473	5.0	473	5.0	0.818	55.6	LOS E	11.3	82.7	1.00	0.96	1.23	22.9
Approach			605	5.0	605	5.0	0.818	47.1	LOS D	11.3	82.7	0.86	0.89	1.04	23.3
West: Dalrymple Road															
10	L2	All MCs	208	5.0	208	5.0	0.165	8.3	LOS A	2.2	15.9	0.33	0.65	0.33	44.8
11	T1	All MCs	629	5.0	629	5.0	* 0.833	43.8	LOS D	14.9	109.1	1.00	0.99	1.21	33.0
12	R2	All MCs	37	5.0	37	5.0	0.308	52.0	LOS D	1.7	12.1	0.99	0.73	0.99	23.5
Approach			875	5.0	875	5.0	0.833	35.7	LOS D	14.9	109.1	0.84	0.90	0.99	34.0
All Vehicles			2655	5.0	2655	5.0	0.858	37.4	LOS D	14.9	109.1	0.87	0.86	0.99	31.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bishop Putney Avenue												

P1	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
East: Dalrymple Road												
P2	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
North: Bishop Putney Avenue												
P3	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
West: Dalrymple Road												
P4	Full	30	32	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04
All Pedestrians		120	126	39.3	LOS D	0.1	0.1	0.93	0.93	193.1	200.0	1.04

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

APPENDIX K

SIDRA Outputs –Bishop Putney Avenue Access Roundabout

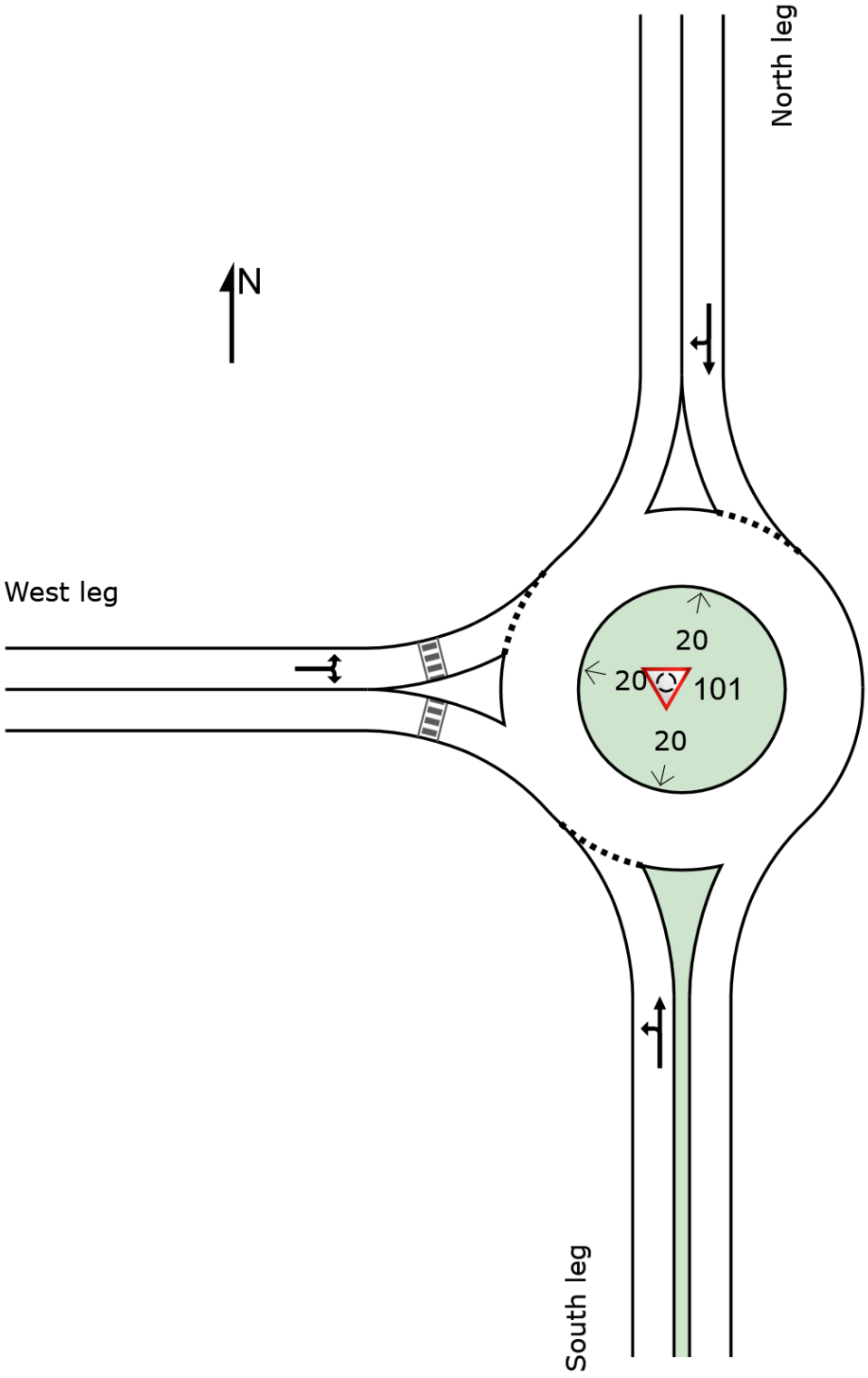
Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

SITE LAYOUT

Site: 101 [Stage 1 opening year (2026) with development traffic (Site Folder: Bishop Putney Avenue roundabout)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [Stage 1 opening year (2026) with development traffic (Site Folder: Bishop Putney Avenue roundabout)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: South leg															
1	L2	All MCs	83	5.0	83	5.0	0.051	1.7	LOS A	0.3	1.9	0.02	0.28	0.02	37.9
2	T1	All MCs	1	5.0	1	5.0	0.051	1.2	LOS A	0.3	1.9	0.02	0.28	0.02	38.7
Approach			84	5.0	84	5.0	0.051	1.7	LOS A	0.3	1.9	0.02	0.28	0.02	37.9
North: North leg															
8	T1	All MCs	1	5.0	1	5.0	0.002	2.1	LOS A	0.0	0.1	0.34	0.40	0.34	36.8
9	R2	All MCs	1	5.0	1	5.0	0.002	6.4	LOS A	0.0	0.1	0.34	0.40	0.34	37.2
Approach			2	5.0	2	5.0	0.002	4.2	LOS A	0.0	0.1	0.34	0.40	0.34	37.0
West: West leg															
10	L2	All MCs	1	5.0	1	5.0	0.124	1.7	LOS A	0.6	4.4	0.02	0.54	0.02	37.1
12	R2	All MCs	206	5.0	206	5.0	0.124	5.5	LOS A	0.6	4.4	0.02	0.54	0.02	34.3
Approach			207	5.0	207	5.0	0.124	5.5	LOS A	0.6	4.4	0.02	0.54	0.02	34.3
All Vehicles			294	5.0	294	5.0	0.124	4.4	LOS A	0.6	4.4	0.02	0.47	0.02	35.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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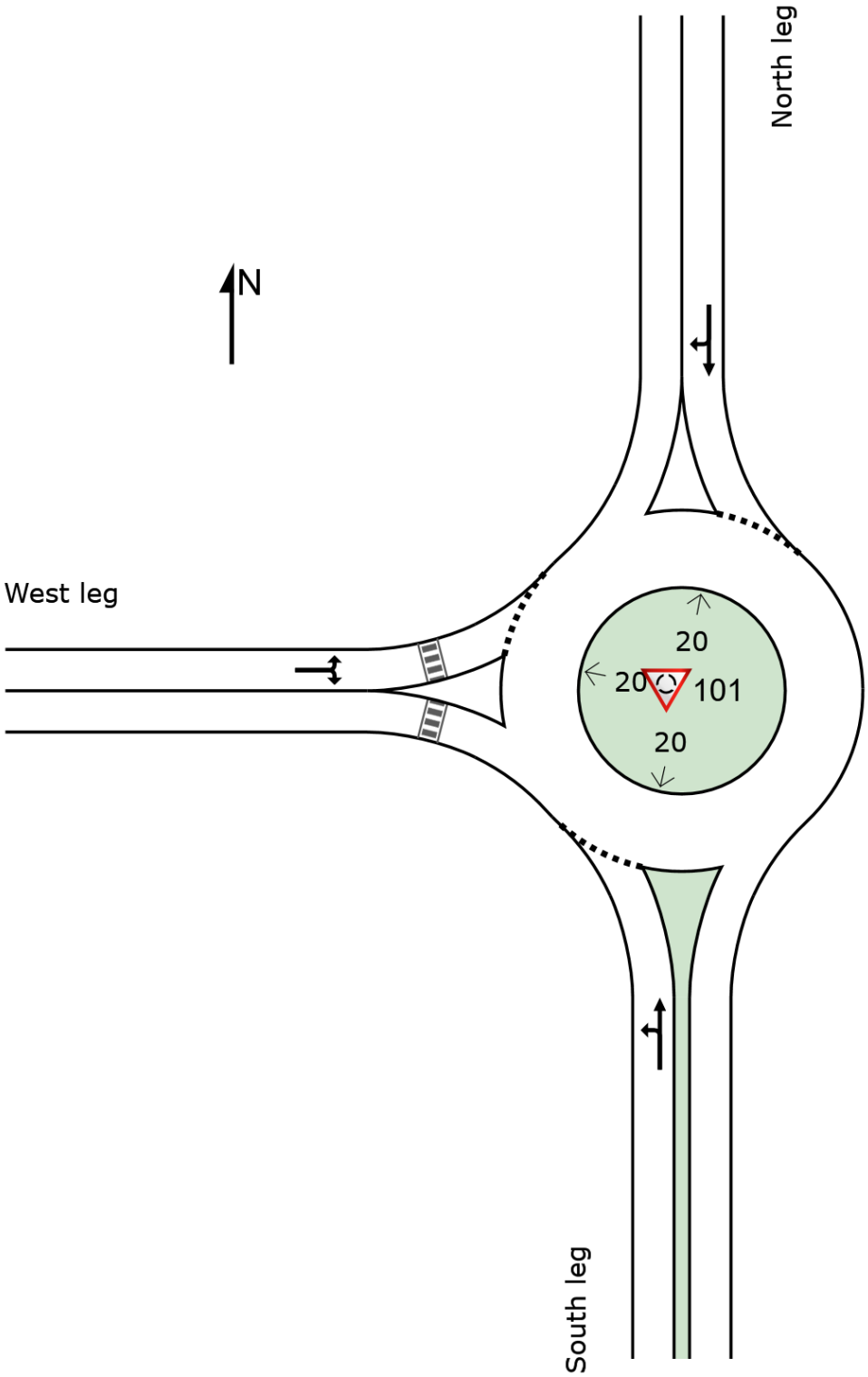
SITE LAYOUT

Site: 101 [Stage 1 design year / complete town centre opening year (2036) with development traffic (Site Folder: Bishop Putney Avenue roundabout)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

MOVEMENT SUMMARY

Site: 101 [Stage 1 design year / complete town centre opening year (2036) with development traffic (Site Folder: Bishop Putney Avenue roundabout)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: South leg															
1	L2	All MCs	209	5.0	209	5.0	0.301	1.9	LOS A	2.1	15.0	0.23	0.25	0.23	37.1
2	T1	All MCs	220	5.0	220	5.0	0.301	1.5	LOS A	2.1	15.0	0.23	0.25	0.23	38.2
Approach			429	5.0	429	5.0	0.301	1.7	LOS A	2.1	15.0	0.23	0.25	0.23	37.8
North: North leg															
8	T1	All MCs	283	5.0	283	5.0	0.295	2.5	LOS A	1.9	13.6	0.46	0.39	0.46	37.1
9	R2	All MCs	51	5.0	51	5.0	0.295	6.8	LOS A	1.9	13.6	0.46	0.39	0.46	37.4
Approach			334	5.0	334	5.0	0.295	3.1	LOS A	1.9	13.6	0.46	0.39	0.46	37.1
West: West leg															
10	L2	All MCs	51	5.0	51	5.0	0.233	3.0	LOS A	1.3	9.6	0.44	0.54	0.44	36.7
12	R2	All MCs	206	5.0	206	5.0	0.233	6.8	LOS A	1.3	9.6	0.44	0.54	0.44	33.5
Approach			257	5.0	257	5.0	0.233	6.1	LOS A	1.3	9.6	0.44	0.54	0.44	34.5
All Vehicles			1020	5.0	1020	5.0	0.301	3.3	LOS A	2.1	15.0	0.36	0.37	0.36	36.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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APPENDIX L

Intersection Delay SIDRA Output

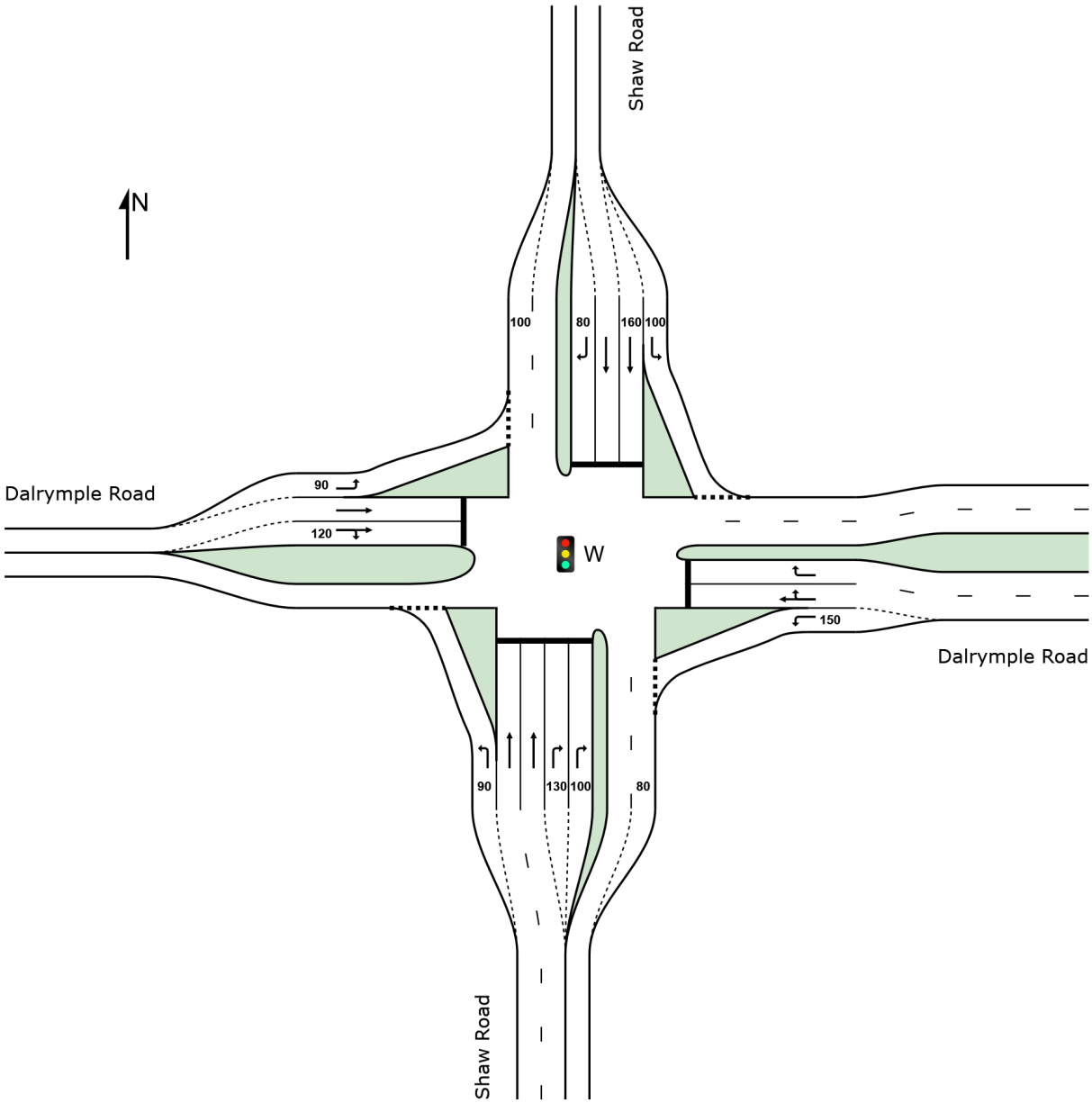
Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

SITE LAYOUT

Site: W [WXO0 (Site Folder: BJ)]

Shaw Road / Dalrymple Road signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic without development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: PREMISE GROUP SERVICES PTY LTD | Licence: NETWORK / 1PC | Created: Tuesday, 4 March 2025 2:16:42 PM
Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

PHASING SUMMARY

Site: W [WXO0 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Shaw Road / Dalrymple Road signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic without development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: STREAMS
Input Phase Sequence: A, D, E, F, F2*, F1*
Output Phase Sequence: A, D, E, F, F1*
Reference Phase: Phase A
(* Variable Phase)

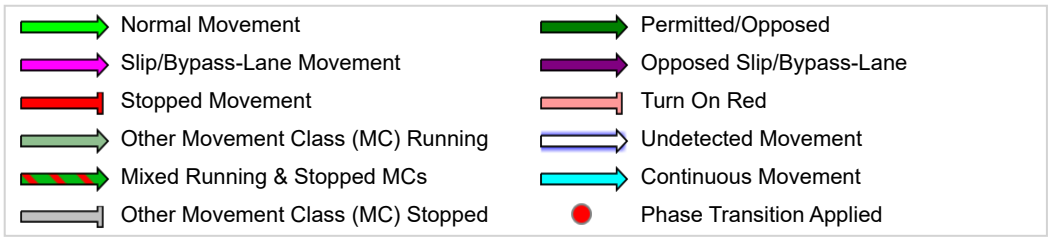
Phase Timing Summary

Phase	A	D	E	F	F1
Phase Change Time (sec)	0	40	54	96	109
Green Time (sec)	34	8	36	7	***
Phase Time (sec)	40	14	42	13	1
Phase Split	36%	13%	38%	12%	1%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

REF: Reference Phase
VAR: Variable Phase



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Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

LANE SUMMARY

Site: W [WXO0 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Shaw Road / Dalrymple Road signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic without development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Shaw Road															
Lane 1	6	5.0	6	5.0	1271	0.005	100	8.4	LOS A	0.1	0.5	Short	90	0.0	NA
Lane 2	187	5.0	187	5.0	584	0.320	58[6]	33.2	LOS C	7.7	56.0	Full	500	0.0	0.0
Lane 3	321	5.0	321	5.0	584	0.549	100	34.1	LOS C	14.4	104.9	Full	500	0.0	0.0
Lane 4	63	5.0	63	5.0	114	0.553	100	63.4	LOS E	3.5	25.8	Short	130	0.0	NA
Lane 5	63	5.0	63	5.0	114	0.553	100	63.4	LOS E	3.5	25.8	Short	100	0.0	NA
Approach	640	5.0	640	5.0		0.553		39.4	LOS D	14.4	104.9				
East: Dalrymple Road															
Lane 1	172	5.0	172	5.0	1172	0.146	100	10.8	LOS B	2.6	19.0	Short	150	0.0	NA
Lane 2	291	5.0	291	5.0	618	0.470	85[5]	31.7	LOS C	12.4	90.5	Full	430	0.0	0.0
Lane 3	323	5.0	323	5.0	587	0.551	100	38.4	LOS D	14.3	104.2	Full	430	0.0	0.0
Approach	785	5.0	785	5.0		0.551		29.9	LOS C	14.3	104.2				
North: Shaw Road															
Lane 1	260	5.0	260	5.0	1467	0.177	100	7.0	LOS A	2.1	15.0	Short	100	0.0	NA
Lane 2	158	5.0	158	5.0	601	0.263	48[6]	30.7	LOS C	6.3	45.9	Short	160	0.0	NA
Lane 3	326	5.0	326	5.0	601	0.543	100	33.3	LOS C	14.5	105.5	Full	290	0.0	0.0
Lane 4	67	5.0	67	5.0	130	0.517	100	61.9	LOS E	3.7	27.0	Short	80	0.0	NA
Approach	812	5.0	812	5.0		0.543		26.8	LOS C	14.5	105.5				
West: Dalrymple Road															
Lane 1	43	5.0	43	5.0	789	0.055	100	14.6	LOS B	0.8	5.8	Short	90	0.0	NA
Lane 2	76	5.0	76	5.0	137	0.552	100	56.3	LOS E	4.2	30.5	Full	500	0.0	0.0
Lane 3	76	5.0	76	5.0	137	0.552	100	56.5	LOS E	4.2	30.4	Short	120	0.0	NA
Approach	195	5.0	195	5.0		0.552		47.1	LOS D	4.2	30.5				
All Vehicles	2432	5.0	2432	5.0		0.553		32.7	LOS C	14.5	105.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: Shaw Road

Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From S To Exit:	W	N	E			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	6	-	-	6	5.0	1271	0.005	100	0.0	2
Lane 2	-	187	-	187	5.0	584	0.320	58[6]	NA	NA
Lane 3	-	321	-	321	5.0	584	0.549	100	NA	NA
Lane 4	-	-	63	63	5.0	114	0.553	100	0.0	3
Lane 5	-	-	63	63	5.0	114	0.553	100	0.0	4
Approach	6	507	126	640	5.0		0.553			

East: Dalrymple Road

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	172	-	-	172	5.0	1172	0.146	100	0.0	2
Lane 2	-	291	-	291	5.0	618	0.470	85[5]	NA	NA
Lane 3	-	-	323	323	5.0	587	0.551	100	NA	NA
Approach	172	291	323	785	5.0		0.551			

North: Shaw Road

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	260	-	-	260	5.0	1467	0.177	100	0.0	2
Lane 2	-	158	-	158	5.0	601	0.263	48[6]	0.0	3
Lane 3	-	326	-	326	5.0	601	0.543	100	NA	NA
Lane 4	-	-	67	67	5.0	130	0.517	100	0.0	3
Approach	260	484	67	812	5.0		0.543			

West: Dalrymple Road

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	-	-	43	5.0	789	0.055	100	0.0	2
Lane 2	-	76	-	76	5.0	137	0.552	100	NA	NA
Lane 3	-	74	2	76	5.0	137	0.552	100	0.0	2
Approach	43	149	2	195	5.0		0.552			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2432	5.0	0.553

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Shaw Road Merge Type: **Priority**												
Exit Short Lane	1	80	0.0	328	337	3.08	2.05	330	1409	0.234	0.5	0.8
Merge Lane	2	-	100.0	Merge Lane is not Opposed				328	1800	0.182	0.0	0.0
North Exit: Shaw Road Merge Type: **Priority**												
Exit Short Lane	1	100	0.0	644	660	3.08	2.05	230	1065	0.216	1.3	1.8
Merge Lane	2	-	100.0	Merge Lane is not Opposed				644	1800	0.358	0.0	0.0

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Shaw Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
Lane 5	0.0	0.0	0.0	0.0
East: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Shaw Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
West: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

MOVEMENT SUMMARY

Site: W [WXO0 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Shaw Road / Dalrymple Road signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic without development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Shaw Road															
1	L2	All MCs	6	5.0	6	5.0	0.005	8.4	LOS A	0.1	0.5	0.27	0.58	0.27	50.9
2	T1	All MCs	507	5.0	507	5.0	0.549	33.8	LOS C	14.4	104.9	0.86	0.73	0.86	35.7
3	R2	All MCs	126	5.0	126	5.0	* 0.553	63.4	LOS E	3.5	25.8	1.00	0.77	1.03	27.8
Approach			640	5.0	640	5.0	0.553	39.4	LOS D	14.4	104.9	0.88	0.74	0.89	33.7
East: Dalrymple Road															
4	L2	All MCs	172	5.0	172	5.0	0.146	10.8	LOS B	2.6	19.0	0.36	0.65	0.36	49.2
5	T1	All MCs	291	5.0	291	5.0	0.470	31.7	LOS C	12.4	90.5	0.85	0.72	0.85	38.7
6	R2	All MCs	323	5.0	323	5.0	* 0.551	38.4	LOS D	14.3	104.2	0.88	0.82	0.88	31.1
Approach			785	5.0	785	5.0	0.551	29.9	LOS C	14.3	104.2	0.75	0.75	0.75	37.4
North: Shaw Road															
7	L2	All MCs	260	5.0	260	5.0	0.177	7.0	LOS A	2.1	15.0	0.23	0.62	0.23	49.4
8	T1	All MCs	484	5.0	484	5.0	* 0.543	32.5	LOS C	14.5	105.5	0.85	0.72	0.85	36.1
9	R2	All MCs	67	5.0	67	5.0	0.517	61.9	LOS E	3.7	27.0	1.00	0.76	1.00	25.9
Approach			812	5.0	812	5.0	0.543	26.8	LOS C	14.5	105.5	0.66	0.69	0.66	37.9
West: Dalrymple Road															
10	L2	All MCs	43	5.0	43	5.0	0.055	14.6	LOS B	0.8	5.8	0.42	0.64	0.42	45.3
11	T1	All MCs	149	5.0	149	5.0	* 0.552	56.3	LOS E	4.2	30.5	1.00	0.77	1.01	30.3
12	R2	All MCs	2	5.0	2	5.0	0.552	62.0	LOS E	4.2	30.4	1.00	0.77	1.01	30.7
Approach			195	5.0	195	5.0	0.552	47.1	LOS D	4.2	30.5	0.87	0.75	0.88	32.4
All Vehicles			2432	5.0	2432	5.0	0.553	32.7	LOS C	14.5	105.5	0.77	0.72	0.77	36.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

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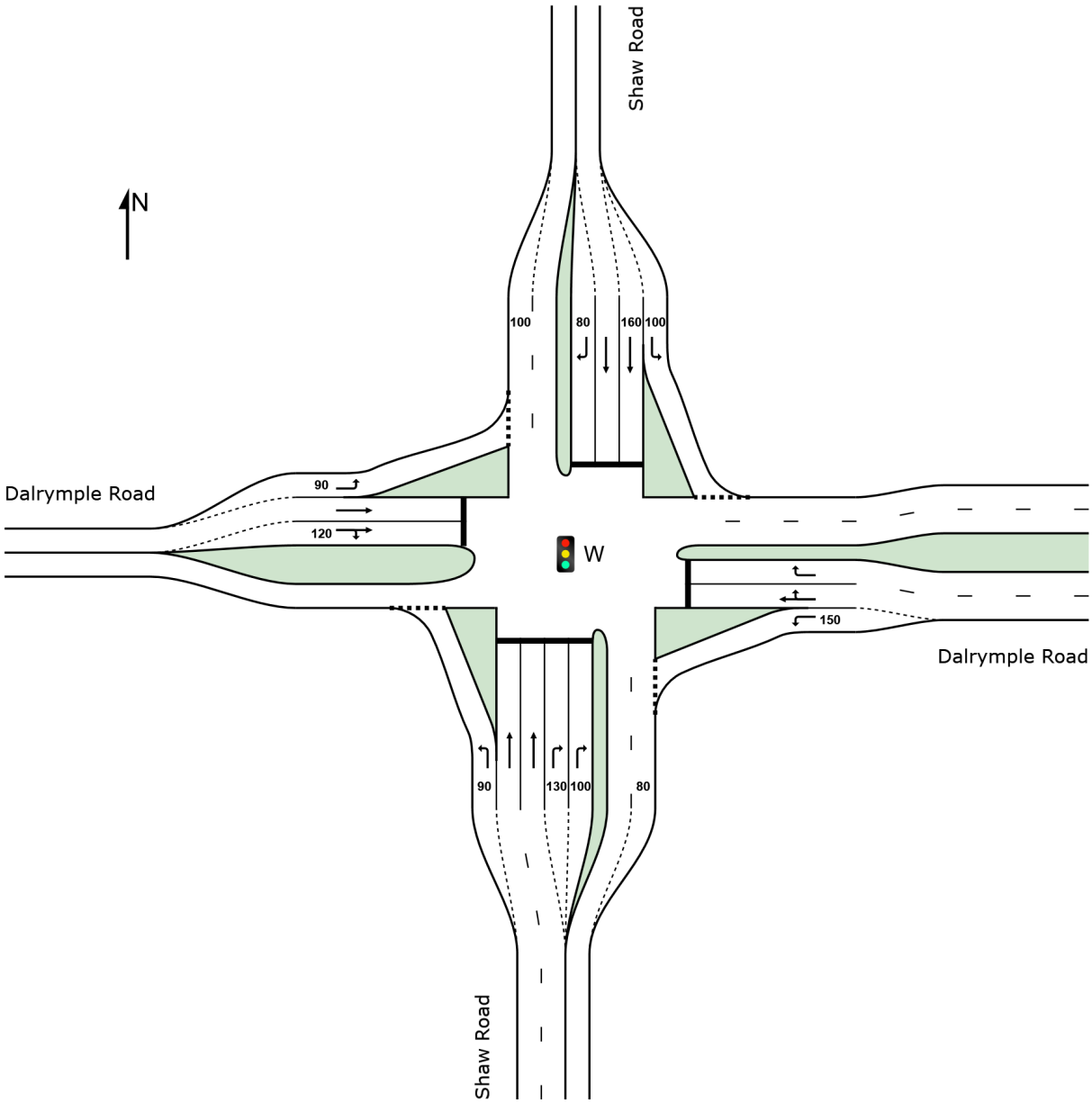
SITE LAYOUT

Site: W [WXO1 (Site Folder: BJ)]

Shaw Road / Dalrymple Road signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: PREMISE GROUP SERVICES PTY LTD | Licence: NETWORK / 1PC | Created: Tuesday, 4 March 2025 2:16:42 PM
Project: C:\12dS\data\12dSynergy\P001406 Greater Ascot Shopping Centre_17161\14. Engineering - Traffic\02. SIDRA\P001406 SIDRA traffic signals.sip9

PHASING SUMMARY

Site: W [WXO1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Shaw Road / Dalrymple Road signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: STREAMS
Input Phase Sequence: A, D, E, F, F2*, F1*
Output Phase Sequence: A, D, E, F, F2*
Reference Phase: Phase A
(* Variable Phase)

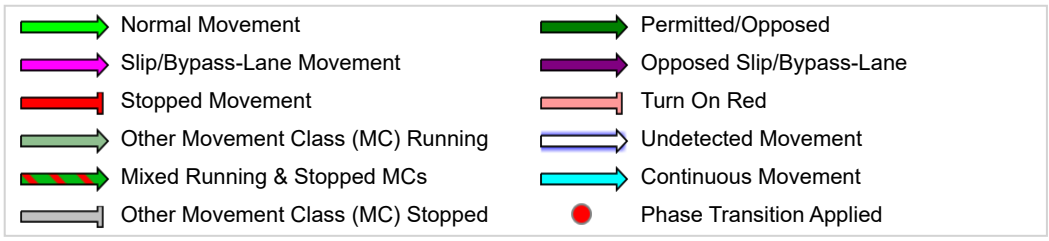
Phase Timing Summary

Phase	A	D	E	F	F2
Phase Change Time (sec)	0	34	48	94	107
Green Time (sec)	28	8	40	7	***
Phase Time (sec)	34	14	46	13	3
Phase Split	31%	13%	42%	12%	3%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

REF: Reference Phase
VAR: Variable Phase



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Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

LANE SUMMARY

Site: W [WXO1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Shaw Road / Dalrymple Road signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Shaw Road															
Lane 1	6	5.0	6	5.0	1264	0.005	100	8.4	LOS A	0.1	0.5	Short	90	0.0	NA
Lane 2	173	5.0	173	5.0	532	0.325	58[6]	35.8	LOS D	7.4	53.7	Full	500	0.0	0.0
Lane 3	297	5.0	297	5.0	532	0.559	100	36.4	LOS D	13.7	99.9	Full	500	0.0	0.0
Lane 4	96	5.0	96	5.0	163	0.591	100	60.3	LOS E	5.3	38.3	Short	130	0.0	NA
Lane 5	96	5.0	96	5.0	163	0.591	100	60.3	LOS E	5.3	38.3	Short	100	0.0	NA
Approach	669	5.0	669	5.0		0.591		42.9	LOS D	13.7	99.9				
East: Dalrymple Road															
Lane 1	238	5.0	238	5.0	1303	0.183	100	9.2	LOS A	2.9	21.3	Short	150	0.0	NA
Lane 2	302	5.0	302	5.0	687	0.440	71[5]	28.4	LOS C	12.2	89.4	Full	430	0.0	0.0
Lane 3	406	5.0	406	5.0	652	0.623	100	36.7	LOS D	18.0	131.1	Full	430	0.0	0.0
Approach	946	5.0	946	5.0		0.623		27.1	LOS C	18.0	131.1				
North: Shaw Road															
Lane 1	343	5.0	343	5.0	1422	0.241	100	7.4	LOS A	3.3	23.9	Short	100	0.0	NA
Lane 2	146	5.0	146	5.0	481	0.304	48[6]	36.6	LOS D	6.4	46.4	Short	160	0.0	NA
Lane 3	301	5.0	301	5.0	481	0.627	100	39.5	LOS D	14.5	105.8	Full	290	0.0	0.0
Lane 4	67	5.0	67	5.0	114	0.590	100	63.8	LOS E	3.8	27.7	Short	80	0.0	NA
Approach	858	5.0	858	5.0		0.627		28.1	LOS C	14.5	105.8				
West: Dalrymple Road															
Lane 1	43	5.0	43	5.0	748	0.058	100	16.4	LOS B	0.9	6.5	Short	90	0.0	NA
Lane 2	82	5.0	82	5.0	137	0.594	100	56.8	LOS E	4.5	33.1	Full	500	0.0	0.0
Lane 3	82	5.0	82	5.0	137	0.594	100	56.9	LOS E	4.5	33.0	Short	120	0.0	NA
Approach	206	5.0	206	5.0		0.594		48.4	LOS D	4.5	33.1				
All Vehicles	2680	5.0	2680	5.0		0.627		33.0	LOS C	18.0	131.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: Shaw Road

Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From S To Exit:	W	N	E			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	6	-	-	6	5.0	1264	0.005	100	0.0	2
Lane 2	-	173	-	173	5.0	532	0.325	58[6]	NA	NA
Lane 3	-	297	-	297	5.0	532	0.559	100	NA	NA
Lane 4	-	-	96	96	5.0	163	0.591	100	0.0	3
Lane 5	-	-	96	96	5.0	163	0.591	100	0.0	4
Approach	6	471	193	669	5.0		0.591			

East: Dalrymple Road

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	238	-	-	238	5.0	1303	0.183	100	0.0	2
Lane 2	-	302	-	302	5.0	687	0.440	71[5]	NA	NA
Lane 3	-	-	406	406	5.0	652	0.623	100	NA	NA
Approach	238	302	406	946	5.0		0.623			

North: Shaw Road

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	343	-	-	343	5.0	1422	0.241	100	0.0	2
Lane 2	-	146	-	146	5.0	481	0.304	48[6]	0.0	3
Lane 3	-	301	-	301	5.0	481	0.627	100	NA	NA
Lane 4	-	-	67	67	5.0	114	0.590	100	0.0	3
Approach	343	447	67	858	5.0		0.627			

West: Dalrymple Road

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	-	-	43	5.0	748	0.058	100	0.0	2
Lane 2	-	82	-	82	5.0	137	0.594	100	NA	NA
Lane 3	-	79	2	82	5.0	137	0.594	100	0.0	2
Approach	43	161	2	206	5.0		0.594			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2680	5.0	0.627

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Shaw Road Merge Type: **Priority**												
Exit Short Lane	1	80	0.0	303	311	3.08	2.05	384	1436	0.267	0.5	0.8
Merge Lane	2	-	100.0	Merge Lane is not Opposed				303	1800	0.169	0.0	0.0
North Exit: Shaw Road Merge Type: **Priority**												
Exit Short Lane	1	100	0.0	704	721	3.08	2.05	216	999	0.216	1.5	2.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				704	1800	0.391	0.0	0.0

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Shaw Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
Lane 5	0.0	0.0	0.0	0.0
East: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Shaw Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
West: Dalrymple Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

MOVEMENT SUMMARY

Site: W [WXO1 (Site Folder: BJ)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Shaw Road / Dalrymple Road signalised crossroads
Existing traffic signal arrangement
Forecast opening year (2028) Thursday evening peak hour traffic with stage 1 development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Shaw Road															
1	L2	All MCs	6	5.0	6	5.0	0.005	8.4	LOS A	0.1	0.5	0.27	0.58	0.27	50.9
2	T1	All MCs	471	5.0	471	5.0	0.559	36.2	LOS D	13.7	99.9	0.88	0.74	0.88	34.7
3	R2	All MCs	193	5.0	193	5.0	* 0.591	60.3	LOS E	5.3	38.3	1.00	0.80	1.03	28.6
Approach			669	5.0	669	5.0	0.591	42.9	LOS D	13.7	99.9	0.91	0.76	0.92	32.6
East: Dalrymple Road															
4	L2	All MCs	238	5.0	238	5.0	0.183	9.2	LOS A	2.9	21.3	0.31	0.64	0.31	50.3
5	T1	All MCs	302	5.0	302	5.0	0.440	28.4	LOS C	12.2	89.4	0.81	0.69	0.81	40.1
6	R2	All MCs	406	5.0	406	5.0	* 0.623	36.7	LOS D	18.0	131.1	0.88	0.83	0.88	31.8
Approach			946	5.0	946	5.0	0.623	27.1	LOS C	18.0	131.1	0.71	0.74	0.71	38.5
North: Shaw Road															
7	L2	All MCs	343	5.0	343	5.0	0.241	7.4	LOS A	3.3	23.9	0.27	0.63	0.27	49.0
8	T1	All MCs	447	5.0	447	5.0	* 0.627	38.6	LOS D	14.5	105.8	0.91	0.77	0.91	33.6
9	R2	All MCs	67	5.0	67	5.0	0.590	63.8	LOS E	3.8	27.7	1.00	0.79	1.06	25.5
Approach			858	5.0	858	5.0	0.627	28.1	LOS C	14.5	105.8	0.66	0.71	0.67	37.0
West: Dalrymple Road															
10	L2	All MCs	43	5.0	43	5.0	0.058	16.4	LOS B	0.9	6.5	0.46	0.65	0.46	44.2
11	T1	All MCs	161	5.0	161	5.0	* 0.594	56.8	LOS E	4.5	33.1	1.00	0.79	1.04	30.2
12	R2	All MCs	2	5.0	2	5.0	0.594	62.4	LOS E	4.5	33.0	1.00	0.79	1.04	30.6
Approach			206	5.0	206	5.0	0.594	48.4	LOS D	4.5	33.1	0.89	0.76	0.92	32.0
All Vehicles			2680	5.0	2680	5.0	0.627	33.0	LOS C	18.0	131.1	0.76	0.74	0.76	35.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

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APPENDIX M

Traffic Impact Assessment Certification

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

TRAFFIC IMPACT ASSESSMENT CERTIFICATION

CERTIFICATION OF TRAFFIC IMPACT ASSESSMENT REPORT REGISTERED PROFESSIONAL ENGINEER QUEENSLAND

FOR

Project Title	Greater Ascot Town Centre Stage 1: Traffic Impact Assessment

As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the *Professional Engineers Act 2002* as competent in my areas of nominated expertise, I understand and recognise:

- The significant role of engineering as a profession; and that
- The community has a legitimate expectation that my certification affixed to this engineering work can be trusted; and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

i. I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the Guide to Traffic Impact Assessment published by the Queensland Department of Transport and Main Roads and using sound engineering principles; and

ii. Where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment; and that

iii. The outcomes of this traffic impact assessment are a true reflection of results of assessment; and that

iv. I believe the strategies recommended for mitigating impacts by this traffic impact assessment, embrace contemporary practice initiatives and will deliver the desired outcomes.

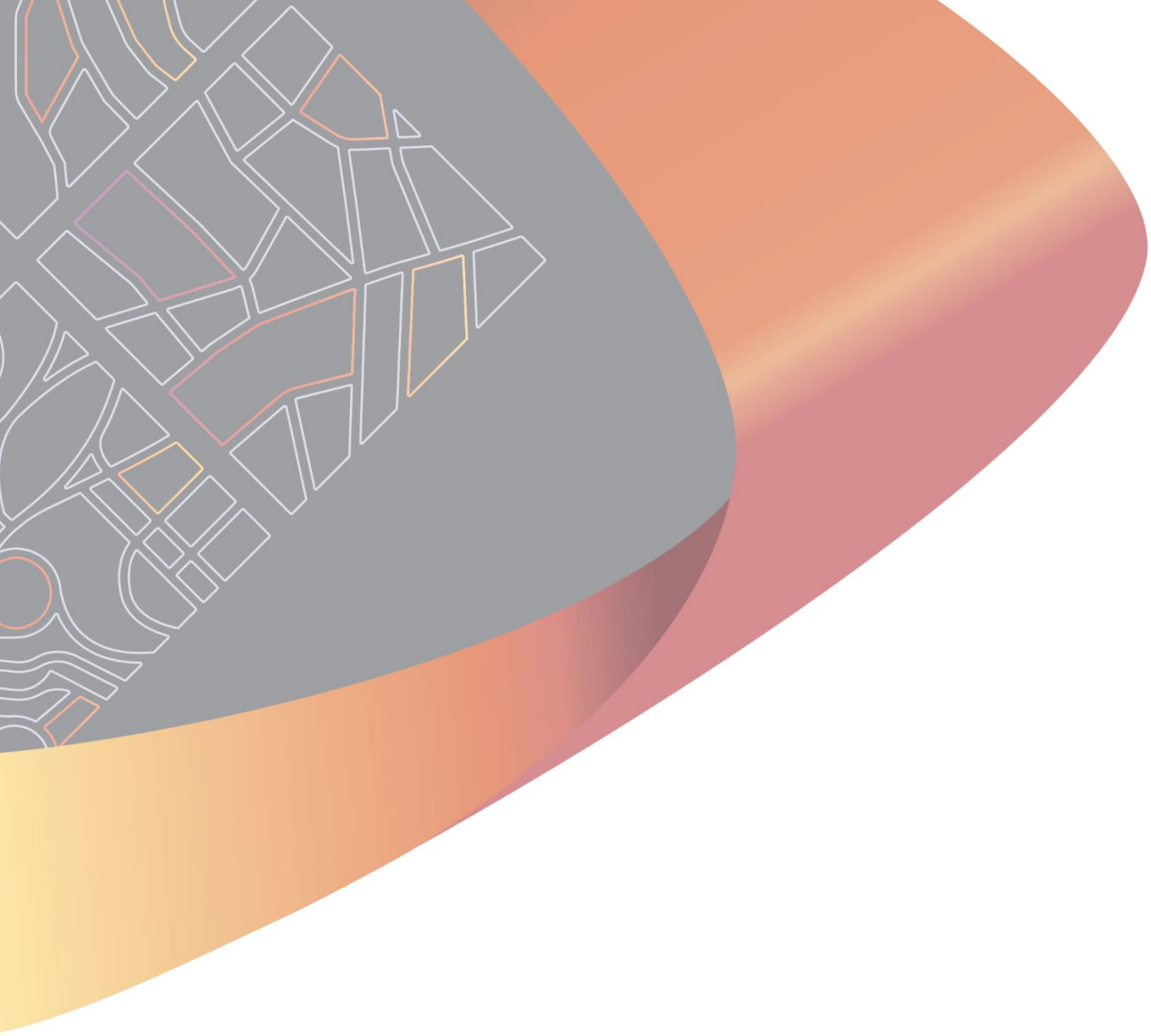
Name	Bradley Jones	**RPEQ No.**	19986
RPEQ Competencies	Civil		
Signature		**Date**	24 March 2025
Postal Address	PO Box 1110, TOWNSVILLE QLD 4810		
Email	Bradley.Jones@premise.com.au		

Premise

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Traffic impact assessment components to which this certification applies	☒
1. Introduction	
Background	☒
Scope and study area	☒
~~Pre-lodgement meeting notes~~ Information requests	☒
2. Existing Conditions	
Land use and zoning	☒
Adjacent land uses / approvals	☒
Surrounding road network details	☒
Traffic volumes	☒
Intersection and network performance	☒
Road safety issues	☒
Site access	☒
Public transport (if applicable)	☒
Active transport (if applicable)	☒
Parking (if applicable)	☐
Pavement (if applicable)	☐
Transport infrastructure (if applicable)	☐
3. Proposed Development Details	
Development site plan	☒
Operational details (including year of opening each stage and any relevant catchment / market analysis)	☒
Proposed access and parking	☒
4. Development Traffic	
Traffic generation (by development stage if relevant and considering light and heavy vehicle trips)	☒
Trip distribution	☒
Development traffic volumes on the network	☒
5. Impact Assessment and Mitigation	
With and without development traffic volumes	☒
Construction traffic impact assessment and mitigation (if applicable)	☐
Road safety impact assessment and mitigation	☒
Access and frontage impact assessment and mitigation	☒
Intersection delay impact assessment and mitigation	☒
Road link capacity assessment and mitigation	☐
Pavement impact assessment and mitigation	☐
Transport infrastructure impact assessment and mitigation	☐
Other impacts assessment relevant to the specific development type / location (if applicable) - Intersection spacing - SARA advice notice response	☒
6. Conclusions and Recommendations	
Summary of impacts and mitigation measures proposed	☒
Certification statement and authorisation	☒

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



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Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

APPENDIX C

Stormwater Management Plan prepared by Premise

brazier motti

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

PARKSIDE DEVELOPMENT PTY LTD

GREATER ASCOT TOWN CENTRE STAGE 1

STORMWATER QUALITY MANAGEMENT PLAN

Report No: P001406.R03
Rev: B
25 March 2025

Premise

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

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DOCUMENT AUTHORISATION					
Revision	**Revision Date**	**Proposal Details**			
A	07/11/24	For Approval			
B	25/03/25	For Approval – Treatment Plan Amended			
Prepared By		**Reviewed By**		**Authorised By**	
Danielle Bamber		Zac Strogusz		Katie De Lacey	

CONTENTS

TABLES

FIGURES

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

APPENDICES

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

1. INTRODUCTION

Premise Townsville Pty Ltd has been commissioned by Parkside Developments Pty Ltd to prepare a Stormwater Quality Management Plan for Stage 1 of the Greater Ascot Town Centre on Lot 2 on SP 107219.

Townsville City Council has consistently provided support for stormwater quality management strategies that involved a monetary contribution toward catchment-wide off-site stormwater quality management infrastructure, for similarly sized developments of a similar nature. It is proposed that a monetary contribution be accepted for a portion of proposed stage 1, with the remainder of the first stage to incorporate a treatment train implementing Bio Pods to meet planning policy targets for pollutant removal.

- It is proposed that a monetary contribution be accepted for the eastern site ingress and internal roundabout which will ultimately become a council asset (shown as cyan in **Figure 1**),
- The remainder of Stage 1 internal road (magenta in **Figure 1**) is proposed to be treated via a treatment train of Bio Pods located within the road reserve upstream of traditional kerb inlet manholes.
- The individual commercial lots (yellow in **Figure 1**) will receive treatment within the lots before being discharged from the lot.

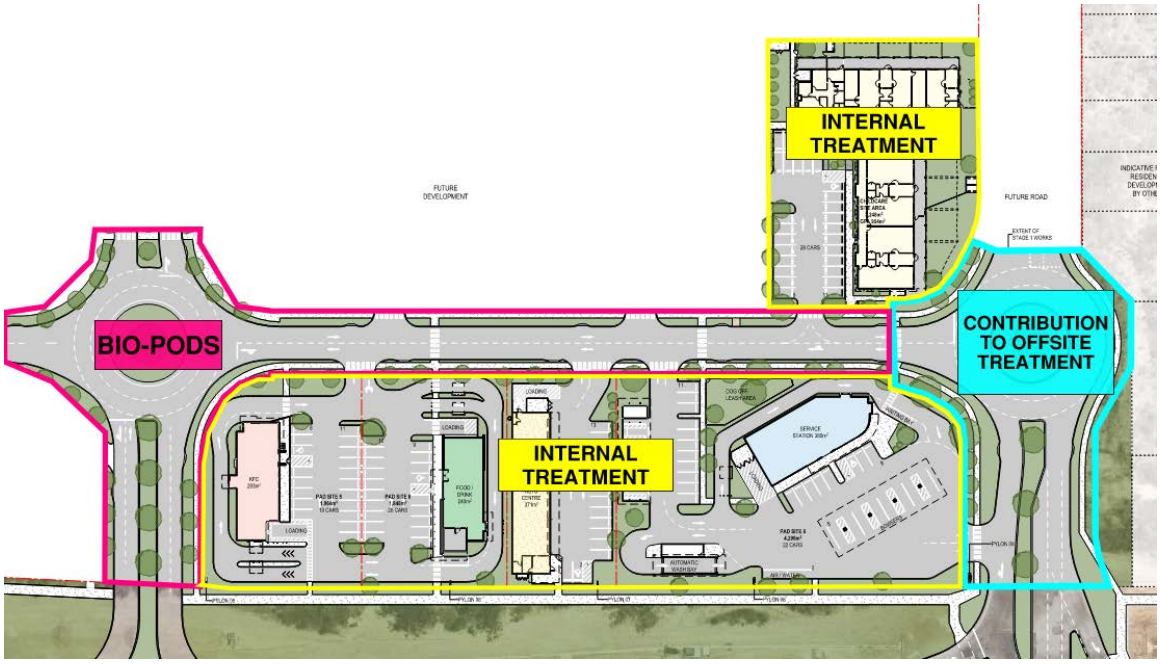


Figure 1: Treatment Intentions for Stage 1

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

2. EXISTING SITE

The site (Stage 1 of Town Centre) is generally a greenfield site with undeveloped land and is zoned as "Emerging Community" under the TCC Planning Scheme. Land use surrounding the site is generally low to medium density residential. The site is currently unoccupied, consisting of cleared land, situated on the outer Southwestern corner of Greater Ascot Residential Development.

3. PROPOSED DEVELOPMENT

The proposed development (Stage1) will consist of five lots which will consist of the following commercial uses:

- A service station, including a convenience store and carwash.
- A car service centre.
- Two (2) fast-food restaurants.
- A childcare centre site.

The proposed development will also consist of an internal road network consisting of two (2) roundabouts, which will be connected to future stages of the Greater Ascot Town Centre. Each of the above commercial facilities are expected to implement their own Stormwater Treatment devices and are not considered within the scope of this Stormwater Quality Plan.

The catchment considered as part of this plan, will consist only of the Internal Access Street and roundabout (Magenta in **Figure 1**) which is estimated to comprise an area of 0.55ha, and the Eastern Ingress and Roundabout (future Council infrastructure) which is estimated to comprise an area of 0.37ha, and shown as Cyan in **Figure 1**.

4. STORMWATER QUALITY

4.1 Stormwater Quality Treatment (Construction Phase)

During the construction phase various pollutants are generated which can find their way into the stormwater runoff. These pollutants can affect the quality of the stormwater runoff and hence pollute both the site and the downstream receiving environment. **Table 1** below outlines the major sources of pollutants.

Table 1: Typical Construction Phase Pollutants

Construction Phase Pollutants
Litter from construction packaging, paper, food packaging, off cuts, etc.
Sediment from erosion of exposed soils and stockpiles.
Hydrocarbons - from fuel and oil spills, leaks from construction equipment.
Toxic Materials - cement slurry, solvents, cleaning agents, wash waters.
pH altering substances - cement slurry, wash waters.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Erosion and sediment control measures used during the construction phase of the development will be designed and installed in accordance with International Erosion Control Association (Australasia) - "Best Practice Erosion & Sediment Control – for building and construction sites" November 2008 as well as the TCC Development Guidelines for Erosion and Sediment Control.

4.2 State Planning Policy Compliance

The latest SPP (2017) Stormwater Management Design Objectives (SMDO's) have been adopted for the operational phases of the development and is detailed in **Table 2** below.

Table 2: Stormwater Quality Objective

Pollutant	Reductions in Mean Annual Load from unmitigated development (%)
Suspended Solids	80
Total Phosphorus	65
Total Nitrogen	40
Gross Pollutants	90

4.3 Stormwater Quality Objectives

The impact of the proposed development was evaluated in terms of long-term average annual pollutant loadings for a traditional residential site. This was accomplished by:

- Establishing long-term base line pollutant loads from a Model for Urban Stormwater Improvement Conceptualisation (MUSIC) model of the current land uses in the catchment;
- Modifying the baseline MUSIC model to incorporate the effects of the development due to changes in land use of the proposed development; and
- Examining the relative increase / decrease in long-term pollutant loads to the receiving waters.

The major pollutants associated with the proposed development are total suspended solids, total Nitrogen, total Phosphorus and gross pollutants.

Townsville City Council requires reduction in pollutants generated from the developed site as detailed in **Table 2** .

4.4 MUSIC Modelling

Stormwater pollutant modelling for the development has been generated using the modelling program "Model for Urban Stormwater Improvement Conceptualisation" (MUSIC) version (v6.3.3) adhering to the prescribed Water By Design MUSIC Modelling Guidelines Version 3.0 2018 (WBDMG).

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

The following data was used as input for the MUSIC models:

- Long term rainfall data was obtained from the Townsville AERO pluviometer (gauge number 032040) at a six (6) minute data interval for a representative period from 1990-1999;
- Monthly aerial potential evapotranspiration data from the Townsville Aero pluviometer;
- The Values for typical Impervious Fractions used have been conservatively calculated from areas on the design plans, and/or adopted from Table SC6.4.9.2 - Design AEPs and fraction Impervious for Land Use Zones in line with TCC City Plan - Stormwater Quantity section.
- Pollutant export parameters have been adopted from Table 3.8 and 3.9 in the Healthy Land and Water (2018) MUSIC Modelling Guidelines Version 3.0, 2018, and Mackay MUSIC Guidelines Version 1.1 (2008), for a land use type of residential; and
- A commercial area was adopted as the land use.

A snapshot of the MUSIC Model catchments can be seen below (Figure 2). See also **Appendix B**.

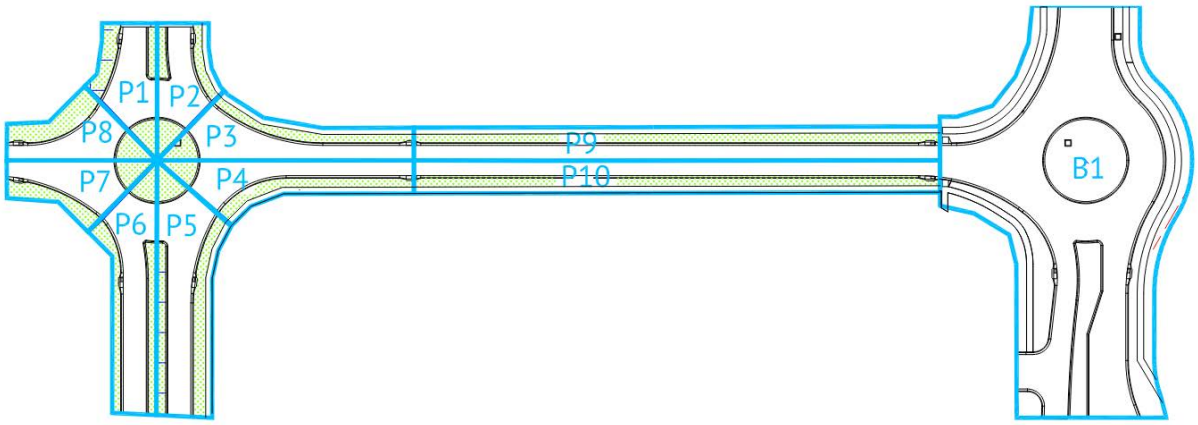


Figure 2: MUSIC Catchments

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Details of catchment assumptions can be seen in Table 3 . Full details of the design treatment train will comply with TCC City plan SC6.4.8 and SC6.4.10 where applicable.

Table 3: MUSIC Model Catchment Parameters

Catchment ID	Land Use	Node Type	Catchment Area (Ha)	Fraction Impervious	Treatments
B1 Urban	Lumped Catchment - Commercial	Urban	0.366	75%	Bioretention Basin
Catchment ID	**Land Use**	**Node Type**	**Catchment Area (Ha)**	**Fraction Impervious**	**Treatments**
P1 Urban	Lumped Catchment - Commercial	Urban	0.032	75%	Bio Pod
P2 Urban	Lumped Catchment - Commercial	Urban	0.032	75%	Bio Pod
P3 Urban	Lumped Catchment - Commercial	Urban	0.050	75%	Bio Pod
P4 Urban	Lumped Catchment - Commercial	Urban	0.050	75%	Bio Pod
P5 Urban	Lumped Catchment - Commercial	Urban	0.072	75%	Bio Pod
P6 Urban	Lumped Catchment - Commercial	Urban	0.058	75%	Bio Pod
P7 Urban	Lumped Catchment - Commercial	Urban	0.034	75%	Bio Pod
P8 Urban	Lumped Catchment - Commercial	Urban	0.034	75%	Bio Pod
P9 Urban	Lumped Catchment - Commercial	Urban	0.092	75%	Bio Pod
P10 Urban	Lumped Catchment - Commercial	Urban	0.092	75%	Bio Pod

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

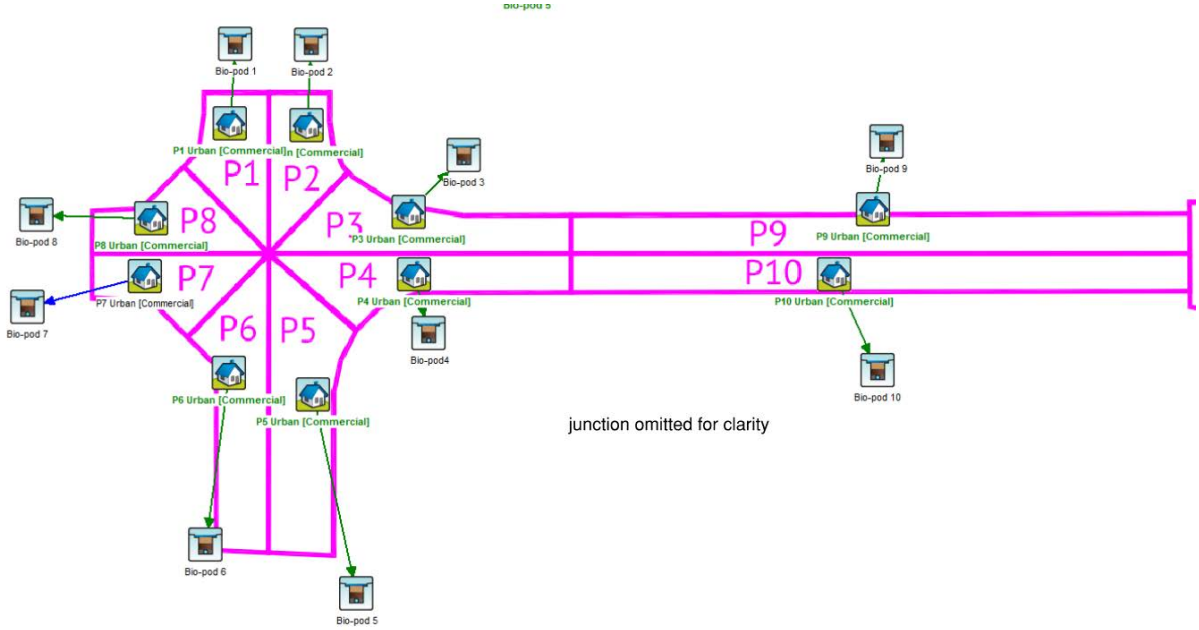


Figure 3: MUSIC Catchments above: (Bio Pod Treatment Areas)

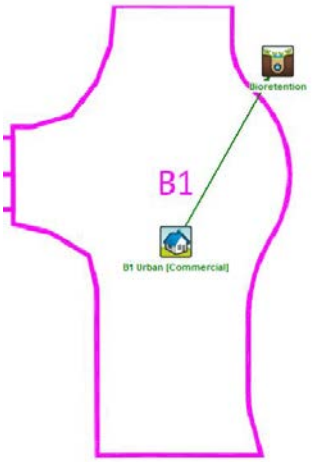


Figure 4: MUSIC Catchments above: (Bioretention Basin Treatment/Contribution Area)

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

4.5 Bio Pod Treatment Nodes

It is proposed that the internal access street (magenta in **Figure 1**) will be treated and managed by the use of kerbside bioretention pods or "Bio Pods". Typical Bio Pod details are presented in **Appendix D** for information only. A total of ten (10) Bio Pods will be integrated into the streetscape and will be co-located with garden beds and otherwise pervious areas. Road runoff from the internal access street will be captured directly from the kerb and treated 'at-surface' using Bio Pods. Runoff in excess of the 3-month rainfall event is bypassed into kerb inlet pits, located adjacent to the pods. The proposed Bio Pod Catchments are generally small (0.1ha per Bio Pod or less). Treated flows from the bio pods shall be collected and discharged via the lawful point of discharge.

The portion of Stage one that is being treated by Bio Pods, was modelled as ten catchment areas each being treated by an upstream Bio Pod. The parameters that are common across all Bio Pods are outlined in **Table 4** below. Individual Bio Pod parameters are displayed in

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Table 5**.** Generally, around 3% of the catchment area translates to a Bio Pod which is sufficient to provide adequate Pollutant Reductions. Each treated catchment was directed at a common Junction Node, from which the overall results for Bio Pod treatment can be presented.

Table 4: Common BioPod Parameters

	Common Bio Pod Parameters	
Inlet Properties	Low Flow Bypass (m^3/s)	0
	High Flow Bypass (m^3/s)	100
Storage Properties	Extended Detention Depth (EDD) (m)	0.2
	Surface Area (m^2)	Varies
	Exfiltration rate (mm/hr)	0
Filter And Media Properties	Filter Area (m^2)	Varies
	Filter Depth (m)	0.6
	Filter Median Particle Diameter (mm)	0.45
	Saturated Hydraulic conductivity (mm/hr)	180
	Depth below underdrain pipe (% of filter depth)	0
Outlet Properties	Overflow Weir Width (m)	2.0

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Table 5: Individual BioPod Parameters

Node Name	Catchment Areas (ha)	Surface Area (m^2)	Filter Area (m^2)
P1 Urban	0.032	10.0	10.0
P2 Urban	0.032	10.0	10.0
P3 Urban	0.050	15.0	15.0
P4 Urban	0.050	15.0	15.0
P5 Urban	0.072	21.2	21.2
P6 Urban	0.058	17.0	17.0
P7 Urban	0.034	11.0	11.0
P8 Urban	0.034	11.0	11.0
P9 Urban	0.092	20.0	20.0
P10 Urban	0.092	20.0	20.0

4.6 Bio Pod Treatment Train Effectiveness

Table 6 Outlines the effectiveness of the overall Bio Pod MUSIC Model Treatment Train in achieving the set Stormwater Management Design Objectives (SMDO's) for pollutant reduction for the subject catchments. The Bio Pod Treatment Train results are the mean pollutant loads at the downstream extent of the model.

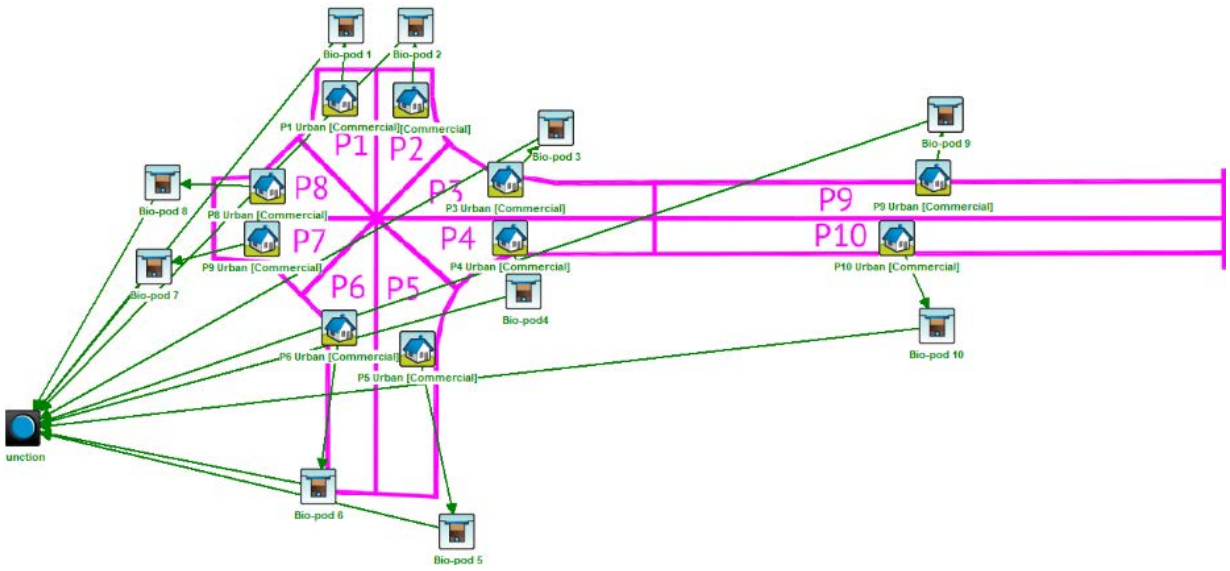


Figure 5: MUSIC Bio Pod Catchments directed to a Junction Node

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Table 6: Summary of Bio Pod MUSIC Results (at Junction for Bio Pods 1 to10)

Node	Pollutant	Sources (kg/yr)	Residual Load (kg/yr) and Reduction (%)		Target Reduction (%)
Final Junction Node	Total Suspended Solids (kg/yr)	897	106	**88.2 %**	80%
	Total Phosphorus (kg/yr)	2.46	0.7	**71.6 %**	65%
	Total Nitrogen (kg/yr)	14.2	8.59	**39.4 %**	40%
	Gross Pollutants (kg/yr)	88.9	0	**100 %**	90%

The overall site meets the Pollutant reduction objectives as shown in Table 6**.**

4.7 Bioretention Basin Treatment Node

The eastern ingress and associated roundabout (cyan in **Figure 1**) have been modelled as receiving treatment via a Bioretention Basin. Preferably, a contribution (based on the expected Bioretention Basin size) be made to Council for development of an effective regional treatment system.

The catchment B1 was modelled as one lumped commercial catchment (B1 Urban). The Fraction Impervious (75%) was conservatively calculated from areas on the design plans. The catchment characteristics are summarised in **Table 3** and a model schematic is shown in **Figure 4.**

Table 9 summarises the specific parameters used to model the Bioretention Basin in MUSIC.

Table 7: Bioretention Basin B1 Parameters

	Parameter	Bioretention B1
1	Surface Area (m^2)	56.2
2	Extended detention depth (m)	0.5
3	Filter treatment area (m^2)	33.0
4	Unlined filter media perimeter (m)	28.0
5	Saturated hydraulic conductivity (mm/hr)	200
6	Filter depth (m)	0.6
7	TN content of filter media (%)	800
8	Orthophosphate content of filter media (mg/kg)	30
9	Is the base lined?	No
10	Vegetated with effective nutrient removal plants	Yes
11	Overflow weir width (m)	5
12	Exfiltration rate (mm/hr)	0
13	If an exfiltration rate has been used, have node water balance losses been used in calculations of treatment train effectiveness	N/A

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

	Parameter	Bioretention B1
14	If exfiltration rate has been used is the exfiltration rate justified?	N/A
15	Underdrain present?	Yes
16	Submerged zone with carbon present?	Yes
17	Depth of submerged zone (m)	0.45
18	Confirmation that K and C* remain default	Yes

Further specifications are as follows:

- Filter Medium – Sandy Loam;
- Transition layer – 100mm thick coarse sand in accordance with WSUD TDG 2006;
- Drainage layer – 200mm 2-5mm gravel in accordance with WSUD TDG 2006; and
- Underdrain System – An under-drain system of slotted drainage pipes (100mm dia at 1.5m centres).

Note: Transition Layer comply with the following: Top of drainage layer is to be at least 100mm above the top of the pipe and filter media / drainage material to comply with the Drainage of Subsurface Water from Road – Technical Bulletin No 32 (VicRoads).

4.8 Bioretention Basin Treatment Train Effectiveness

Table 8 Outlines the effectiveness of the proposed Bioretention Basin MUSIC Model Treatment Train in achieving the set Stormwater Management Design Objectives (SMDO's) for pollutant reduction. Overall pollutant loads have been reported at the downstream extent of the model.

Table 8: Summary of MUSIC Results - Catchment B1

Pollutant	Sources (kg/yr)	Residual Load (kg/yr) and Reduction (%)		Target Reduction (%)
Total Suspended Solids (kg/yr)	1480	252	**83.0 %**	80%
Total Phosphorus (kg/yr)	4.09	1.43	**65.0 %**	65%
Total Nitrogen (kg/yr)	23.6	10.5	**55.7 %**	40%
Gross Pollutants (kg/yr)	148	0	**100 %**	90%

This indicates that the proposed bioretention basin has been adequately sized to satisfy the minimum reduction targets, for the allocated catchment as specified by Townsville City Council.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

5. STORMWATER QUALITY MAINTENANCE

Prior to commencement of construction, an Erosion and Sediment Control Plan (ESCP) will be prepared and implemented to minimise the impacts on stormwater quality. The plan will address site and catchment specific erosion control measures, generally adhering to the following control measures.

5.1 Pre-Construction

Before construction the following measures will be established and maintained for any to be disturbed:

- Stockpile areas to be designated to minimise impacts on site runoff.
- Provision of shakedown pit for any entry/exit points to the site; and
- Toolbox talk to inform any regular site personnel

5.2 During Construction

- Construction related activities will be contained within the subject site where possible to minimise areas of disturbance
- Topsoil retention for site rehabilitation.
- Regular inspection of sediment control measures; and
- Dynamic response to any changing site conditions

5.3 Post-Construction

Following construction any disturbed areas will be stabilised through revegetation which is to be maintained until established.

6. RECOMMENDATION

The Stormwater Quality Improvement Devices (SQID's) proposed for the development include Bioretention Basins and Bio Pods to provide adequate stormwater quality treatment. The MUSIC modelling of the proposed treatment trains demonstrates the SPP's Pollutant Load SMDO's are achieved.

The internal road (magenta in **Figure 1**) part of Stage 1 can be adequately treated via the proposed treatment train of Bio Pods located within the road reserve upstream of traditional kerb inlet manholes.

The Eastern Ingress (shown as cyan in **Figure 1**), can be adequately treated via a Bioretention Basin as detailed in the previous sections. However, it is preferable that a monetary contribution toward catchment-wide off-site stormwater quality management infrastructure be accepted for this portion of the site. In line with advice provided by Townsville City Council for similar developments of comparable size, it is proposed that bioretention basin infrastructure is not implemented on the subject site as a part of this development. For this development:

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

a) The provision of on-site stormwater quality management infrastructure is not a cost-effective means of achieving stormwater quality outcomes for the developer;

b) The maintenance costs associated with any on-site stormwater quality management infrastructure is not a cost-effective means for Council to achieve stormwater quality outcomes;

c) Any on-site stormwater quality management infrastructure that is provided on-site will be a less effective means of achieving stormwater quality outcomes than an offsite solution that could treat water from the broader catchment; and

A monetary contribution toward the implementation of catchment-wide stormwater quality management infrastructure, or the preparation of plans for such infrastructure, is recommended to be the most efficient and effective way to realise stormwater quality improvement for the catchment.

Table 9 below summarises construction details of recent bioretention basins built in Townsville over the past year including development name, treatment areas, construction costs, and the calculated cost per m^2 of filter/treatment area. The construction costs include earthworks, drainage structures, subsoil drains, filter material and temporary turfing, topsoil & geofabric for each bioretention. The temporary turfing, topsoil and geofabric is not required when the bioretention is constructed to its ultimate form and therefore the temporary works are considered equal in value to the planting out of the basin treatment surface area.

Appendix C contains the bioretention basins civil layout plans and extracts from the progress claims for each of the developments listed in **Table 9.**

Table 9: Bioretention Construction Costs

Development	Basin Filter Treatment Area m2 (Approx.)	Total Construction Cost (2023/2024)	Cost per m^2 of Filter Treatment Area
Elliot Springs - Whites Creek Stages 37 to 40 - Basin A	570	$ 206,425.00	$ 362.15
Elliot Springs - Whites Creek Stages 37 to 40 -Basin B	230	$ 91,238.00	$ 396.69
Elliot Springs - Whites Creek Stages 10 -14 - Basin C	410	$ 177,660.00	$ 433.32
Elliot Springs - Whites Creek Stages 10 -14 - Basin D	1055	$ 383,555.00	$ 363.56
Elliot Springs - Whites Creek Stages 10 -14 - Basin E	208	$ 122,009.00	$ 586.58
Greater Ascot Stages 804 805 806 - Basin A	380	$ 124,545.00	$ 327.75
Greater Ascot Stages 804 805 806 - Basin B	335	$ 110,033.00	$ 328.46

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Development	Basin Filter Treatment Area m2 (Approx.)	Total Construction Cost (2023/2024)	Cost per m^2 of Filter Treatment Area
Riverstone - Basin A	270	$ 74,457.00	$ 275.77
Riverstone - Basin B	620	$ 127,857.00	$ 206.22
Total	**4078m^2**	**$ 1,417,779.00**	**$347.65/$m^2$**

Based on the developments listed in **Table 9** it is determined that the average construction cost per m^2 of Filter treatment area for a bioretention basin in Townsville is approximately $347.65/$m^2$.

The cost of providing stormwater treatment facilities for the future council owned portion of Stage 1 of the Greater Ascott Town Centre, proportionate to the approved land area has been calculated as 56.2m^2 (**Table 7,** Row 3) basin filter treatment area, multiplied by average construction cost per m^2 $347/m2, $19,500.00 excl GST.

It is recommended that the developer and council enter into an Infrastructure Agreement based on the above calculated costs and the developer makes a monetary contribution to Townsville City Council to offset any stormwater quality requirements of the development.

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

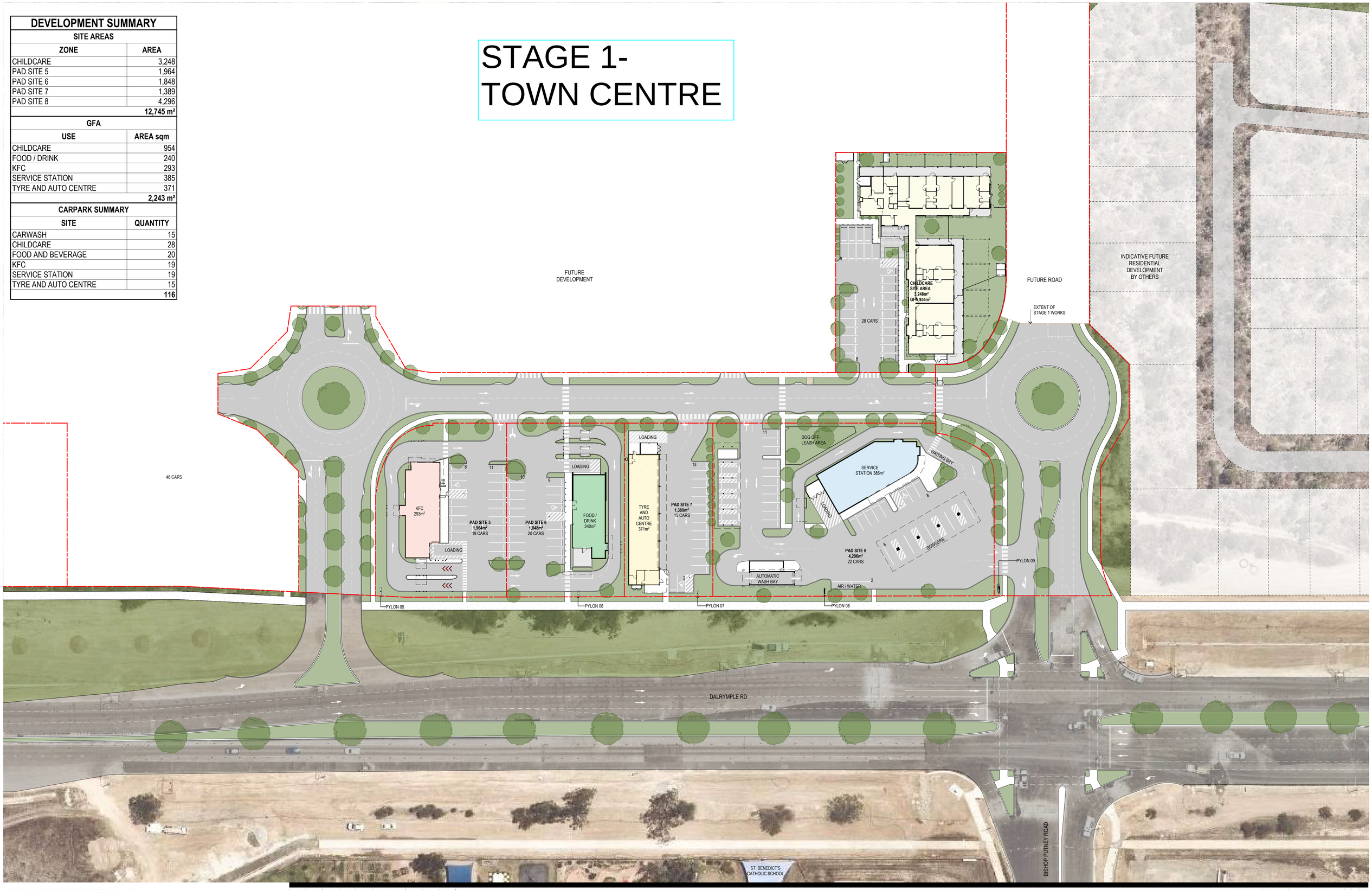
Appendix A

Development Site Plan

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

STAGE 1- TOWN CENTRE

DEVELOPMENT SUMMARY	
SITE AREAS	
ZONE	**AREA**
CHILDCARE	3,248
PAD SITE 5	1,964
PAD SITE 6	1,848
PAD SITE 7	1,389
PAD SITE 8	4,296
	12,745 m²
GFA	
USE	**AREA sqm**
CHILDCARE	954
FOOD / DRINK	240
KFC	293
SERVICE STATION	385
TYRE AND AUTO CENTRE	371
	2,243 m²
CARPARK SUMMARY	
SITE	**QUANTITY**
CARWASH	15
CHILDCARE	28
FOOD AND BEVERAGE	20
KFC	19
SERVICE STATION	19
TYRE AND AUTO CENTRE	15
	116



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ISSUE	PURPOSE	DATE	D	C	A
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06	FOR INFOMATION	19/09/24	CPA	EB	MC
05	PROGRESS ISSUE	30/08/24	CPA	EB	MC
04	PROGRESS ISSUE	23/08/24	CPA	MC	MC
03	FOR INFORMATION	20/08/24	EB	MC	MC
02	FOR INFORMATION	15/07/2024	JG	EB	MC
01	FOR INFORMATION	01/07/24	EB	MC	MC
SD					

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW
CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
STAGE 1 SITE PLAN

JOB No	DRAWING No	ISSUE
6570	**SD1002**	**07**

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

ALL STAGES - TOWN CENTRE

AREAS SUMMARY

STAGE	USE	AREA
STAGE 1		
	CHILDCARE	954
	FOOD / DRINK	240
	KFC	293
	SERVICE STATION	385
	TYRE AND AUTO CENTRE	371
		2,243 m²
STAGE 2A		
	KIOSK	25
	LFR	2,559
	RETAIL	788
	SUPERMARKET	3,814
	TOWN SQUARE	1,573
		8,759 m²
STAGE 2B		
	RETAIL	1,029
		1,029 m²
STAGE 2C		
	RETAIL	1,405
		1,405 m²
STAGE 2D		
	GROCERIES	1,532
	LIBRARY	287
	MINI MAJOR	624
	RETAIL	342
	SWIM SCHOOL	602
		3,387 m²
STAGE 2E		
	LFR	1,246
	MC DONALDS	533
	QSR 2	277
	QSR 3	271
		2,327 m²
STAGE 3		
	BEER GARDEN	195
	LFR	13,355
	LIQUOR	800
	RETAIL	153
	TAVERN	557
		15,060 m²
		34,210 m²

CARPARK SUMMARY

STAGE	USE	QUANTITY
STAGE 1		
	CARWASH	15
	CHILDCARE	28
	FOOD AND BEVERAGE	20
	KFC	19
	SERVICE STATION	19
	TYRE AND AUTO CENTRE	15
		116
STAGE 2A		
		6
	DTB	6
	STREET PARKING	27
	SUPERMARKET	253
		292
STAGE 2B		
	RETAIL	24
		24
STAGE 2C		
	STREET PARKING	37
	SUPERMARKET	18
		55
STAGE 2D		
	SWIM SCHOOL	24
		24
STAGE 2E		
	LFR	46
	MC DONALDS	24
	QSR 2	20
	QSR 3	21
		111
STAGE 3		
	LFR	400
	TAVERN AND LIQUOR	44
		444
		1066

PARKING RATIO

STAGE 1		
2,243 m²	116 CARS	1 CAR / 19.3 m²
STAGE 2 COMBINED		
16,907 m²	506 CARS	1 CAR / 33.4 m²
STAGE 3		
15,060 m²	444 CARS	1 CAR / 33.9 m²
OVERALL BALANCE		
34,210 m²	1066 CARS	1 CAR / 32.1 m²

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07	MASTERPLAN PROGRESS ISSUE	25/09/24	EB	MC	MC
06	FOR INFOMATION	19/09/24	CPA	EB	MC
05	STAGE 2 PROGRESS ISSUE	05/09/24	EB	MC	MC
04	PROGRESS ISSUE	23/08/24	CPA	MC	MC
03	FOR INFORMATION	23/07/24	EB	MC	MC
02	FOR INFORMATION	15/07/2024	JG	EB	MC
01	FOR INFORMATION	12/07/24	CPA	MC	MC

SD

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
MASTERPLAN

JOB No	DRAWING No	ISSUE
6570	**SD1003**	**08**

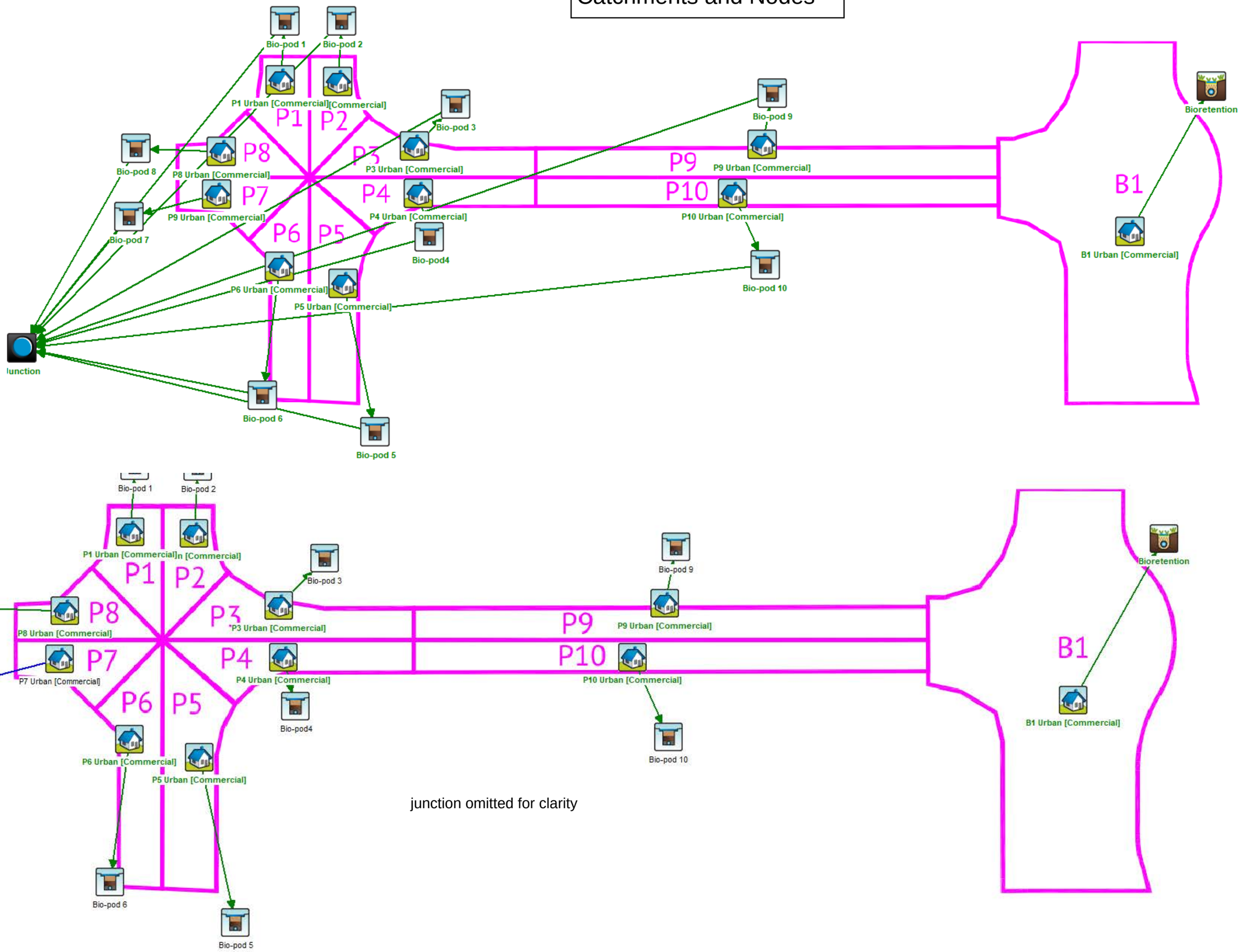
Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Appendix B

Preliminary Stormwater Drainage Layout Plan & WSUD Catchments

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Catchments and Nodes



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Version: 1, Version Date: 03/04/2025

STAGE 1- TOWN CENTRE

DEVELOPMENT SUMMARY	
SITE AREAS	
ZONE	**AREA**
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USE	**AREA sqm**
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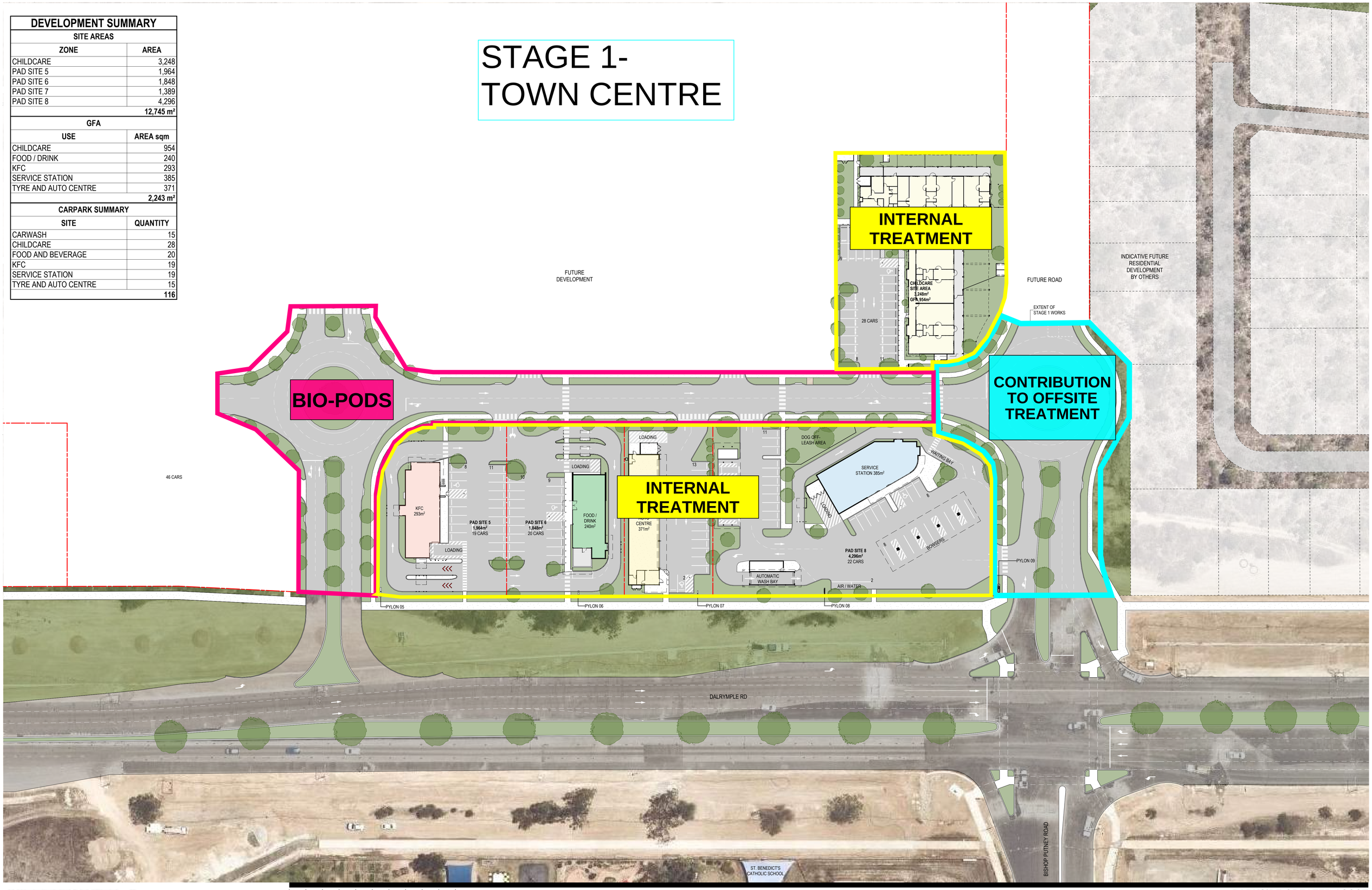

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05	PROGRESS ISSUE	30/08/24	CPA	EB	MC
04	PROGRESS ISSUE	23/08/24	CPA	MC	MC
03	FOR INFORMATION	20/08/24	EB	MC	MC
02	FOR INFORMATION	15/07/2024	JG	EB	MC
01	FOR INFORMATION	01/07/24	EB	MC	MC
SD					

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW
CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
STAGE 1 SITE PLAN

JOB No	DRAWING No	ISSUE
6570	**SD1002**	**07**

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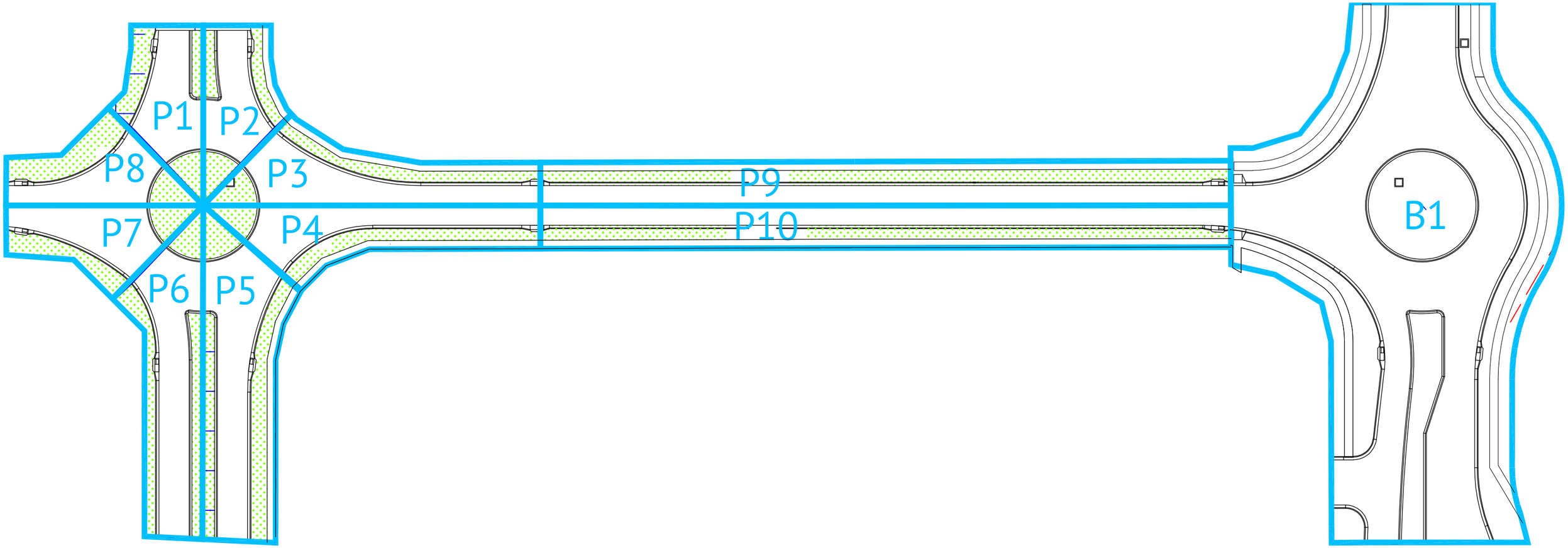

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Version: 1, Version Date: 03/04/2025

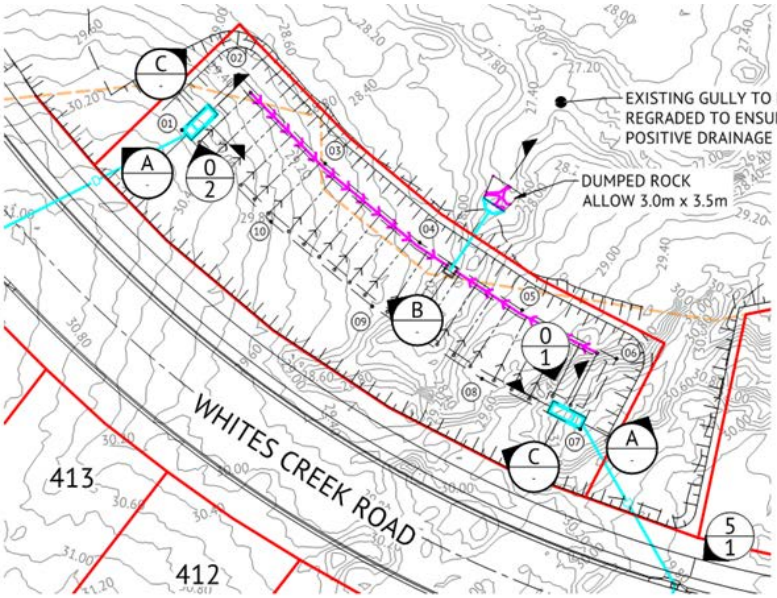
Appendix C

Bio Retention Layout Plans and Costs

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

BASIN A - BASE AREA 615m2					
ELLIOT SPRINGS - WHITES CREEK STAGES 37 TO 40 LLC-0093 SEPT 2024					
Item	**Description**	**Unit**	**Quantity**	**Contract Rate**	**Contract Amount**
4	**Scour Protection**				
(a)	Dumped rock - 600mm thick (D_{50} 300mm) on geotextile fabric (Bidum A34)	m^2	11	$ 45.25	$ 497.75
5	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(a)	Bio-Retention A - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	600	$ 183.60	$ 110,160.00
(b)	Bio-Retention A - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	600	$ 117.23	$ 70,338.00
7	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCBC sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	2.0	$ 11,259.51	$ 22,519.02
(a)	Hydromulching H2	m^2	990	$ 2.94	$ 2,910.60
					$ 206,425.37

from payment claim 05



MODIFIED HES AND
BIO-RETENTION BASIN A LAYOUT
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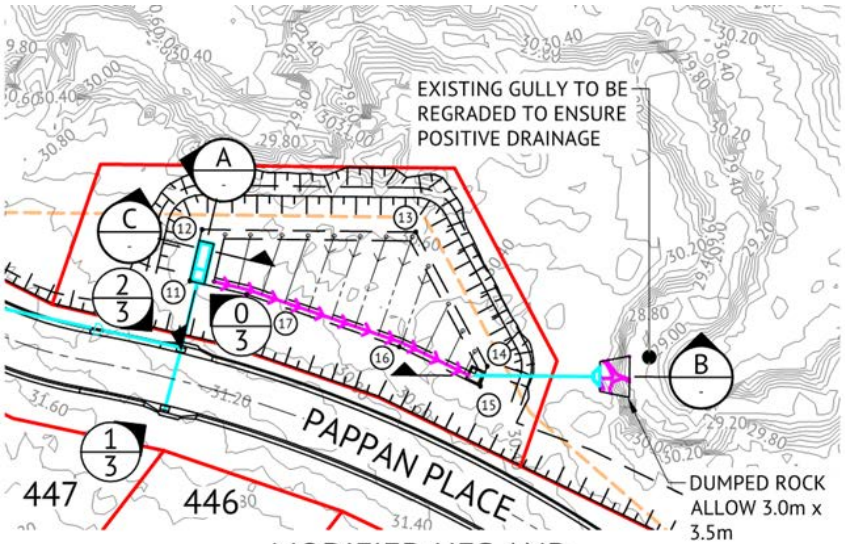
Version: 1, Version Date: 03/04/2025

BASIN B - BASE AREA 245 m2					
ELLIOT SPRINGS - WHITES CREEK STAGES 37 TO 40 LLC-0093 SEPT 2024					
Item	**Description**	**Unit**	**Quantity**	**Contract Rate**	**Contract Amount**
4	**Scour Protection**				
(a)	Dumped rock - 600mm thick (D_{50} 300mm) on geotextile fabric (Bidum A34)	m^2	11	$ 45.25	$ 497.75
5	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(c)	Bio-Retention B - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	236	$ 209.15	$ 49,359.40
(d)	Bio-Retention B - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	236	$ 122.90	$ 29,004.40
7	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCBC sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	1.0	$ 11,259.51	$ 11,259.51
(a)	Hydromulching H2	m^2	380	$ 2.94	$ 1,117.20
					$ 91,238.26

from payment claim 05



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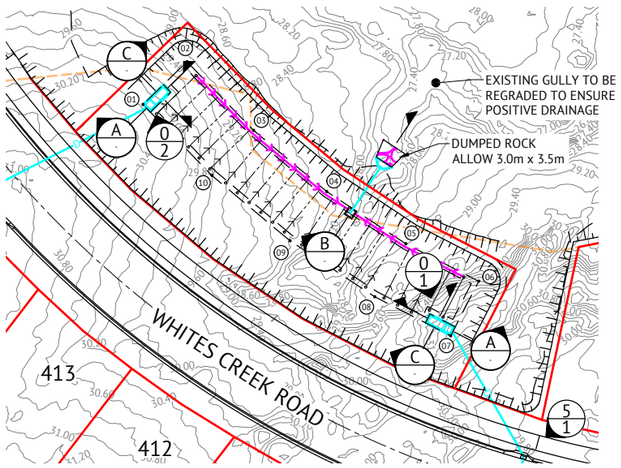

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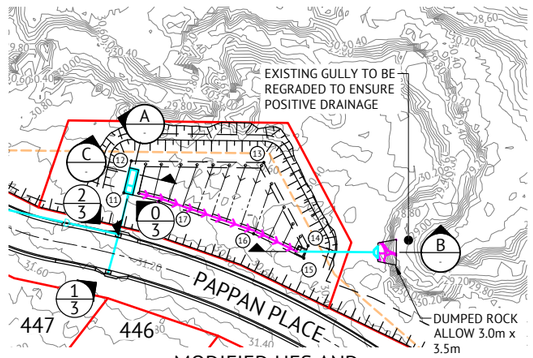

MODIFIED HES AND BIO-RETENTION BASIN B LAYOUT

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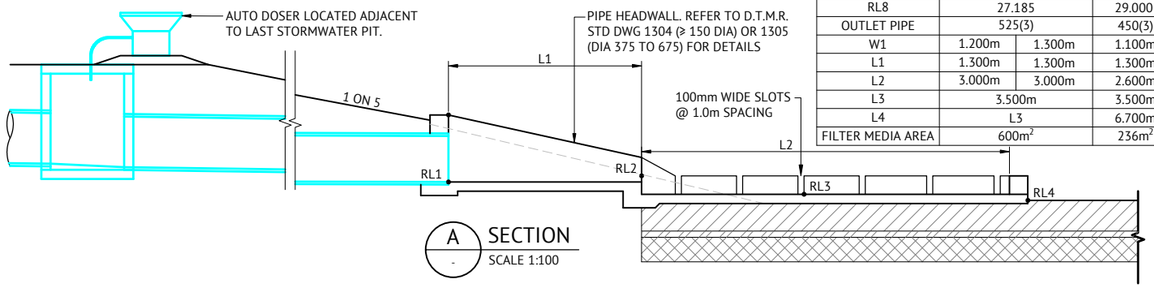
H.E.S DETAILS

NOTATION	BASIN A		BASIN B
	OUTLET 0/1	OUTLET 0/2	
RL1	DSIL		DSIL
RL2	RL1 + 0.100m		RL1 + 0.100m
RL3	RL1 - 0.200m		RL1 - 0.200m
RL4	RL1 - 0.300m		RL1 - 0.300m
RL5	RL1 + 0.100m		RL1 + 0.100m
RL6	RL1 + 0.400m		RL1 + 0.400m
RL7	27.285		29.100
RL8	27.185		29.000
OUTLET PIPE	525(3)		450(3)
W1	1.200m	1.300m	1.100m
L1	1.300m	1.300m	1.300m
L2	3.000m	3.000m	2.600m
L3	3.500m		3.500m
L4	L3		6.700m
FILTER MEDIA AREA	600m²		236m²



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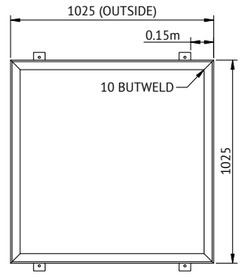
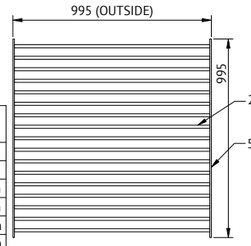
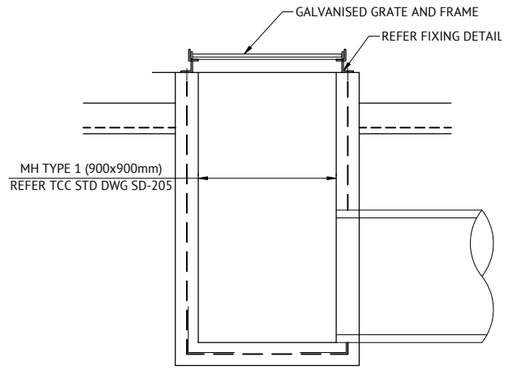
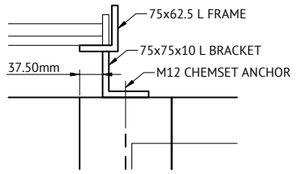


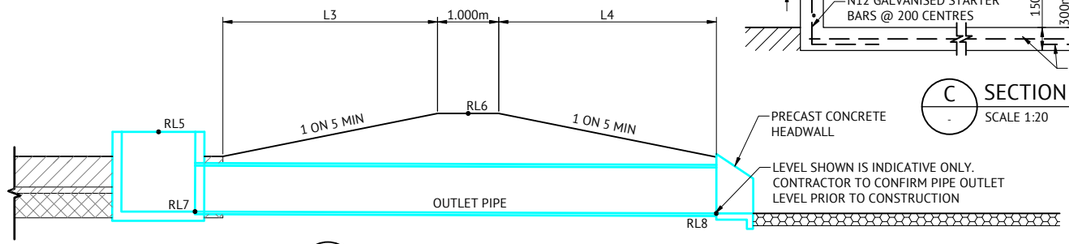




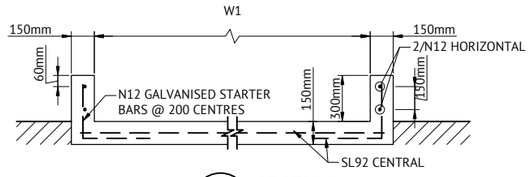


RAISED GRATE FIELD INLET

SCALE: 1:20



B SECTION
SCALE 1:100



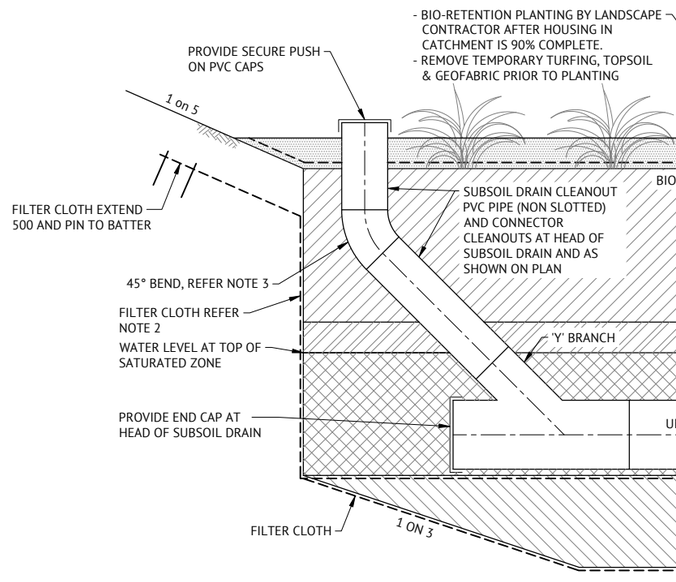
C SECTION
SCALE 1:20

LEGEND

- EXISTING SURFACE CONTOURS (5.90)
- VEGETATION BUFFER
- EARTHWORKS LEVEL (RL.31.75)
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS
- DUMPED ROCK SCOUR PROTECTION ON GEOTEXTILE FABRIC (200g/m²) ROCK GRADING - 600mm THICK d50 = 300mm

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH IPWEA STANDARD DRAWING DS-078.
2. FILTER CLOTH - PROPRIETARY PRODUCT, BIDIM A24 OR EQUIVALENT NON-WOVEN GEOTEXTILE.
   FILTER CLOTH NOT TO BE PLACED BETWEEN ANY FILTER LAYERS.
3. UNDER-DRAIN: 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE. PIPES SHOULD NOT BE INSTALLED WITH A FILTER SOCK SURROUNDING PIPE. UNDER-DRAINAGE PIPES SHALL BE SEALED INTO PITS USING GROUT OR OTHER APPROVED WATERTIGHT SEAL.
4. FOR COARSE SEDIMENT FOREBAY CONCRETE AND REINFORCEMENT DETAILS, REFER TO DTMR STANDARD DRAWING 1304 (DRAWINGS 1 AND 2).



BIO-BASIN WILL PERFORM AS SEDIMENT BASIN UNTIL HOUSING IN CATCHMENT IS 90% COMPLETE. TEMPORARILY INSTALL GEOTEXTILE FABRIC (200g/m²) , TOPSOIL & TURF IN INTERIM.

FILTER MEDIA - CONSTANT DEPTH (SANDY LOAM) SATURATED HYDRAULIC CONDUCTIVITY OF 100mm-500mm/hr

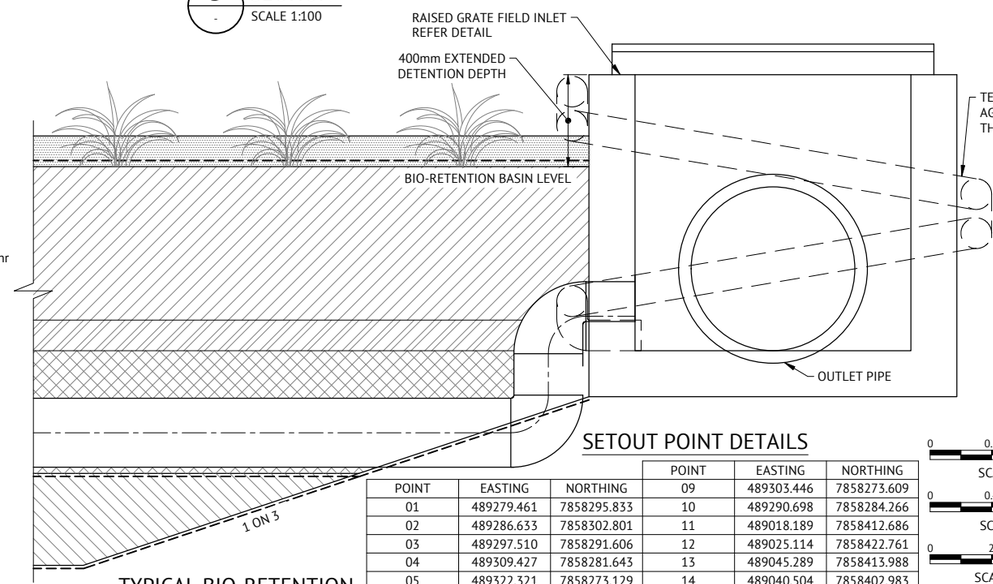
TRANSITION LAYER - CONSTANT DEPTH (COARSE SAND) SATURATED HYDRAULIC CONDUCTIVITY OF 1000mm/hr

SATURATED DRAINAGE LAYER - CONSTANT DEPTH 'CLEAN' AGGREGATE 2mm-5mm MIXED WITH 4% BY VOLUME HARDWOOD CHIPS AND 2% BY VOLUME STRAW SATURATED HYDRAULIC CONDUCTIVITY > 1000mm/hr

TEMPORARY CONSTRUCTION TO ACT AS A MODIFIED HIGH EFFICIENCY SEDIMENT BASIN. TO BE FILLED IN WITH EMBANKMENT MATERIAL PRIOR TO THE INSTALLATION OF BIO-RETENTION BASIN FILTER MATERIAL.

BIO-RETENTION BASIN SUBSOIL CLEANOUT AND FILTER MEDIA

SCALE: 1:10



TYPICAL BIO-RETENTION BASIN OVERFLOW PIT

SCALE: 1:10

SETOUT POINT DETAILS

POINT	EASTING	NORTHING	POINT	EASTING	NORTHING
01	489279.461	7858295.833	09	489303.446	7858273.609
02	489286.633	7858302.801	10	489290.698	7858284.266
03	489297.510	7858291.606	11	489018.189	7858412.686
04	489309.427	7858281.643	12	489025.114	7858422.761
05	489322.321	7858273.129	13	489045.289	7858413.988
06	489334.220	7858267.016	14	489040.504	7858402.983
07	489329.651	7858258.121	15	489033.472	7858399.460
08	489317.266	7858264.483	16	489025.273	7858403.447
			17	489009.855	7858408.756

0 0.2 0.4 0.6m
SCALE 1:10 (A1)

0 0.4 0.8 1.2m
SCALE 1:20 (A1)

0 2 4 6m
SCALE 1:100 (A1)

0 10 20 30m
SCALE 1:500 (A1)

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
22/03/23	B	LOT LAYOUT REVISED	GB	PP
07/11/22	A	ISSUED FOR CONSTRUCTION	GB	PP
12/08/22	1	ISSUED FOR OPERATIONAL WORKS APPROVAL	JJ	PP

REVISIONS

Premise
TOWNSVILLE OFFICE
84 DENHAM STREET
PO BOX 1110
TOWNSVILLE, QLD 4810
PH: (07) 4772 0666
WEB: www.premise.com.au

DESIGNED JJONES
CHECKED G.BROSNAN
PROJECT MANAGER P.PETERSEN
ENGINEERING CERTIFICATION
P.PETERSEN RPEQ 13231

SCALE

ORIGINAL SHEET SIZE A1

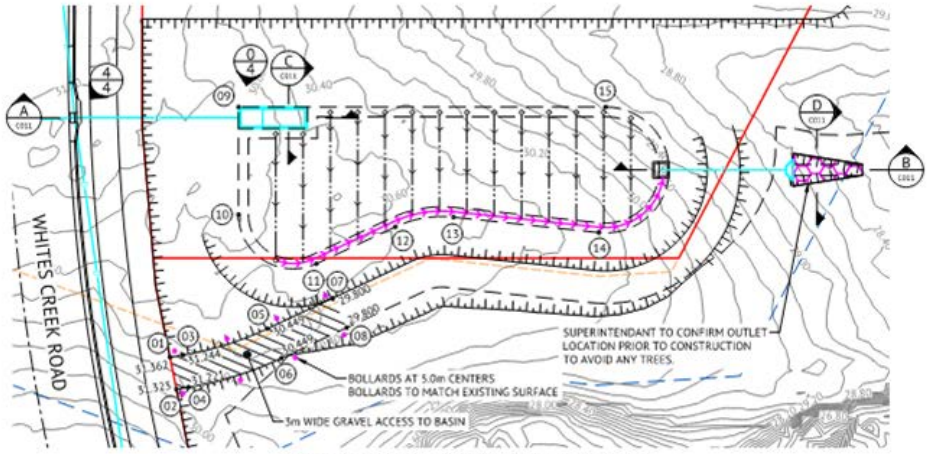
CLIENT: LENDLEASE COMMUNITIES (TOWNSVILLE) PTY LTD
PROJECT: WHITES CREEK STAGES 37-40
LOCATION: WHITES CREEK ROAD, JULAGO
SHEET TITLE: MODIFIED H.E.S SEDIMENT BASIN AND BIO-RETENTION BASIN DETAILS

JOB CODE: LLC-0093
SHEET NUMBER: C031
REV: B

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

BASIN C - BASE 440m2					
ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 LLC-0095 TENDERS ONLY					
Item	**Description**	**Unit**	**Quantity**	**Rate**	**Amount**
3	**Scour Protection**				
(a)	Dumped rock - 500mm thick (D_{50} 200mm) on geotextile fabric (Bidrum A34)	m^2	13	$ 69.90	$ 908.70
4	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(a)	Bio-Retention C - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	440	$ 68.99	$ 30,355.60
(b)	Bio-Retention C - preparation of subgrade, installation of all drainage pipes and filter media,	m^2	440	$ 282.63	$ 124,357.20
2	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	1	$ 22,039.30	$ 22,039.30
2	**LANDSCAPING Earthworks**				
					$ 177,660.80

taken from Tender

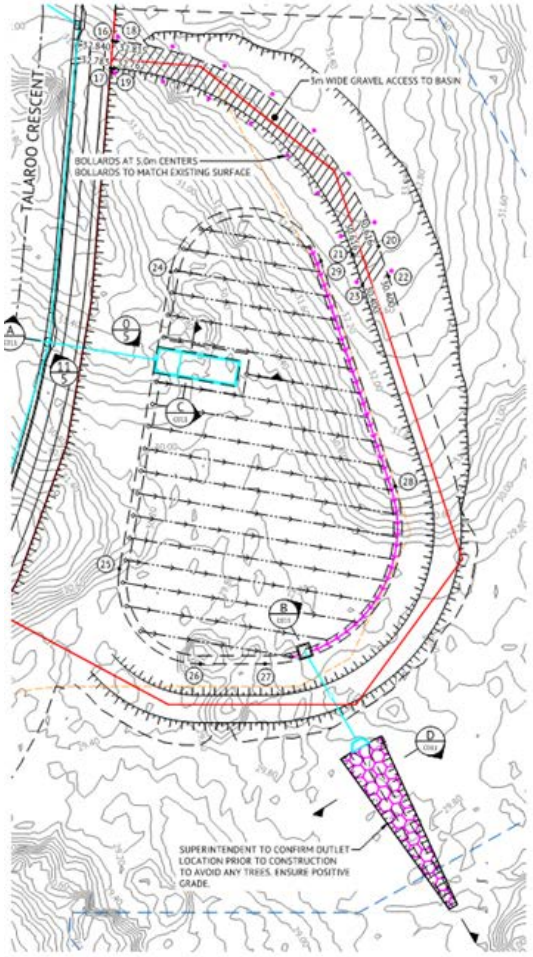


HES AND BIO-RETENTION BASIN C LAYOUT
SCALE: 1:250

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

BASIN D - BASE 1135m2					
ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 LLC-0095 TENDERS ONLY					
Item	**Description**	**Unit**	**Quantity**	**Rate**	**Amount**
3	**Scour Protection**				
(a)	Dumped rock - 500mm thick (D_{50} 200mm) on geotextile fabric (Bidrum A34)	m^2	61	$ 69.90	$ 4,263.90
(c)	Bio-Retention D - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	1135	$ 46.06	$ 52,278.10
(d)	Bio-Retention D - preparation of subgrade, installation of all drainage pipes and filter media,	m^2	1135	$ 268.70	$ 304,974.50
2	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	1	$ 22,039.30	$ 22,039.30
2	**LANDSCAPING Earthworks**				
					$ 383,555.80

taken from Tender



HES AND BIO-RETENTION BASIN D LAYOUT
SCALE: 1:250

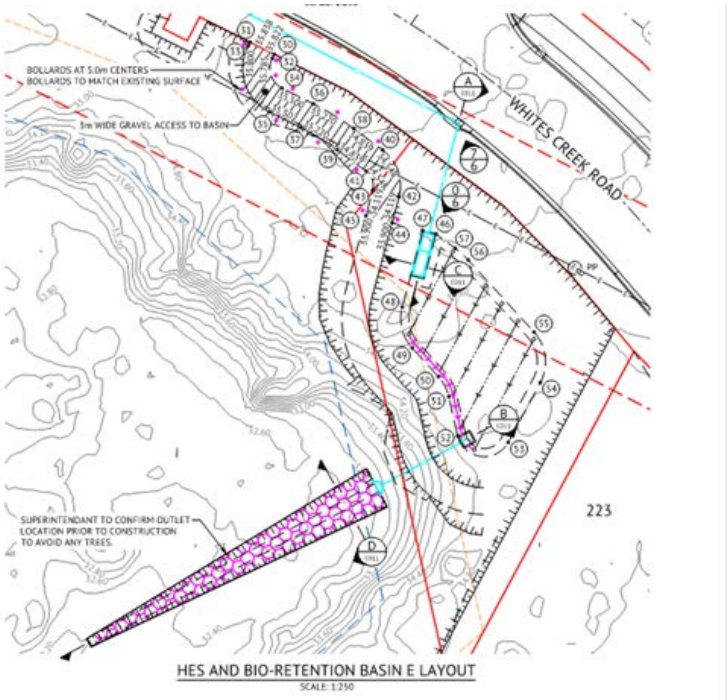
Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

BASIN E - BASE 224m2

ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 LLC-0095 TENDERS ONLY

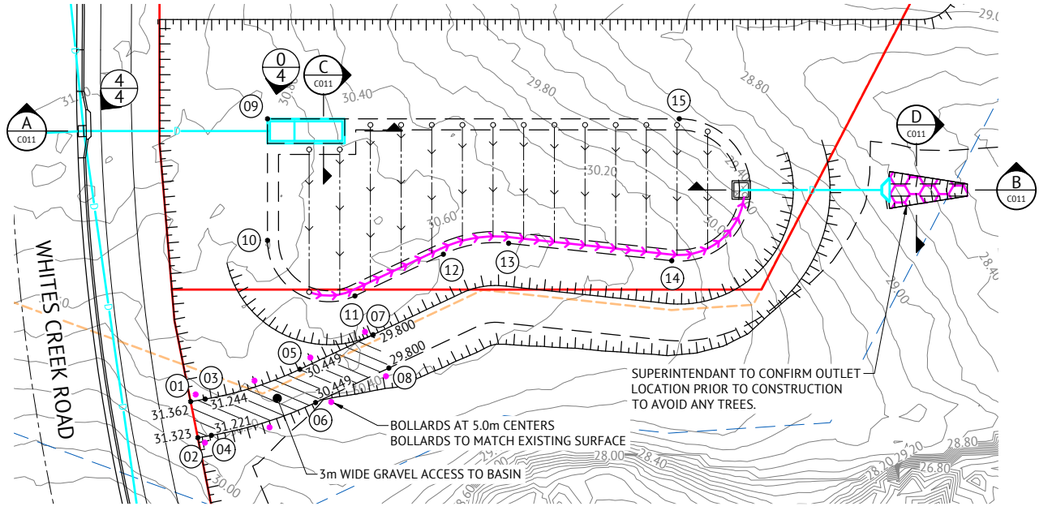
Item	Description	Unit	Quantity	Rate	Amount
3	**Scour Protection**				
(a)	Dumped rock - 500mm thick (D_{50} 200mm) on geotextile fabric (Bidrum A34)	m^2	106	$ 69.90	$ 7,409.40
(f)	Bio-Retention E - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	224	$ 302.16	$ 67,683.84
(e)	Bio-Retention E - including excavate 300mm below filter media profile, place geofabric and	m^2	224	$ 111.06	$ 24,877.44
2	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCP sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	1	$ 22,039.30	$ 22,039.30
					$ 122,009.98

taken from Tender



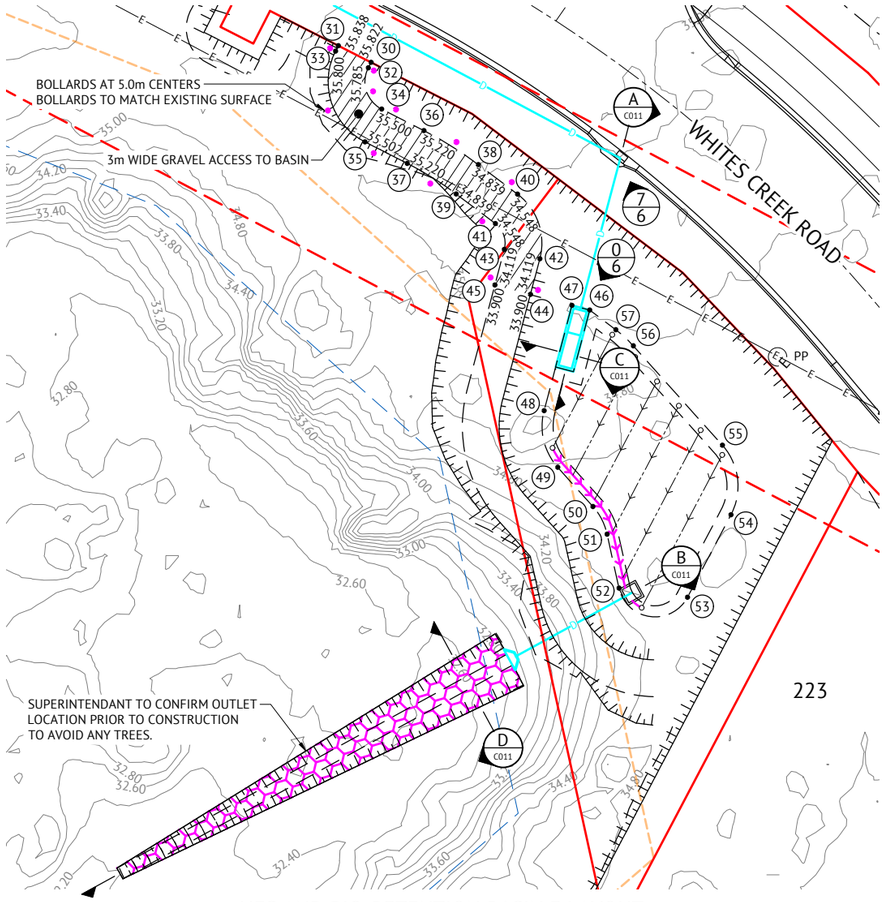
HES AND BIO-RETENTION BASIN E LAYOUT
SCALE: 1:250

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



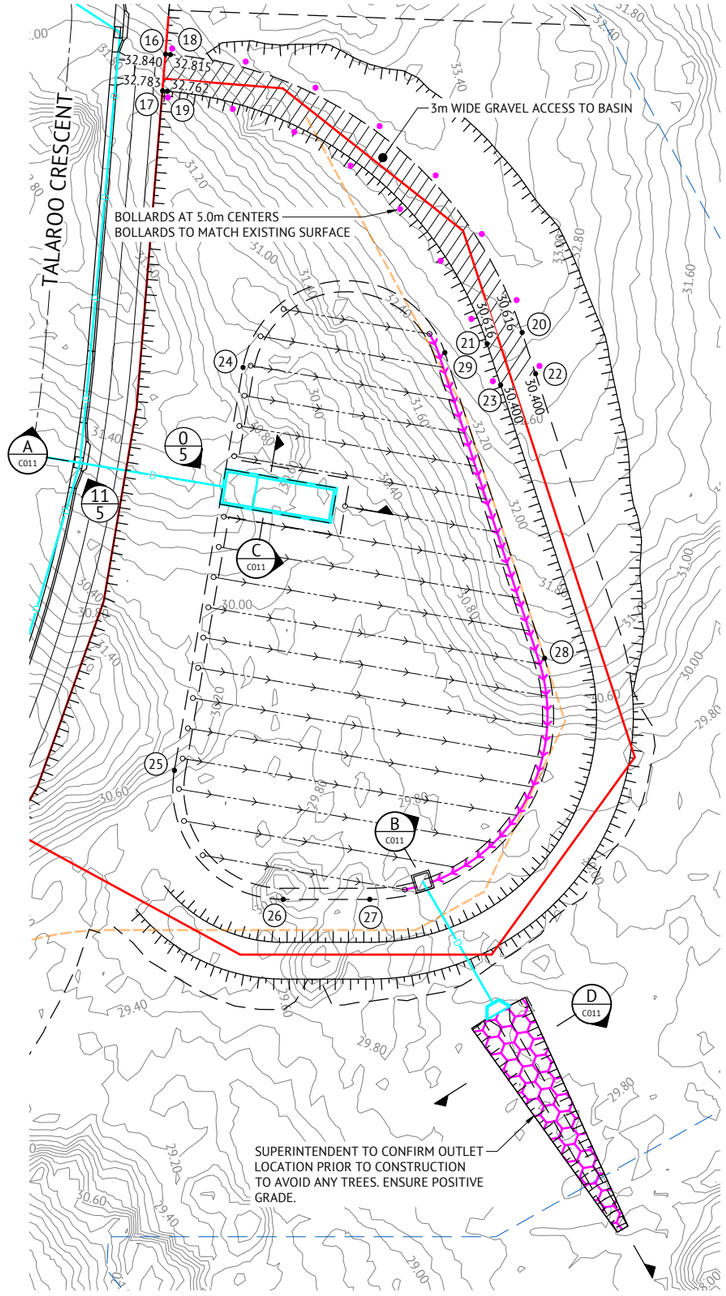
HES AND BIO-RETENTION BASIN C LAYOUT

SCALE: 1:250



HES AND BIO-RETENTION BASIN E LAYOUT

SCALE: 1:250



HES AND BIO-RETENTION BASIN D LAYOUT

SCALE: 1:250

LEGEND

- EXISTING SURFACE CONTOURS
- RL.31.75 — EARTHWORKS LEVEL
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS
- VEGETATION BUFFER
- SURVEYED TOP OF BANK NO ACCESS OR CLEARING
- DUMPED ROCK SCOUR PROTECTION ON GEOTEXTILE FABRIC (200g/m²) ROCK GRADING - 400mm THICK 75mm-325mm, AVERAGE SIZE 200mm
- GRAVEL TRACK BOLLARDS
- EXISTING OVERHEAD POWER LINE
- EASEMENT
- PP — POWER POLE

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH IPWEA STANDARD DRAWING DS-078.
2. FILTER CLOTH - PROPRIETARY PRODUCT, BIDIM A24 OR EQUIVALENT NON-WOVEN GEOTEXTILE.
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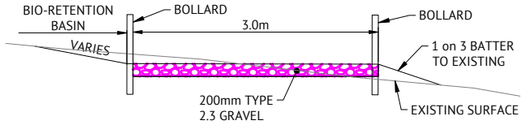
4. FOR COARSE SEDIMENT FOREBAY CONCRETE AND REINFORCEMENT DETAILS, REFER TO DTMR STANDARD DRAWING 1304 (DRAWINGS 1 AND 2).



TYPICAL GRAVEL ACCESS SECTION

NTS

SETOUT POINT DETAILS

POINT	EASTING	NORTHING
01	489231.074	7858369.723
02	489231.661	7858366.780
03	489232.261	7858369.926
04	489232.766	7858366.969
05	489239.983	7858372.355
06	489241.261	7858369.640
07	489245.963	7858375.170
08	489247.241	7858372.456
09	489237.342	7858392.773
10	489237.342	7858382.860
11	489244.472	7858378.337
12	489251.686	7858381.733
13	489257.009	7858382.629
14	489270.314	7858381.206
15	489270.931	7858392.773
16	489196.577	7858754.429
17	489196.333	7858751.439
18	489196.972	7858754.397
19	489196.728	7858751.406
20	489225.658	7858731.748
21	489222.806	7858730.817
22	489226.755	7858728.387
23	489223.904	7858727.456
24	489202.899	7858728.890
25	489197.304	7858696.045
26	489206.176	7858685.533
27	489213.233	7858685.533
28	489227.492	7858705.189

POINT	EASTING	NORTHING
29	489219.358	7858730.101
30	488905.197	7858736.713
31	488902.524	7858738.075
32	488904.970	7858736.267
33	488902.297	7858737.629
34	488906.062	7858732.905
35	488904.700	7858730.232
36	488909.504	7858731.151
37	488908.142	7858728.478
38	488913.939	7858728.380
39	488912.133	7858725.984
40	488917.136	7858725.971
41	488915.330	7858723.575
42	488918.961	7858720.701
43	488916.060	7858721.467
44	488918.194	7858717.799
45	488915.294	7858718.566
46	488923.028	7858716.522
47	488921.578	7858716.905
48	488919.309	7858708.318
49	488920.420	7858703.704
50	488923.286	7858700.505
51	488924.444	7858698.250
52	488925.418	7858693.858
53	488931.001	7858693.108
54	488934.546	7858699.833
55	488933.847	7858705.502
56	488926.585	7858713.606
57	488925.156	7858714.919

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
30/08/24	2	RESPONSE TO COUNCIL RFI	GB	ZS
03/10/23	1	ISSUED FOR OPERATIONAL WORKS APPROVAL	GB	PP

REVISIONS

Premise
TOWNSVILLE OFFICE
84 DENHAM STREET
PO BOX 1110
TOWNSVILLE, QLD 4810
PH: (07) 4772 0666
WEB: www.premise.com.au

DESIGNED G.BROSNAN
CHECKED Z.STROGUSZ
PROJECT MANAGER Z.STROGUSZ
ENGINEERING CERTIFICATION A.PEASE RPEQ 22556

SCALE 0 5 10 15m
SCALE 1:250 (A1)
ORIGINAL SHEET SIZE A1

CLIENT LENDLEASE COMMUNITIES (TOWNSVILLE) PTY LTD
PROJECT WHITES CREEK STAGES 10-14
LOCATION WHITES CREEK ROAD, JULAGO
SHEET TITLE BIO-RETENTION DETAILS PLAN - SHEET 1 OF 2

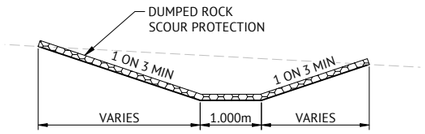
JOB CODE LLC-0095
SHEET NUMBER C010
REV 2

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

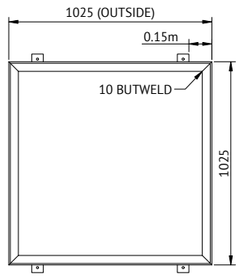
BASIN DETAILS

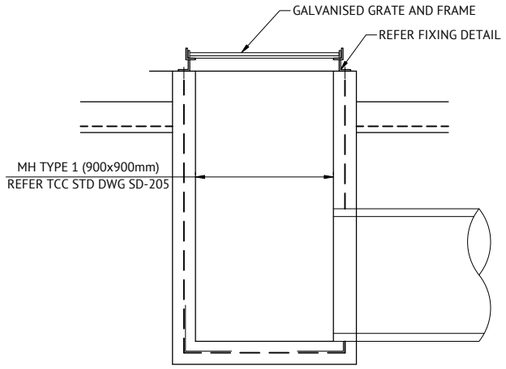
NOTATION	BASIN C	BASIN D	BASIN E
RL1	29.400	30.000	33.500
RL2	RL1 + 0.100m	RL1 + 0.100m	RL1 + 0.100m
RL3	RL1 - 0.200m	RL1 - 0.200m	RL1 - 0.200m
RL4	RL1 - 0.300m	RL1 - 0.300m	RL1 - 0.300m
RL5	RL1 + 0.100m	RL1 + 0.100m	RL1 + 0.100m
RL6	RL1 + 0.400m	RL1 + 0.400m	RL1 + 0.400m
RL7	28.200	28.800	32.300
RL8	28.170	28.770	32.270
OUTLET PIPE	600(3)	900(3)	450(3)
W1	1.600m	2.500m	1.100m
L1	2.000m	2.500m	2.000m
L2	3.900m	6.300m	2.800m
L3	3.500m	3.500m	3.500m
L4	L3	L3	L3
FILTER MEDIA AREA	439m^2	1135m^2	224m^2

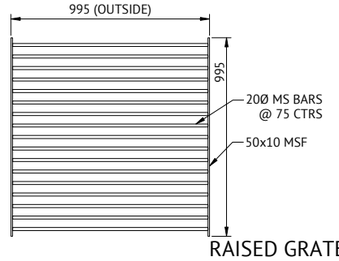
C SECTION
SCALE 1:20

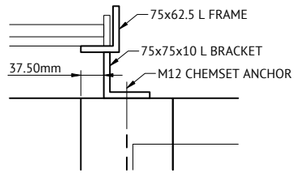


D SECTION
SCALE 1:50









RAISED GRATE FIELD INLET
SCALE: 1:20

LEGEND

- EXISTING SURFACE CONTOURS
- RL.31.75 — EARTHWORKS LEVEL
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS
- VEGETATION BUFFER
- SURVEYED TOP OF BANK NO ACCESS OR CLEARING
- DUMPED ROCK SCOUR PROTECTION ON GEOTEXTILE FABRIC (200g/m^2) ROCK GRADING - 400mm THICK 75mm-325mm, AVERAGE SIZE 200mm
- EXISTING OVERHEAD POWER LINE
- EASEMENT
- PP — POWER POLE

NOTES:

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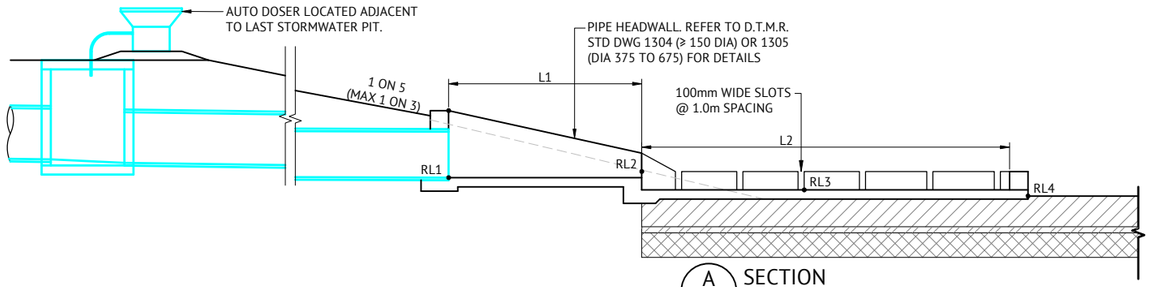
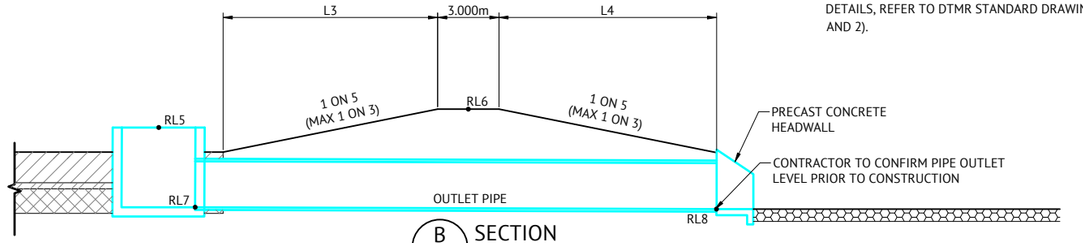
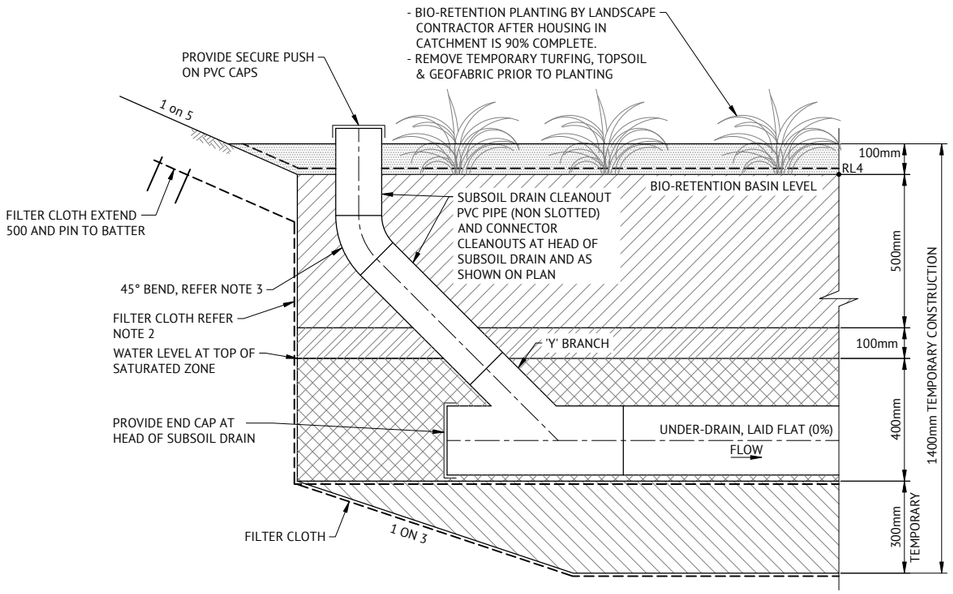


A SECTION
SCALE 1:100



B SECTION
SCALE 1:100



BIO-BASIN WILL PERFORM AS SEDIMENT BASIN UNTIL HOUSING IN CATCHMENT IS 90% COMPLETE. TEMPORARILY INSTALL GEOTEXTILE FABRIC (200g/m^2) , TOPSOIL & TURF IN INTERIM.

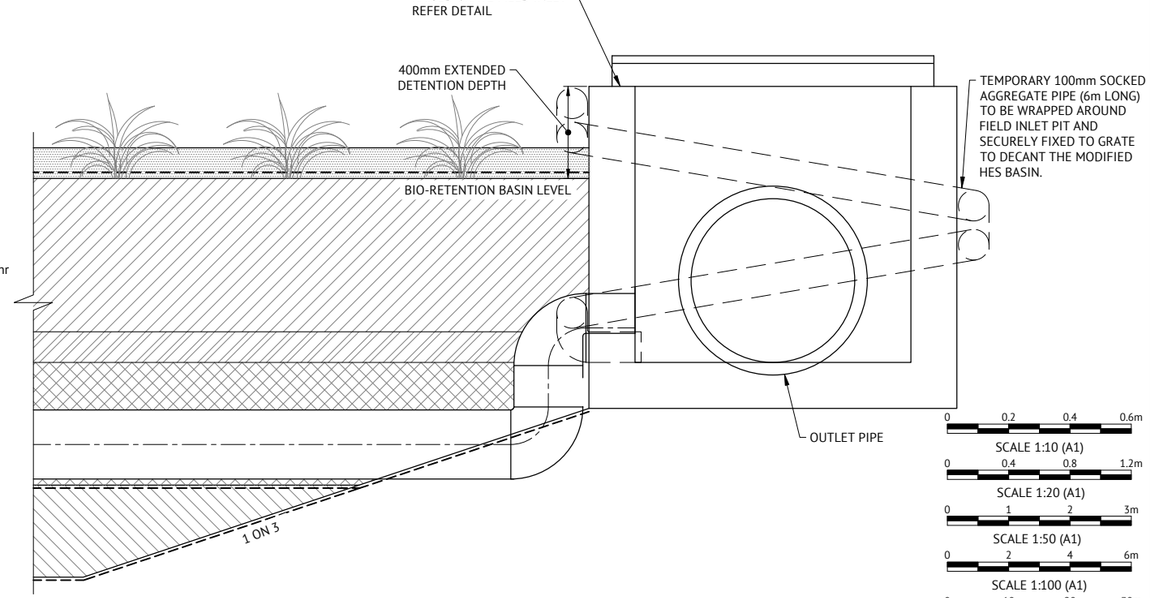
FILTER MEDIA - CONSTANT DEPTH (SANDY LOAM) SATURATED HYDRAULIC CONDUCTIVITY OF 100mm-500mm/hr

TRANSITION LAYER - CONSTANT DEPTH (COARSE SAND) SATURATED HYDRAULIC CONDUCTIVITY OF 1000mm/hr

SATURATED DRAINAGE LAYER - CONSTANT DEPTH 'CLEAN' AGGREGATE 2mm-5mm MIXED WITH 4% BY VOLUME HARDWOOD CHIPS AND 2% BY VOLUME STRAW SATURATED HYDRAULIC CONDUCTIVITY > 1000mm/hr

TEMPORARY ADDITIONAL CONSTRUCTION REQUIRED FOR HIGH EFFICIENCY SEDIMENT BASIN. TO BE FILLED IN WITH EMBANKMENT MATERIAL PRIOR TO THE INSTALLATION OF BIO-RETENTION BASIN FILTER MATERIAL.

BIO-RETENTION BASIN SUBSOIL CLEANOUT AND FILTER MEDIA
SCALE: 1:10



TYPICAL BIO-RETENTION BASIN OVERFLOW PIT
SCALE: 1:10

0 0.2 0.4 0.6m
SCALE 1:10 (A1)
0 0.4 0.8 1.2m
SCALE 1:20 (A1)
0 1 2 3m
SCALE 1:50 (A1)
0 2 4 6m
SCALE 1:100 (A1)
0 10 20 30m
SCALE 1:500 (A1)

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
30/08/24	2	RESPONSE TO COUNCIL RFI	GB	ZS
03/10/23	1	ISSUED FOR OPERATIONAL WORKS APPROVAL	GB	PP

REVISIONS

Premise
TOWNSVILLE OFFICE
84 DENHAM STREET
PO BOX 1110
TOWNSVILLE, QLD 4810
PH: (07) 4772 0666
WEB: www.premise.com.au

DESIGNED G.BROSNAN
CHECKED Z.STROGUSZ
PROJECT MANAGER Z.STROGUSZ
ENGINEERING CERTIFICATION A.PEASE RPEQ 22556
SCALE
ORIGINAL SHEET SIZE A1

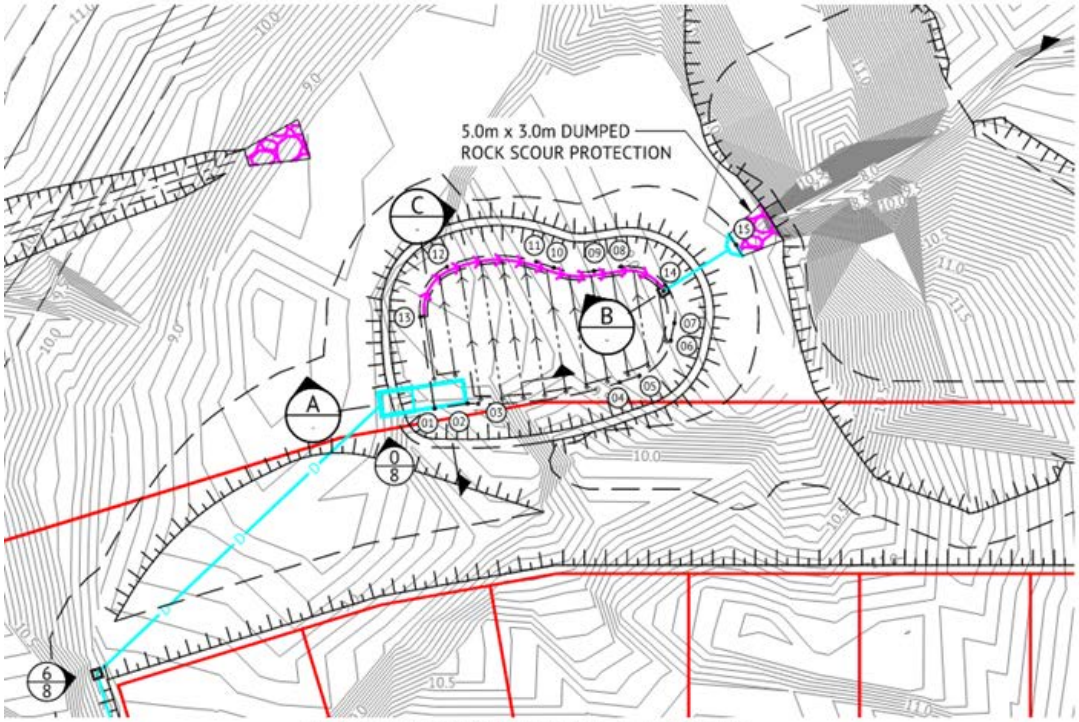
CLIENT: LENDLEASE COMMUNITIES (TOWNSVILLE) PTY LTD
PROJECT: WHITES CREEK STAGES 10-14
LOCATION: WHITES CREEK ROAD, JULAGO
SHEET TITLE: BIO-RETENTION DETAILS PLAN - SHEET 2 OF 2

JOB CODE: LLC-0095
SHEET NUMBER: C011
REV: 2

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

BASIN A - BASE 410m2					
GREATER ASCOT STAGES 805 806 PAR0081					
Item	**Description**	**Unit**	**Quantity**	**Rate**	**Amount**
3	**Revegetation including establishment**				
(a)	Hydromulching -	m^2	350	$ 7.60	$ 2,660.00
4	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(a)	Bio-Retention A - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	410	$ 60.00	$ 24,600.00
(b)	Bio-Retention A - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	410	$ 130.00	$ 53,300.00
4	**Field inlets complete including excavation and disposal of spoil**				
(b)	Flush grate field inlet - 900mm x 900mm - Basin A & B	Each	1	$ 6,585.00	$ 6,585.00
6	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCP sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay - Basin - A	Each	1	$ 36,500.00	$ 36,500.00
6	**Scour Protection**				
(a)	Dumped Rock - 400mm thick (DN 200mm) on geotextile fabric (200g/m2)	m^2	15	$ 60.00	$ 900.00
					$ 124,545.00

taken from Claim 6

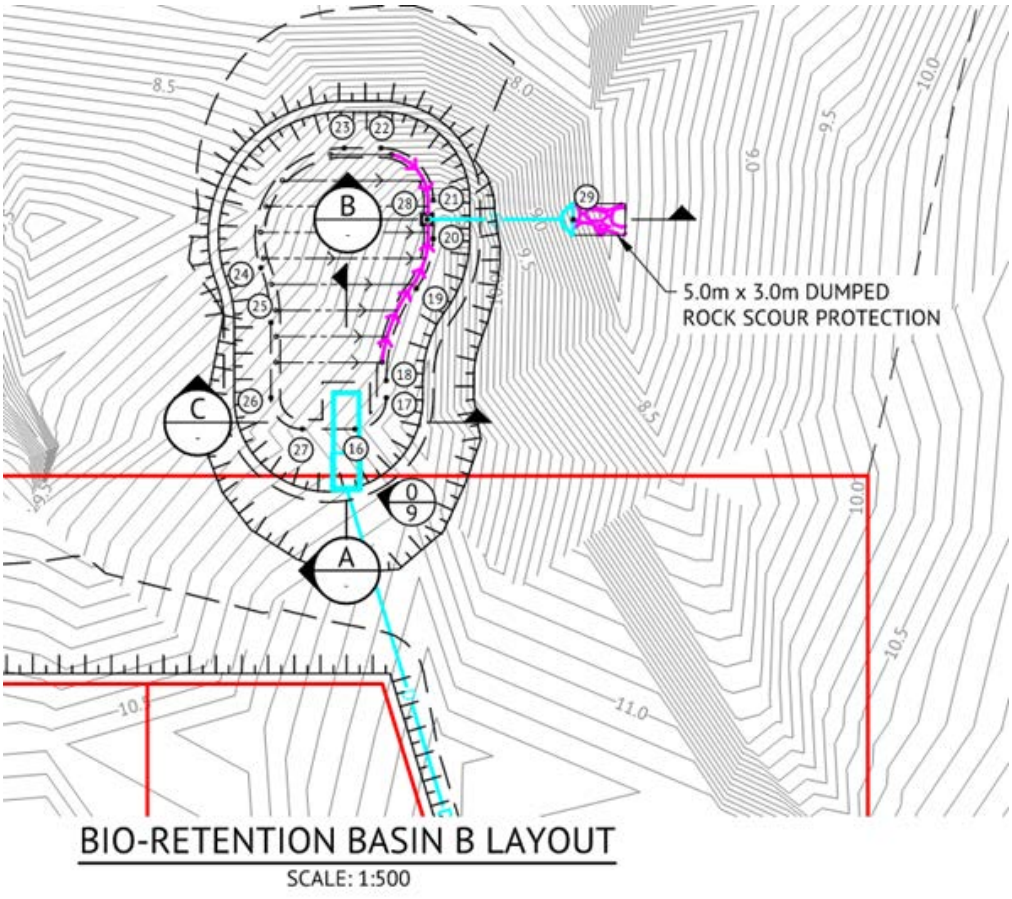


BIO-RETENTION BASIN A LAYOUT
SCALE: 1:500

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

BASIN B - BASE 360m2					
GREATER ASCOT STAGES 805 806 PAR0081					
Item	Description	Unit	Quantity	Rate	Amount
3	**Revegetation including establishment**				
(a)	Hydromulching -	m^2	330	$ 7.60	$ 2,508.00
4	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(c)	Bio-Retention B - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	360	$ 62.00	$ 22,320.00
(d)	Bio-Retention B - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	360	$ 127.00	$ 45,720.00
4	**Field inlets complete including excavation and disposal of spoil**				
(b)	Flush grate field inlet - 900mm x 900mm - Basin A & B	Each	1	$ 6,585.00	$ 6,585.00
6	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCP sizes**				
(b)	Bio-retention headwall including wingwalls and course sediment forebay - Basin - B	Each	1	$ 32,000.00	$ 32,000.00
6	**Scour Protection**				
(a)	Dumped Rock - 400mm thick (DN 200mm) on geotextile fabric (200g/m2)	m^2	15	$ 60.00	$ 900.00
					$ 110,033.00

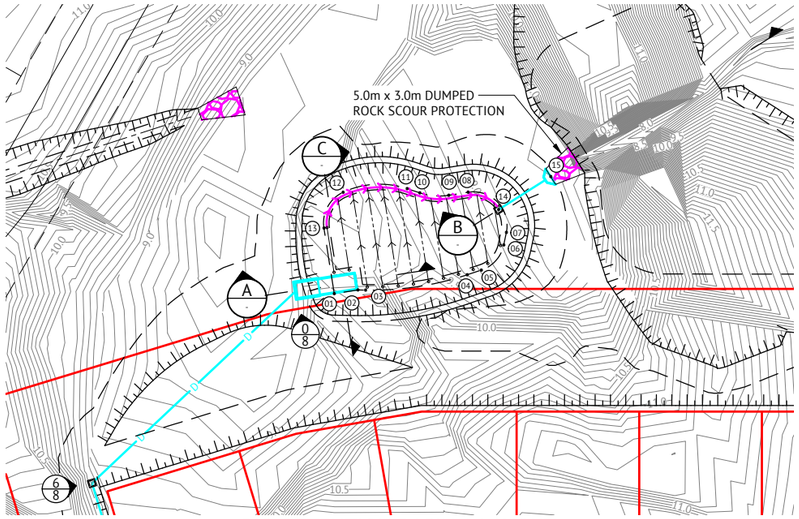
taken from Claim 6



BIO-RETENTION BASIN B LAYOUT

SCALE: 1:500

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



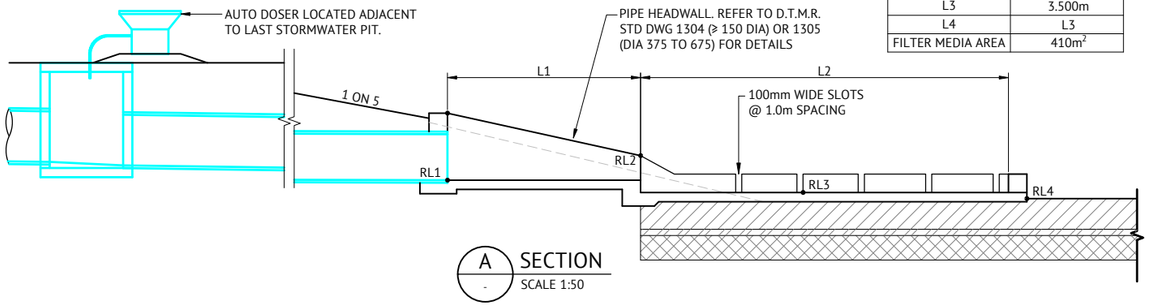
BIO-RETENTION BASIN A LAYOUT
SCALE: 1:500

SETOUT POINT DETAILS

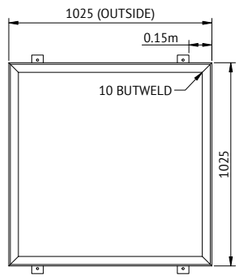
POINT	EASTING	NORTHING
01	68981.483	89603.945
02	68985.340	89604.550
03	68986.588	89604.527
04	69003.159	89607.023
05	69005.465	89607.782
06	69009.130	89611.884
07	69009.556	89613.928
08	69003.319	89620.484
09	69000.147	89619.986
10	68995.437	89620.377
11	68993.367	89621.067
12	68982.925	89620.478
13	68979.805	89614.636
14	69008.285	89617.653
15	69016.789	89623.036

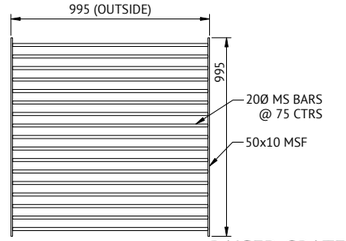
BIO-BASIN A DETAILS

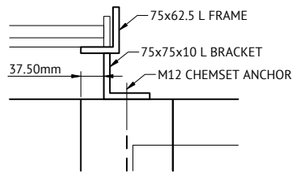
NOTATION	DETAILS
RL1	9.110
RL2	RL1 + 0.300m
RL3	RL1 - 0.200m
RL4	RL1 - 0.300m
RL5	RL1 + 0.100m
RL6	RL1 + 0.400m
RL7	7.910
RL8	7.825
OUTLET PIPE	750(2)
W1	2.500m
L1	3.700m
L2	6.000m
L3	3.500m
L4	L3
FILTER MEDIA AREA	410m²



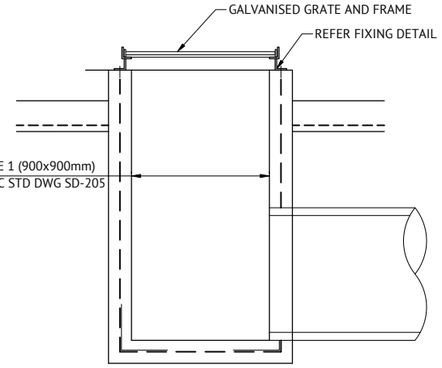
A SECTION
SCALE 1:50







RAISED GRATE FIELD INLET
SCALE: 1:20

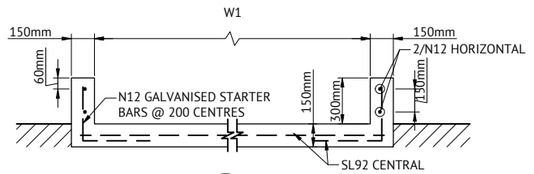


LEGEND

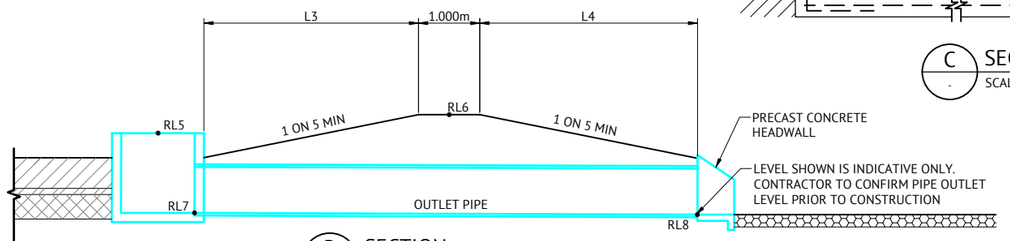
- EXISTING SURFACE CONTOURS (5.90)
- EARTHWORKS LEVEL (RL.31.75)
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS
- DUMPED ROCK SCOUR PROTECTION ON GEOTEXTILE FABRIC (200g/m²) ROCK GRADING - 400mm THICK 75mm-325mm, AVERAGE SIZE 200mm

NOTES:

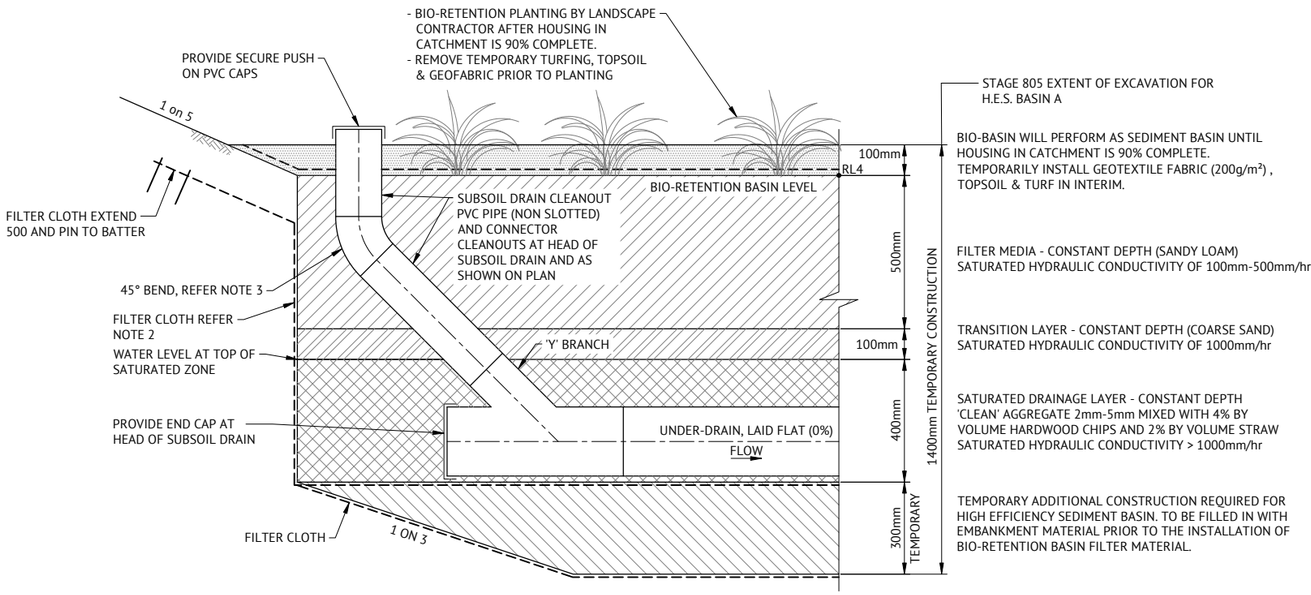
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH IPWEA STANDARD DRAWING DS-078.
2. FILTER CLOTH - PROPRIETARY PRODUCT, BIDIM A24 OR EQUIVALENT NON-WOVEN GEOTEXTILE.
   FILTER CLOTH NOT TO BE PLACED BETWEEN ANY FILTER LAYERS.
3. UNDER-DRAIN: 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE. PIPES SHOULD NOT BE INSTALLED WITH A FILTER SOCK SURROUNDING PIPE.
   UNDER-DRAINAGE PIPES SHALL BE SEALED INTO PITS USING GROUT OR OTHER APPROVED WATERTIGHT SEAL.
4. FOR COARSE SEDIMENT FOREBAY CONCRETE AND REINFORCEMENT DETAILS, REFER TO DTMR STANDARD DRAWING 1304 (DRAWINGS 1 AND 2).



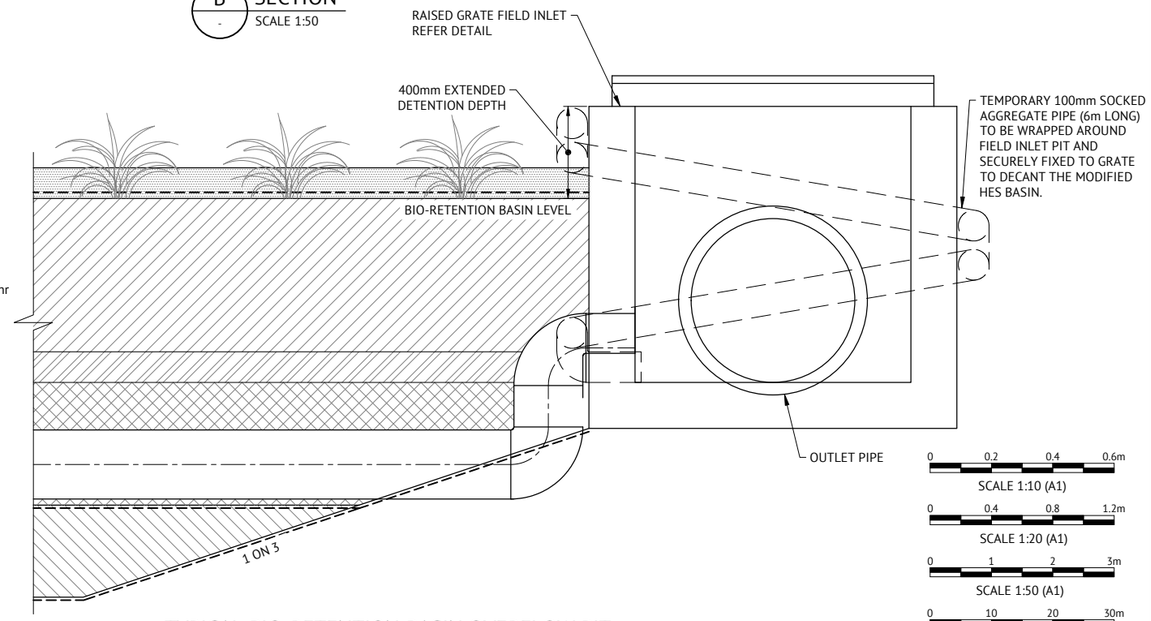
C SECTION
SCALE 1:20



B SECTION
SCALE 1:50



BIO-RETENTION BASIN SUBSOIL CLEANOUT AND FILTER MEDIA
SCALE: 1:10



TYPICAL BIO-RETENTION BASIN OVERFLOW PIT
SCALE: 1:10

0 0.2 0.4 0.6m — SCALE 1:10 (A1)
0 0.4 0.8 1.2m — SCALE 1:20 (A1)
0 1 2 3m — SCALE 1:50 (A1)
0 10 20 30m — SCALE 1:500 (A1)

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
04/08/23	A	ISSUED FOR CONSTRUCTION	JJ	P.P
02/06/23	2	MINOR AMENDMENTS	JJ	P.P
24/03/23	2	PRELIMINARY - NOT FOR CONSTRUCTION	JJ	P.P

REVISIONS

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TOWNSVILLE OFFICE
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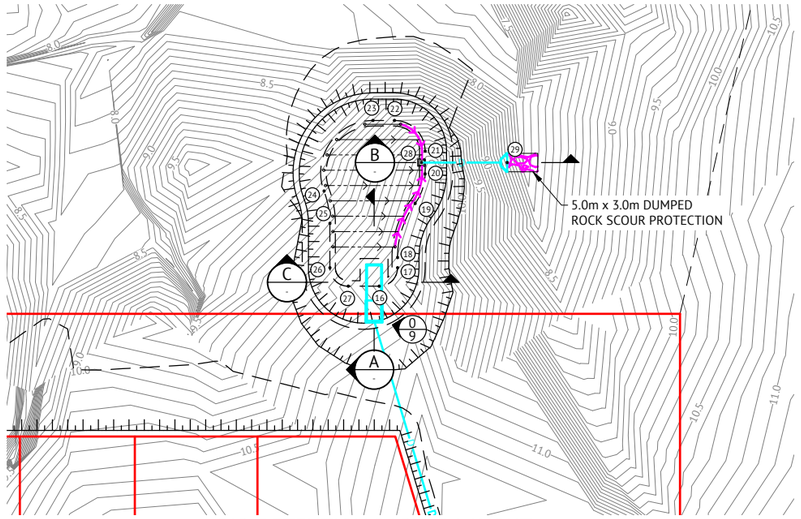
DESIGNED: J.JONES
CHECKED: G.FYSH
PROJECT MANAGER: P.PETERSEN
ENGINEERING CERTIFICATION: P.PETERSEN 13231
SCALE
ORIGINAL SHEET SIZE A1

CLIENT: PARKSIDE DEVELOPMENT PTY LTD
PROJECT: GREATER ASCOT - STAGE 804, 805 & 805
LOCATION: GREATER ASCOT AVENUE, SHAW
SHEET TITLE: BIO-RETENTION DETAILS PLAN SHEET 1 OF 2

JOB CODE: PAR-0081
SHEET NUMBER: C029
REV: A

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



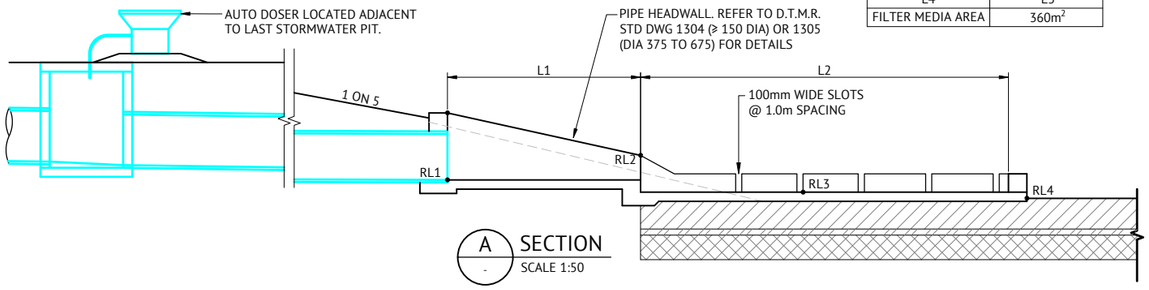
BIO-RETENTION BASIN B LAYOUT
SCALE: 1:500

SETOUT POINT DETAILS

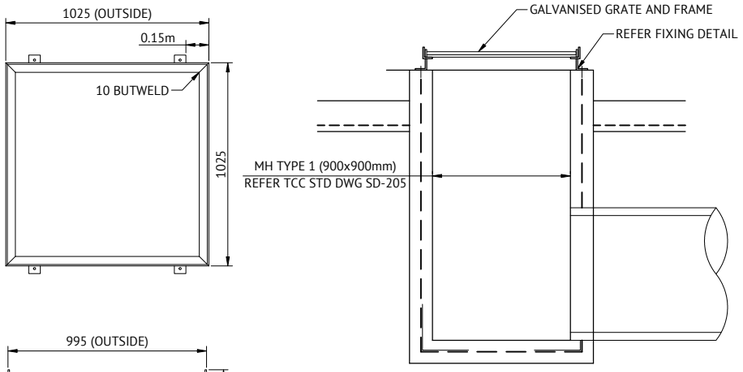
POINT	EASTING	NORTHING
16	69132.337	89609.226
17	69135.337	89612.226
18	69135.337	89613.891
19	69138.207	89622.715
20	69139.835	89627.522
21	69139.835	89631.243
22	69134.835	89636.243
23	69131.320	89636.243
24	69123.346	89624.733
25	69124.303	89619.461
26	69124.303	89612.226
27	69127.303	89609.226
28	69139.235	89629.383
29	69153.215	89629.383

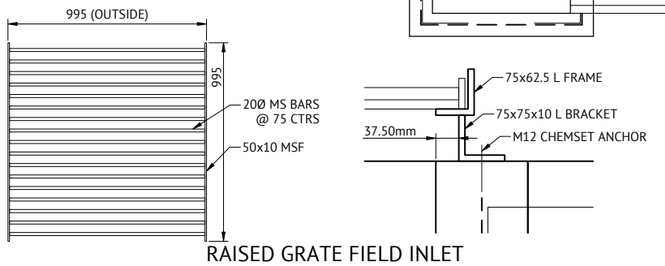
BIO-BASIN B DETAILS

NOTATION	DETAILS
RL1	8.830
RL2	RL1 + 0.300m
RL3	RL1 - 0.200m
RL4	RL1 - 0.300m
RL5	RL1 + 0.100m
RL6	RL1 + 0.400m
RL7	7.630
RL8	7.605
OUTLET PIPE	675(2)
W1	2.300m
L1	3.300m
L2	5.700m
L3	3.500m
L4	L3
FILTER MEDIA AREA	360m²



A SECTION
SCALE 1:50





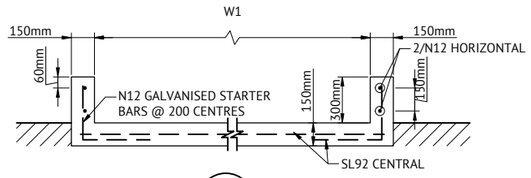
RAISED GRATE FIELD INLET
SCALE: 1:20

LEGEND

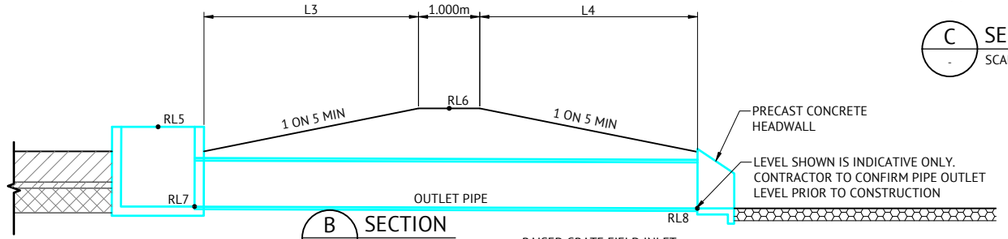
- EXISTING SURFACE CONTOURS (5.90)
- EARTHWORKS LEVEL (RL.31.75)
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS
- DUMPED ROCK SCOUR PROTECTION ON GEOTEXTILE FABRIC (200g/m²) ROCK GRADING - 400mm THICK 75mm-325mm, AVERAGE SIZE 200mm

NOTES:

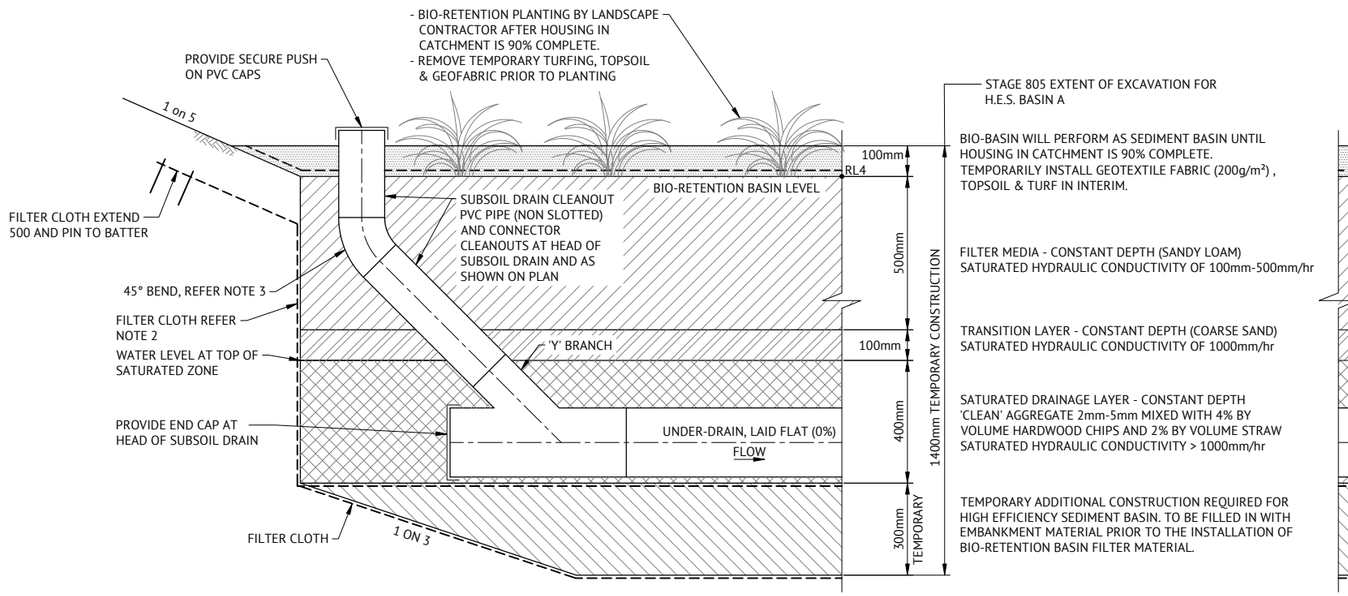
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH IPWEA STANDARD DRAWING DS-078.
2. FILTER CLOTH - PROPRIETARY PRODUCT, BIDIM A24 OR EQUIVALENT NON-WOVEN GEOTEXTILE.
   FILTER CLOTH NOT TO BE PLACED BETWEEN ANY FILTER LAYERS.
3. UNDER-DRAIN: 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE. PIPES SHOULD NOT BE INSTALLED WITH A FILTER SOCK SURROUNDING PIPE.
   UNDER-DRAINAGE PIPES SHALL BE SEALED INTO PITS USING GROUT OR OTHER APPROVED WATERTIGHT SEAL.
4. FOR COARSE SEDIMENT FOREBAY CONCRETE AND REINFORCEMENT DETAILS, REFER TO DTMR STANDARD DRAWING 1304 (DRAWINGS 1 AND 2).



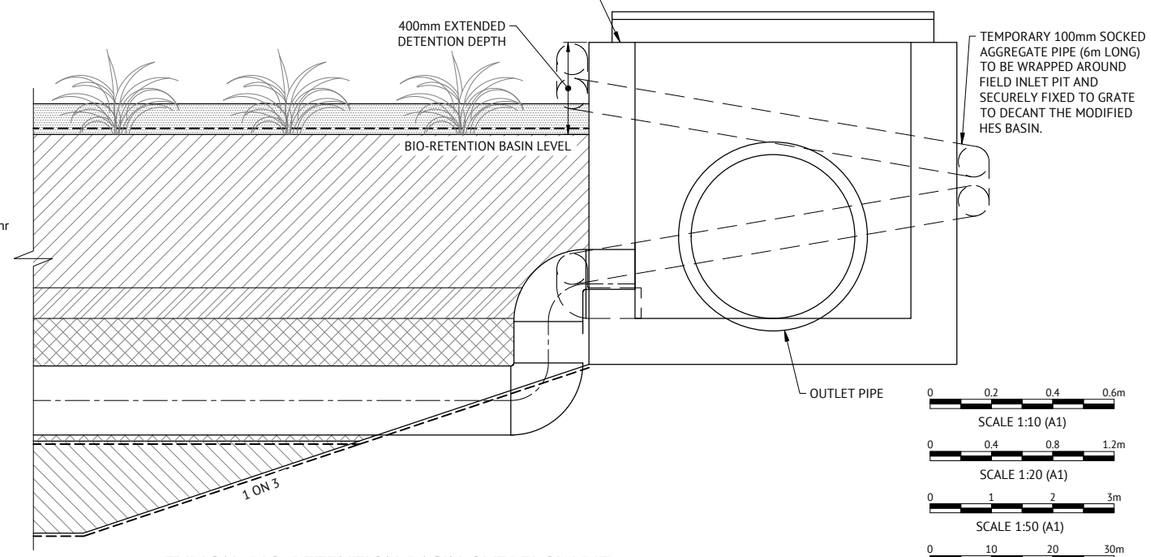
C SECTION
SCALE 1:20



B SECTION
SCALE 1:50



BIO-RETENTION BASIN SUBSOIL CLEANOUT AND FILTER MEDIA
SCALE: 1:10



TYPICAL BIO-RETENTION BASIN OVERFLOW PIT
SCALE: 1:10

0 0.2 0.4 0.6m
SCALE 1:10 (A1)

0 0.4 0.8 1.2m
SCALE 1:20 (A1)

0 1 2 3m
SCALE 1:50 (A1)

0 10 20 30m
SCALE 1:500 (A1)

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
04/08/23	A	ISSUED FOR CONSTRUCTION	JJ	P.P
02/06/23	2	MINOR AMENDMENTS	JJ	P.P
24/03/23	2	PRELIMINARY - NOT FOR CONSTRUCTION	JJ	P.P

REVISIONS

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WEB: www.premise.com.au

DESIGNED JJONES
CHECKED G.FYSH
PROJECT MANAGER P.PETERSEN
ENGINEERING CERTIFICATION
P.PETERSEN 13231
SCALE
ORIGINAL SHEET SIZE A1

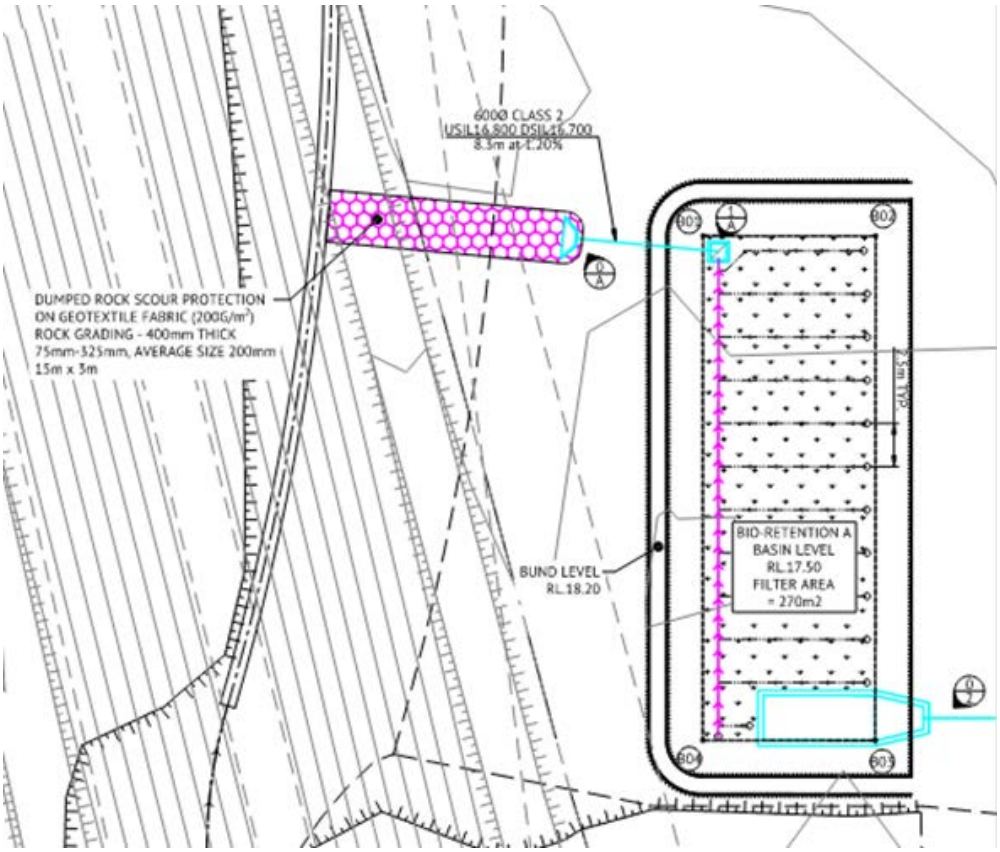
CLIENT: PARKSIDE DEVELOPMENT PTY LTD
PROJECT: GREATER ASCOT - STAGE 804, 805 & 805
LOCATION: GREATER ASCOT AVENUE, SHAW
SHEET TITLE: BIO-RETENTION DETAILS PLAN SHEET 2 OF 2

JOB CODE: PAR-0081
SHEET NUMBER: C030
REV: A

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

BASIN A - BASE 290 m2 (FILTER AREA 270m2)					
RIVERSTONE ELE0101					
Item	**Description**	**Unit**	**Quantity**	**Rate**	**Amount**
3	**Revegetation including establishment**				
(a)	Hydromulching (Standard hydromulch with temporary irrigation)	m^2	182	$ 5.40	$ 982.80
4	**Scour Protection**				
(a)	Dumped rock - 400mm thick (D_{50} 200mm) on geotextile fabric (200g/m2)	m^2	45	$ 55.00	$ 2,475.00
5a	**Temporary modified high efficiency sediment basin including geofabric lining and auto rainfall doser**				
(a)	Basin - A	Lump Sum	1	$ 12,500.00	$ 12,500.00
5b	**Convert temporary basin constructed to Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing.**				
(a)	Bio-Retention - A	Lump Sum	1	$ 30,000.00	$ 30,000.00
6	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCP sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay - A	Each	1	$ 28,500.00	$ 28,500.00
					$ 74,457.80

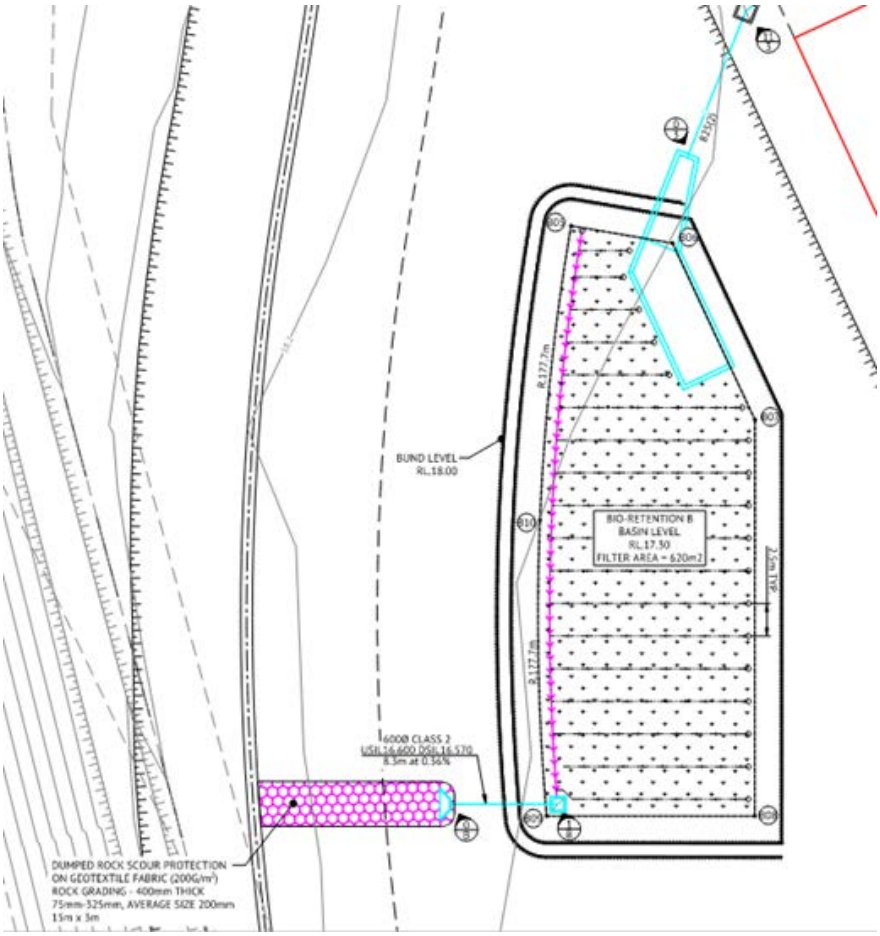
taken from Payment Claim 14



Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

BASIN B - BASE 665 m2 (FILTER AREA 620m2)					
RIVERSTONE ELE0101					
Item	**Description**	**Unit**	**Quantity**	**Rate**	**Amount**
3	**Revegetation including establishment**				
(a)	Hydromulching (Standard hydromulch with temporary irrigation)	m^2	256	$ 5.40	$ 1,382.40
4	**Scour Protection**				
(a)	Dumped rock - 400mm thick (D_{50} 200mm) on geotextile fabric (200g/m2)	m^2	45	$ 55.00	$ 2,475.00
5a	**Temporary modified high efficiency sediment basin including geofabric lining and auto rainfall doser**				
(b)	Basin - B	Lump Sum	1	$ 18,000.00	$ 18,000.00
5b	**Convert temporary basin constructed to Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing.**				
(b)	Bio-Retention - B	Lump Sum	1	$ 65,000.00	$ 65,000.00
6	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCP sizes**				
(b)	Bio-retention headwall including wingwalls and course sediment forebay - B	Each	1	$ 41,000.00	$ 41,000.00
					$ 127,857.40

taken from Payment Claim 14



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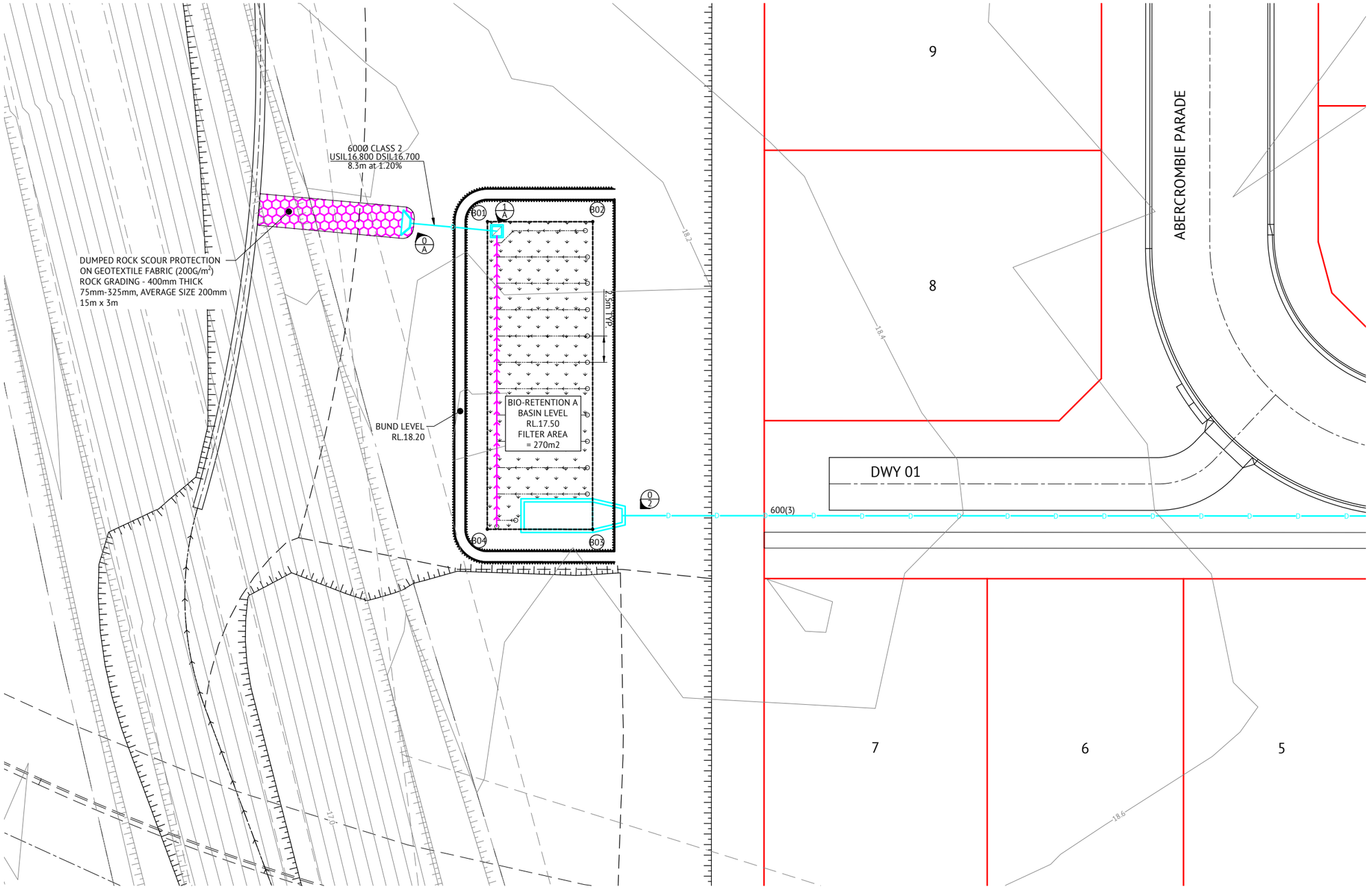
Version: 1, Version Date: 03/04/2025



LEGEND

- 5.90 — EXISTING SURFACE CONTOURS
- RL.31.75 — EARTHWORKS LEVEL
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH IPWEA STANDARD DRAWING DS-078.
2. FILTER CLOTH - PROPRIETARY PRODUCT, BIDIM A24 OR EQUIVALENT NON-WOVEN GEOTEXTILE.
   FILTER CLOTH NOT TO BE PLACED BETWEEN ANY FILTER LAYERS.
3. UNDER-DRAIN: 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE.
   PIPES SHOULD NOT BE INSTALLED WITH A FILTER SOCK SURROUNDING PIPE.
   UNDER-DRAINAGE PIPES SHALL BE SEALED INTO PITS USING GROUT OR OTHER APPROVED WATERTIGHT SEAL.
4. FOR COARSE SEDIMENT FOREBAY CONCRETE AND REINFORCEMENT DETAILS, REFER TO DTMR STANDARD DRAWING 1304 (DRAWINGS 1 AND 2).

BIO-RETENTION BASIN LAYOUT - A

SCALE: 1:200

BIO RETENTION SETOUT

POINT	EASTING	NORTHING
B01	70396.176	59892.434
B02	70405.908	59894.732
B03	70412.617	59866.313
B04	70402.885	59864.016

STORMWATER PIT DETAILS

PIT	TYPE	LEVEL	EASTING	NORTHING
1/A	900x900 FIELD INLET	TM.17.900	70397.258	59891.765
0/A	PRECAST CONCRETE HEADWALL	-	70389.041	59890.595

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
13/10/2021	A	ISSUED FOR CONSTRUCTION	GF	PP
17/06/2021	1	PRELIMINARY - NOT FOR CONSTRUCTION	JS	PP

REVISIONS

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WEB: www.premise.com.au

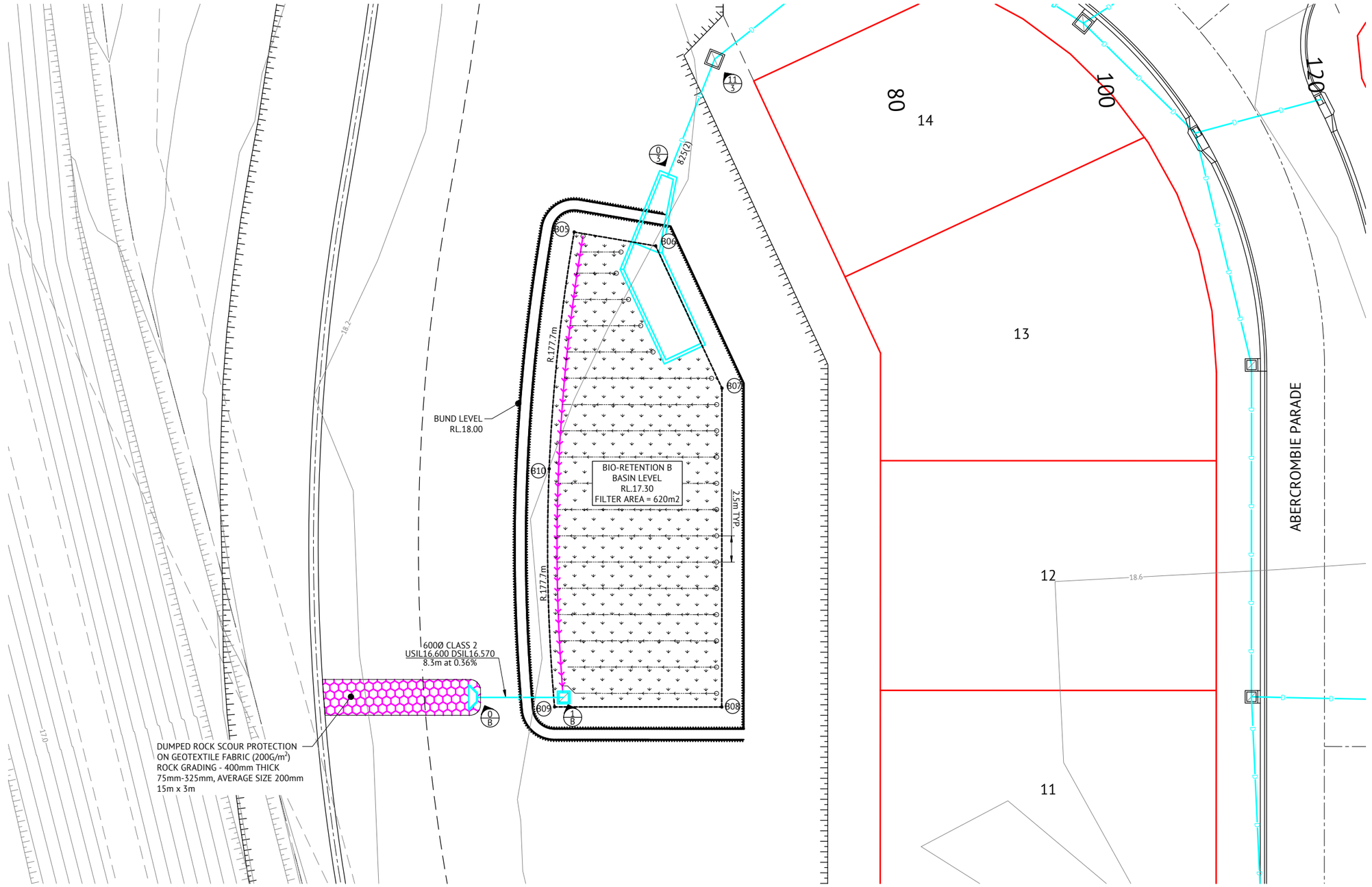
DESIGNED J.STROGUSZ
CHECKED P.PETERSEN
PROJECT MANAGER P.PETERSEN
ENGINEERING CERTIFICATION
P.PETERSEN RPEQ 13231

SCALE
0 4 8 12m
SCALE 1:200 (A1)
ORIGINAL SHEET SIZE A1

CLIENT ELEMENTS NQ (RASMUSSEN) PTY LTD
PROJECT RIVERSTONE - PRECINCT 1 - STAGE 1A
LOCATION SOUTH BECK DRIVE, RASMUSSEN
SHEET TITLE BIO-RETENTION DETAILS PLAN - SHEET 1 OF 2

JOB CODE ELE-0101
SHEET NUMBER C040
REV A

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



BIO-RETENTION BASIN LAYOUT - B

SCALE: 1:200

BIO RETENTION SETOUT

POINT	EASTING	NORTHING
B05	70368.121	59998.713
B06	70375.986	59999.212
B07	70385.243	59987.488
B08	70392.218	59957.945
B09	70376.714	59954.285
B10	70370.998	59976.224

STORMWATER PIT DETAILS

PIT	TYPE	LEVEL	EASTING	NORTHING
1/B	900x900 FIELD INLET	TM.17.70	70377.357	59955.363
0/B	PRECAST CONCRETE HEADWALL	-	70369.279	59953.456

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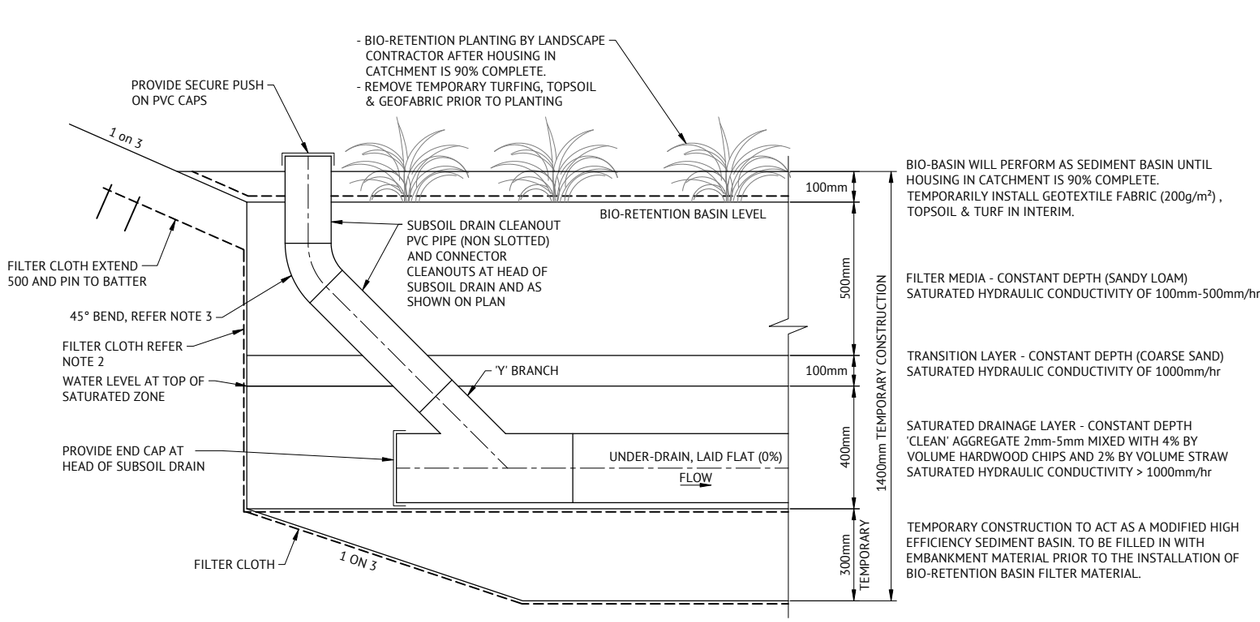
ENGINEERING CERTIFICATION
P.PETERSEN RPEQ 13231

SCALE
0 4 8 12m
SCALE 1:200 (A1)
ORIGINAL SHEET SIZE A1

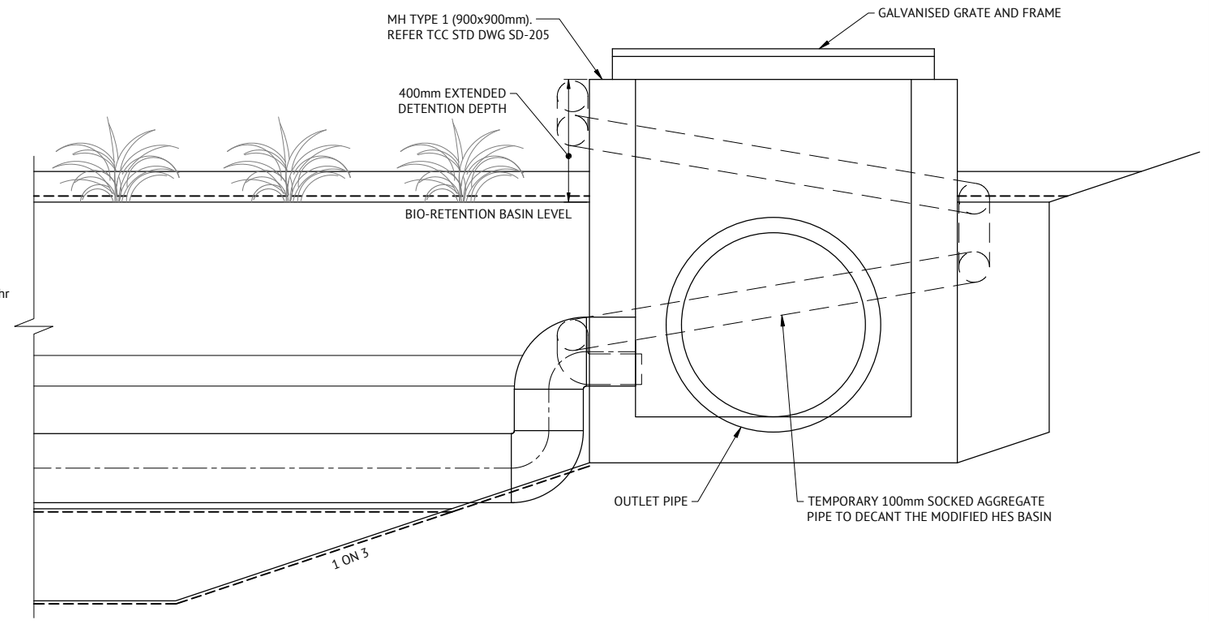
CLIENT ELEMENTS NQ (RASMUSSEN) PTY LTD
PROJECT RIVERSTONE - PRECINCT 1 - STAGE 1A
LOCATION SOUTH BECK DRIVE, RASMUSSEN
SHEET TITLE BIO-RETENTION DETAILS PLAN - SHEET 2 OF 2

JOB CODE ELE-0101
SHEET NUMBER C041
REV A

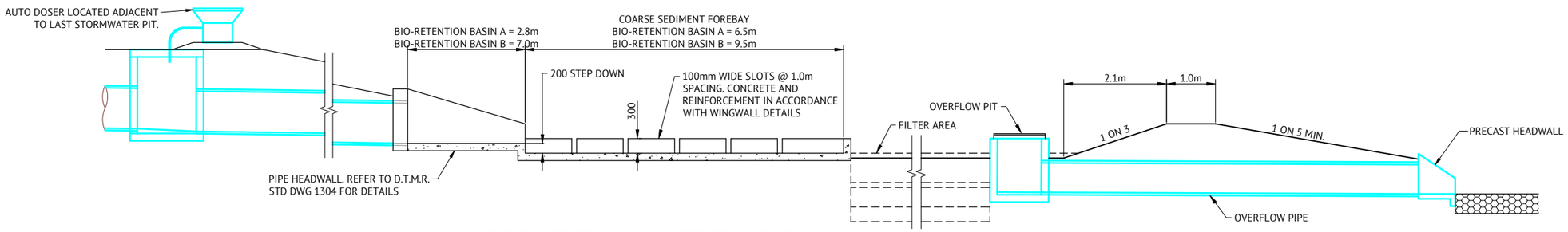
Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025



BIO-RETENTION BASIN SUBSOIL CLEANOUT AND FILTER MEDIA
SCALE: 1:10

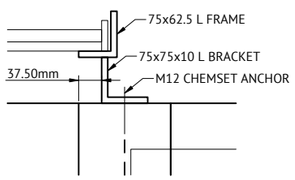


TYPICAL BIO-RETENTION BASIN OVERFLOW PIT
SCALE: 1:10

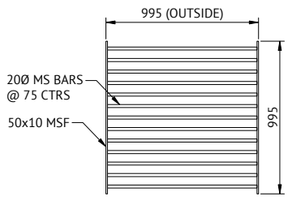


TYPICAL SECTION - BIO-RETENTION BASIN
SCALE 1:50

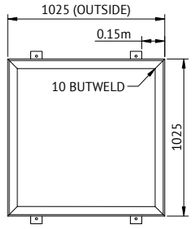
NOTES:
1. FRAME, ANGLES AND GRATE SHALL BE HOT DIPPED GALVANISED.
2. ALL BARS TO BE MILD STEEL. ALL WELDS TO BE 6mm FILLET WELDS.



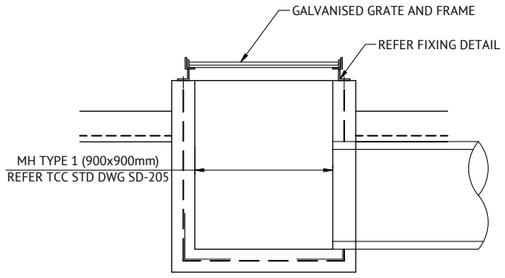
FIXING DETAIL



GRATE

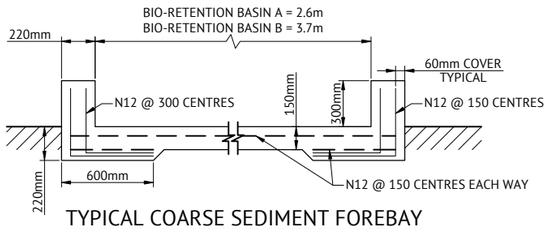


FRAME



FIELD INLET

RAISED GRATE FIELD INLET
1:20



TYPICAL COARSE SEDIMENT FOREBAY RE-INFORCEMENT DETAIL
SCALE 1:20

0 0.2 0.4 0.6m
SCALE 1:10 (A1)

0 0.4 0.8 1.2m
SCALE 1:20 (A1)

0 1 2 3m
SCALE 1:50 (A1)

0 2 4 6m
SCALE 1:100 (A1)

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PROJECT MANAGER P.PETERSEN
ENGINEERING CERTIFICATION
P.PETERSEN RPEQ 13231

SCALE: AS SHOWN
ORIGINAL SHEET SIZE A1

CLIENT: ELEMENTS NQ (RASMUSSEN) PTY LTD
PROJECT: RIVERSTONE - PRECINCT 1 - STAGE 1A
LOCATION: SOUTH BECK DRIVE, RASMUSSEN
SHEET TITLE: BIO-RETENTION DETAILS

JOB CODE: ELE-0101
SHEET NUMBER: C042
REV: A

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025

Appendix D

General Bio Pod Details

Document Set ID: 26953055
Version: 1, Version Date: 03/04/2025