Application for Planning Approval

Land Use Planning and Approvals Act 1993

APPLICATION NO.

SA2023/043

LOCATION OF AFFECTED AREA

110 COVE HILL ROAD BRIDGEWATER, 100 COVE HILL ROAD BRIDGEWATER, 122 COVE HILL ROAD BRIDGEWATER AND ROAD RESERVES (CT 136905/102 & 144927/11)

DESCRIPTION OF DEVELOPMENT PROPOSAL

SUBDIVISION (12 LOTS & DEMOLITION OF EXISTING DWELLING)

A COPY OF THE DEVELOPMENT APPLICATION MAY BE VIEWED AT www.brighton.tas.gov.au AND AT THE COUNCIL OFFICES, 1 TIVOLI ROAD, OLD BEACH, BETWEEN 8:15 A.M. AND 4:45 P.M, MONDAY TO FRIDAY OR VIA THE QR CODE BELOW. ANY PERSON MAY MAKE WRITTEN REPRESENTATIONS IN ACCORDANCE WITH S.57(5) OF THE LAND USE PLANNING AND APPROVALS ACT 1993 CONCERNING THIS APPLICATION UNTIL 4:45 P.M. ON **25/06/2024**. ADDRESSED TO THE GENERAL MANAGER AT 1 TIVOLI ROAD, OLD BEACH, 7017 OR BY EMAIL AT development@brighton.tas.gov.au. REPRESENTATIONS SHOULD INCLUDE A DAYTIME TELEPHONE NUMBER TO ALLOW COUNCIL OFFICERS TO DISCUSS, IF NECESSARY, ANY MATTERS RAISED.

JAMES DRYBURGH
General Manager

SCAN ME

Brighton
going places

THIS PLAN HAS BEEN PREPARED TO ACCOMPANY A PLANNING APPLICATION TO COUNCIL AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.

NOTE: Contours shown have been derived from a combination of survey data and lidar data obtained from Geoscience Australia.

Notes:
1. All dimensions and areas are approximate only and subject to survey.
2. Horizontal datum is plane based on MGA'2020.
3. Vertical datum is AHD'83.
4. Contour interval is 0.25m, index is 1.0m.
5. Not all services have been measured by this survey and some are shown for diagrammatic purposes only.

PROPOSED SUBDIVISION
12 LOTS, 1 ROAD LOT, AND 1 DRAINAGE LOT
100 & 110 COVE HILL ROAD,BRIDGEWATER
C.T.136905/2, C.T.150349/1 & C.T.150349/2

N

WOOLCOTT SURVEYS
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Job Number L230127

Drawn	File Name	Date	Scale	Edition	Sheet
CSS/EGB	L230127_PROP_PLAN_V6.3_80524.DWG	8/05/24	1:2000 @ A3	V6.3	1/2

THIS PLAN HAS BEEN PREPARED TO ACCOMPANY A PLANNING APPLICATION TO COUNCIL AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.

- DISAPPEARING BOUNDARY.

NOTE: Contours shown have been derived from a combination of survey data and lidar data obtained from Geoscience Australia.

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WOOLCOTT SURVEYS

EAST COAST SURVEYING
CONSULTING SURVEYORS & LAND PLANNERS

PLANNING SUPPORTING REPORT

12 Lot Subdivision & Demolition of Existing Dwelling.

100 & 110 Cove Hill Road, Bridgewater

May 2024

Job Number: L230127

Prepared by: James Stewart (james@woolcottsurveys.com.au)
Senior Planner

Rev. no	Description	Date
1	Final	7th December 2023
2	Updated Plan	10th May 2024

Contents

1. Introduction

This report has been prepared in support of a planning permit application under Section 57 of the Land Use Planning and Approval Act 1993.

This application should be read in conjunction with the following supporting documentation:

Document	Consultant
Annexure 2 - Proposal Plan	Woolcott Surveys
Annexure 3 - Engineering Design	Rare Engineering
Annexure 4 - Bushfire Hazard Report	Woolcott Surveys
Annexure 5 - Traffic Impact Assessment	Keith Midson
Annexure 6 – Emissions Assessment	Pitt & Sherry

2. Subject site and proposal

2.1 Site details

Address	100 & 110 Cove Hill Road, Bridgewater
Property ID	2658252 & 2184712
Title	CT150349/1, CT150349/2, CT136905/2 CT144927/11 (Road lot), CT136905/102 (Road lot), CT144927/9 (stormwater discharge).
Land area	10.4ha
Planning Authority	Brighton Council
Covenants/Easements	Wayleave easement & Right of Carriageway
Existing Access	Cove Hill Road.
Proposed development	Subdivision – 12 Industrial Lots. Demolition of existing dwelling. Service and access infrastructure.
Zone	General Industrial
Overlay/s	Bushfire Prone Areas Electricity Transmission Corridor Attenuation Code (Bridgewater Quarry)
Specific Area Plan	Bridgewater Quarry Specific Area Plan. Brighton Industrial Hub Specific Area Plan
Existing development	Single Dwelling

2.2 The Proposal

Application is made to subdivide the existing three titles into 12 Industrial lots. Lots 1-6, and 9-14 are General Industrial zoned lots for future use and development. Lot 202 is proposed for stormwater detention. Lots will be accessed via a new cul-de-sac road, which connects to Cove Hill Road in the south.

Lots will be connected to reticulated water, sewer, and stormwater. New stormwater infrastructure will be provided within the proposed road lot, as well as discharge points from the proposed detention basin for the southern catchment. The northern catchment (lot 6) will discharge to a new stormwater line and headwall, which directs stormwater to the overland flow path.

The stormwater report from Rare confirms that the detention basin will limit flows below the capacity of the existing roadside drain in Cove Hill Road, while the northern catchment will ensure that no additional flows for the 2% AEP are discharged to the existing network.

All lots will be provided with a new vehicle crossing, noting that lot 6 includes three vehicle crossings. Lot 202 (detention lot) includes a new vehicle crossing onto Cove Hill Road.

Details of the proposed lots are shown below:

Lot #	**Proposed Area m²**	**Frontage**
Lot 1	7196m²	161m (Cove Hill Rd & New cul de sac)
Lot 2	5884m²	72m
Lot 3	3543m²	55m
Lot 4	2759m²	55m
Lot 5	7005m²	55m
Lot 6	4.94ha	60m+
Lot 9	2353m²	52m
Lot 10	2533m²	44m
Lot 11	3136m²	51m
Lot 12	3309m²	52m
Lot 13	4280m²	59m
Lot 14	3259m²	98m (Cove Hill Rd & New cul de sac)
Lot 202	2720m²	48m
Road Lot	7828m²	Not applicable.

2.3 Images

Figure 1 – Aerial view of the subject site (Source: LISTMap)

Figure 2 - Looking west across proposed lot 6

Figure 3 - Looking south from proposed lot 5

Figure 4 - Existing dwelling proposed for demolition

Figure 5- Looking south at existing driveway for dwelling, over proposed lot 13

Figure 6 - Looking north from lot 13

Figure 7 - Looking east across proposed lot 14

3. Planning Assessment

3.1 Zoning

The site is zoned General Industrial under the *Tasmanian Planning Scheme – Brighton.*

Figure 8 - Zoning of the subject site and surrounding area (Source: LISTMap)

3.2 Overlays

The entire site is affected by the Bushfire prone area overlay and Attenuation Area overlay.
The Electricity Transmission Infrastructure overlay impacts the northern part of the site. The electricity transmission corridor is shown below with the inner protection area highlighted.

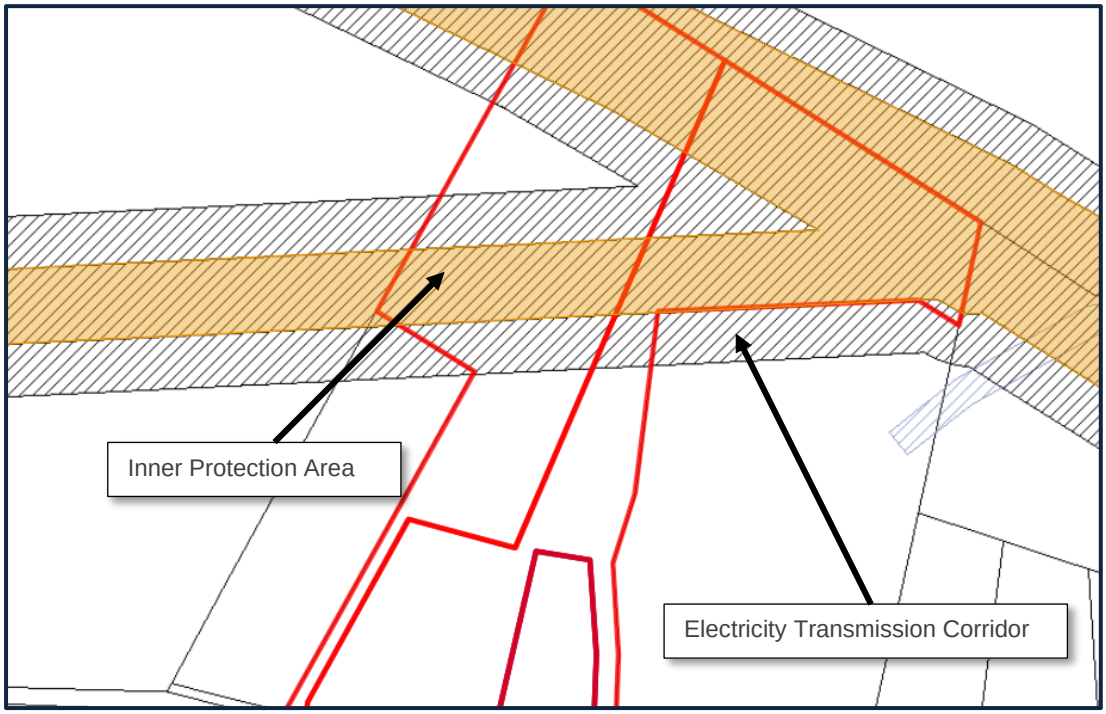

Figure 9 - Overlays affecting the subject site (Source: Launceston draft LPS)

In addition to the code overlay, there are two general overlays that impact the site. The general overlays are the Bridgewater Quarry Specific Area Plan, and the Brightton Industrial Hub Specific Area Plan. The extent of the two-overlays in relation to the subject site are shown below.

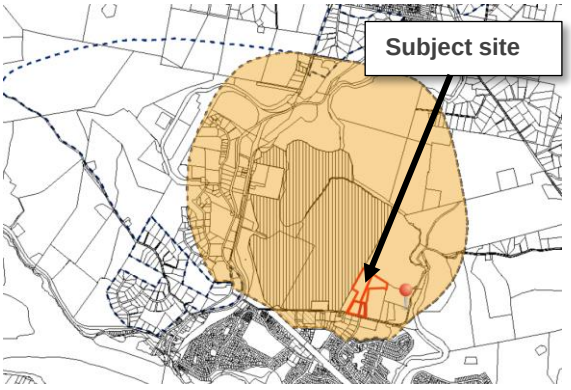

Figure 10 - Bridgewater Quarry Specific Area Plan overlay

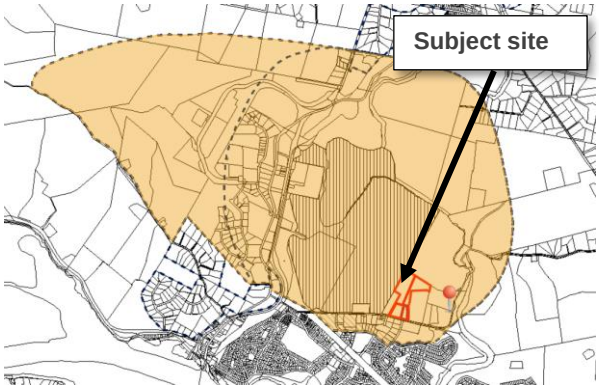

Figure 11 - Brighton Industrial hub Specific Area Plan overlay

4. Planning Scheme Zone Assessment

4.1 Zone assessment

19.0 General Industrial Zone

19.1 Zone Purpose

19.1.1	To provide for manufacturing, processing, repair, storage and distribution of goods and materials where there may be impacts on adjacent uses.
19.1.2	To provide for use or development that supports and does not adversely impact on industrial activity.

Response

Complies. The subdivision will provide for future industrial uses as per the zone purpose.

19.5.1 Lot design

Objective

That each lot:

a) has an area and dimensions appropriate for use and development in the zone; and

b) is provided with appropriate access to a road.

Acceptable Solutions	Performance Criteria
A1 Each lot, or a lot proposed in a plan of subdivision, must: (a) have an area of not less than 2000m2 and: (i) be able to contain a minimum area of 20m x 40m clear of: a. all setbacks required by clause 19.4.2 A1; and b. easements or other title restrictions that limit or restrict development; and (ii) existing buildings are consistent with the setback required by clause 19.4.2 A1; (b) be required for public use by the Crown, a council or a State authority; (c) be required for the provision of Utilities; or d) be for the consolidation of a lot with another lot provided each lot is within the same zone.	P1 Each lot, or a lot proposed in a plan of subdivision, must have sufficient useable area and dimensions suitable for its intended use, having regard to: (a) the relevant requirements for development of buildings on the lot; (b) existing buildings and the intended location of new buildings on the lot; (c) the topography of the site; (d) the presence of any natural hazards; and (e) the pattern of development existing on established properties in the area.

Response

A1 Acceptable solution achieved.

a) Each lot has an area in excess of 2000m^2

(i) Each lot contains a minimum area of 20m x 40, as shown on the proposal plan. The 20m x 40m area is clear of:

a) The frontage setback of 10m, as required under clause 19.4.2 A1

b) Any easements or title restrictions. In relation to lots 5 and 6, all can be provided with a 20m x 40m envelope clear of the existing Tasnetworks wayleave easement.

c) Complies. Lot 202 is set aside for drainage purposes.

A2 Each lot, or a lot proposed in a plan of subdivision, must have a frontage of not less than 20m.	P2 Each lot, or a lot proposed in a plan of subdivision, must be provided with a frontage or legal connection to a road by a right of carriageway, that is sufficient for the intended use, having regard to: a) the number of other lots which have the land subject to the right of carriageway as their sole or principal means of access; b) the topography of the site; c) the functionality and useability of the frontage; d) the anticipated nature of vehicles likely to access the site; e) the ability to manoeuvre vehicles on the site; f) the ability for emergency services to access the site; and g) the pattern of development existing on established properties in the area.

Response

A2 Acceptable solution achieved. Each lot is provided with a frontage of not less than 20m.

A3 Each lot, or a lot proposed in a plan of subdivision, must be provided with a vehicular access from the boundary of the lot to a road in accordance with the requirements of the road authority.	P3 Each lot, or a lot proposed in a plan of subdivision, must be provided with reasonable vehicular access to a boundary of a lot or building area on the lot, if any, having regard to: a) the topography of the site; b) the distance between the lot or building area and the carriageway; c) the nature of the road and the traffic, including pedestrians; and d) (d) the pattern of development existing on established properties in the area.

Response:

A3 Acceptable solution is achieved. Each lot will be provided with vehicular access from the boundary of the lot to a road, in accordance with the requirements of the road authority.

19.5.2 Services

Objective	
That the subdivision of land provides services for the future use and development of the land.	
Acceptable Solutions	**Performance Criteria**
A1 Each lot, or a lot proposed in a plan of subdivision, excluding for public open space, a riparian or littoral reserve or Utilities, must: a) be connected to a full water supply service if the frontage of the lot is within 30m of a full water supply service; or b) be connected to a limited water supply service if the frontage of the lot is within 30m of a connection to a limited water	P1 No Performance Criterion.

supply service, unless a regulated entity advises that the lot is unable to be connected to the relevant water supply service.	

Response

A1 Acceptable solution is achieved Each lot will have a connection to reticulated water. Refer to engineering design plans completed by Rare Engineering as Annexure 3. The DN 100 along Cove Hill Road, opposite Cowle Road will be upgraded to a DN 150 as discussed with TasWater.

A2 Each lot, or a lot proposed in a plan of subdivision, excluding for public open space, a riparian or littoral reserve or Utilities, must have a connection to a reticulated sewerage system.	P2 Each lot, or a lot proposed in a plan of subdivision, excluding for public open space, a riparian or littoral reserve or Utilities, must be capable of accommodating an on-site waste-water treatment system adequate for the future use and development of the land.

Response

A2 Acceptable solution is achieved. Each lot will have a connection to reticulated sewer. Refer to the engineering design plans completed by Rare Engineering as Annexure 3.

A3 Each lot, or a lot proposed in a plan of subdivision, excluding for public open space, a riparian or littoral reserve or Utilities, must be capable of connecting to a public stormwater system.	P3 Each lot, or a lot proposed in a plan of subdivision, must be capable of accommodating an on-site stormwater management system adequate for the future use and development of the land, having regard to: a) the size of the lot; b) topography of the site; c) soil conditions; d) any existing buildings on the site; e) any area of the site covered by impervious surfaces; and f) any watercourse on the land.

Response

A3 Acceptable solution is achieved. Each lot will have a connection to the stormwater system. A stormwater detention basin is proposed on lot 202. Refer to engineering design plans and report completed by Rare Engineering as Annexure 3. A new stormwater main and headwall will be provided over 122 Cove Hill Road, allowing stormwater to connect to the existing overland flow path for the northern catchment.

4.2 Specific Area Plan Assessment

BRI S4.0 Bridgewater Quarry Specific Area Plan

S4.1 Plan Purpose

S4.1.1	To protect the operations of the Bridgewater Quarry from incompatible or conflicting use or development.

S4.8.1 Subdivision within Bridgewater Quarry Specific Area Plan

Objective
That subdivision is compatible with the operations of the Bridgewater Quarry.

Acceptable Solutions	Performance Criteria
A1 No Acceptable Solution..	P1 Each lot, or a lot proposed in a plan of subdivision, must not result in potential to interfere or conflict with quarry operations having regard to: (a) the nature of the quarry; including: (i) operational characteristics; (ii) scale and intensity; (iii) degree of hazard or pollution that may be emitted from the activity. (b) the future use and development of the lot; and (c) any advice from the Bridgewater Quarry operator.

Response

P1 Performance criteria is relied upon, as there is no acceptable solution. Please refer to the emissions report by Pitt & Sherry, included as annexure 6 to this submission.

The Pitt & Sherry response concludes that the proposed industrial subdivision is compatible with the operation of the Bridgewater Quarry, and that the requirements of BRI-S4.7.1 *Bridgewater Quarry Specific Area Plan* are met.

BRI S10.0 Brighton Industrial hub Specific Area Plan

S10.1 Plan Purpose

S10.1.1	To protect the Brighton Industrial Hub from sensitive use establishing in the area.

S10.8 Development Standards for Subdivision

This sub-clause is not used in this specific area plan.

S10.0 does not apply to subdivision and is therefore not applicable to this application.

4.3 Code Assessment

C2.0 Parking and Sustainable Transport Code

C2.5 Use Standards

A1 The lots are sufficiently sized to allow onsite parking for a range of vehicle types associated with industrial development.

C2.6 Development standards for buildings and works

No further development of the lots is proposed as a part of this application.

C3.0 Roads Code

Please refer to annexure 5. A Traffic Impact Assessment has been provided by Keith Midson confirming the development complies.

C4.0 Electricity Transmission Infrastructure Protection Code

C4.7 Development Standards for Subdivision

C4.7.1 Subdivision

Objective	
To provide for subdivision: a. that allows for development to be suitably located to avoid hazards from electricity transmission infrastructure and enable appropriate levels of amenity; and b. so that future development does not compromise safety, security, access to, and operation of, existing and future electricity transmission infrastructure.	
Acceptable Solutions	**Performance Criteria**
A1 A lot, or a lot proposed in a plan of subdivision, within an electricity transmission corridor, must: a) be for the creation of separate lots for existing buildings where the buildings are located wholly outside an inner protection area or a registered electricity easement; b) be required for public use by the Crown, a council or a State authority; c) be required for the provision of Utilities; or d) be for the creation of a lot that contains a building area not less than 10m x 15m entirely located outside an inner protection area or registered electricity easement.	P1 A lot, or a lot proposed in a plan of subdivision, within the electricity transmission corridor must not cause an unreasonable impact on the safety, security, operation of, or access to, existing or future electricity transmission infrastructure, having regard to: a) the intended use of the proposed lots; b) the location of any proposed building areas; and c) any advice from the electricity entity.

Response

A1 The acceptable solution is achieved. Lots 5, and 6 can each provide a 10m x 15m building area located entirely outside of the inner protection area or registered electricity easement.

An additional wayleave easement currently runs across lots 11, 12 13 and 14 which will be removed. The application complies with the acceptable solution. As discussed with Councils Planning officer via email correspondence on 23rd Jan 2024, Council will not require a building envelope be shown on the final plan.

Note: The proposed subdivision has been discussed with Tasnetworks who indicated there are no future plans for an additional transmission line to be constructed. The building envelopes do not present any operational risk to the current transmission line assets and Tasnetworks has no objection to their location.

C9.0 Attenuation Code

As per clause C9.2.1, the code only applies to subdivision where it could create a sensitive use. In this instance, sensitive uses are prohibited under the two applicable SAPS. There is no potential for a sensitive uses to become established on the site. The code does not apply.

C13.0 Bushfire-Prone Areas Code

Please refer to Annexure 4 for a response to this code.

5. Conclusion

The proposed development is for subdivision to create 12 industrial lots, along with demolition of the existing dwelling. The site has suitable access to a Council Maintained Road. The lot is located within an established industrial area, with existing industrial use and development located on all sides.

The adjoining quarry to the north will not be impacted by the proposed subdivision. The proposal will ensure all lots connect to reticulated services, while providing building areas outside of the Tasnetworks inner protection area.

The proposed development furthers the purpose of the zone by providing land to support use and development permissible under the General Industrial Zone. The application complies with all relevant zone and code criteria, and Council approval of the application is sought.

Annexure 1 – Certificate of Title Plan and Folio Text
Annexure 2 – Subdivision proposal plan
Annexure 3 – Engineering Design
Annexure 4 – Bushfire Hazard Assessment
Annexure 5 – Traffic Impact Assessment
Annexure 6 – Emissions Report

Land Surveying | Town Planning | Project Management

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Hobart
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CLIENT:
SHAW

PROJECT:
SUBDIVISION

ADDRESS:
100-110 COVE HILL RD, BRIDGEWATER

PROJECT No:
241005

STATUS:
CONTROLLED DOCUMENT

ISSUED FOR / DESCRIPTION:
DEVELOPMENT APPLICATION

DRAWINGS:

INFORMATION ONLY
NOT FOR CONSTRUCTION

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS: CONTROLLED DOCUMENT

APPROVED: R. JESSON ACRED. No: CC4858I

DESIGN BY: JF
DESIGN CHK: RJJ
DRAWN BY: KL
DRAFT CHK: JF
DATE: 18-12-23

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CLIENT: SHAW
PROJECT: SUBDIVISION
ADDRESS: 100-110 COVE HILL ROAD BRIDGEWATER

TITLE: COVER SHEET
SCALE: - SHEET SIZE: A1 DWGs IN SET: -
PROJECT No: 241005 DWG No: COV REV: 2

GENERAL

1. NOTICE TO TENDERER
THE CONTRACTOR / TENDERER IS TO MAKE THEMSELVES AWARE OF THE LOCAL COUNCIL, TASWATER AND THE DEPARTMENT OF STATE GROWTH (D.S.G.) STANDARDS FOR CIVIL WORKS. CONSTRUCTION IS TO BE CARRIED OUT TO THESE STANDARDS. TENDERER IS TO ALLOW FOR THESE STANDARDS DURING PRICING. COPIES OF THE STANDARDS ARE AVAILABLE FOR INSPECTION UPON REQUEST FROM THE LOCAL COUNCIL OR D.S.G.'s WEB SITE.

2. NOTIFICATION
THE CONTRACTOR IS TO NOTIFY ALL RELEVANT STATUTORY AUTHORITIES PRIOR TO COMMENCING ANY WORK FOR THE POSSIBLE LOCATION OF ANY EXISTING SERVICES NOT SHOWN ON THESE PLANS, AND IS TO NOTIFY THE SUPERINTENDENT OF THE SAME.
ALL EXISTING SERVICES ARE TO BE PROTECTED DURING CONSTRUCTION. ANY DAMAGE TO EXISTING SERVICES IS TO BE MADE GOOD AT THE CONTRACTOR'S EXPENSE.

3. DRAWINGS AND SPECIFICATIONS
THESE DRAWINGS AND SPECIFICATIONS HAVE BEEN PREPARED FOR THE PURPOSE OF OBTAINING COUNCIL APPROVAL AND CALLING OF TENDERS. THEY ARE NOT TO BE USED FOR CONSTRUCTION. A CONSTRUCTION SET OF DRAWINGS STAMPED "CONSTRUCTION SET" WILL BE ISSUED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

4. COMMON TRENCHING
WHERE ANY COMMON TRENCHING IS REQUIRED, THE FOLLOWING CLEARANCE DISTANCES (BARREL TO BARREL) MUST BE MAINTAINED FROM EXISTING OR PROPOSED SERVICES:
HORIZONTALLY:
- 300mm ALONG A LENGTH GREATER THAN 2 METRES.
- 500mm MINIMUM FROM ANY MAIN GREATER THAN 200mm DIA.
- 150mm MINIMUM ALONG A LENGTH LESS THAN 2 METRES.

VERTICALLY:
- 150mm MINIMUM
- 300mm MINIMUM FROM ANY MAIN GREATER THAN 200mm DIA.

ELECTRICAL CABLES SHOULD BE LOCATED ON THE OPOSITE SIDE OF THE STREET. WHERE THIS IS NOT POSSIBLE A 400mm MINIMUM DISTANCE MUST BE OBSERVED OF WHICH 300mm SHOULD BE IN NATURAL AND UNDISTURBED MATERIAL.

5. TASNETWORKS TRENCHING
THE CONTRACTOR IS TO ALLOW FOR EXCAVATION AND BACKFILLING OF ALL TRENCHES FOR THE INSTALLATION OF TASNETWORKS CABLES. CONTRACTOR IS TO LIAISE WITH THE TASNETWORKS FOR THE EXTENT OF CABLE TRENCHING, CONDUITS & PITS.

6. COMMUNICATION TRENCHING
THE CONTRACTOR IS TO ALLOW FOR EXCAVATION AND BACKFILLING OF ALL TRENCHES FOR THE INSTALLATION OF COMMUNICATIONS CABLES. CONTRACTOR IS TO LIAISE WITH COMMUNICATION AUTHORITY FOR THE EXTENT OF CABLE TRENCHING.

7. EXISTING SERVICES
LOCATE EXISTING SERVICES PRIOR TO COMMENCING DEMOLITION AND SITE WORKS. THE CONTRACTOR IS TO ARRANGE AND PAY FOR THE ON SITE MARKING AND CONFIRMATION OF DEPTH OF SERVICE LOCATIONS FOR ALL UNDERGROUND SERVICES INCLUDING COMMUNICATIONS, TASNETWORKS, TASWATER (WATER & SEWER) AND COUNCIL SERVICES (ie: STORMWATER) IN THE AREA OF NEW WORKS. LOCATION TO BE CONFIRMED USING CABLE LOCATORS AND HAND DIGGING METHODS. PRIOR TO ANY WORKS ON SITE, ANY CLASHES WITH DESIGNED SERVICES ON FOLLOWING DRAWINGS ARE TO BE REPORTED TO DESIGN ENGINEER FOR DIRECTION.

8. COUNCIL & AUTHORITIES APPROVALS
ALL WORKS ARE TO BE IN ACCORDANCE WITH THE FOLLOWING APPROVALS:
- NIL

9. SIGNAGE
ALL SIGN WORKS AND INSTALLATION TO BE IN ACCORDANCE WITH CURRENT VERSION OF MUTCD & AUSTROADS FOR SIGNAGE DETAILS.

10. SCOPE OF WORKS
THE SCOPE OF WORKS ARE SHOWN IN THESE DOCUMENTS AND THE SPECIFICATION. IT IS EXPECTED THE CONTRACTOR WILL RESOLVE ALL ISSUES UNCOVERED ON SITE THAT ARE NOT DETAILED IN CONJUNCTION WITH THE SUPERINTENDENT.

GENERAL CONT.

11. LINE TYPE LEGEND

xx xx xx	DN100 AGG PIPE OR MEGAFLOW DRAIN AS NOTED @ 1:100 FALL TO STORM WATER SYSTEM
eSW	DENOTES EXISTING STORM WATER MAIN (CONFIRM EXACT LOCATION)
SW	DENOTES PROPOSED STORM WATER MAIN
eS	DENOTES EXISTING SEWER MAIN (CONFIRM EXACT LOCATION)
S	DENOTES PROPOSED SEWER MAIN
eW	DENOTES EXISTING WATER MAIN (CONFIRM EXACT LOCATION)
W	DENOTES PROPOSED WATER MAIN
eGAS	DENOTES EXISTING GAS MAIN (CONFIRM EXACT LOCATION)
GAS	DENOTES PROPOSED GAS MAIN
eCOM	DENOTES EXISTING UNDERGROUND TELECOM / FIBRE OPTIC LINE (CONFIRM EXACT LOCATION)
	DEMOLITION

12. SITE WORKS SYMBOLS LEGEND

PED	PEDESTRIAN RAMP
TYPE BK	BARRIER KERB
TYPE KC	KERB AND CHANNEL
TYPE KCS	KERB AND CHANNEL - SMALL
TYPE KCM	MOUNTABLE KERB AND CHANNEL
TYPE KCV	VEHICULAR CROSSING
BOL.	BOLLARD, REFER DETAIL
WS1	HUDSON CIVIL PRECAST CONCRETE WHEEL STOP (2000 LONG x 100 HIGH)

13. BUILDING SERVICES SYMBOLS LEGEND

TEL-PIT	TELECOMMUNICATION PIT

14. SURVEY SYMBOLS LEGEND

e	EXISTING
TOK 44.400	SPOT LEVEL WITH DESCRIPTION
+ 44.330	EXISTING SPOT LEVEL

15. DRAINAGE SYMBOLS LEGEND

MHx-SW	STORMWATER MANHOLE
MHx-S	SEWER MANHOLE
GPx-SW	GRATED/GULLY PIT - STORM WATER
GDx-SW	GRATED DRAIN - STORM WATER
SEPx-SW	SIDE ENTRY PIT - STORM WATER
uPVC	UNPLASTICIZED POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE (OR FCR) CLASS 4 (Z)
DN	NOMINAL DIAMETER
CL	COVER LEVEL
IL	INVERT LEVEL
DP	DOWN PIPE
IO	INSPECTION OPENING
IOS	INSPECTION OPENING TO SURFACE
	GRATED PIT

16. WATER RETICULATION SYMBOLS LEGEND

M	METER
CM	CHECK METER
FP	FIRE PLUG
	ISOLATION VALVE
	CHECK VALVE
	STRAINER
M	MONITORED VALVE
	BALANCE VALVE
SV	STOP VALVE
	DN100 REFLUX VALVE
BFPD	BACK FLOW PREVENTION DEVICE
A/BAPs	PRESSURE REDUCING VALVE
HBC	HOSE BIB COCK
	FIRE HYDRANT
	DUAL HEAD FIRE HYDRANT
FHR	FIRE HOSE REEL

EARTHWORKS

1. GENERAL
GENERAL EARTHWORKS, MATERIAL AND WORKMANSHIP SHALL COMPLY WITH THIS SPECIFICATION AND THE CURRENT EDITION OF THE S.A.A. CODE FOR EARTHWORKS AS 3798 TOGETHER WITH ANY CODES, STANDARDS OR REGULATIONS REFEREED TO THEREIN.

2. INSPECTIONS
THE CONTRACTOR IS TO ENGAGE AN APPROVED GEOTECHNICAL ENGINEER TO CARRY OUT LEVEL 2 TESTING OF ALL EARTH WORKS TO AS 3798, INCLUDING
- SUBGRADE
- FILLS
- PAVEMENTS
- BACKFILLING OF SERVICE TRENCHES

CERTIFICATION OF THESE ELEMENTS IS TO BE PROVIDED PRIOR TO TO PRACTICAL COMPLETION

3. AREAS OF FILL
A. REMOVE TOP SOIL AND ORGANIC MATERIAL
B. PROOF ROLL SUBGRADE IN ACCORDANCE WITH AS1289 TO:
- 98% STANDARD DRY DENSITY UNDER BUILDING
- 98% STANDARD DRY DENSITY UNDER ROADS AND CARPARKS
- REMOVE ANY SOFT SPOTS AND COMPACT WITH 2% OF OPTIMUM MOISTURE CONTENT TO STANDARD DRY DENSITY AS STATED ABOVE

C. PLACE FILL AS SPECIFIED AND COMPACT WITHIN 2% OF OPTIMUM MOISTURE CONTENT TO STANDARD DRY DENSITY AS STATED ABOVE
D. SUB-GRADE IMPROVEMENT MATERIAL TO BE PLACED AND TESTED IN ACCORDANCE WITH DSG SPEC SECTION 204 FOR EMBANKMENT MATERIAL.

4. AREAS OF CUT
A. REMOVE TOP SOIL AND ORGANIC MATERIAL
B. PROOF ROLL SUBGRADE IN ACCORDANCE WITH AS1289 TO:
- 98% STANDARD DRY DENSITY UNDER BUILDINGS
- 98% STANDARD DRY DENSITY UNDER ROADS AND CAR PARKS
- REMOVE ANY SOFT SPOTS AND COMPACT WITH 2% OF OPTIMUM MOISTURE CONTENT TO STANDARD DRY DENSITY AS STATED ABOVE

SOIL & WATER MANAGEMENT

1. GENERAL
ALL WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH 'SOIL & WATER MANAGEMENT ON BUILDING & CONSTRUCTION SITES' GUIDELINES AVAILABLE FROM NORTHERN RESOURCE MANAGEMENT (NRM).

2. SOIL EROSION CONTROL
SOIL EROSION CONTROL IN ACCORDANCE WITH NRM GUIDELINES. CONTRACTOR TO ALLOW TO:
- LIMIT DISTURBANCE WHEN EXACTING BY PRESERVING VEGETATED AREAS AS MUCH AS POSSIBLE
- DIVERT UP-SLOPE WATER WHERE PRACTICAL
- INSTALL SEDIMENT FENCES DOWN SLOPE OF ALL DISTURBED LANDS TO FILTER LARGE PARTICLES PRIOR TO STORM WATER SYSTEM
- WASH EQUIPMENT IN DESIGNATED AREA THAT DOES NOT DRAIN TO STORM WATER SYSTEM
- PLACE STOCK PILES AWAY FROM ON-SITE DRAINAGE & UP-SLOPE FROM SEDIMENT FENCES
- LEAVE & MAINTAIN VEGETATED FOOT PATH
- STORE ALL HARD WASTE & LITTER IN A DESIGNATED AREA THAT WILL PREVENT IT FROM BEING BLOWN AWAY & WASHED INTO THE STORM WATER SYSTEM
- RESTRICT VEHICLE MOVEMENT TO A STABILISED ACCESS

3. NRM GUIDELINES
CONTRACTOR TO COMPLETE ALL WORKS IN ACCORDANCE WITH NRM SOIL & WATER MANAGEMENT ON BUILDING & CONSTRUCTION SITE USING THE FACT SHEETS:
- FACT SHEET 1: SOIL & WATER MANAGEMENT ON LARGE BUILDING & CONSTRUCTION SITES
- FACT SHEET 2: SOIL & WATER MANAGEMENT ON STANDARD BUILDING & CONSTRUCTION SITES
- FACT SHEET 3: SOIL & WATER MANAGEMENT PLANS
- FACT SHEET 4: DISPERSIVE SOILS - HIGH RISK OF TUNNEL EROSION
- FACT SHEET 5: MINIMISE SOIL DISTURBANCE
- FACT SHEET 6: PRESERVE VEGETATION
- FACT SHEET 7: DIVERT UP-SLOPE WATER
- FACT SHEET 8: EROSION CONTROL MATS & BLANKETS
- FACT SHEET 9: PROTECT SERVICE TRENCHES & STOCKPILES
- FACT SHEET 10: EARLY ROOF DRAINAGE CONNECTION
- FACT SHEET 11: SCOUR PROTECTION - STORM WATER PIPE OUTFALLS & CHECK DAMS
- FACT SHEET 12: STABILISED SITE ACCESS
- FACT SHEET 13: WHEEL WASH
- FACT SHEET 14: SEDIMENT FENCES & FIBRE ROLLS
- FACT SHEET 15: PROTECTION OF STORM WATER PITS
- FACT SHEET 16: MANAGE CONCRETE, BRICK & TILE CUTTING
- FACT SHEET 17: SEDIMENT BASINS
- FACT SHEET 18: DUST CONTROL
- FACT SHEET 19: SITE RE-VEGETATION

ROAD WORKS

1. GENERAL
ALL WORKS ARE TO BE CARRIED OUT TO THE LOCAL COUNCIL AND D.S.G. STANDARDS. ANY DEPARTURES FROM THESE STANDARDS REQUIRES THE PRIOR APPROVAL OF THE SUPERINTENDENT AND THE LOCAL COUNCIL WORKS SUPERVISOR.

2. INSPECTIONS
THE CONTRACTOR IS RESPONSIBLE FOR ORGANISING THE FOLLOWING INSPECTIONS WITH THE SUPERINTENDENT. 48 HOURS NOTICE IS REQUIRED TO BE GIVEN TO THE SUPERINTENDENT PRIOR TO THE INSPECTION.
- SUBGRADE PREPARATION
- SUB-BASE FOR ROADS, CARPARKS AND KERBS
- BASE COURSE
- FINAL TRIM PRIOR TO PLACING KERBS
- FINAL TRIM PRIOR TO SEALING

3. TESTING
THE CONTRACTOR IS TO BE RESPONSIBLE FOR ORGANISING AND PAYING ALL COSTS ASSOCIATED WITH TESTING IN ACCORDANCE WITH D.S.G. SPEC SECTION 173-EXAMINATION AND TESTING OF MATERIALS AND WORK (ROADWORKS).

4. BASE COURSE LAYERS
- SUB-BASE TYPE 3 MATERIAL TO BE PLACED AND TESTED IN ACCORDANCE WITH DSG SPEC SECTION 304 FOR SUB-BASE CLASS 3 MATERIAL
- BASE CLASS 2 MATERIAL TO BE PLACED AND TESTED IN ACCORDANCE WITH DSG SPEC SECTION 304 FOR BASE CLASS 2 MATERIAL

5. HOTMIX
ALL HOTMIX IS TO BE BLACK IN COLOUR AND IS TO MEET AND BE PLACED IN ACCORDANCE WITH D.S.G. SPEC SECTION 407-HOT MIX ASPHALT.

6. KERBS
ALL KERBS ARE TO BE AS SHOWN ON THE DRAWINGS AND BE IN ACCORDANCE WITH IPWEA LGAT STANDARD DRAWINGS.

7. ROAD RESERVE WORKS
ALL WORKS IN (OR REQUIRING OCCUPATION) IN THE ROAD RESERVE MUST BE UNDERTAKEN BY CONTRACTOR REGISTERED WITH COUNCIL'S (REGISTERED CONTRACTOR).

8. FOOTPATHS
CONSTRUCT FOOTPATHS INCLUDING EXPANSION / CONTROL / WEAKENED PLANE JOINTS IN ACCORDANCE WITH IPWEA STD DWG TSD-R11-v3

9. LANDSCAPE / STREET FURNITURE
- BOLLARDS, REFER DETAILS / SUPERINTENDENTS SPEC.
- LANDSCAPING & STREET FURNITURE BY CONTRACTOR - U.N.O

STORMWATER

1. GENERAL
ALL WORKS ARE TO BE CARRIED OUT TO THE LOCAL COUNCIL AND DSG STANDARDS. ANY DEPARTURES FROM THESE STANDARDS REQUIRES THE PRIOR APPROVAL OF THE SUPERINTENDENT AND THE LOCAL COUNCIL WORKS SUPERVISOR. ALL STORM WATER PLUMBING & DRAINAGE TO COMPLY WITH A.S 3500.3:2003 STORM WATER DRAINAGE.

2. TESTING
ALL DRAINAGE WORKS SHALL BE SUBJECT TO THE TESTS PRESCRIBED BY THE AUTHORITIES HAVING JURISDICTION OVER THE VARIOUS SERVICES. ANY SECTION FAILING SUCH TESTS SHALL BE REMOVED AND PROPERLY INSTALLED AT THE CONTRACTOR'S EXPENSE.

3. MANHOLES
MANHOLES ARE TO BE 1050 I.D. U.N.O PRECAST CONCRETE INSTALLED TO LOCAL COUNCIL STANDARDS. ALL MANHOLES IN TRAFFICED AREAS ARE TO BE FITTED WITH HEAVY DUTY GATIC COVERS AND SURROUNDS. ALL MANHOLES ARE TO HAVE A 5 METRE LENGTH OF 75mm AG-PIPE CONNECTED TO THEM AND LAID IN THE UPSTREAM PIPE TRENCH IMMEDIATELY ADJACENT TO AND AT THE INVERT OF THE LOWEST PIPE WORK.

4. SIDE ENTRY PIT (SEP)
- PIT INVERT DEPTHS VARY, REFER SITE PLAN.
- BENCH OUT IN A NEAT AND TIDY MANNER TO ENGINEERS APPROVAL.
- GRATED PIT - GULLY HINGED OR OTHER TYPE APPROVED
- CONCRETE KERB LINTEL - STEEL KERB LINTEL AND 1200 LONG GALV BAR

5. TRENCHING AND BACKFILL
ALL TRENCHES ARE TO BE EXCAVATED AND BACKFILLED IN ACCORDANCE WITH THE DRAWINGS AND THE LOCAL COUNCIL STANDARDS.

6. INSPECTIONS
THE CONTRACTOR IS RESPONSIBLE FOR ORGANISING THE FOLLOWING INSPECTIONS WITH THE SUPERINTENDENT. 48 HOURS NOTICE IS REQUIRED TO BE GIVEN TO THE SUPERINTENDENT PRIOR TO THE INSPECTION.
- PIPEWORK BEDDING
- INSTALLED PIPE PRIOR TO BACKFILLING
- BACKFILLING

7. AS CONSTRUCTED DRAWINGS
THE CONTRACTOR WILL BE RESPONSIBLE FOR PRODUCING "AS CONSTRUCTED" DRAWINGS TO THE STANDARD REQUIRED BY TYPE B IN THE NOTES REGARDING TABLE 202-A SHALL BE AMENDED TO READ "WHERE SEWER AT GRADE > 1 IN 10"
MRWA-S-205
NOTE C REMAINS VALID "WHEN SOCKETED MAINS ARE LAID AT >1 IN 20 SLOPE IN AREAS THAT ARE LIKELY TO HAVE HIGH GROUND WATER, CEMENT STABILIZED EMBEDMENT SHALL BE USED AS PER MRWA-S-202"

8. TESTING
CONTRACTOR SHALL CAMERA TEST ALL PIPES AND SUBMIT FOOTAGE TO LOCAL COUNCIL FOR APPROVAL.

9. REDUNDANT PIPE WORK
FILL REDUNDANT SECTION OF PIPEWORK WITH 'LIQUIFILL' (GRADE PC.1 - 0.5-2.0 MPa)

SEWERAGE

1. GENERAL
ALL SEWER WORKS TO BE IN ACCORDANCE WITH THE WSA SEWER CODE (WSA 02-2014-3.1 MRWA) AND AS AMENDED BY THE TASWATER SUPPLEMENT.
TASWATER APPROVED PRODUCTS ARE CONTAINED ON THE CITY WEST WATER WEBSITE HTTP://WWW.MRWA.COM.AU/PAGES/PRODUCTS.ASPX.
ANY DEPARTURES FROM THESE STANDARDS REQUIRES THE PRIOR APPROVAL OF THE SUPERINTENDENT AND TASWATER FIELD SERVICES OFFICER.

2. TESTING
ALL DRAINAGE WORKS SHALL BE SUBJECT TO THE TESTS PRESCRIBED BY THE AUTHORITIES HAVING JURISDICTION OVER THE VARIOUS SERVICES. ANY SECTION FAILING SUCH TESTS SHALL BE REMOVED AND PROPERLY INSTALLED AT THE CONTRACTOR'S EXPENSE.

3. SEWER MAIN CONNECTIONS
ALL NEW 'LIVE' CONNECTIONS TO EXISTING TASWATER SEWER INFRASTRUCTURE INCLUDING BUT NOT LIMITED TO SEWER MAINS / MANHOLES TO BE COMPLETED BY TASWATER (UNLESS PRIOR WRITTEN APPROVAL) AT OWNERS COST.
INSTALL PROPERTY SEWER CONNECTIONS (STANDARD OR SLOPED) WITH SURFACE I.O. NOMINALLY 1.0m WITHIN EACH NEW LOT IN ACCORDANCE WITH SECTION 5 OF WSA 02-2014-3.1.

4. MANHOLES
MANHOLES ARE TO BE 1050 I.D. PRECAST CONCRETE INSTALLED TO WSA STANDARDS. CONSTRUCT ALL MANHOLES (MH) AND MANHOLE COVERS IN ACCORDANCE WITH THE SEWERAGE CODE OF AUSTRALIA - MELBOURNE RETAIL WATER AGENCIES INTEGRATED CODE - WSA 02-2014-3.1 MRWA VERSION 2.0 AND TASWATER'S SUPPLEMENT TO THIS CODE. ALL MANHOLES IN TRAFFICABLE AREAS ARE TO BE FITTED WITH HEAVY DUTY CLASS D GATIC COVERS AND SURROUNDS.
ALL MANHOLES IN NON-TRAFFICABLE AREAS ARE TO BE FITTED WITH MEDIUM DUTY CLASS B GATIC COVERS AND SURROUNDS.
BENCHING TO BE FULL DEPTH OF PIPE DIAMETER AS PER DETAILS IN WSA 02-2014-3.1 MRWA VERSION 2.0

5. TRENCHING AND BACKFILL
ALL TRENCHES ARE TO BE EXCAVATED AND BACKFILLED IN ACCORDANCE WITH THE DRAWINGS AND TASWATER STANDARDS INCLUDING ELECTROMAGNETIC METAL IMPREGNATED TAPE IN ALL NON METALLIC PIPE TRENCHES.

CEMENT STABILISED EMBEDMENT:

FOR SEWER MAINS THE FOLLOWING CHANGES SHOULD BE APPLIED TO THE MRWA SEWERAGE STANDARDS DRAWINGS MRWA-S-202 AND MRWA-S-205
MRWA-S-202
THE REQUIREMENT IDENTIFIED IN THE THIRD DOT POINT FOR TYPE B IN THE NOTES REGARDING TABLE 202-A SHALL BE AMENDED TO READ "WHERE SEWER AT GRADE > 1 IN 10"
MRWA-S-205
NOTE C REMAINS VALID "WHEN SOCKETED MAINS ARE LAID AT >1 IN 20 SLOPE IN AREAS THAT ARE LIKELY TO HAVE HIGH GROUND WATER, CEMENT STABILIZED EMBEDMENT SHALL BE USED AS PER MRWA-S-202"

6. INSPECTIONS
THE CONTRACTOR IS RESPONSIBLE FOR ORGANISING THE FOLLOWING INSPECTIONS WITH THE SUPERINTENDENT (LIAS WITH TASWATER) .
48 HOURS NOTICE IS REQUIRED TO BE GIVEN TO THE SUPERINTENDENT PRIOR TO THE INSPECTION.
- PIPEWORK BEDDING
- INSTALLED PIPE PRIOR TO BACKFILLING
- BACKFILLING

7. AS CONSTRUCTED DRAWINGS
THE CONTRACTOR WILL BE RESPONSIBLE FOR PRODUCING "AS INSTALLED" DRAWINGS TO THE STANDARD REQUIRED BY TASWATER. THE DRAWINGS SHALL BE CERTIFIED AS BEING CORRECT BY EITHER A CHARTERED CIVIL ENGINEER OR A REGISTERED SURVEYOR. RARE CAN PROVIDE THIS SERVICE, HOWEVER THE CONTRACTOR WILL BE CHARGED FOR THIS SERVICE AND SHOULD BE AWARE OF THIS WHEN PRICING.

8. TESTING
CONTRACTOR SHALL CCTV ALL PIPES AND SUBMIT FOOTAGE TO TASWATER FOR APPROVAL.

9. REDUNDANT PIPE WORK
FILL REDUNDANT SECTION OF PIPEWORK WITH 'LIQUIFILL' (GRADE PC.1 - 0.5-2.0 MPa)

WATER RETICULATION

1. GENERAL
ALL WATER SUPPLY CONSTRUCTION TO:
- WATER SUPPLY CODE OF AUSTRALIA (WSA 03-2011-3.1 VERSION MRWA EDITION V2.0) - PART 2: CONSTRUCTION
- WATER SERVICES ASSOCIATION OF AUSTRALIA - TASWATER SUPPLEMENT
- TASWATER'S STANDARD DRAWINGS TWS-W-0002 SERIES
- WATER METERING POLICY/METERING GUIDELINES
- TASWATER'S STANDARD DRAWINGS TWS-W-0003 - FOR PROPERTY SERVICE CONNECTIONS - CAGE FOR WATER METER ASSEMBLY
- BOUNDARY BACKFLOW CONTAINMENT REQUIREMENTS AND AS3500.1:2003.

ANY DEPARTURES FROM THESE STANDARDS REQUIRES THE PRIOR APPROVAL OF THE SUPERINTENDENT AND THE LOCAL WATER AUTHORITY WORKS SUPERVISOR.

2. TESTING
ALL WATER RETICULATION WORKS SHALL BE SUBJECT TO THE TESTS PRESCRIBED BY THE AUTHORITIES HAVING JURISDICTION OVER THE VARIOUS SERVICES. ANY SECTION FAILING SUCH TESTS SHALL BE REMOVED AND PROPERLY INSTALLED AT THE CONTRACTOR'S EXPENSE.

3. FIRE HYDRANTS
FIRE HYDRANTS ARE TO BE AS SHOWN ON THE DRAWINGS. THE CONTRACTOR IS TO ALLOW TO PLACE STANDARD MARKERS AS REQUIRED BY THE LOCAL AUTHORITY.

4. THRUST AND ANCHOR BLOCKS
THRUST AND ANCHOR BLOCKS ARE TO BE PROVIDED AT BENDS, VALVES, HYDRANTS AND LINE ENDS IN ACCORDANCE WITH TASWATER STANDARDS.

5. TRENCHING AND BACKFILL
ALL TRENCHES ARE TO BE EXCAVATED AND BACKFILLED IN ACCORDANCE WITH THE DRAWINGS AND TASWATER STANDARDS INCLUDING ELECTROMAGNETIC METAL IMPREGNATED TAPE IN ALL NON METALLIC PIPE TRENCHES.

CEMENT STABILISED EMBEDMENT:

THE LATEST VERSION OF DRAWING MRWA-W-208 (REV 3) INCLUDES TABLE 208_A WITH NOTE G INDICATING THAT WHEN TRENCHSTOPS OR BULKHEADS ARE USED (GRADES GREATER THAN 5%) CEMENT STABILISED EMBEDMENT MUST BE USED. THIS IS NOT TASWATER'S PREFERRED STANDARD.
FOR PIPES UP TO 10% GRADE TASWATER WILL ACCEPT THE PREVIOUS REVISION OF MRWA (REV 2). IE. PIPES UP TO 10% GRADE DO NOT REQUIRE CEMENT STABILISED EMBEDMENT UNLESS THE CONDITIONS OF NOTE H APPLY. "WHEN SOCKETED MAINS ARE LAID AT >5% SLOPE IN AREAS THAT ARE LIKELY TO HAVE HIGH GROUND WATER, CEMENT STABILISED EMBEDMENT SHALL BE USED..."
FOR PIPES AT GRADE GREATER THAN 10% MRWA-W-208 REV 3 REMAINS VALID.
THE LATEST VERSION OF MRWA-W-203 (REV 2) EMBEDMENT SHALL BE ADOPTED NOTING THAT THE REQUIREMENT IDENTIFIED IN THE THIRD DOT POINT FOR TYPE B IN THE NOTES REGARDING TABLE 203-A SHALL BE AMENDED TO READ "WHERE WATER MAIN GRADE >10%",

FURTHER TO THIS IT SHOULD BE NOTED THAT MOST WATER MAINS ARE LIKELY TO REQUIRE A TYPE A EMBEDMENT SYSTEM. THE VARIOUS MATERIALS AVAILABLE FOR THIS SYSTEM ARE IDENTIFIED IN TABLE 203-B

6. INSPECTIONS
THE CONTRACTOR IS RESPONSIBLE FOR ORGANISING THE FOLLOWING INSPECTIONS WITH THE SUPERINTENDENT. 48 HOURS NOTICE IS REQUIRED TO BE GIVEN TO THE SUPERINTENDENT PRIOR TO THE INSPECTION.
- PIPEWORK BEDDING
- INSTALLED PIPE PRIOR TO BACKFILLING
- BACKFILLING

7. PIPE CLEANING - 'DISINFECTION'
THE CONTRACTOR IS TO ALLOW TO CLEANSE WATER MAINS BY FLUSHING WITH SODIUM HYPOCHLORIDE AS DIRECTED BY THE LOCAL AUTHORITY.

8. AS CONSTRUCTED DRAWINGS
THE CONTRACTOR WILL BE RESPONSIBLE FOR PRODUCING "AS INSTALLED" DRAWINGS TO THE STANDARD REQUIRED BY TASWATER. THE DRAWINGS SHALL BE CERTIFIED AS BEING CORRECT BY EITHER A CHARTERED CIVIL ENGINEER OR A REGISTERED SURVEYOR. RARE CAN PROVIDE THIS SERVICE, HOWEVER THE CONTRACTOR WILL BE CHARGED FOR THIS SERVICE AND SHOULD BE AWARE OF THIS WHEN PRICING.

9. PROPERTY WATER CONNECTIONS
ALL PROPERTY CONNECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MRWA-W-110 AND MRWA-W-111 AND TASWATER STANDARD DRAWING
TW W-0002 SERIES. THEY SHALL BE DN25(I.D.20) HDPE (PE100) SDR 11 PN16 PIPE. WHERE UNDER ROADS PIPES SHALL BE SLEEVED IN DN100 SN4 PIPE FITTED WITH TRACE AND TIGHT FITTING RUBBER WRAPS AT 2M CENTRES TO PREVENT WATER HAMMER

10. WATER MAINS CONNECTIONS
ALL NEW 'LIVE' CONNECTIONS TO EXISTING TASWATER WATER INFRASTRUCTURE TO BE COMPLETED BY TASWATER AT OWNERS COST.

11. MINIMUM COVER
MINIMUM COVER FOR WATER LINES ARE TO BE:
- UNDER ROAD WAYS (EXCLUDING MAJOR ROADS) AND VEHICULAR CROSS OVERS - 750mm
- RESIDENTIAL LAND - 450mm
- NON-RESIDENTIAL LAND - 600mm

SURVEY

1. SURVEY DETAILS
FOLLOWING ARE SURVEY DETAILS USED AS BASIS FOR DESIGN:

SURVEYOR:	WOOLCOTT SURVEYS
SURVEY REF. NO.	L230127
SURVEY DATE:	25-07-23
SITE LOCATION:	100 & 110 COVE HILL RD, BRIDGEWATER
COORDINATE SYSTEM:	GDA20 MGA55
LEVEL DATUM:	AHD 83
SERVICE MARKER:	-

2. SETOUT
1. SETOUT RESPONSIBILITY
   - CONTRACTOR TO ARRANGE AND PAY FOR REGISTERED SURVEYOR TO SETOUT THE PROJECT. RARE WILL PROVIDE CAD FILES TO ASSIST.

IMPORTANT NOTE:
THESE CAN BE READ IN BLACK AND WHITE, HOWEVER THESE DRAWINGS ARE BEST PRINTED IN FULL COLOUR FOR OPTIMUM CLARITY OF NEW AND EXISTING PIPE WORK.
A COLOUR COPY SHOULD BE RETAINED ON SITE AT ALL TIMES FOR CONTRACTORS COMPLETING WORKS.

INFORMATION ONLY
NOT FOR CONSTRUCTION

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
1	DEVELOPMENT APPLICATION	KL	08-05-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

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APPROVED: R. JESSON | ACRED. No: CC4858I

DESIGN BY: JF
DESIGN CHK: RJJ
DRAWN BY: KL
DRAFT CHK: JF
DATE: 18-12-23

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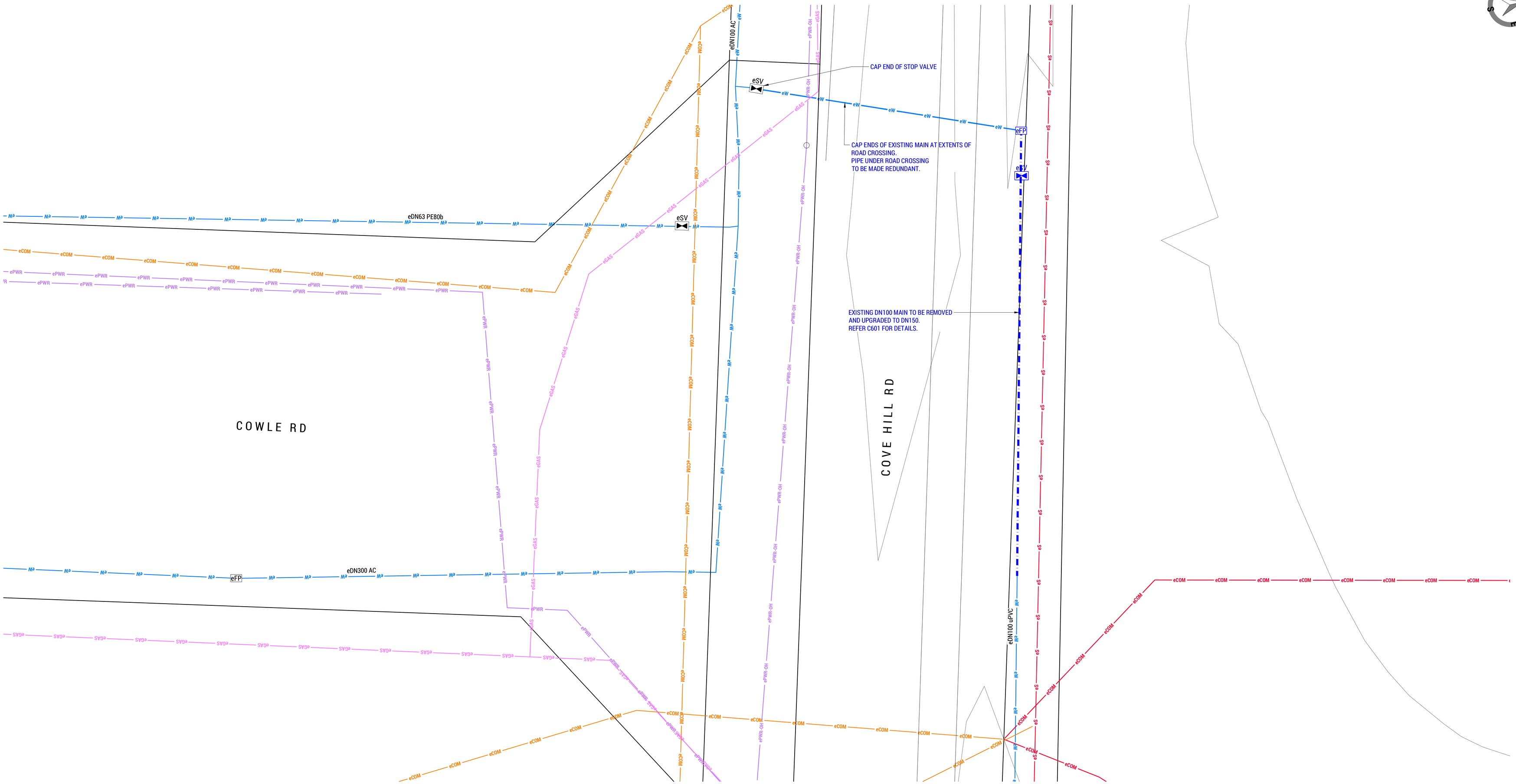
CLIENT: SHAW
PROJECT: SUBDIVISION
ADDRESS: 100-110 COVE HILL ROAD BRIDGEWATER

TITLE: CIVIL NOTES
SCALE: - | SHEET SIZE: A1 | DWGs IN SET: -
PROJECT No: 241005 | DWG No: C000 | REV: 2



EXISTING SITE / DEMOLTION PLAN

SCALE 1:100

DEMOLITION NOTES

1. PRIOR TO COMMENCING DEMOLITION AND SITE WORKS, THE CONTRACTOR IS TO ARRANGE AND PAY FOR THE ON SITE MARKING AND CONFIRMATION OF DEPTH, OF SERVICE LOCATIONS FOR ALL UNDERGROUND SERVICES INCLUDING COMMUNICATIONS, TASNETWORKS, POWERCO AND COUNCIL SERVICES (ie: WATER, STORMWATER AND SEWER) IN THE AREA OF NEW WORKS. LOCATION TO BE CONFIRMED USING CABLE LOCATORS AND HAND DIGGING METHODS. PRIOR TO ANY WORKS ON SITE, ANY CLASHES WITH DESIGNED SERVICES ON FOLLOWING DRAWINGS ARE TO BE REPORTED TO DESIGN ENGINEER FOR DIRECTION.
2. REFER DRAWINGS FOR SET OUT DIMENSIONS & COORDINATE ALL LEVELS, CONTRACTOR TO REFER ENGINEER FOR ANY DISCREPANCIES / CLASHES.
3. CAP & TERMINATE & REMOVE REDUNDANT DISUSED DRAINAGE SERVICES TO SATISFACTION OF ENGINEER & LOCAL AUTHORITIES
4. INSTALL SILT FENCES & TRAPS TO PREVENT SEDIMENTS & POLLUTANTS ENTERING STORM WATER SYSTEM OR NATURAL DRAINAGE LINES
5. STOCK PILING OF SOILS OR MATERIALS AFFECTED BY WATER TO BE STORED CLEAR OF ANY DRAINAGE PATH
6. CLEAN SITE VEHICLES BEFORE EXITING SITE
7. DISPOSE OF EXCAVATED MATERIAL TO LICENSED WASTE FACILITY OR APPROVED LAND FILL SITE
8. TRENCHES WHERE SERVICES ARE REMOVED ARE TO BE FILLED WITH AN APPROVED COMPACTED MATERIAL & TO ENGINEERS COMPACTION SPECIFICATIONS. MATCH & MAKE GOOD EXISTING SURFACES TO MATCH EXISTING SURROUNDINGS.

LEGEND

- eSW — EXISTING STORM WATER MAIN
- eS — EXISTING SEWER MAIN
- eW — EXISTING WATER MAIN
- eGAS — EXISTING GAS MAIN
- eCOM — EXISTING COMMUNICATIONS LINE
- ePWR-OH — EXISTING OVERHEAD POWERLINE
- ePWR — EXISTING UNDERGROUND POWER
- EXISTING WATER MAIN TO BE DEMOLISHED

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1	DEVELOPMENT APPLICATION	KL	08-05-24
0	DEVELOPMENT APPLICATION	TM	19-01-24

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APPROVED: R. JESSON | ACRED. No: CC4858I

DESIGN BY: - | DESIGN CHK: - | DRAWN BY: - | DRAFT CHK: - | DATE: 18-12-23

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CLIENT: SHAW

PROJECT: SUBDIVISION

ADDRESS: 100-110 COVE HILL ROAD BRIDGEWATER

TITLE: EXISTING SITE / DEMOLITION PLAN

SCALE: 1:100 | SHEET SIZE: A1 | DWGs IN SET: -

PROJECT No: 241005 | DWG No: C101 | REV: 2

OVERALL CIVIL WORKS PLAN
SCALE 1:1000

INFORMATION ONLY
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1	DEVELOPMENT APPLICATION	KL	08-05-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

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CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

TITLE: **OVERALL CIVIL WORKS PLAN**
SCALE: **1:1000** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C400** REV: **2**

CIVIL WORKS PLAN

SCALE 1:500

LEGEND

PAV-A	HOTMIX - TRAFFICABLE REFER SHEET C701	KC	KERB & CHANNEL
PAV-B	CONCRETE - TRAFFICABLE REFER SHEET C701	KCM2	KERB & CHANNEL MOUNTABLE - REFER D04 ON C701
SURF-A	GRASSED / TURFED / LANDSCAPED AREA 200mm MIN GOOD QUALITY TOP SOIL	MH	MANHOLE
	PROPOSED GAS MAIN CORRIDOR	SEP	SIDE ENTRY PIT
		ME	MATCH EXISTING
		SAW	SAW CUT

INFORMATION ONLY
NOT FOR CONSTRUCTION

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

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DRAWN BY:	KL
DRAFT CHK:	JF
DATE:	18-12-23

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CLIENT: **SHAW**

PROJECT: **SUBDIVISION**

ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

TITLE: **CIVIL WORKS PLAN**

SCALE: **1:500** SHEET SIZE: **A1** DWGs IN SET: **-**

PROJECT No: **241005** DWG No: **C401** REV: **2**

CIVIL LEVELS PLAN
SCALE 1:500

LEGEND

PAV-A	HOTMIX - TRAFFICABLE REFER SHEET C701	KC	KERB & CHANNEL
PAV-B	CONCRETE - TRAFFICABLE REFER SHEET C701	KCM2	KERB & CHANNEL MOUNTABLE - REFER D04 ON C701
SURF-A	GRASSED / TURFED / LANDSCAPED AREA 200mm MIN GOOD QUALITY TOP SOIL	MH	MANHOLE
		SEP	SIDE ENTRY PIT
	PROPOSED GAS MAIN CORRIDOR	ME	MATCH EXISTING
		SAW	SAW CUT

INFORMATION ONLY
NOT FOR CONSTRUCTION

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS:
CONTROLLED DOCUMENT

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APPROVED: R. JESSON | ACRED. No: CC4858I

DESIGN BY:	JF
DESIGN CHK:	RJJ
DRAWN BY:	KL
DRAFT CHK:	JF
DATE:	18-12-23

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22–24 Paterson Street
Launceston TAS 7250
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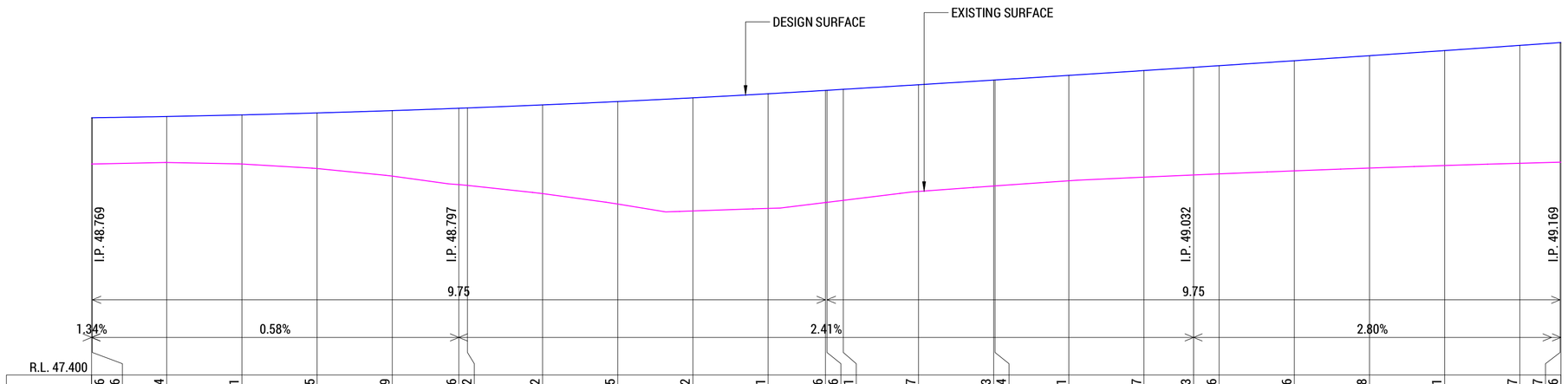
P. 03 6388 9200

CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

TITLE: **CIVIL LEVELS PLAN**
SCALE: **1:500** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C402** REV: **2**



Cut Fill	+0.246	+0.246	+0.244	+0.261	+0.295	+0.349	+0.406	+0.412	+0.472	+0.545	+0.602	+0.611	+0.596	+0.596
Design Levels	48.769	48.769	48.775	48.784	48.794	48.807	48.819	48.821	48.837	48.855	48.875	48.897	48.914	48.915
Existing Levels	48.523	48.523	48.531	48.523	48.499	48.458	48.413	48.409	48.365	48.310	48.273	48.286	48.318	48.319
Chainage	0.000	0.010	1.000	2.000	3.000	4.000	4.887	5.000	6.000	7.000	8.000	9.000	9.763	9.783

Cut Fill	+0.591	+0.567	+0.563	+0.564	+0.561	+0.567	+0.573	+0.576	+0.586	+0.598	+0.611	+0.627	+0.637	+0.636
Design Levels	48.920	48.944	48.969	48.970	48.994	49.020	49.037	49.046	49.072	49.099	49.126	49.154	49.169	49.169
Existing Levels	48.329	48.377	48.406	48.406	48.433	48.453	48.464	48.470	48.486	48.501	48.515	48.527	48.532	48.533
Chainage	10.000	11.000	12.000	12.019	13.000	14.000	14.660	15.000	16.000	17.000	18.000	19.000	19.536	19.546

LONGITUDINAL SECTION
Scales: H 1:50 V 1:20

KB1 - KERB RETURN

Cut Fill	+0.206	+0.206	+0.206	+0.206	+0.204	+0.203	+0.200	+0.198	+0.198	+0.194	+0.189	+0.186	+0.184	+0.281	+0.140
Design Levels	49.173	49.173	49.173	49.173	49.174	49.178	49.183	49.190	49.191	49.200	49.211	49.219	49.224	49.239	49.252
Existing Levels	48.967	48.967	48.967	48.967	48.970	48.975	48.983	48.992	48.993	49.006	49.022	49.033	49.040	48.958	49.112
Chainage	0.000	0.010	0.579	1.000	2.000	3.000	4.000	4.924	5.000	6.000	7.000	7.631	8.000	9.000	9.837

Cut Fill	+0.132	+0.089	+0.200	+0.210	+0.218	+0.226	+0.225	+0.224	+0.220	+0.215	+0.208	+0.200	+0.195	+0.195
Design Levels	49.253	49.255	49.272	49.288	49.303	49.318	49.328	49.331	49.344	49.357	49.368	49.379	49.386	49.386
Existing Levels	49.121	49.166	49.072	49.078	49.085	49.092	49.103	49.107	49.124	49.142	49.160	49.179	49.191	49.191
Chainage	9.857	10.000	11.000	12.000	13.000	14.000	14.771	15.000	16.000	17.000	18.000	19.000	19.684	19.694

LONGITUDINAL SECTION
Scales: H 1:50 V 1:20

KB2 - KERB RETURN

INFORMATION ONLY
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REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS:
CONTROLLED DOCUMENT

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ABN 51 619 598 257

APPROVED: **R. JESSON**
ACRED. No: **CC4858I**

DESIGN BY: **JF**
DESIGN CHK: **RJJ**
DRAWN BY: **KL**
DRAFT CHK: **JF**
DATE: **18-12-23**

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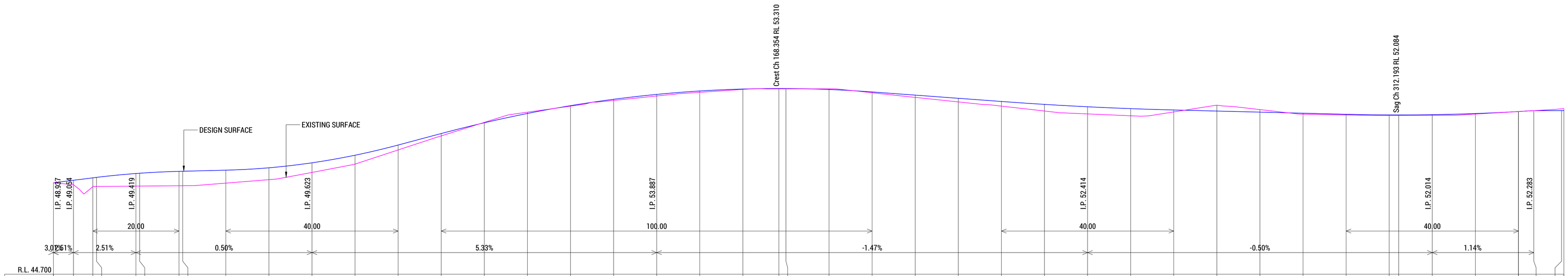
CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD**
BRIDGEWATER

TITLE: **CIVIL LONG SECTIONS - SHEET 1**
SCALE: **H 1:50, V 1:20** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C411** REV: **2**



Cut Fill	-0.000	-0.210	-0.411	-0.420	-0.585	-0.597	-0.670	-0.672	-0.601	-0.550	-0.447	-0.412	-0.228	-0.109	+0.018
Design Levels	48.937	49.054	49.167	49.188	49.368	49.381	49.469	49.473	49.523	49.633	49.864	50.216	50.689	51.222	51.721
Existing Levels	48.937	48.844	48.756	48.768	48.783	48.784	48.799	48.801	48.922	49.083	49.417	49.804	50.461	51.113	51.739
Chainage	0.000	4.650	9.142	10.000	19.142	20.000	29.142	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000

Cut Fill	+0.059	-0.023	-0.052	-0.073	-0.060	-0.019	-0.018	-0.016	+0.032	-0.038	-0.106	-0.168	-0.216	-0.308	-0.332
Design Levels	52.152	52.515	52.810	53.036	53.195	53.286	53.310	53.309	53.264	53.150	53.003	52.856	52.709	52.574	52.463
Existing Levels	52.211	52.492	52.758	52.963	53.135	53.267	53.292	53.293	53.296	53.112	52.897	52.688	52.493	52.266	52.131
Chainage	110.000	120.000	130.000	140.000	150.000	160.000	168.354	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000

Cut Fill	-0.331	-0.091	+0.271	+0.119	-0.045	-0.031	-0.024	-0.022	-0.029	-0.025	-0.001	-0.001	-0.000	+0.083	+0.092
Design Levels	52.376	52.314	52.264	52.214	52.164	52.114	52.085	52.084	52.096	52.149	52.242	52.242	52.283	52.283	52.283
Existing Levels	52.045	52.223	52.535	52.333	52.119	52.083	52.061	52.062	52.067	52.124	52.241	52.241	52.283	52.366	52.375
Chainage	250.000	260.000	270.000	280.000	290.000	300.000	310.000	312.193	320.000	330.000	340.000	340.000	343.554	350.000	350.541

LONGITUDINAL SECTION
Scales: H 1:500 V 1:100

R-1 - NEW ROAD

Cut Fill	-0.215	-0.215	-0.219	-0.222	-0.225	-0.225	-0.225	-0.222	-0.219	-0.215	-0.209	-0.208	-0.208	-0.206
Design Levels	52.003	52.003	52.011	52.019	52.025	52.032	52.038	52.044	52.049	52.054	52.058	52.062	52.065	52.068
Existing Levels	52.218	52.218	52.230	52.241	52.250	52.257	52.263	52.266	52.268	52.269	52.267	52.270	52.273	52.274
Chainage	0.000	0.010	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000

Cut Fill	-0.204	-0.201	-0.199	-0.195	-0.190	-0.187	-0.185	-0.185	-0.180	-0.173	-0.166	-0.160	-0.152	-0.144
Design Levels	52.071	52.073	52.074	52.075	52.076	52.076	52.076	52.076	52.076	52.076	52.075	52.073	52.071	52.069
Existing Levels	52.275	52.274	52.273	52.270	52.266	52.263	52.261	52.261	52.256	52.249	52.241	52.233	52.223	52.213
Chainage	13.000	14.000	15.000	16.000	17.000	17.660	18.000	18.088	19.000	20.000	21.000	22.000	23.000	24.000

Cut Fill	-0.136	-0.130	-0.128	-0.118	-0.103	-0.086	-0.070	-0.056	-0.042	-0.029	-0.017	-0.008	-0.004	-0.004
Design Levels	52.066	52.064	52.062	52.059	52.054	52.050	52.045	52.039	52.033	52.027	52.020	52.012	52.010	52.010
Existing Levels	52.202	52.194	52.190	52.177	52.157	52.136	52.115	52.095	52.075	52.056	52.037	52.020	52.014	52.014
Chainage	25.000	25.668	26.000	27.000	28.000	29.000	30.000	31.000	32.000	33.000	34.000	35.000	35.310	35.330

Cut Fill	+0.002	+0.010	+0.017	+0.024	+0.025	+0.025	+0.025	+0.025	+0.023	+0.021	+0.018	+0.013	+0.002	-0.010
Design Levels	52.005	51.997	51.990	51.984	51.977	51.971	51.965	51.960	51.954	51.950	51.945	51.941	51.937	51.933
Existing Levels	52.003	51.987	51.973	51.960	51.952	51.946	51.940	51.935	51.931	51.929	51.927	51.928	51.935	51.943
Chainage	36.000	37.000	38.000	39.000	40.000	41.000	42.000	43.000	44.000	45.000	46.000	47.000	48.000	49.000

Cut Fill	-0.022	-0.035	-0.039	-0.044	-0.052	-0.052	-0.059	-0.066	-0.072	-0.079	-0.084	-0.088	-0.093	-0.096
Design Levels	51.930	51.926	51.925	51.924	51.921	51.921	51.919	51.917	51.916	51.914	51.913	51.913	51.912	51.912
Existing Levels	51.952	51.961	51.964	51.968	51.973	51.973	51.978	51.983	51.988	51.993	51.997	52.001	52.005	52.008
Chainage	50.000	51.000	51.335	52.000	52.980	53.000	54.000	55.000	56.000	57.000	58.000	59.000	60.000	60.678

Cut Fill	-0.097	-0.101	-0.103	-0.105	-0.106	-0.108	-0.108	-0.108	-0.106	-0.106	-0.105
Design Levels	51.912	51.912	51.913	51.914	51.915	51.916	51.918	51.920	51.923	51.925	51.927
Existing Levels	52.009	52.013	52.016	52.019	52.021	52.024	52.026	52.028	52.029	52.031	52.032
Chainage	61.000	62.000	63.000	64.000	65.000	66.000	67.000	68.000	69.000	70.000	70.640

LONGITUDINAL SECTION
Scales: H 1:100 V 1:100

CS1 - CUL-DE-SAC

INFORMATION ONLY
NOT FOR CONSTRUCTION

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS:
CONTROLLED DOCUMENT
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APPROVED: R. JESSON
ACRED. No: CC4858I

DESIGN BY: JF
DESIGN CHK: RJJ
DRAWN BY: KL
DRAFT CHK: JF
DATE: 18-12-23

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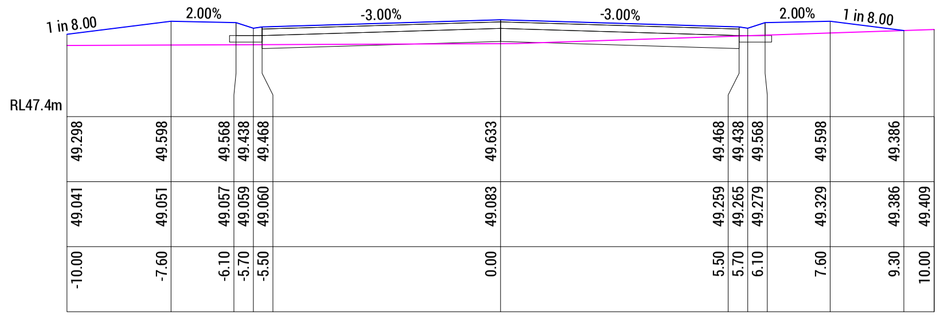
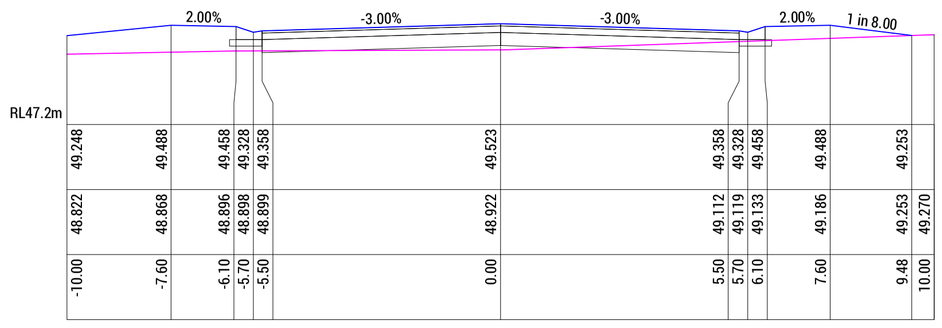
CLIENT: SHAW
PROJECT: SUBDIVISION
ADDRESS: 100-110 COVE HILL ROAD
BRIDGEWATER

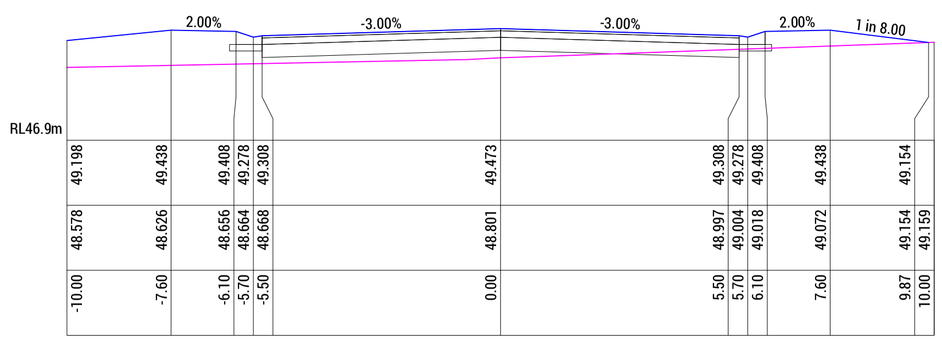
TITLE: CIVIL LONG SECTIONS - SHEET 2
SCALE: 1:100, 1:500 SHEET SIZE: A1 DWGs IN SET: -
PROJECT No: 241005 DWG No: C412 REV: 2



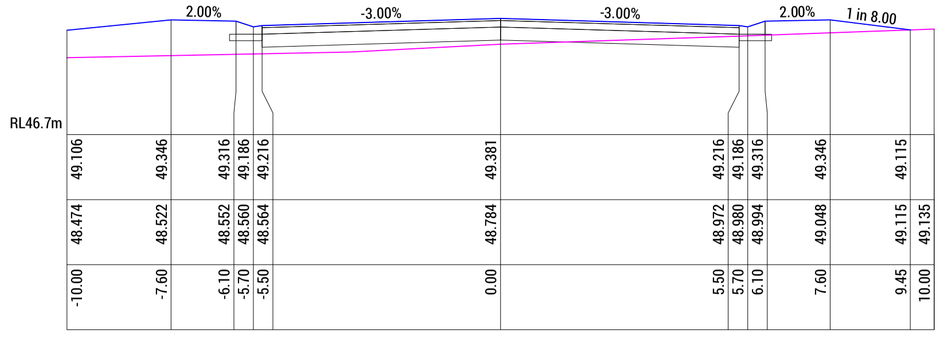
Ch 50.00 m



Ch 40.00 m



Ch 30.00 m



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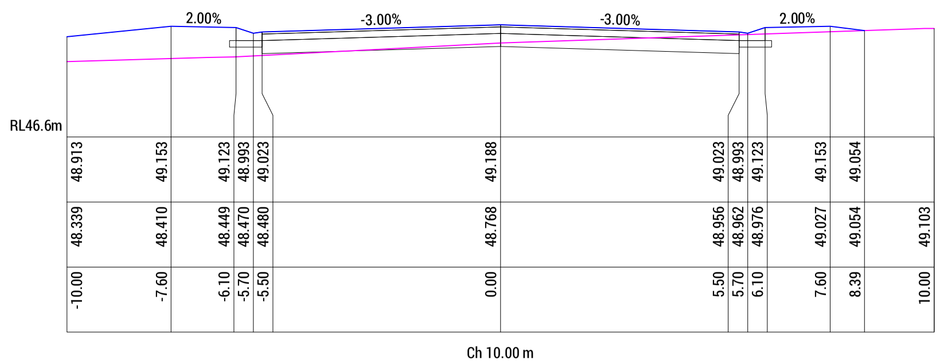

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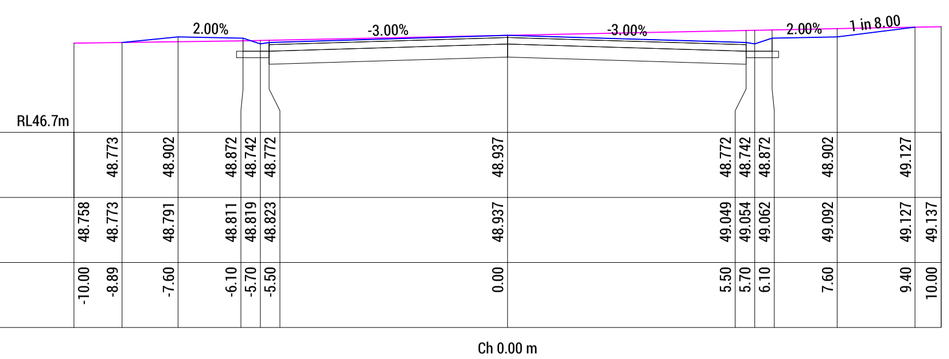

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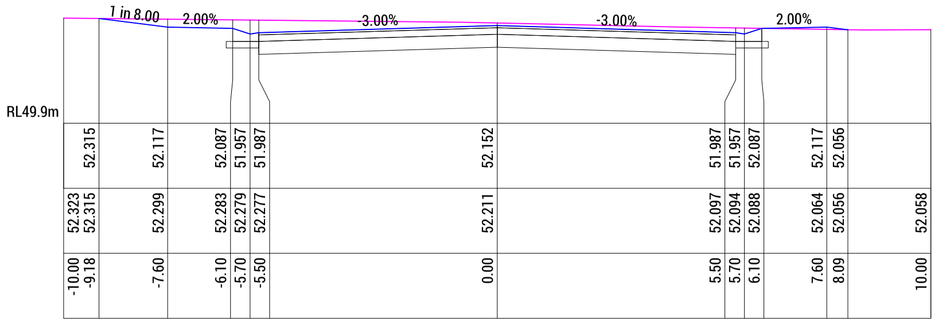
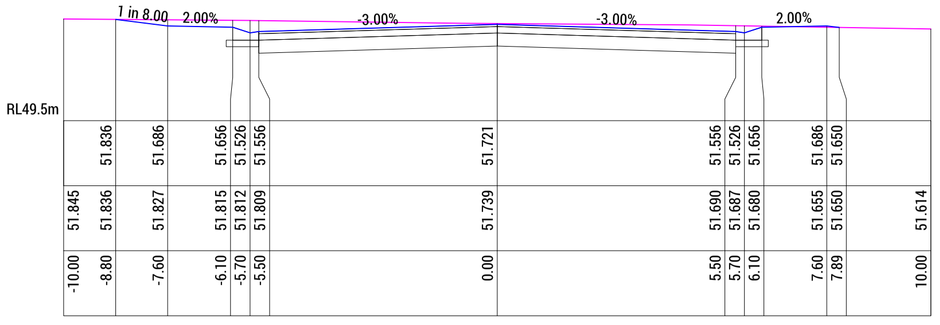
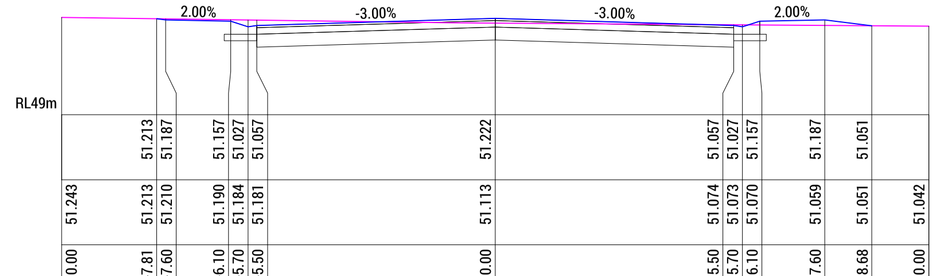


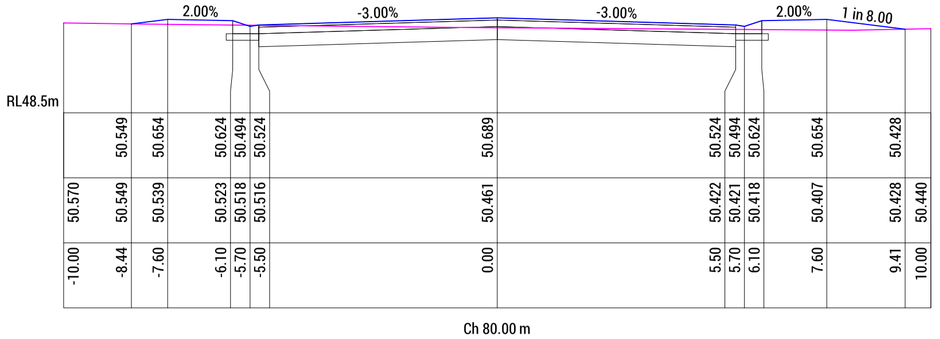
Ch 110.00 m



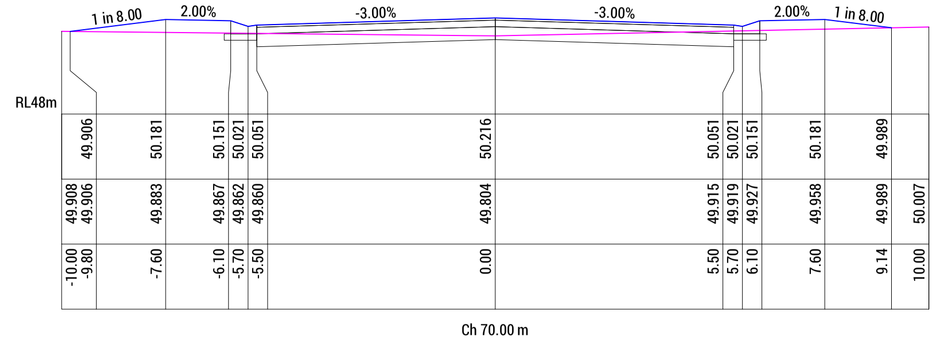
Ch 100.00 m



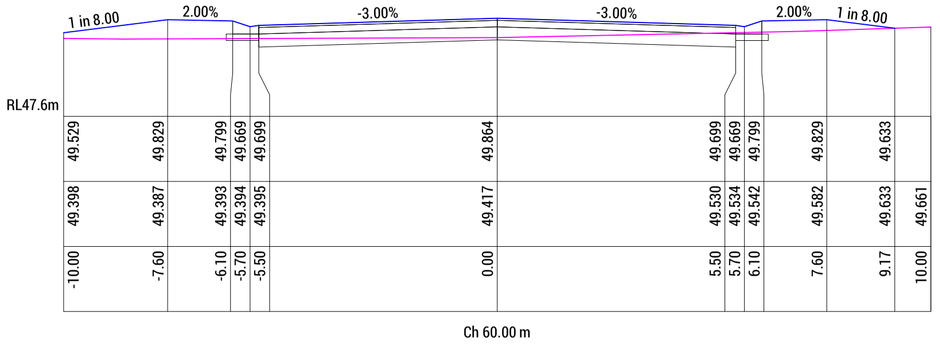
Ch 90.00 m



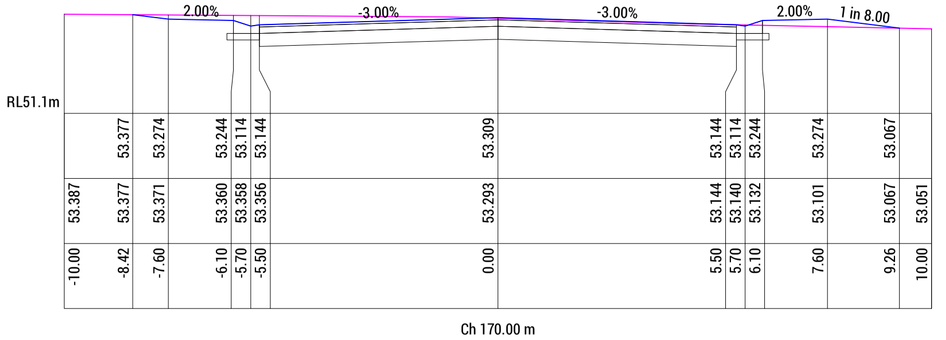
Ch 80.00 m



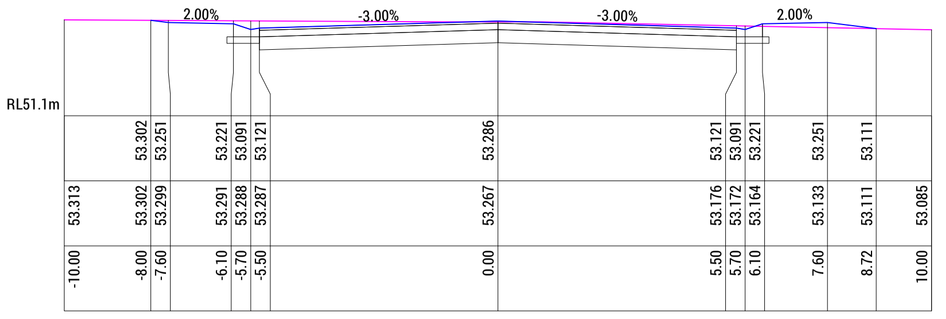
Ch 70.00 m



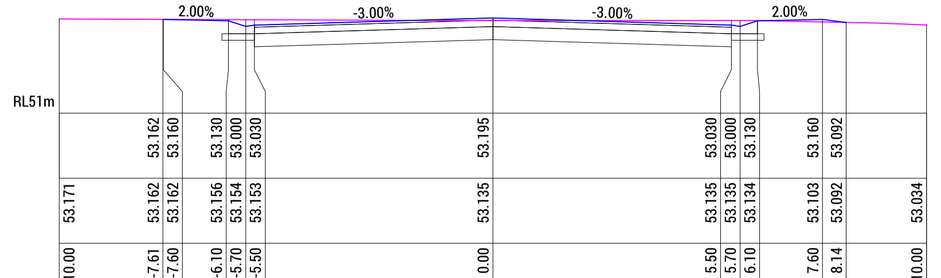
Ch 60.00 m



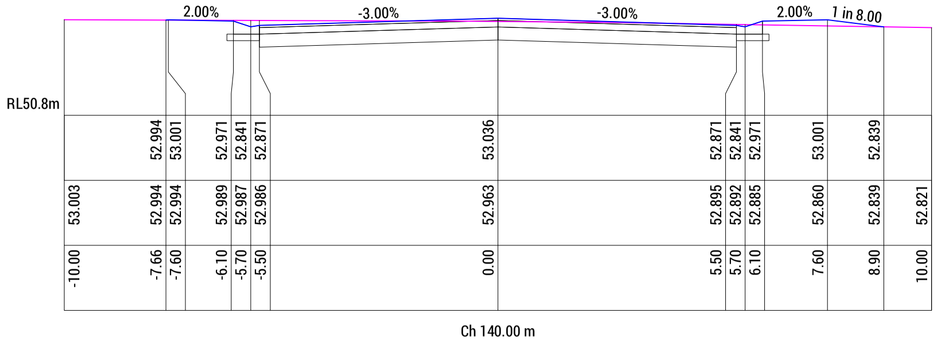
Ch 170.00 m



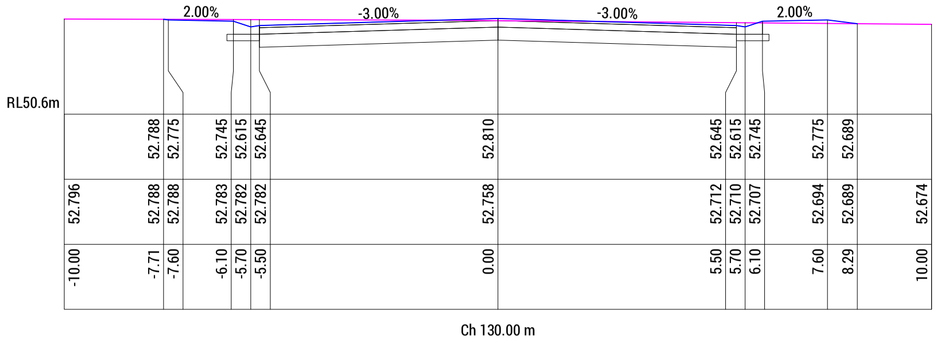
Ch 160.00 m



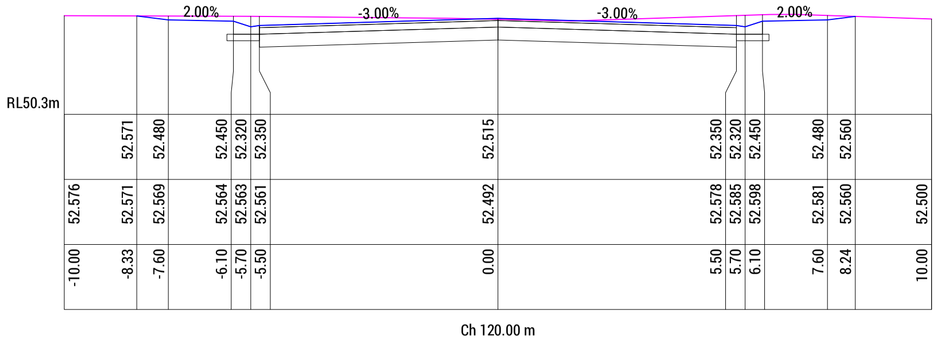
Ch 150.00 m



Ch 140.00 m



Ch 130.00 m



Ch 120.00 m

INFORMATION ONLY
NOT FOR CONSTRUCTION

ROAD 1 CROSS SECTIONS - SHEET 1

SCALE 1:100

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK

APPROVED: **R. JESSON** ACRED. No: **CC4858I**

DESIGN BY: **JF**
DESIGN CHK: **RJJ**
DRAWN BY: **KL**
DRAFT CHK: **JF**
DATE: **18-12-23**

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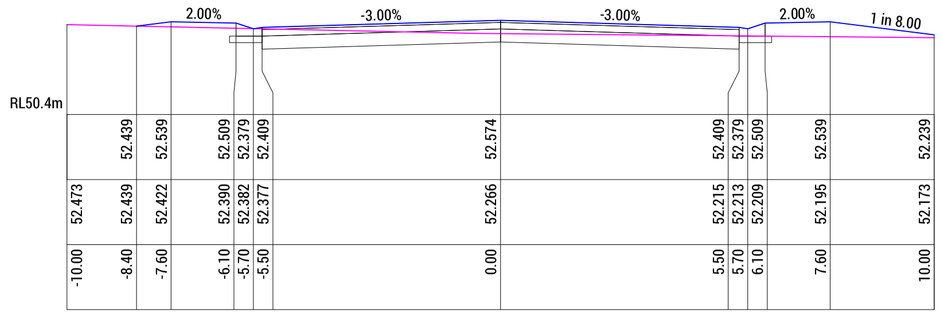
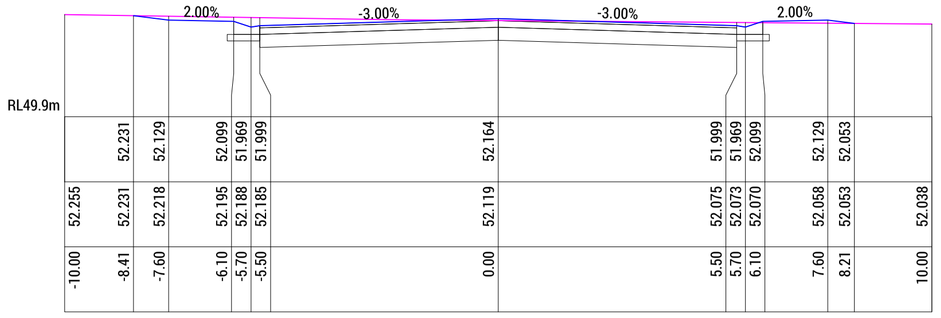
CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

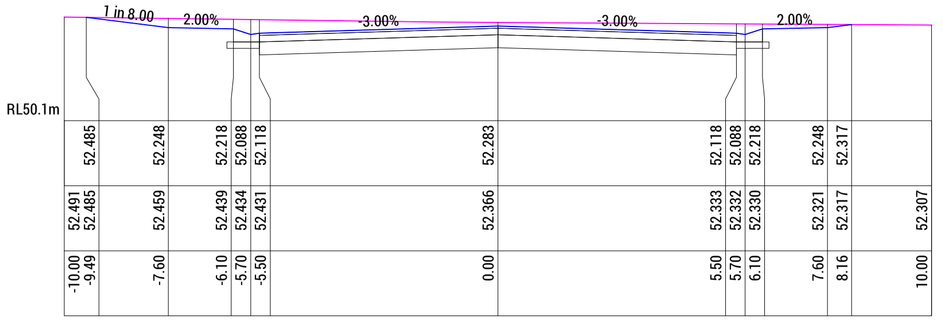
TITLE: **CIVIL CROSS SECTIONS - SHEET 1**
SCALE: **1:100** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C421** REV: **2**



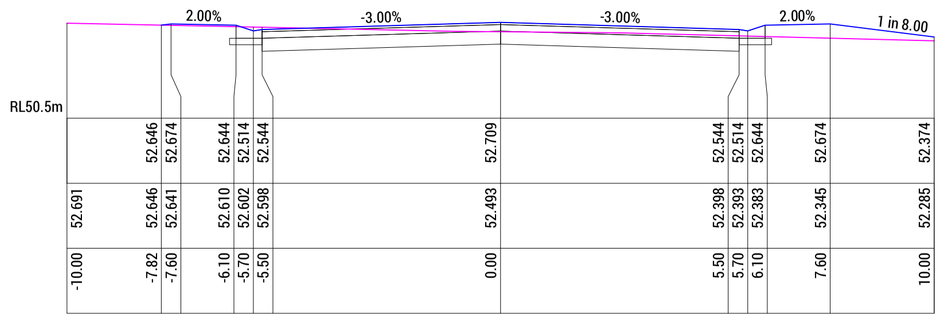
Ch 230.00 m



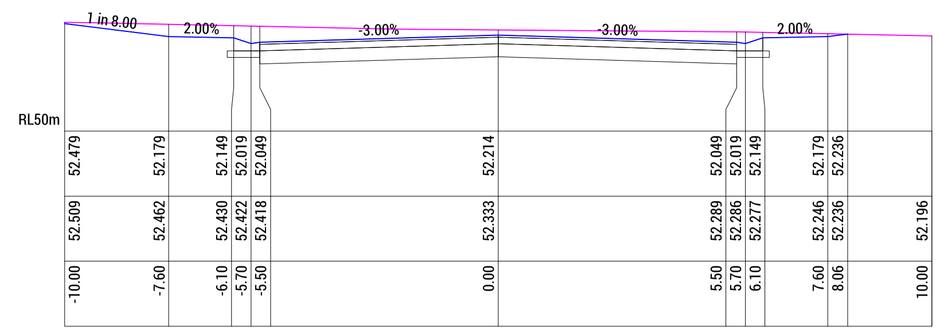
Ch 290.00 m



Ch 350.00 m



Ch 220.00 m



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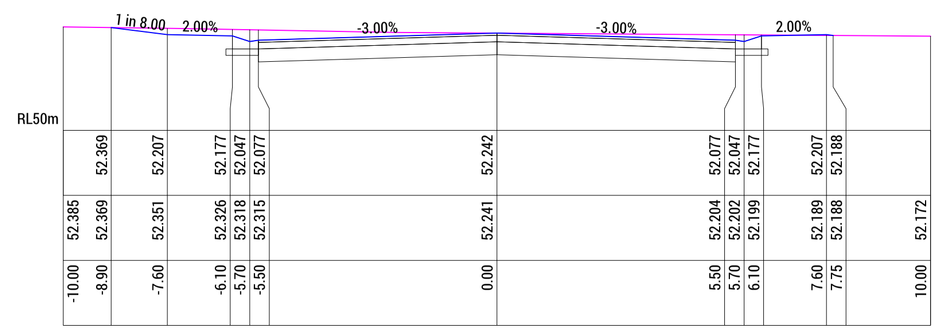

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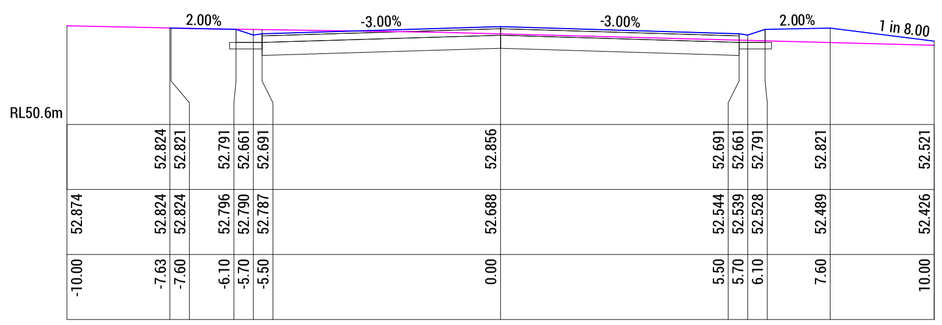
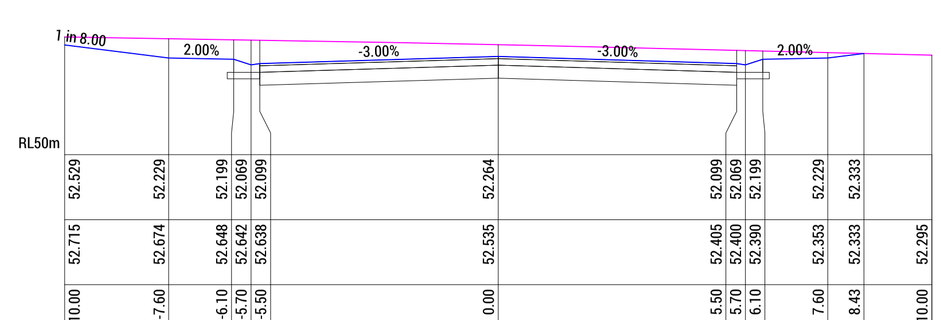


Ch 210.00 m



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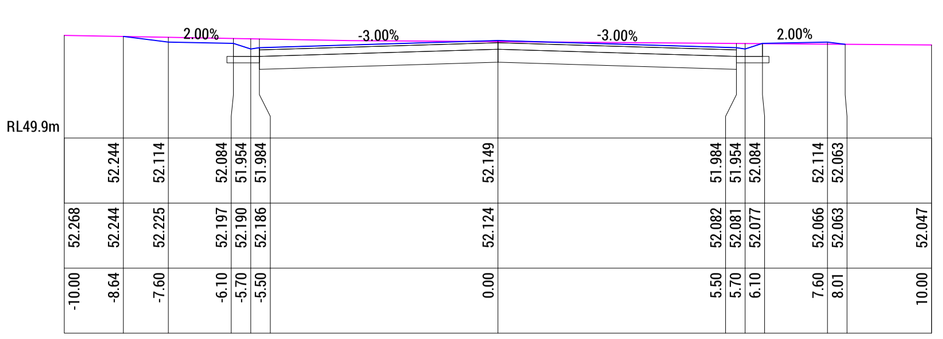
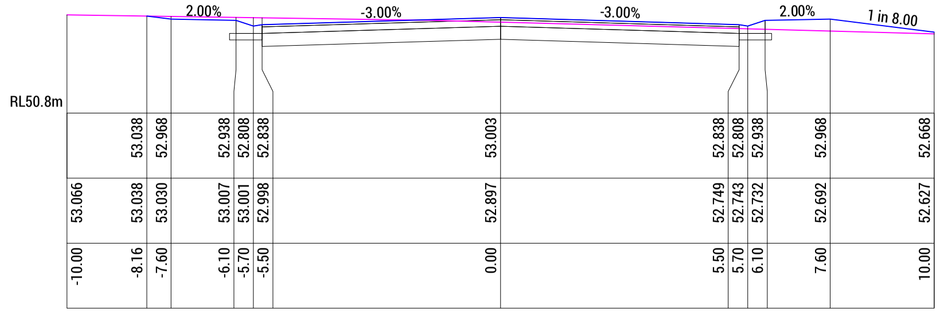
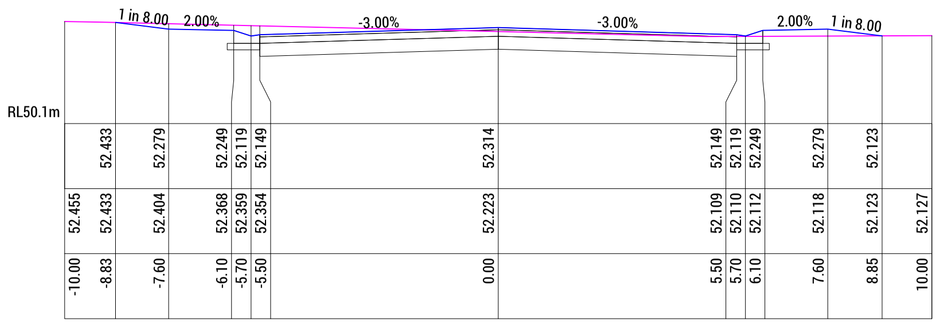


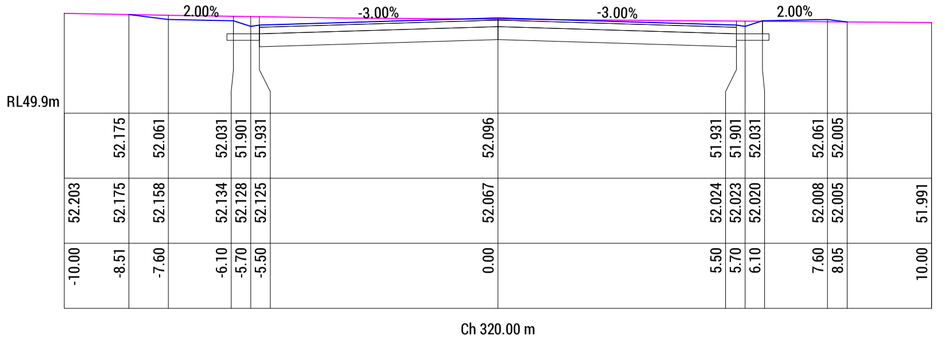
Ch 330.00 m



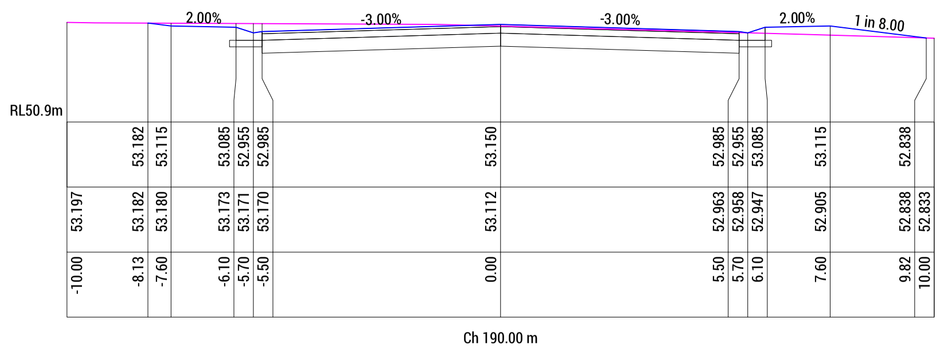
Ch 200.00 m



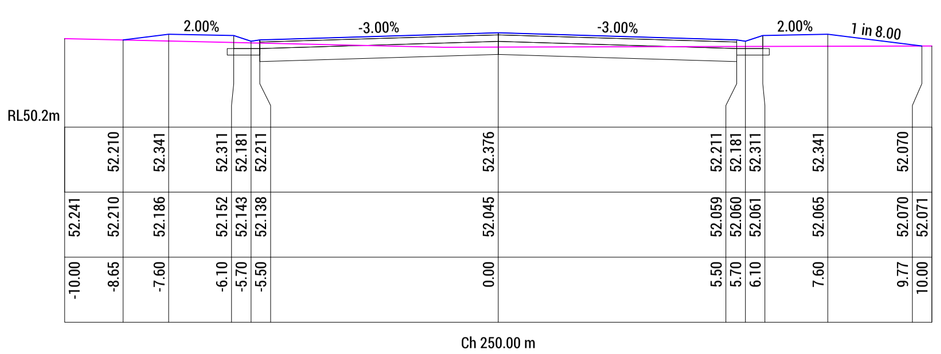
Ch 260.00 m



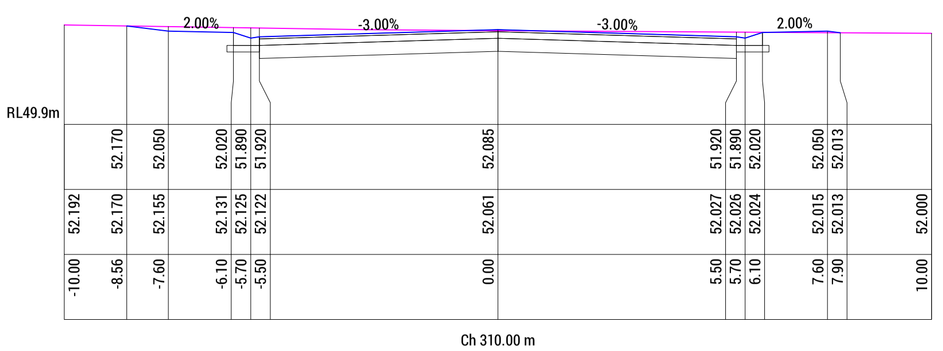
Ch 320.00 m



Ch 190.00 m

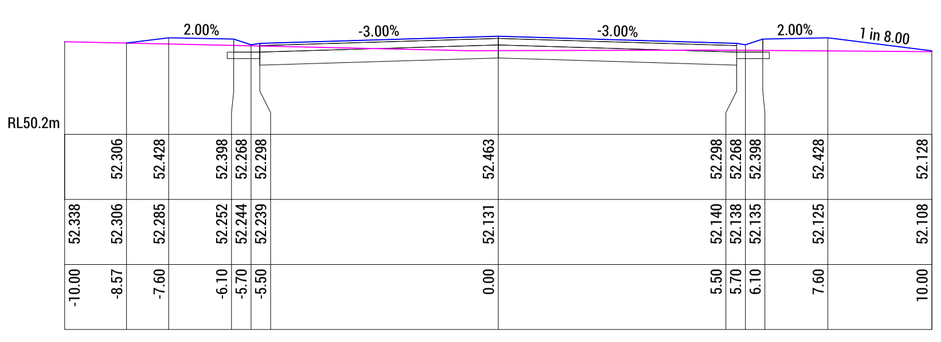


Ch 250.00 m

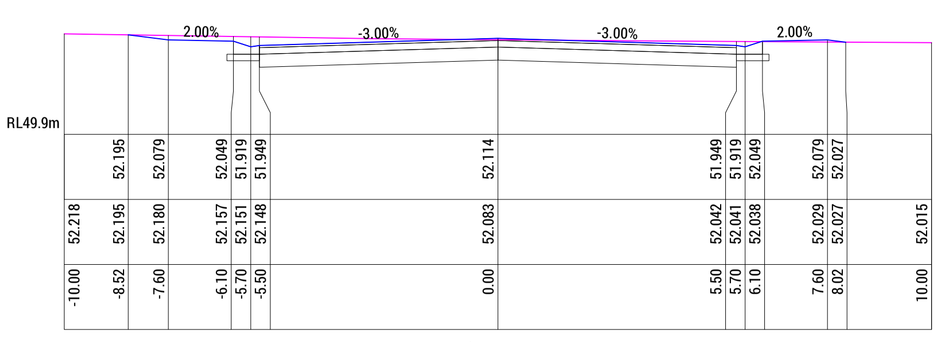


Ch 310.00 m

Ch 180.00 m



Ch 240.00 m



Ch 300.00 m

INFORMATION ONLY
NOT FOR CONSTRUCTION

ROAD 1 CROSS SECTIONS - SHEET 2

SCALE 1:100

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS: **CONTROLLED DOCUMENT**

APPROVED: **R. JESSON** ACRED. No: **CC4858I**

DESIGN BY: **JF**
DESIGN CHK: **RJJ**
DRAWN BY: **KL**
DRAFT CHK: **JF**
DATE: **18-12-23**

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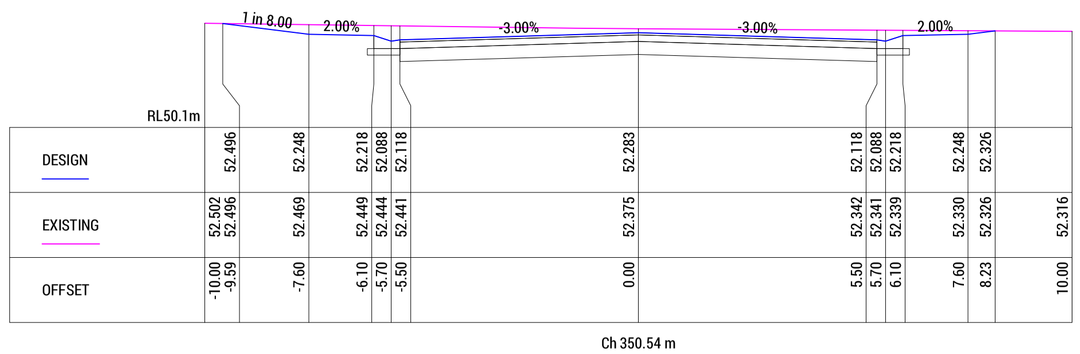
P. 03 6388 9200

CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

TITLE: **CIVIL CROSS SECTIONS - SHEET 2**
SCALE: **1:100** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C422** REV: **2**



ROAD 1 CROSS SECTIONS - SHEET 3

SCALE 1:100

INFORMATION ONLY
NOT FOR CONSTRUCTION

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS: **CONTROLLED DOCUMENT**

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APPROVED: **R. JESSON** ACRED. No: **CC4858I**

DESIGN BY: **JF**
DESIGN CHK: **RJJ**
DRAWN BY: **KL**
DRAFT CHK: **JF**
DATE: **18-12-23**

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CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

TITLE: **CIVIL CROSS SECTIONS - SHEET 3**
SCALE: **1:100** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C423** REV: **2**

LANDSCAPING PLAN

SCALE 1:500

LEGEND

SURF-A — GRASSED / TURFED / LANDSCAPED AREA
200mm MIN GOOD QUALITY TOP SOIL

TREE SCHEDULE	
MARK	TYPE
T-1	EUCALYPTUS PULCHELLA (WHITE PEPPERMINT)

INFORMATION ONLY
NOT FOR CONSTRUCTION

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
1	DEVELOPMENT APPLICATION	KL	08-05-24
0	DEVELOPMENT APPLICATION	TM	19-01-24

STATUS: CONTROLLED DOCUMENT

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APPROVED: R. JESSON | ACRED. No: CC4858I

DESIGN BY: JF
DESIGN CHK: RJJ
DRAWN BY: KL
DRAFT CHK: JF
DATE: 18-12-23

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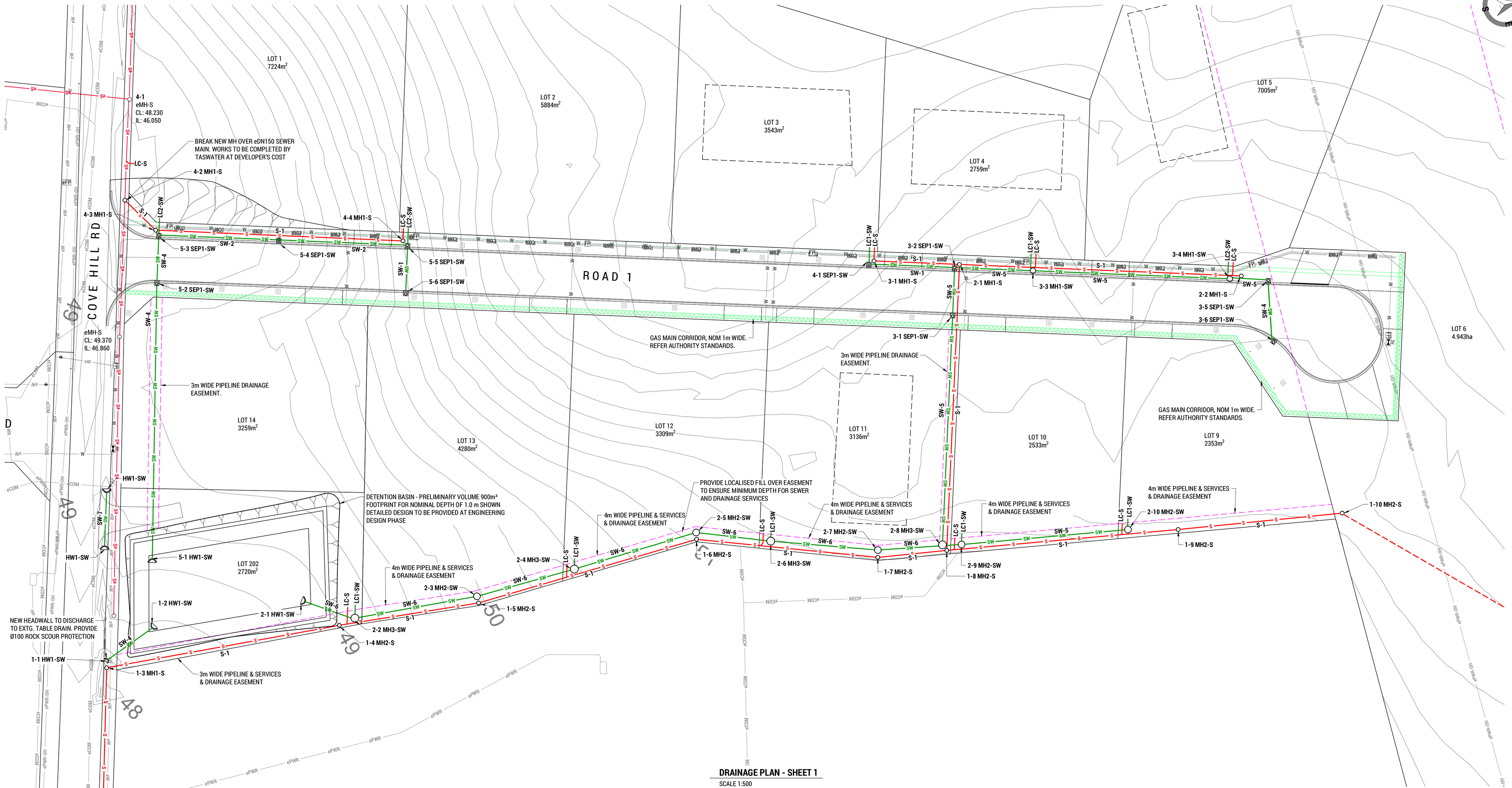
CLIENT: SHAW
PROJECT: SUBDIVISION
ADDRESS: 100-110 COVE HILL ROAD
BRIDGEWATER

TITLE: LANDSCAPING PLAN
SCALE: 1:500 SHEET SIZE: A1 DWGs IN SET: -
PROJECT No: 241005 DWG No: C431 REV: 1



DRAINAGE PLAN - SHEET 1

SCALE 1:500

LEGEND

eSW	EXISTING STORM WATER MAIN	LC1-SW	DN300 POLYPROPYLENE LOT CONNECTION
SW	PROPOSED STORMWATER MAIN	LC2-SW	DN375 POLYPROPYLENE LOT CONNECTION
eS	EXISTING SEWER MAIN	LC3-SW	DN450 POLYPROPYLENE LOT CONNECTION
S	PROPOSED SEWER MAIN	LC-S	DN150 uPVC LOT CONNECTION
AG	PROPOSED AG DRAIN		
	PROPOSED OPEN / SWALE / VEE DRAIN		
	PROPOSED GAS MAIN CORRIDOR		
MH-SW	STORMWATER MANHOLE		
SEP-SW	SIDE ENTRY PIT		
GPx-SW	GRATED PIT		
GDx-SW	GRATED DRAIN		

INFORMATION ONLY NOT FOR CONSTRUCTION

STORMWATER PIPE SCHEDULE

MARK	PIPE SIZE	TYPE	CLASS	GRADE
SW-1	Ø300	POLYPROPYLENE	SN8	-
SW-2	Ø450	POLYPROPYLENE	SN8	-
SW-3	Ø525	POLYPROPYLENE	SN8	-
SW-4	Ø600	POLYPROPYLENE	SN8	-
SW-5	Ø750	POLYPROPYLENE	SN8	-
SW-6	Ø1050	RCP.	CLASS 2	-
SW-7	Ø300	RCP.	CLASS 4	MIN 1%

SEWER PIPE SCHEDULE

MARK	PIPE SIZE	TYPE	CLASS	GRADE
S-1	Ø150	uPVC RRJ	SN8	-
LC-S	Ø150	uPVC RRJ	SN8	-

STORMWATER PIT / MANHOLE SCHEDULE

MARK	SIZE	TYPE	ACCESSORIES
MH1-SW	Ø1500	PRECAST CONC.	CLASS D 'SW' MARKED GATIC LID
MH2-SW	Ø1800	PRECAST CONC.	CLASS B 'SW' MARKED GATIC LID
MH3-SW	Ø2100	PRECAST CONC.	CLASS B 'SW' MARKED GATIC LID
SEP1-SW	1200 WIDE	TYPE 5	REFER LGAT STD DWG TSD-SW12-v3
HW1-SW	TO SUIT PIPE	PRECAST CONC.	-
HW2-SW	TWIN CELL TO SUIT PIPE	PRECAST CONC.	-

SEWER PIT / MANHOLE SCHEDULE

MARK	SIZE	TYPE	ACCESSORIES
MH1-S	Ø1050	PRECAST CONC.	CLASS D 'S' MARKED GATIC LID
MH2-S	Ø1050	PRECAST CONC.	CLASS B 'S' MARKED GATIC LID

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS: **CONTROLLED DOCUMENT**

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APPROVED: R. JESSON | ACRED. No: CC4858I

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DESIGN CHK:	RJJ
DRAWN BY:	KL
DRAFT CHK:	JF
DATE:	18-12-23

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CLIENT: SHAW

PROJECT: SUBDIVISION

ADDRESS: 100-110 COVE HILL ROAD BRIDGEWATER

TITLE: DRAINAGE PLAN - SHEET 1

SCALE: 1:500 | SHEET SIZE: A1 | DWGs IN SET: -

PROJECT No: 241005 | DWG No: C501 | REV: 2

DRAINAGE PLAN - SHEET 2

SCALE 1:500

LEGEND

eSW	EXISTING STORM WATER MAIN	LC1-SW	DN300 POLYPROPYLENE LOT CONNECTION
SW	PROPOSED STORMWATER MAIN	LC2-SW	DN375 POLYPROPYLENE LOT CONNECTION
eS	EXISTING SEWER MAIN	LC3-SW	DN450 POLYPROPYLENE LOT CONNECTION
S	PROPOSED SEWER MAIN	LC-S	DN150 uPVC LOT CONNECTION
AG	PROPOSED AG DRAIN		
	PROPOSED OPEN / SWALE / VEE DRAIN		
	PROPOSED GAS MAIN CORRIDOR		
MH-SW	STORMWATER MANHOLE		
SEP-SW	SIDE ENTRY PIT		
GPx-SW	GRATED PIT		
GDx-SW	GRATED DRAIN		

STORMWATER PIPE SCHEDULE

MARK	PIPE SIZE	TYPE	CLASS	GRADE
SW-1	Ø300	POLYPROPYLENE	SN8	-
SW-2	Ø450	POLYPROPYLENE	SN8	-
SW-3	Ø525	POLYPROPYLENE	SN8	-
SW-4	Ø600	POLYPROPYLENE	SN8	-
SW-5	Ø750	POLYPROPYLENE	SN8	-
SW-6	Ø1050	RCP.	CLASS 2	-
SW-7	Ø300	RCP.	CLASS 4	MIN 1%

SEWER PIPE SCHEDULE

MARK	PIPE SIZE	TYPE	CLASS	GRADE
S-1	Ø150	uPVC RRJ	SN8	-
LC-S	Ø150	uPVC RRJ	SN8	-

STORMWATER PIT / MANHOLE SCHEDULE

MARK	SIZE	TYPE	ACCESSORIES
MH1-SW	Ø1500	PRECAST CONC.	CLASS D 'SW' MARKED GATIC LID
MH2-SW	Ø1800	PRECAST CONC.	CLASS B 'SW' MARKED GATIC LID
MH3-SW	Ø2100	PRECAST CONC.	CLASS B 'SW' MARKED GATIC LID
SEP1-SW	1200 WIDE	TYPE 5	REFER LGAT STD DWG TSD-SW12-v3
HW1-SW	TO SUIT PIPE	PRECAST CONC.	-
HW2-SW	TWIN CELL TO SUIT PIPE	PRECAST CONC.	-

SEWER PIT / MANHOLE SCHEDULE

MARK	SIZE	TYPE	ACCESSORIES
MH1-S	Ø1050	PRECAST CONC.	CLASS D 'S' MARKED GATIC LID
MH2-S	Ø1050	PRECAST CONC.	CLASS B 'S' MARKED GATIC LID

INFORMATION ONLY
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REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
1	DEVELOPMENT APPLICATION	KL	08-05-24
0	DEVELOPMENT APPLICATION	TM	19-01-24

STATUS: **CONTROLLED DOCUMENT**

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APPROVED: R. JESSON | ACRED. No: CC4858I

DESIGN BY: JF | DESIGN CHK: RJJ | DRAWN BY: KL | DRAFT CHK: JF | DATE: 18-12-23

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CLIENT: SHAW

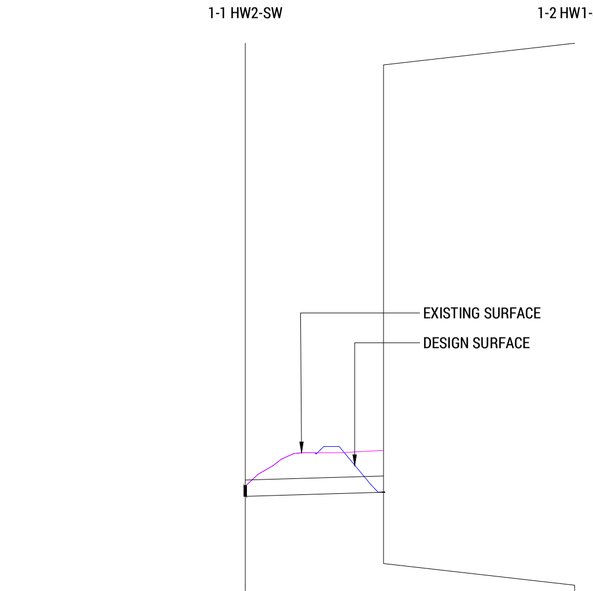
PROJECT: SUBDIVISION

ADDRESS: 100-110 COVE HILL ROAD
BRIDGEWATER

TITLE: DRAINAGE PLAN - SHEET 2

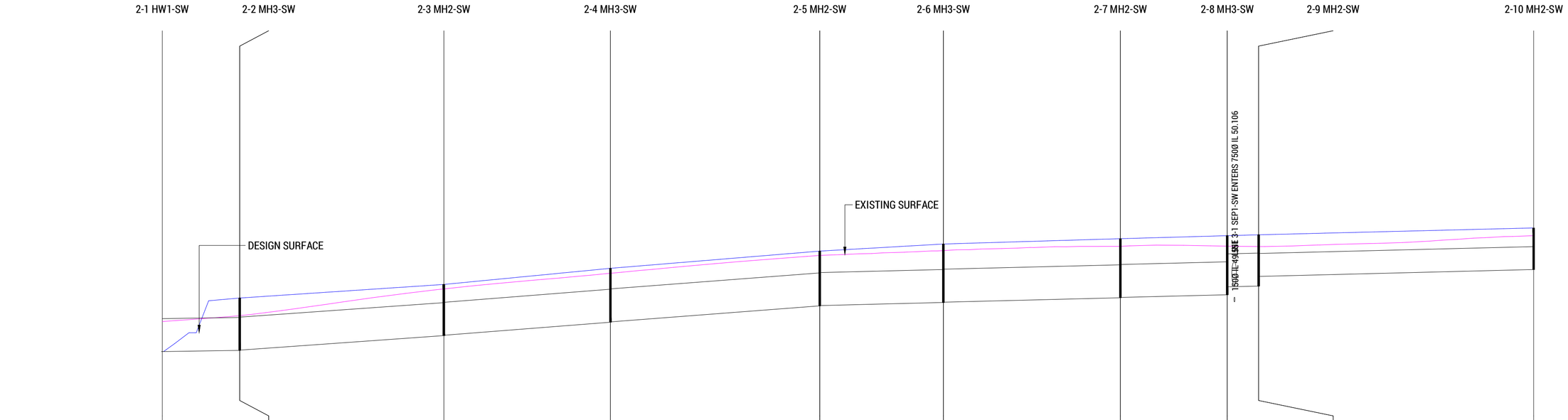
SCALE: 1:500 | SHEET SIZE: A1 | DWGs IN SET: -

PROJECT No: 241005 | DWG No: C502 | REV: 1



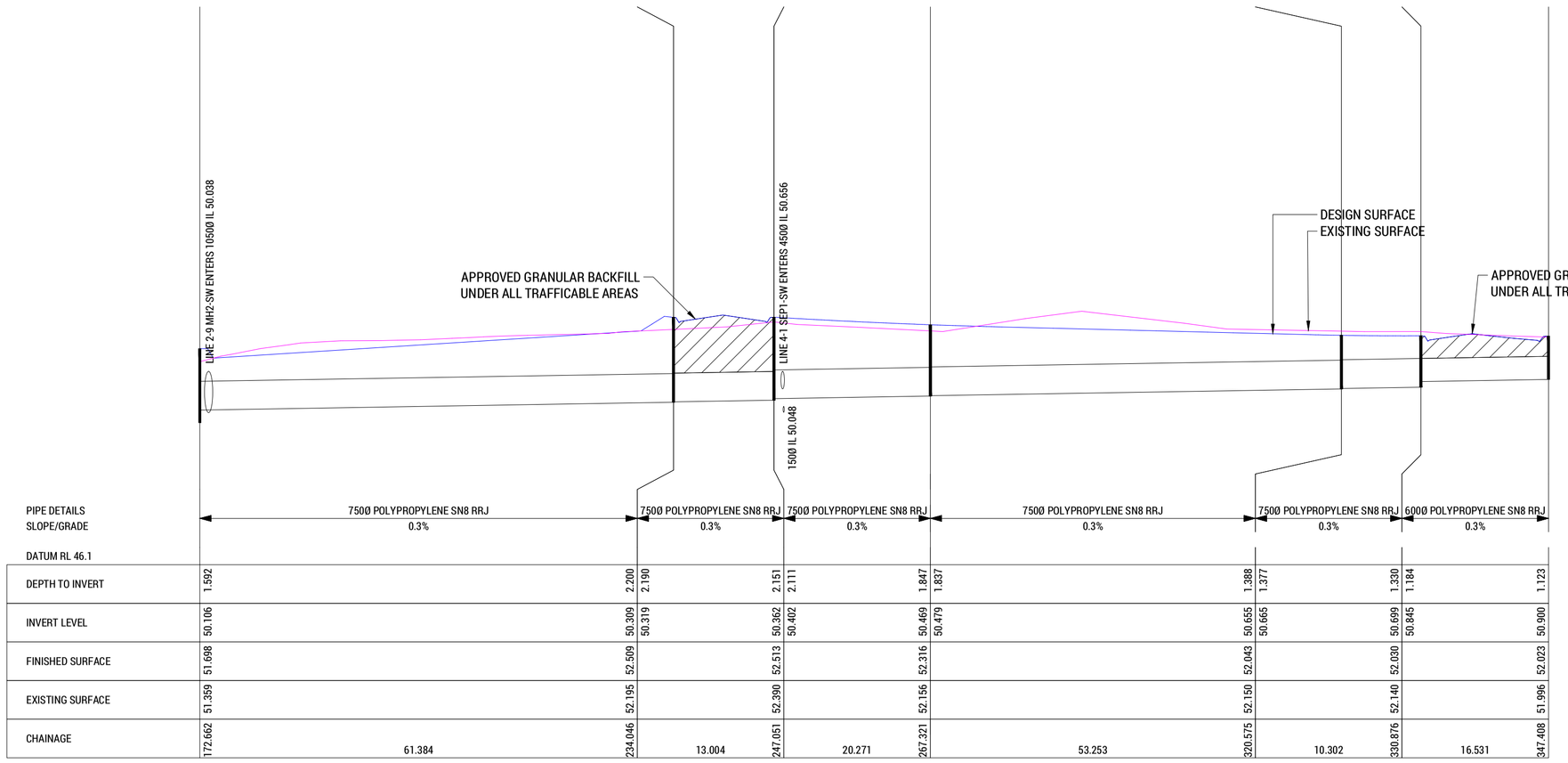
PIPE DETAILS	375Ø POLYPROPYLENE SN8 RRJ	
SLOPE/GRADE	0.5%	
DATUM RL 43.4		
DEPTH TO INVERT	0.247	0.009
INVERT LEVEL	47.401	47.494
FINISHED SURFACE	47.648	47.503
EXISTING SURFACE	47.648	48.460
CHAINAGE	0.000	15.940

LONGITUDINAL SECTION FOR LINE 1
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



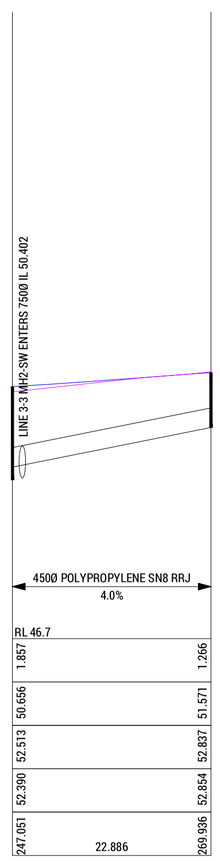
PIPE DETAILS	1050Ø RCP Class 2 RRJ		1050Ø RCP Class 2 RRJ		1050Ø RCP Class 2 RRJ		1050Ø RCP Class 2 RRJ		1050Ø RCP Class 2 RRJ		1050Ø RCP Class 2 RRJ		1050Ø RCP Class 2 RRJ		1050Ø RCP Class 2 RRJ		7500Ø POLYPROPYLENE SN8 RRJ	
SLOPE/GRADE	0.3%		1.4%		1.6%		1.5%		0.5%		0.5%		0.5%		0.5%		0.5%	
DATUM RL 43.9																		
DEPTH TO INVERT	0.001	1.700	1.690	1.660	1.650	1.748	1.738	1.777	1.767	1.897	1.887	1.917	1.907	1.918	1.669	1.664	1.350	1.350
INVERT LEVEL	47.937	47.975	47.985	48.456	48.466	48.891	48.901	49.421	49.431	49.531	49.541	49.684	49.694	49.780	50.038	50.063	50.377	50.600
FINISHED SURFACE	47.938	49.675		50.116		50.659		51.198		51.428		51.601		51.698		51.727		51.950
EXISTING SURFACE	48.913	49.102		49.971		50.479		51.058		51.215		51.353		51.399		51.347		51.699
CHAINAGE	0.000	12.548	12.548	33.102	45.650	27.002	72.652	33.953	106.605	20.043	126.648	28.695	155.343	17.319	172.662	5.098	177.760	44.599	222.360

LONGITUDINAL SECTION FOR LINE 2
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



PIPE DETAILS	7500 POLYPROPYLENE SN8 RRJ		7500 POLYPROPYLENE SN8 RRJ		7500 POLYPROPYLENE SN8 RRJ		7500 POLYPROPYLENE SN8 RRJ		7500 POLYPROPYLENE SN8 RRJ		6000 POLYPROPYLENE SN8 RRJ	
SLOPE/GRADE	0.3%		0.3%		0.3%		0.3%		0.3%		0.3%	
DATUM RL 46.1												
DEPTH TO INVERT	1.592	2.200	2.190	2.151	2.111	1.847	1.837	1.388	1.377	1.330	1.184	1.123
INVERT LEVEL	50.106	50.309	50.319	50.362	50.402	50.469	50.479	50.655	50.665	50.699	50.845	50.900
FINISHED SURFACE	51.698	52.509		52.513		52.316		52.043		52.030		52.023
EXISTING SURFACE	51.359	52.195		52.390		52.156		52.150		52.140		51.996
CHAINAGE	172.662	234.046	61.384	247.051	13.004	267.321	20.271	320.575	53.253	330.876	10.302	347.408	16.531

LONGITUDINAL SECTION FOR LINE 3
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



PIPE DETAILS	4500 POLYPROPYLENE SN8 RRJ	
SLOPE/GRADE	4.0%	
RL 46.7		
	1.857	1.266
	50.566	51.571
	52.513	52.837
	52.390	52.854
	247.051	269.936
CHAINAGE	22.886	

LONGITUDINAL SECTION FOR LINE 4
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

INFORMATION ONLY
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REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS:
CONTROLLED DOCUMENT
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APPROVED: R. JESSON | ACRED. No: CC4858I

DESIGN BY: JF
DESIGN CHK: RJJ
DRAWN BY: KL
DRAFT CHK: JF
DATE: 18-12-23

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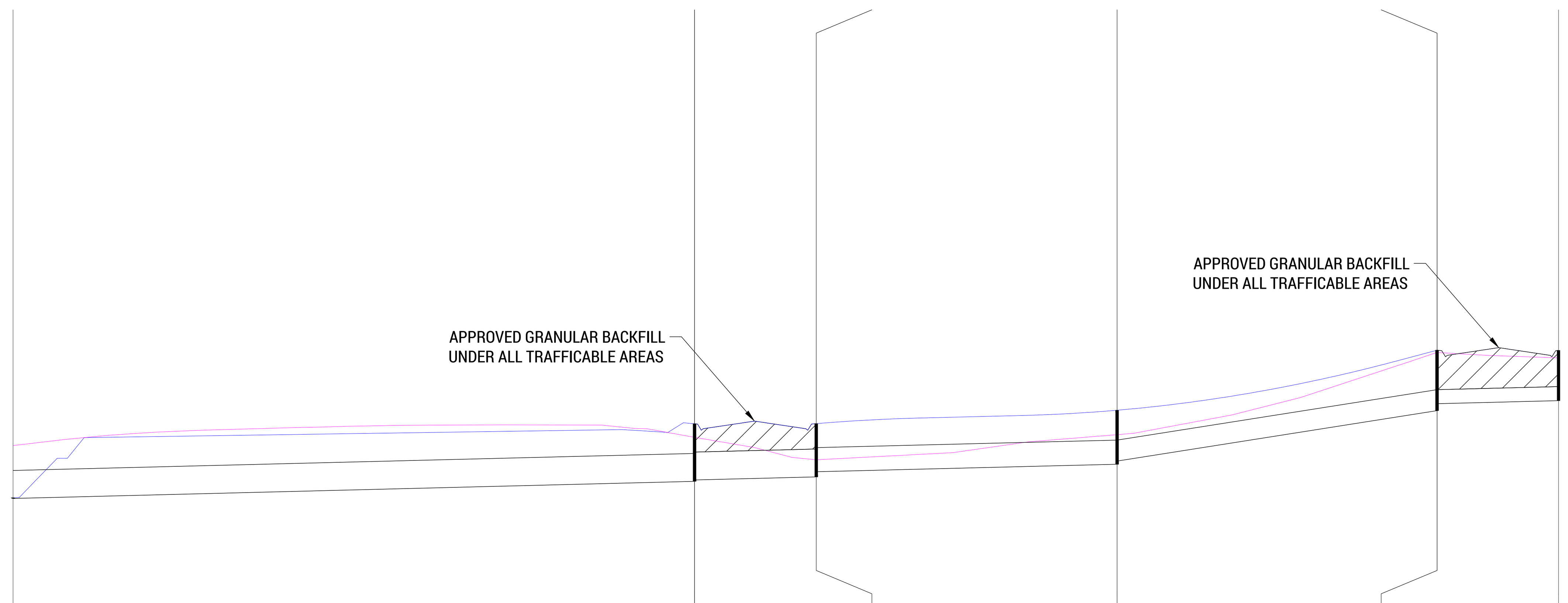
CLIENT: SHAW
PROJECT: SUBDIVISION
ADDRESS: 100-110 COVE HILL ROAD
BRIDGEWATER

TITLE: STORMWATER LONG SECTION - SHEET 1
SCALE: 1:100, 1:500 SHEET SIZE: A1 DWGs IN SET: -
PROJECT No: 241005 DWG No: C511 REV: 2

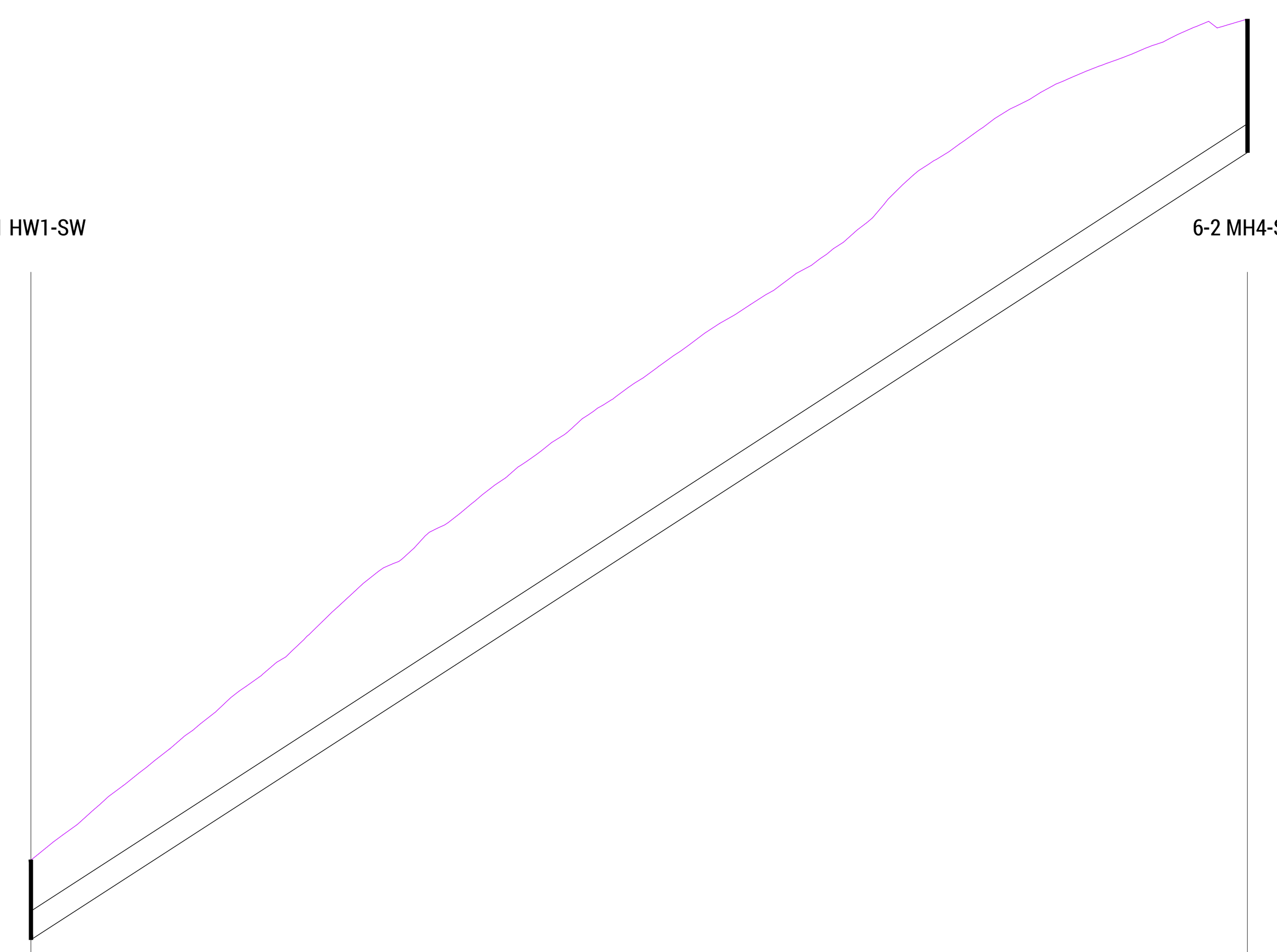
5-1 HW1-SW | 5-2 SEP1-SW | 5-3 SEP1-SW | 5-4 SEP1-SW | 5-5 SEP1-SW | 5-6 SEP1-SW



PIPE DETAILS / SLOPE/GRADE	600Ø POLYPROPYLENE SN8 RRJ 0.5%		600Ø POLYPROPYLENE SN8 RRJ 0.5%		525Ø POLYPROPYLENE SN8 RRJ 0.5%		450Ø POLYPROPYLENE SN8 RRJ 3.1%		300Ø POLYPROPYLENE SN8 RRJ 0.5%	
DATUM RL 43.7										
DEPTH TO INVERT	0.014		1.232 / 1.202		1.141 / 1.031		1.157 / 1.089		1.295 / 1.145	1.075
INVERT LEVEL	47.692		48.057 / 48.087		48.152 / 48.262		48.423 / 48.491		49.570 / 49.720	49.785
FINISHED SURFACE	47.706		49.289		49.293		49.580		50.865	50.860
EXISTING SURFACE	48.824		49.000		48.519		49.056		50.818	50.700
CHAINAGE	0.000	72.975	72.975	13.034	86.009	32.215	118.224	34.266	152.490	13.009 / 165.499

LONGITUDINAL SECTION FOR LINE 5
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

6-1 HW1-SW | 6-2 MH4-SW



PIPE DETAILS / SLOPE/GRADE	450Ø POLYPROPYLENE SN8 RRJ 12.9%	
DATUM RL 32.3		
DEPTH TO INVERT	1.254	2.091
INVERT LEVEL	36.290	48.623
FINISHED SURFACE	37.544	50.714
EXISTING SURFACE	37.544	50.714
CHAINAGE	0.000	95.290 (95.290)

LONGITUDINAL SECTION FOR LINE 6
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

INFORMATION ONLY
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REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS:
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 ABN 51 619 598 257
APPROVED: R. JESSON ACRED. No: CC4858I

DESIGN BY: JF
DESIGN CHK: RJJ
DRAWN BY: KL
DRAFT CHK: JF
DATE: 18-12-23

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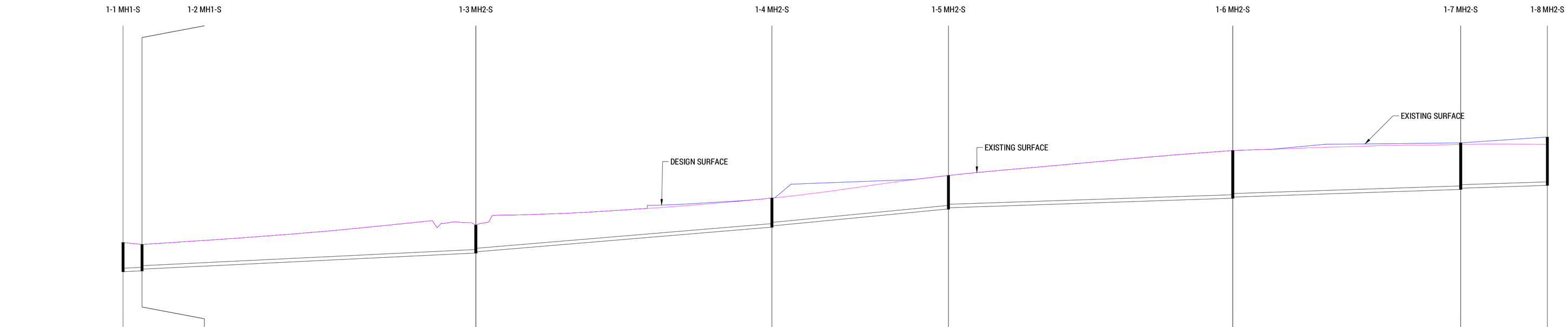
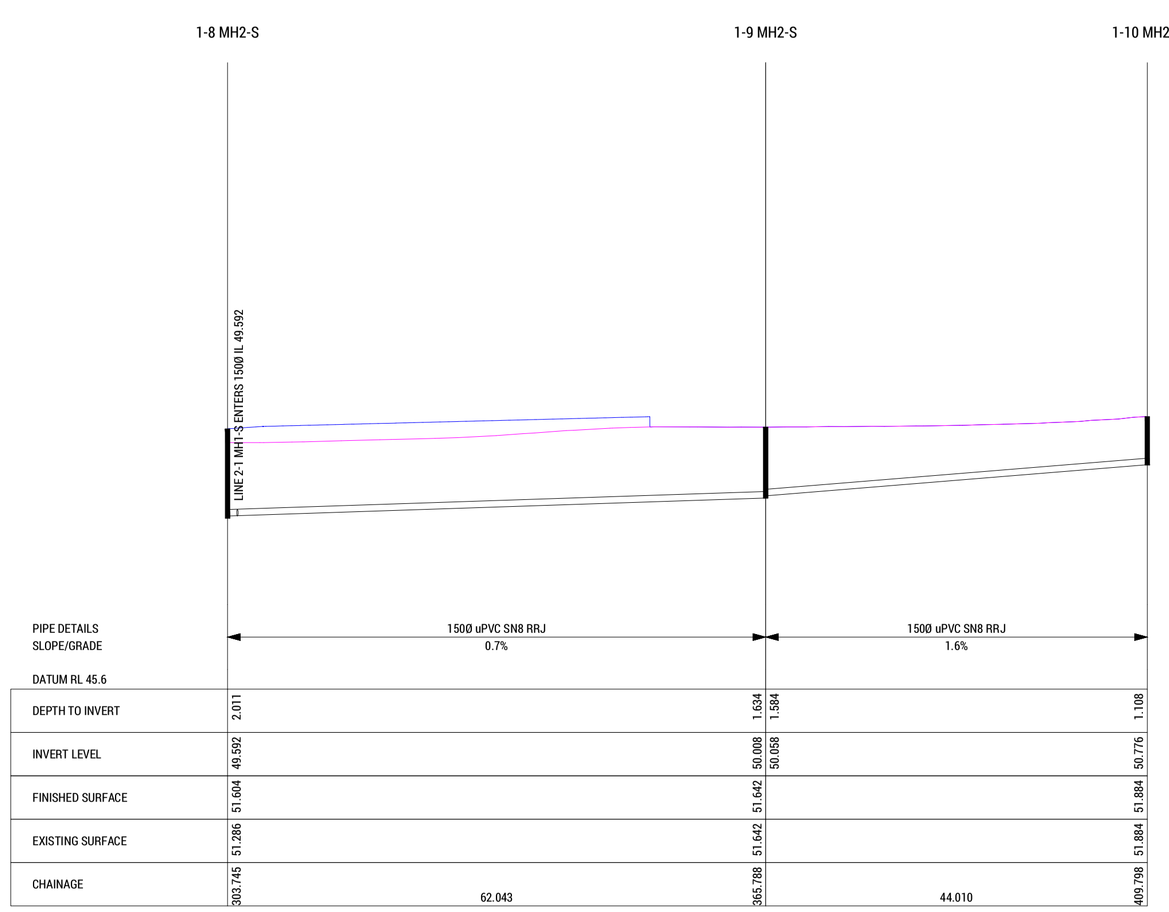
CLIENT: SHAW
PROJECT: SUBDIVISION
ADDRESS: 100-110 COVE HILL ROAD BRIDGEWATER

TITLE: STORMWATER LONG SECTION - SHEET 2
SCALE: 1:100, 1:500 SHEET SIZE: A1 DWGs IN SET: -
PROJECT No: 241005 DWG No: C512 REV: 2



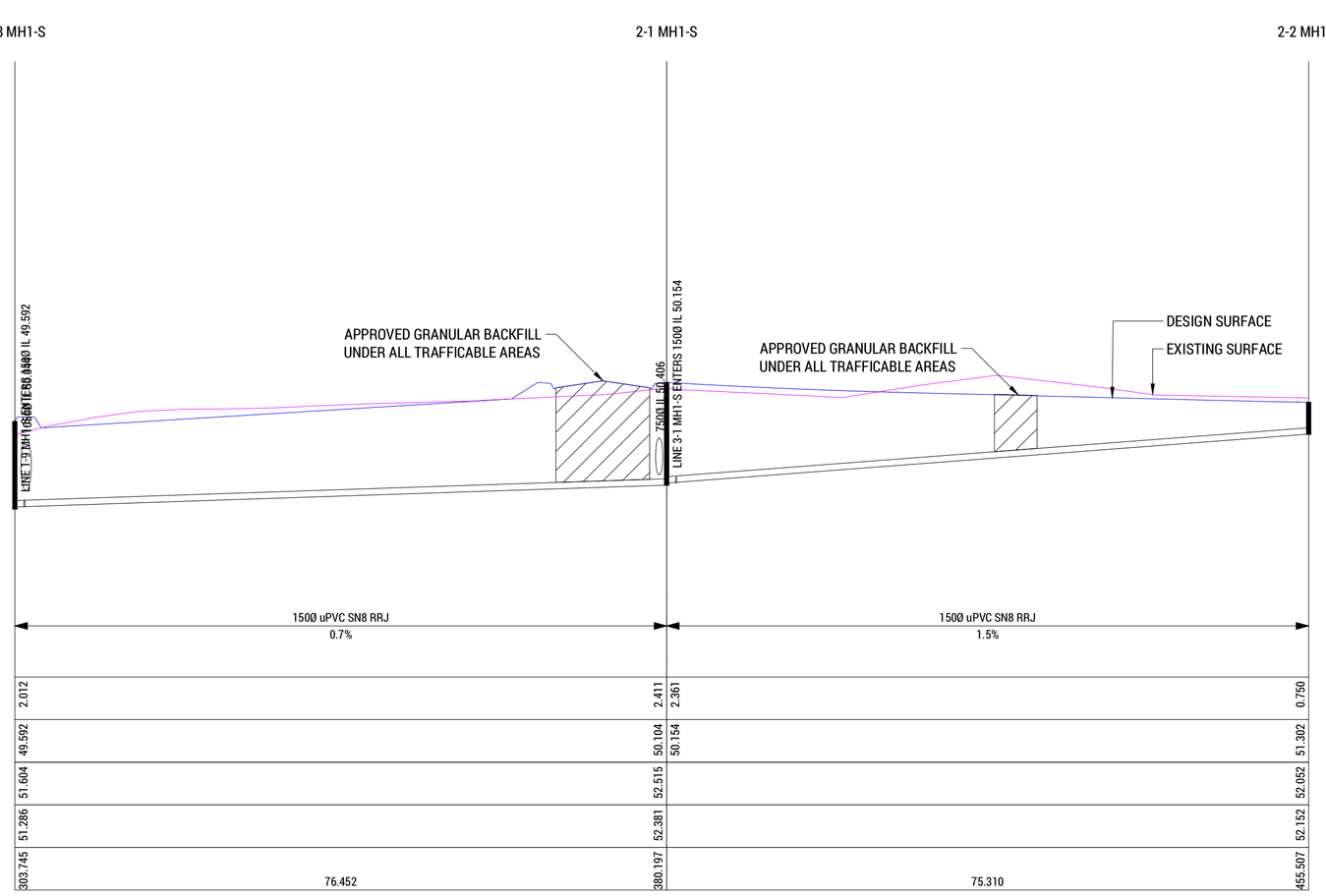
PIPE DETAILS	1500 uPVC SN8 RRJ	1500 uPVC SN8 RRJ	1500 uPVC SN8 RRJ	1500 uPVC SN8 RRJ	1500 uPVC SN8 RRJ	1500 uPVC SN8 RRJ	1500 uPVC SN8 RRJ	
SLOPE/GRADE	1.0%	1.0%	1.7%	1.9%	0.7%	0.7%	0.7%	
DATUM RL 41.9								
DEPTH TO INVERT	1.248	1.124 / 1.054	1.186 / 1.136	1.241 / 1.191	1.427 / 1.377	2.035 / 1.984	1.985 / 1.935	2.062
INVERT LEVEL	45.855	45.895 / 45.965	46.654 / 46.704	47.759 / 47.809	48.535 / 48.585	48.992 / 49.042	49.368 / 49.418	49.542
FINISHED SURFACE	47.103	47.019	47.840	49.000	49.962	51.027	51.353	51.604
EXISTING SURFACE	47.103	47.019	47.840	49.000	49.962	51.027	51.286	51.286
CHAINAGE	0.000	4.050 / 4.050	75.233	138.374	176.017	236.650	285.263	303.745
	4.050	71.182	63.141	37.643	60.633	48.613	18.482	

LONGITUNDINAL SECTION FOR LINE 1
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



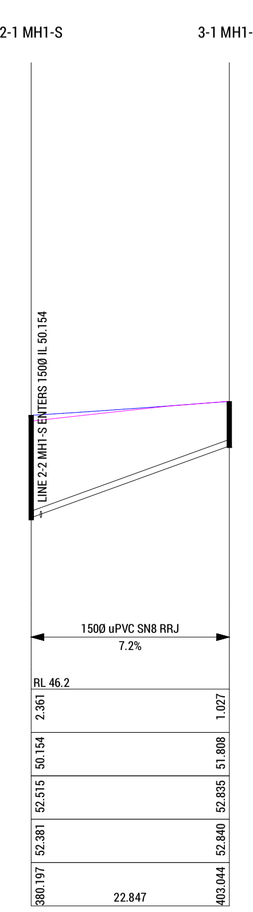
PIPE DETAILS	1500 uPVC SN8 RRJ	1500 uPVC SN8 RRJ	
SLOPE/GRADE	0.7%	1.6%	
DATUM RL 45.6			
DEPTH TO INVERT	2.011	1.634 / 1.584	1.108
INVERT LEVEL	49.592	50.008 / 50.058	50.776
FINISHED SURFACE	51.604	51.642	51.884
EXISTING SURFACE	51.286	51.642	51.884
CHAINAGE	303.745	365.788	409.798
	62.043	44.010	

LONGITUNDINAL SECTION FOR LINE 1
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



PIPE DETAILS	1500 uPVC SN8 RRJ	1500 uPVC SN8 RRJ	
SLOPE/GRADE	0.7%	1.5%	
DATUM RL 45.6			
DEPTH TO INVERT	2.012	2.411 / 2.361	0.759
INVERT LEVEL	49.592	50.104 / 50.154	51.302
FINISHED SURFACE	51.604	52.515	52.052
EXISTING SURFACE	51.286	52.381 / 52.152	52.152
CHAINAGE	303.745	380.197	455.507
	76.452	75.310	

LONGITUNDINAL SECTION FOR LINE 2
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



PIPE DETAILS	1500 uPVC SN8 RRJ
SLOPE/GRADE	7.2%
RL 46.2	
DEPTH TO INVERT	2.361 / 1.027
INVERT LEVEL	50.154 / 51.808
FINISHED SURFACE	52.515 / 52.835
EXISTING SURFACE	52.381 / 52.840
CHAINAGE	380.197 / 403.044
	22.847

LONGITUNDINAL SECTION FOR LINE 3
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

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REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	**DEVELOPMENT APPLICATION**	**KL**	**08-05-24**
1	**DEVELOPMENT APPLICATION**	**TM**	**19-01-24**
0	**DEVELOPMENT APPLICATION**	**KL**	**18-12-23**

STATUS: **CONTROLLED DOCUMENT**

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APPROVED: **R. JESSON** ACRED. No: **CC4858I**

DESIGN BY: **JF**
DESIGN CHK: **RJJ**
DRAWN BY: **KL**
DRAFT CHK: **JF**
DATE: **18-12-23**

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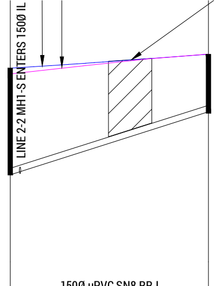
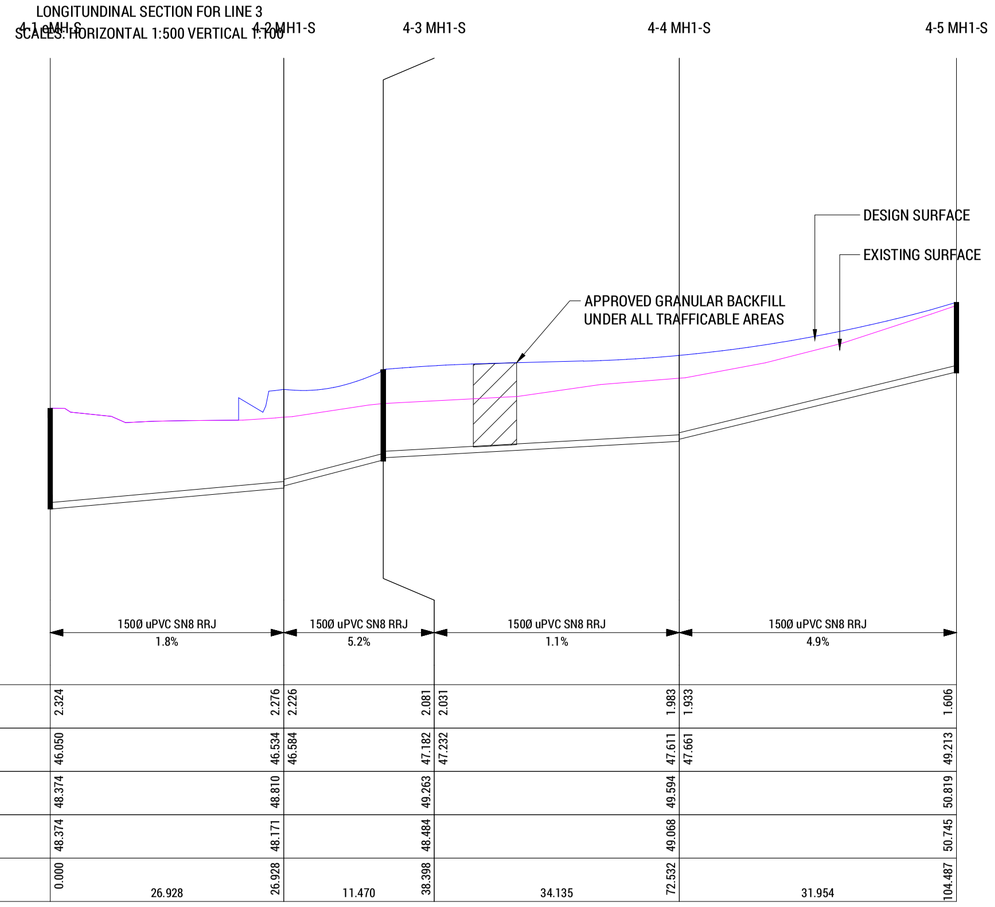
CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

TITLE: **SEWER LONG SECTION - SHEET 1**
SCALE: **1:100, 1:500** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C521** REV: **2**



PIPE DETAILS SLOPE/GRADE	1500 uPVC SN8 RRJ 6.36%		
DATUM RL 46.1			
BACKFILL TYPE EMBEDMENT			
DEPTH TO INVERT	2.461		1.327
INVERT LEVEL	50.054		51.508
FINISHED SURFACE	52.515		52.835
EXISTING SURFACE	52.381		52.840
CHAINAGE	380.290	22.847	403.137

LONGITUNDINAL SECTION FOR LINE 3
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



PIPE DETAILS SLOPE/GRADE	1500 uPVC SN8 RRJ 1.8%	1500 uPVC SN8 RRJ 5.2%	1500 uPVC SN8 RRJ 1.1%	1500 uPVC SN8 RRJ 4.9%	
DATUM RL 42					
DEPTH TO INVERT	2.324	2.276 / 2.226	2.081 / 2.031	1.983 / 1.933	1.606
INVERT LEVEL	46.050	46.534 / 46.584	47.182 / 47.232	47.611 / 47.661	49.213
FINISHED SURFACE	48.374	48.810	49.263	49.594	50.819
EXISTING SURFACE	48.374	48.171	48.484	49.068	50.745
CHAINAGE	0.000	26.928 / 26.928	38.398 / 11.470	72.532 / 34.135	104.487 / 31.954

LONGITUDINAL SECTION FOR LINE 1
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

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REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
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0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS: **CONTROLLED DOCUMENT**

APPROVED: **R. JESSON** ACRED. No: **CC4858I**

DESIGN BY: **JF**
DESIGN CHK: **RJJ**
DRAWN BY: **KL**
DRAFT CHK: **JF**
DATE: **18-12-23**

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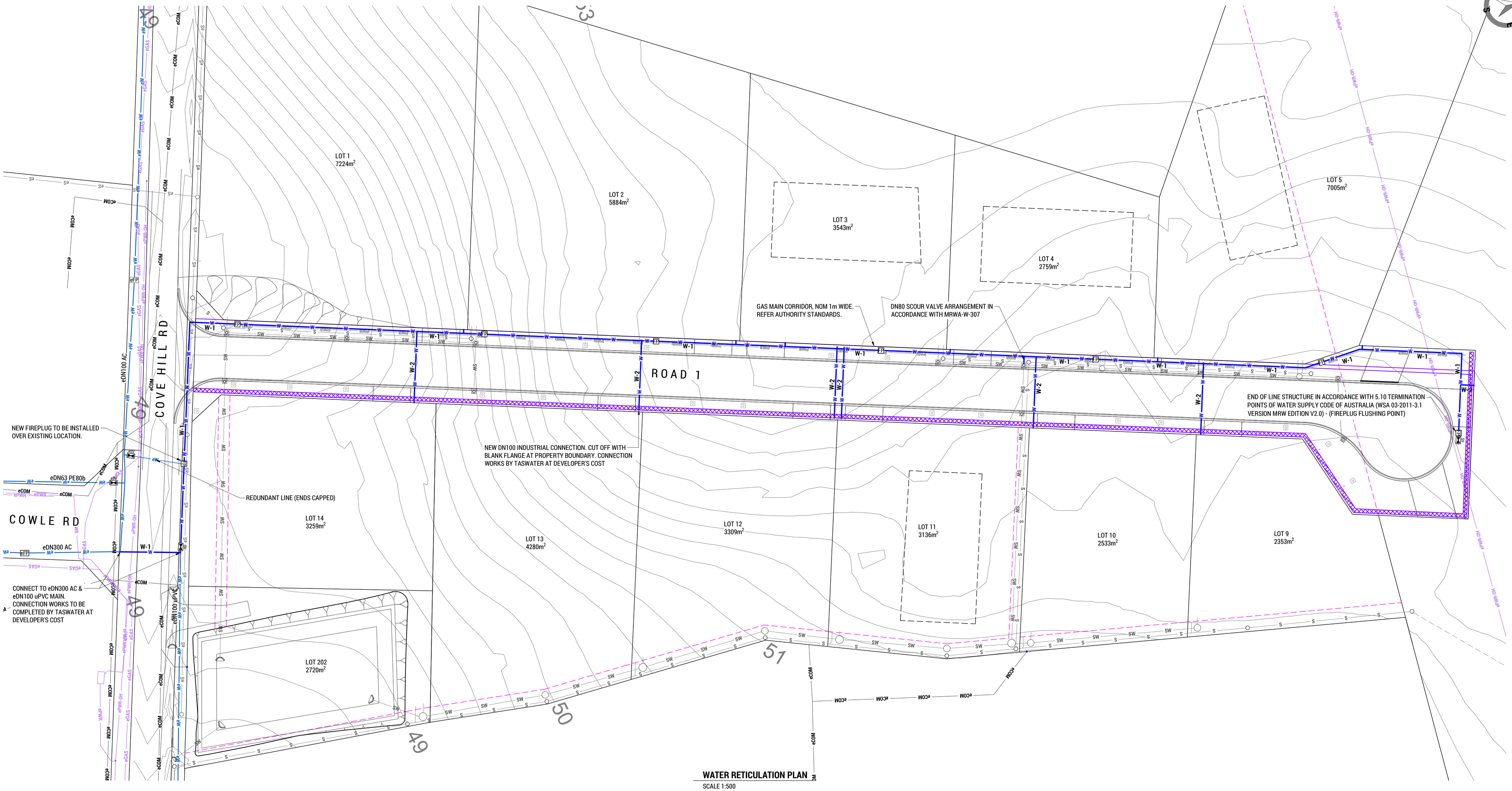
CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

TITLE: **SEWER LONG SECTION - SHEET 2**
SCALE: **1:100, 1:500** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C522** REV: **2**



WATER RETICULATION PLAN

SCALE 1:500

LEGEND

- eW — EXISTING WATER MAIN
- W — PROPOSED WATER MAIN
- PROPOSED GAS MAIN CORRIDOR
- eFP — EXISTING FIRE PLUG
- eSV — EXISTING STOP VALVE
- eWM — EXISTING WATER METER

WATER MAIN SCHEDULE

MARK	PIPE SIZE	TYPE
W-1	Ø150	PVC-O SERIES 2 RRJ
W-2	Ø100	PVC-O SEREIS 2 RRJ

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APPROVED: R. JESSON | ACRED. No: CC4858I

DESIGN BY: JF
DESIGN CHK: RJJ
DRAWN BY: KL
DRAFT CHK: JF
DATE: 18-12-23

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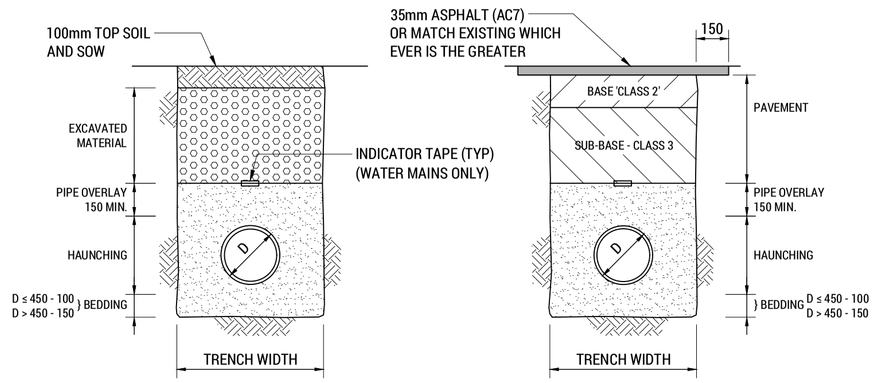
CLIENT: SHAW
PROJECT: SUBDIVISION
ADDRESS: 100-110 COVE HILL ROAD BRIDGEWATER

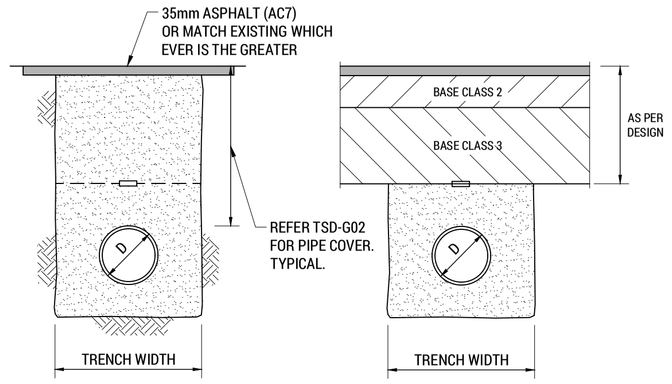
TITLE: WATER RETICULATION PLAN
SCALE: 1:500 SHEET SIZE: A1 DWGs IN SET: -
PROJECT No: 241005 DWG No: C601 REV: 2



CLASS 1, 2 AND 3 ROADS

D01 - **TRENCHES - NON-TRAFFICABLE**
SCALE 1:20

D02 - **TRENCHES - EXISTING ROADS**
SCALE 1:20



CLASS 4 LOCAL ROADS
PARKING LANES - ALL ROADS
FOOTPATHS / DRIVEWAYS

D03 - **TRENCHES - NEW ROADS**
SCALE 1:20

TRENCH WIDTH		
PIPE TYPE	**NOM. DIA (D)**	**TRENCH WIDTH**
CONCRETE	≤ 1500	D + 300
	> 1500	DESIGN REQ.
OTHER PIPES	100	300
	150	450
	225-300	600
	450	750
	450-1500	D + 600
	> 1500	DESIGN REQ.

MINIMUM TRENCH WIDTHS MAY BE VARIED ABOVE THE PIPE OVERLAY ZONE TO MEET 'WORPLACE STANDARDS' REQUIREMENTS.
ie EXCAVATIONS OVER 1.5m MAY REQUIRE RISK ASSESSMENT.

COMPACTION OF BEDDING, HAUNCHING & OVERLAY
REFER TO AS 1289-5.5
CONCRETE PIPES = MIN. DENSITY INDEX = 60% (85% STD. COMPACTION)
uPVC PIPES = DENSITY INDEX = 65% (90% STD. COMPACTION)
DICL PIPES = DENSITY INDEX = 65% (90% STD. COMPACTION)

BEDDING, HAUNCHING AND OVERLAY MATERIAL
BEDDING , HAUNCHING AND PIPE OVERLAY MATERIAL SHALL CONTAIN NO DELETERIOUS MATERIAL OR CLAY LUMPS AND SHALL COMPLY WITH THE FOLLOWING GRADINGS:

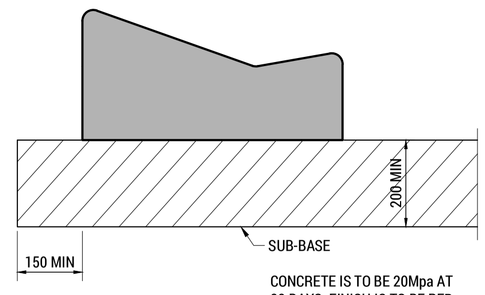
FOR uPVC AND DUCTILE IRON PIPES
SAND OR CRUSHED ROCK (STONE DUST)

SIEVE APERTURE (mm) TO AS 1152	% PASSING (BY MASS)
6.7	100
2.36	70-100
0.6	20-90
0.3	8-50
0.15	0-20
0.075	0-10

FOR CONCRETE PIPES
CRUSHED ROCK

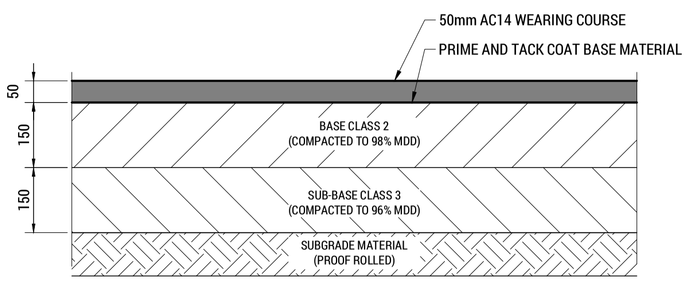
SIEVE APERTURE (mm) TO AS 1152	% PASSING (BY MASS)
19	100
2.36	50-100
0.6	20-90
0.3	10-60
0.15	0-25
0.075	0-10

ALL MATERIAL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH AS 3725 AND TO THE SATISFACTION OF THE SUPERINTENDENT.

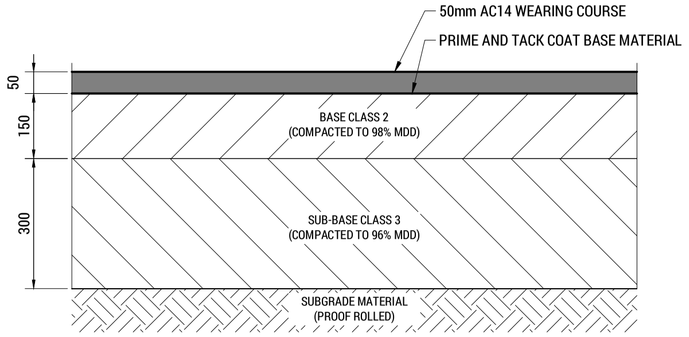


CONCRETE IS TO BE 20Mpa AT 28 DAYS. FINISH IS TO BE PER D.S.G. SPEC SECTION 703.

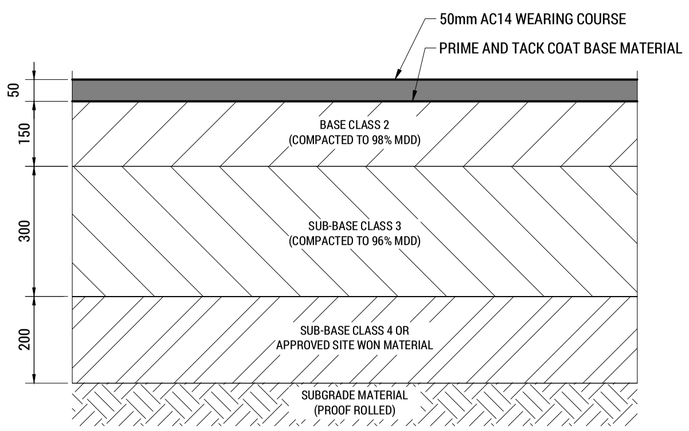
D04 - **TYPE KCM2 KERB (MOUNTABLE)**
SCALE 1:10
REFER IPWEA STD DWG TSD-R14-v3 FOR APPROVED KERB & CHANNEL PROFILES & DIMENSIONS



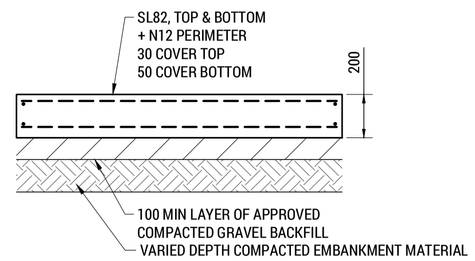
D05 - **HOT MIX PAVEMENT 'A-1' - ROADWAYS**
SCALE 1:10
TYPE A1 TO BE USED WHERE CBR >6%
WHERE POSSIBLE, AFTER STRIPPING, REMOVE LOW STRENGTH BROWN SILTY CLAY MATERIAL TO GRAVEL SUBGRADE WHERE EXPECTED CBR IS GREATER THAN 15%. IT IS RECOMMENDED TO POTHOLE PRIOR TO BOXING OUT PAVEMENT TO DETERMINE DEPTH TO EXPECTED GRAVEL SUBGRADE



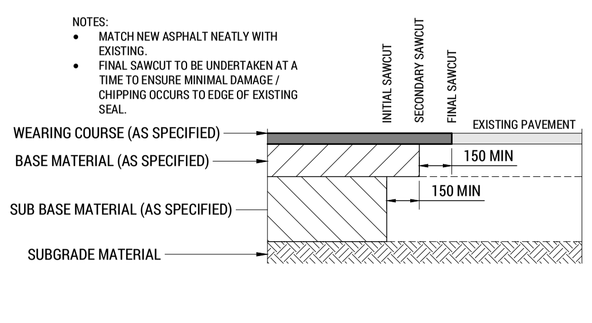
D06 - **HOT MIX PAVEMENT 'A-2' - ROADWAYS**
SCALE 1:10
TYPE A2 TO BE USED WHERE CBR BETWEEN 3%-6%
WHERE POSSIBLE, AFTER STRIPPING, REMOVE LOW STRENGTH BROWN SILTY CLAY MATERIAL TO GRAVEL SUBGRADE WHERE EXPECTED CBR IS GREATER THAN 15%. IT IS RECOMMENDED TO POTHOLE PRIOR TO BOXING OUT PAVEMENT TO DETERMINE DEPTH TO EXPECTED GRAVEL SUBGRADE



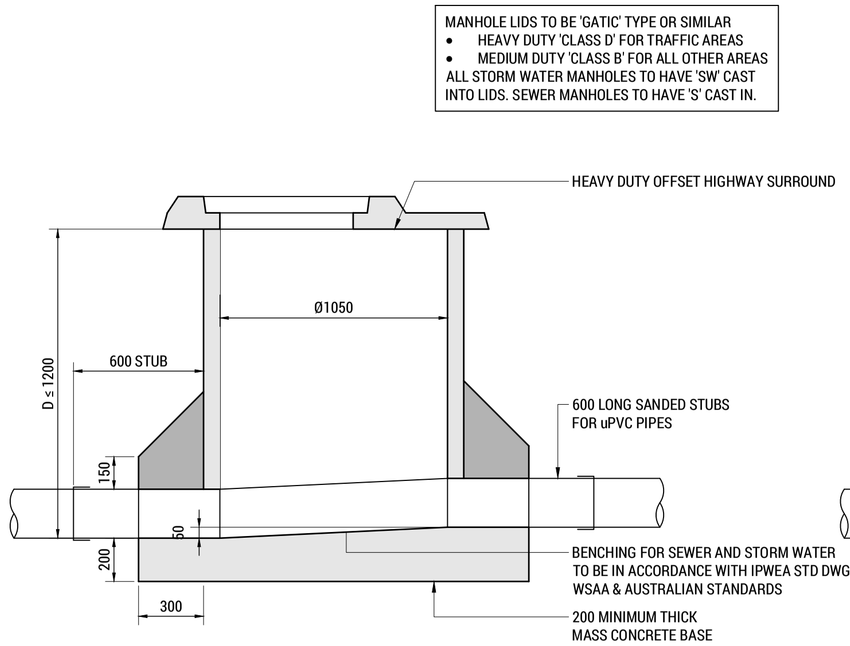
D07 - **HOT MIX PAVEMENT 'A-3' - ROADWAYS**
SCALE 1:10
TYPE A3 TO BE USED WHERE CBR 1.5%-3%
WHERE POSSIBLE, AFTER STRIPPING, REMOVE LOW STRENGTH BROWN SILTY CLAY MATERIAL TO GRAVEL SUBGRADE WHERE EXPECTED CBR IS GREATER THAN 15%. IT IS RECOMMENDED TO POTHOLE PRIOR TO BOXING OUT PAVEMENT TO DETERMINE DEPTH TO EXPECTED GRAVEL SUBGRADE



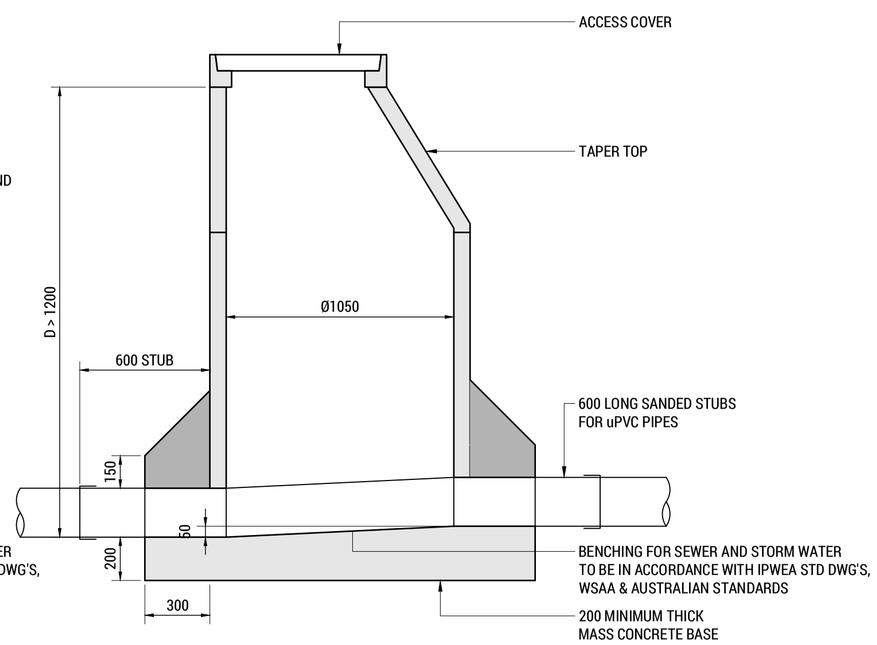
D08 - **SECTION - PAVEMENT 'B' DRIVEWAY (TYP.)**
SCALE 1:20
REFER IPWEA STD DWG TSD-R09-v3 FOR ADDITIONAL DRIVEWAY DETAILS



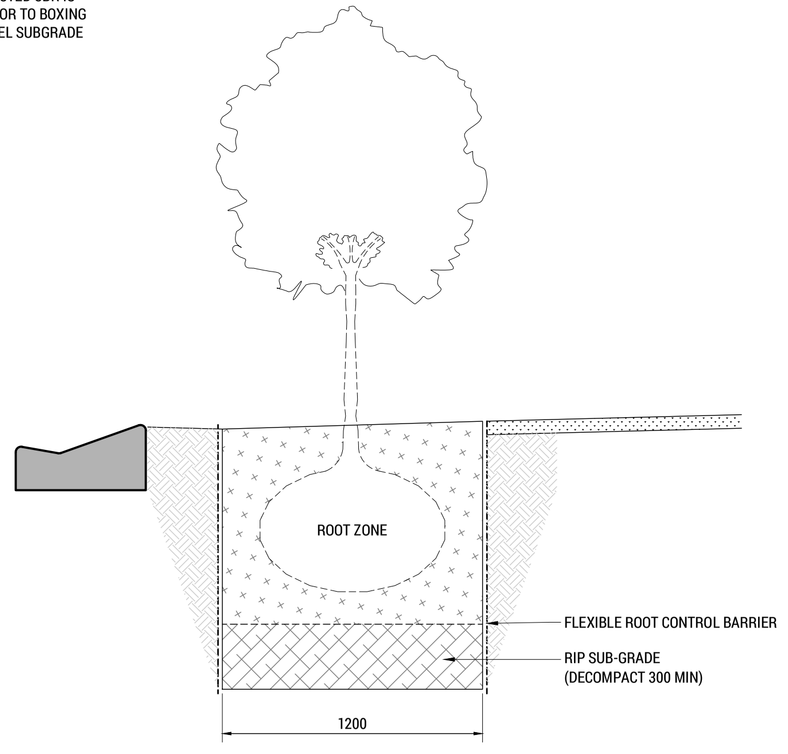
D09 - **NEW TO EXISTING HOT MIX TRANSITION**
SCALE 1:20
MIN CBR 4% (CONTRACTOR TO CONFIRM ONSITE)



D10 - **DETAIL OF MANHOLE - D ≤ 1200**
SCALE 1:20
REFER IPWEA STD DWG TSD-SW02-v3 FOR STORMWATER MANHOLE DETAILS
REFER WSAA STD DWG'S FOR SEWER MANHOLE DETAILS



D11 - **DETAIL OF MANHOLE - D > 1200**
SCALE 1:20



D12 - **TYPICAL TREE / SHRUB PLANTING DETAIL**
SCALE 1:20
REFER LGAT STD DWG TSD-R36-v3 FOR TREE / SHRUB PLANTING DETAILS.

INFORMATION ONLY
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REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
2	DEVELOPMENT APPLICATION	KL	08-05-24
1	DEVELOPMENT APPLICATION	TM	19-01-24
0	DEVELOPMENT APPLICATION	KL	18-12-23

STATUS: **CONTROLLED DOCUMENT**
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APPROVED: **R. JESSON** ACRED. No: **CC4858I**

DESIGN BY: **JF**
DESIGN CHK: **RJJ**
DRAWN BY: **KL**
DRAFT CHK: **JF**
DATE: **18-12-23**

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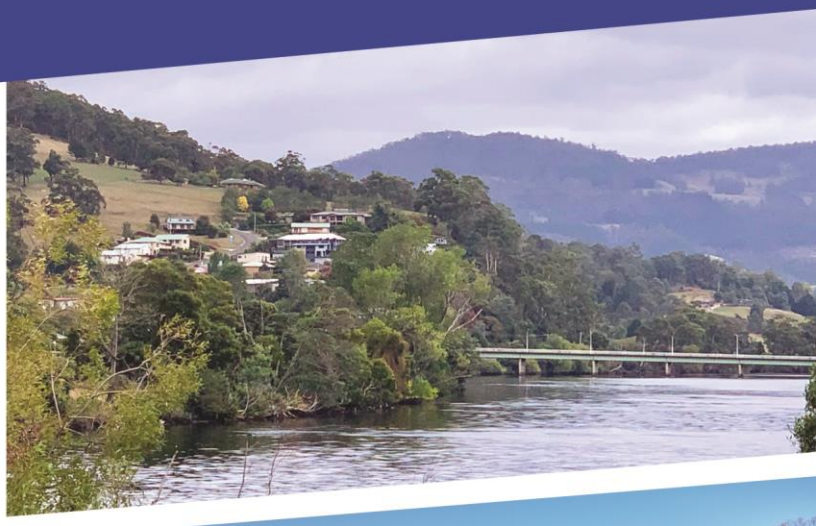
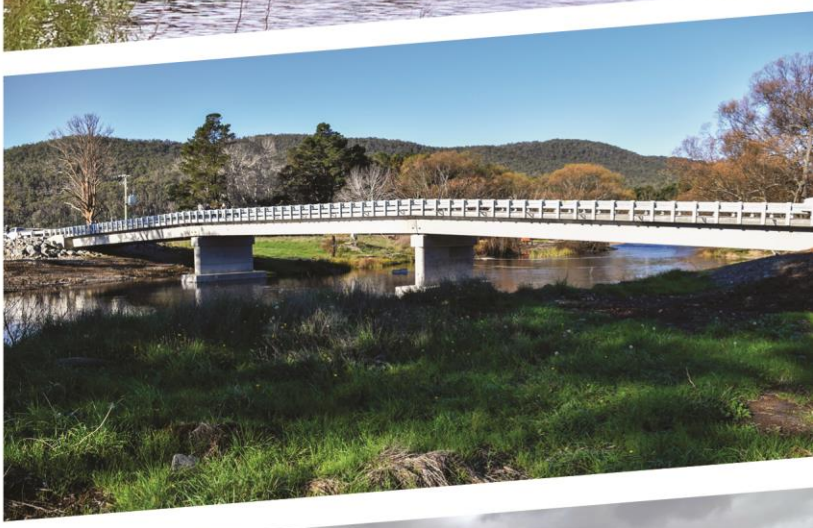
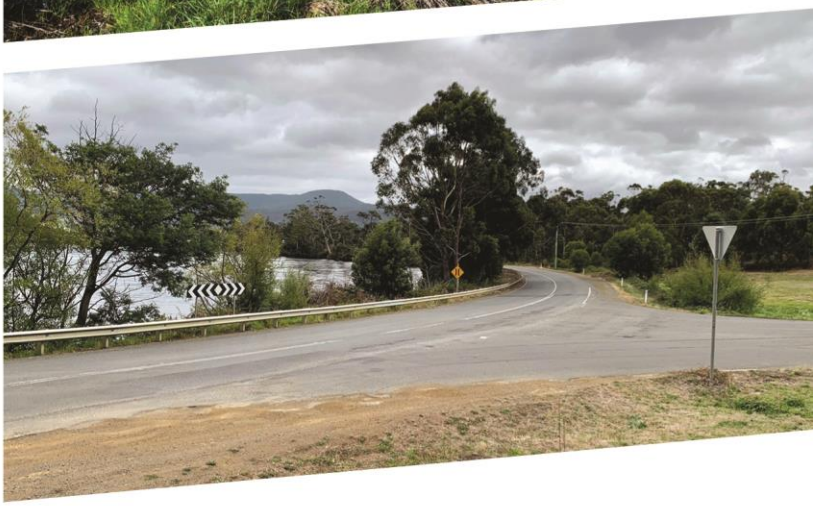
P. 03 6388 9200

CLIENT: **SHAW**
PROJECT: **SUBDIVISION**
ADDRESS: **100-110 COVE HILL ROAD BRIDGEWATER**

TITLE: **SECTIONS & DETAILS**
SCALE: **1:10, 1:20** SHEET SIZE: **A1** DWGs IN SET: **-**
PROJECT No: **241005** DWG No: **C701** REV: **2**







Stormwater Management Report

Shaw Tas
Subdivision
100-110 Cove Hill Road, Bridgewater

Prepared for:	Shaw Tas
Project No:	241005
Document No:	241005 SMR - 001
Issue No:	01
Revision No:	B

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Contents

1. INTRODUCTION

Rare Innovation Pty Ltd (Rare) have been engaged to undertake engineering design and provide a Stormwater Management Report for the proposed subdivision located at 100-110 Cove Hill Road, Bridgewater. The purpose of this report is to provide supporting information regarding stormwater management for the site and is to be read in conjunction with Rare project drawings *241005-C* Series.

2. EXISTING SITE

2.1. Location & Property Details

The proposed development is located across three existing land titles at 100-110 Cove Hill Road, Bridgewater (Property ID: 2658252 & 2184712, Title References: 150349/1, 150349/2, 136905/2) as shown in Figure 1. The site is currently zoned General Industrial and is bounded by Cove Hill Road to the south, existing industrial developments to the south-west and south-east, existing undeveloped land to the north-west and north-east, as well as the existing Boral Quarries to the north.

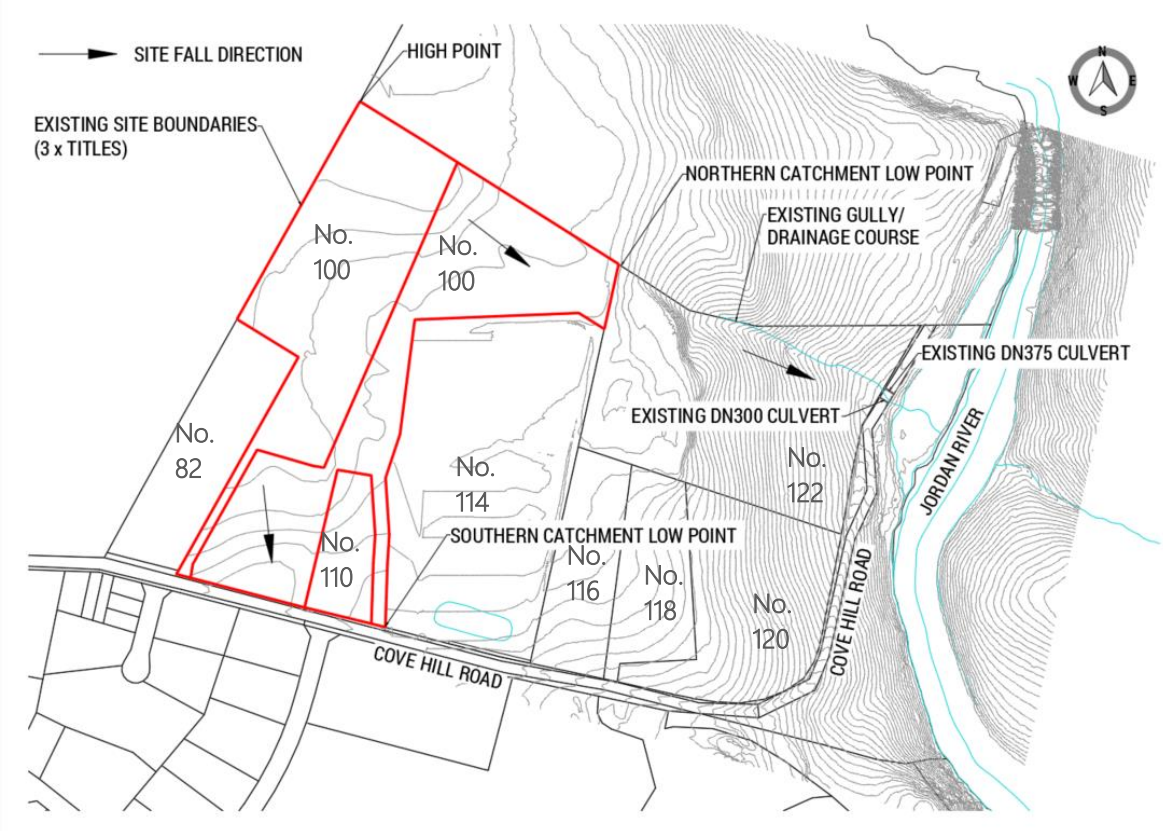


Figure 1 – Existing Site/Development Area

2.2. Land Description & Existing Stormwater System

The existing titles are currently serviced by three separate driveway accesses from Cove Hill Road with an existing dwelling located on 110 Cove Hill Road (ID: 2658252, Title Ref: 150349/2). The remainder of the site is predominantly undeveloped.

The existing topography varies across the site with localised high points along the western boundary with 82 Cove Hill Road and at the northern corner of the site as shown in Figures 1 and 2. The southern portion of the site falls to the south towards Cove Hill Road with typically low grades of approximately 2-6%, while the northern portion of the site generally falls to the east, also with typically low grades of approximately 1-6%.

No existing stormwater drainage infrastructure is present within the site. Public stormwater drainage infrastructure consists of roadside open drains and culverts along Cove Hill Road which flow to the east towards the Jordan River. An existing overland flow path is present along the northern boundary of the neighbouring property of 122 Cove Hill Road, in close proximity to the proposed development site. The existing topography through the northern portion of the site indicates that surface runoff currently flows to the east into 122 Cove Hill Road and this overland flow path before reaching the roadside open drains along Cove Hill Road itself. In this location, two existing Ø300 and Ø375 culverts currently drain these flows under the road and ultimately into the adjacent Jordan River.

3. PROPOSAL

3.1. Proposed Development

The proposed development is for subdivision of three existing titles into 12 industrial lots (Lots 1-6, 9-14). Additionally, a proposed new road and cul-de-sac is required to provide access from Cove Hill Road (Lot 201) and a lot is required for stormwater management at the rear of Lot 14 (Lot 202). Lots 1-6 & 9-14 are General Industrial zoned lots for future development with Lot 202 proposed to accommodate a stormwater detention basin. Associated works to service the new lots including water, sewer, and stormwater reticulation are also proposed.

3.1.1. Southern Catchment

The southern catchment includes all lots excluding Lot 6 and drains south towards Cove Hill Road. These lots are to be serviced by a piped stormwater reticulation network situated within the new road reserve and along the rear of Lots 9-14, where they will discharge into a proposed detention basin and subsequently into the roadside open drains along Cove Hill Road. The topography necessitates different considerations for catchments on this site. The southern catchment extents are as illustrated in Figure 3.

3.1.1.1. Minor Network

The proposed minor stormwater network has been designed to accommodate flows for up to the 2% AEP storm event with the major stormwater network (overland flows in excess of the minor system) designed to accommodate flows up to the 1% AEP storm event. The northern end of the proposed road normally contributes to the northern catchment, however the piped network in this area and downstream has been sized to accommodate flows from the 1% AEP event from this portion of the site to ensure overflows are not directed onto adjacent property. Thus major network flows from lots 3, 4 and 5 are accommodated for in the underground network. 1% AEP flows from the northern half of Road 1 are catered for in the underground network with sufficient capture.

Additional provisions to increase minor network capacity have been made by duplication of five existing driveway culverts within Cove Hill Road, adding a Ø375 pipe to each crossover. This provision is closely linked to the proposed detention storage strategy, refer further discussion on detention storage in section 3.4.

3.1.1.2. Major Network

The major drainage network for the southern catchment will allow for overland flows to be contained within the road reserve and directed towards Cove Hill Road. This is in addition to allowances made in the underground network for the 1% AEP event as described in section 3.2.1.1. Additional considerations for the major network have been made in the detention basin design. Refer section 3.2.1.3 below.

3.1.1.3. Detention

A preliminary design has been undertaken for the sizing of the detention basin with an approximate 900m^2 base area currently allowed for, providing approximately 445m^3 of storage volume with further future detailed design to be undertaken. The basin is to be situated within Lot 202 with a twin Ø300 piped headwall outlet and a nominal storage depth of 0.75m (1.0m total basin height).

Provisions for overflow have been made via a weir structure to convey any flow exceeding the capacity of the detention basin into Cove Hill Road. The weir structure has been notionally sized as 5.0 m wide, and rests 300mm below the crest of the detention basin. Further design details for the weir will be furnished as part of the engineering design approval process, with considerations to be given to erosion control of the weir structure itself.

3.1.2.Northern Catchment

The northern catchment consists of Lot 6 and drains towards the eastern side of the site. It is proposed to construct a stormwater line from the lot connection into the neighbouring property of 122 Cove Hill Road via a new easement before discharging into an existing overland flow path and subsequently into the Cove Hill Road roadside open drains. Two existing culverts (Ø300 & Ø375) are present which currently drain flows from the existing overland flow path beneath Cove Hill Road and towards the Jordan River on the eastern side. The northern catchment extents are as illustrated in Figure 3.

3.1.2.1. Minor Network

This lot is to be serviced by a new Ø450 piped lot connection at the north-eastern corner, nominated as the property connection for Lot 6. The Ø450 piped lot connection has been sized based on the pre-development flows. This ensures that no additional flows for the 2% AEP event are to be discharged to the existing network in this location.

3.1.2.2. Major Network

Overland flows from the northern catchment up to the 1% AEP event are to be directed to the new drainage easement and existing open drain at the time of future development of this lot.

3.1.2.3. Detention

Future site-specific detention for Lot 6 is to be determined and provided at the time of site development under a separate application.

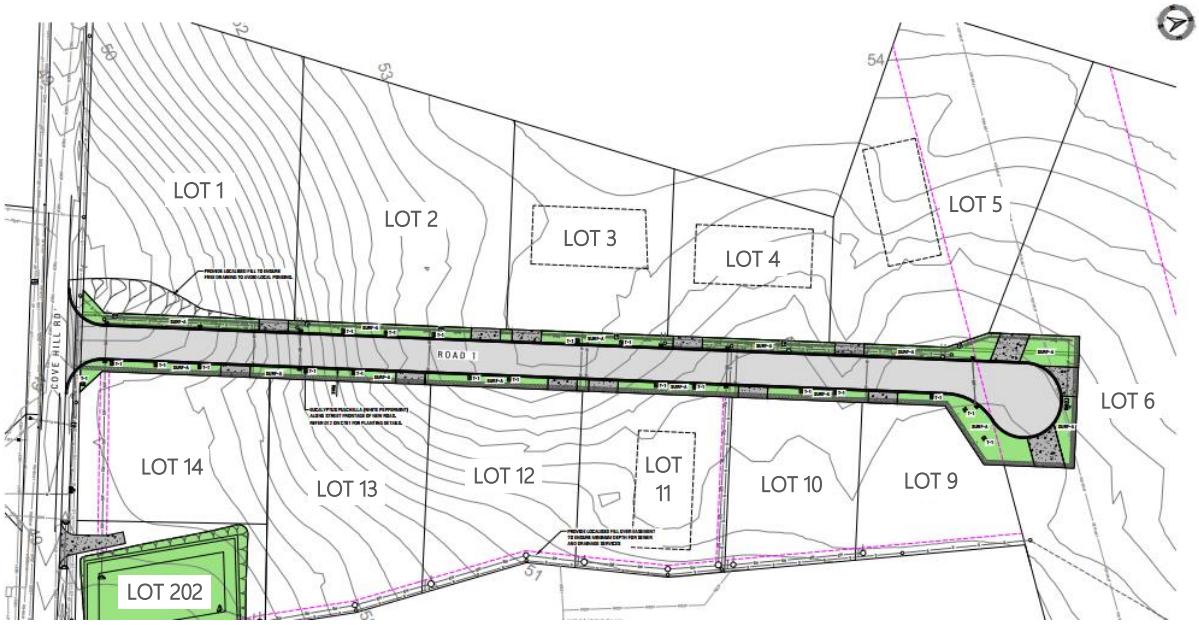


Figure 2 – Proposed Development Plan

3.2. Stormwater Analysis

3.2.1. Modelling parameters & targets

Modelling of the proposed subdivision's stormwater network has been undertaken using the Watercom DRAINS software package to assist in determining the hydraulic capacity of the system and sizing of pipe, basin and overflow components. A screenshot of the model is shown in Figure 3. Model input data has been obtained from the AR&R Data Hub for the development location utilising an initial loss/continuing loss model in accordance with AR&R guidelines. The following key model input parameters were used:

- Impervious Area Initial Loss: 1mm
- Impervious Area Continuing Loss: 0mm/hr
- Pervious Area Initial Loss: 26mm
- Pervious Area Continuing Loss: 4.3mm/hr

Design and modelling parameters for the proposed detention basin at the south of the site have been estimated by the theoretical maximum capacity of the downstream driveway culverts. To minimise the impact of the detention basin footprint, the addition of an extra Ø375 pipe to each of the driveway culverts has been nominated. This addition increases the PSD from approximately 120 L/s to 291 L/s. This is the PSD target adopted for detention storage modelling.

Levels of service adopted for the network are as follows:

- 2% AEP, generally.
- 1% AEP, where major event overland flows are to be conveyed underground.
- 5% AEP, an acceptable level of service nominated by Brighton Council for detention storage.
- No overtopping of driveway culverts located within Cove Hill Road for the 5% AEP event..

3.2.2. Modelling results

The following sections (3.2.2.1, 3.2.2.2 & 3.2.2.3) discuss results found within the southern catchment. Notable results for the northern catchment are summarised as follows.

- Sizing undertaken to achieve 2% AEP level of service, assuming predevelopment flows for an undeveloped site.
- Pre-development flows estimated to be 325L/s
- A Ø450 pipe is sufficient to cater for the pre-development flow.

Future site-specific detention storage for the northern catchment should be determined and provided at the time of Lot 6 development under a separate application.

3.2.2.1. Minor network

Modelling results show that in the 2% AEP event, the underground network is appropriately sized to convey the minor storm to the detention basin site, with the peak flowrate into the basin lot being 767 L/s from the north and 464 L/s from the east. No overland flow prior to the basin lot is evident. The 5% AEP event also shows no overland flows, and flows into the basin lot are 588 L/s from the north and 377 L/s from the east.

3.2.2.2. Detention storage

The detention basin system has been determined to provide a level of service for storage capacity up to approximately the 5% AEP (1 in 20 year) event. The maximum capacity of driveway culverts in Cove Hill Road has been used to establish the permissible site discharge (PSD) at approximately 294 L/s. As such, the proposed detention basin outlet has been designed to limit discharge flows from the development's southern catchment to 243 L/s by use of twin Ø300 pipes, which is below the PSD (294 L/s). The adjacent road catchment is catered for within the difference between the discharge flowrate and the PSD, with road catchment flowrates expected to be 12 L/s.

These changes in isolation do not satisfy the requirement to have no overland flow overtopping of driveway crossings in Cove Hill Road during the 5% AEP event, therefore the basin will require one of two design options to be implemented, as discussed in section 3.4.3 and 3.4.4. Overflows for the 2% AEP event are expected to be approximately 393 L/s. and are discussed in the major network section below.

3.2.2.3. Major network

The localised high point in Cove Hill Road and the roadside drain is located adjacent to the development site meaning the site and the basin discharge is located at the top of the catchment for this drain. The capacity of the roadside table drain is greater than the capacity of the existing driveway culverts, with these being the restricting points in the public system. Downhill of the development site, the slope of the existing roadside drain increases from approximately 2% to 3-4% near no. 116/118 and further to approximately 7-9% near no. 120 Cove Hill Road, increasing the existing capacity of the drain where the adjacent properties are assumed to also discharge, however additional Ø300 driveway culverts are also present and are assumed to also restrict the system.

The existing table drain has sufficient capacity to convey both the 2% AEP and 5% AEP flows after detention including flows exceeding the capacity of the weir without overtopping onto the road, however the existing Ø300 driveway crossing culverts do not have sufficient capacity to convey these flows and are likely to cause overtopping of the driveways in these locations. This proposal requires an additional Ø375 pipe to be installed with each Ø300 driveway culvert. DRAINS modelling indicates that additional capacity provided by addition of a new pipe increases the capacity from 120 L/s to 294 L/s.

In the 5% AEP event, minor flows overtop downstream driveway culverts, with 290 L/s piped and 46 L/s overtopping. This flow consists of both detention basin piped discharge (243 L/s) and weir discharge (119 L/s), indicating that an additional treatment on the detention basin is required to satisfy this design criteria.

In the 2% AEP event, flows will overtop driveway culverts, with 324 L/s piped and 300 L/s overtopping. A maximum Depth x Velocity of 0.09 m^2/s was calculated, with a hazard classification of 'H1 – Generally safe for vehicles, people and buildings,' in accordance with *ARR&R 2019 Book 6, Chapter 7 Figure 6.7.9 and Table 6.7.3.* Flows within the open drain itself are of a H5 hazard category, however are fully contained within the drain.

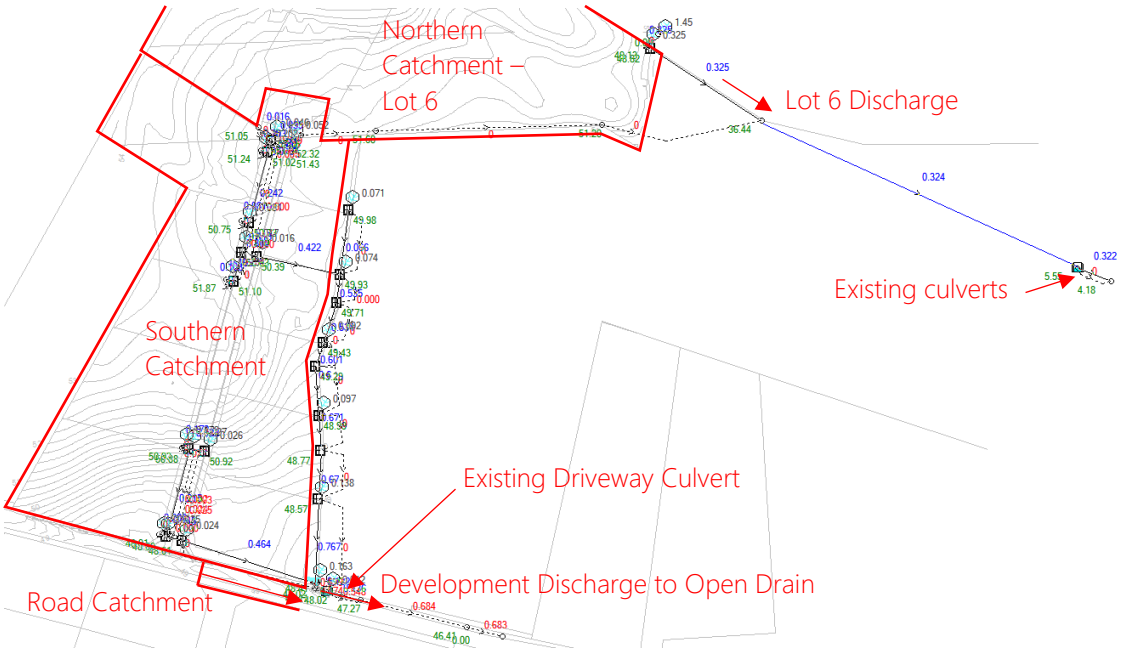


Figure 3 – DRAINS Stormwater Model – 2% AEP Storm Event

3.3. Additional Stormwater Considerations

Based on Brighton Council's feedback on previous iterations of the design and this report, the minimum acceptable level of service for the proposed detention basin is to cater for a 5% AEP event and show no overtopping of driveway roadside culverts. It is also not satisfactory for the detention basin to show flow through it's weir overflow outlet. It has been demonstrated the proposed detention basin exhibits both these two flaws therefore additional measures must be undertaken to satisfy these design criteria. Two prevailing options remain to be discussed in section 3.3.2 and 3.3.3. To provide a basis of comparison, details describing a full service basin are provided in section 3.3.1.

A summary of detention basin parameters for each scenario is shown in Table 1 below. Note that in all scenarios, the basin outlet remains twin Ø300 and upgrades in Cove Hill Road driveway culverts are required.

Table 1 – Detention Basin summary

Detention basin scenario	Level of service AEP	Volume (m^3)	Approximate Base Area (m^2)	Piped discharge (L/s)	Weir discharge (L/s)	Driveway Culvert overtopping (L/s)	Notes
Proposed in section 3.1.1.3	2% AEP	445	900	243	393	300	Does not comply with level of service requirement
Full service Basin proposed in 3.3.1	2% AEP	911	1500 - 1800	241	0	0	Compliance with full level of service
Acceptable service basin proposed in 3.3.2 - Footprint	5% AEP	597	1220	241	0	0	Compliance with acceptable level of service
Acceptable service basin proposed in 3.3.2 - Volume	5% AEP	764	1100	241	0	0	Compliance with acceptable level of service
Acceptable service basin + lot 5 detention proposed in 3.3.3	5% AEP	486	1000	241	0	0	Compliance with acceptable level of service
Lot 5 detention storage requirements proposed in 3.3.3	5% AEP	~ 100	~ 100	24	0	N/A	

3.3.1. Full Service Basin

To inform Council on the potential for any developer contribution to meet the shortfalls in the level of service provided by the proposed detention basin, an approximate sizing of the detention basin has been estimated that would be required to provide a full level of service, i.e. capacity up to the 2% AEP event.

If the capacity of the existing driveway culverts within Cove Hill Road are upgraded as described above, with a twin Ø300 basin outlet size, a total approximate basin size of 911 m^3 (based on an approximate surface area of 1500-1800 m^2 and increased ponding depth of 1m) would be required to achieve service up to the 2% AEP event flows.

3.3.2. Acceptable Service Basin – Increased volume

As stated previously, Brighton Council have indicated that the acceptable level of service for the detention basin is a 5% AEP storm event, with no overtopping of driveways. In assessing this scenario, the same approach as discussed for a full service basin was applied. In conducting this analysis, it was found that a basin of nominal 1230 m^3 would be sufficient to provide the acceptable level of service with no overtopping of driveways, equating to an overall footprint of 1900 m^2 and no increase in detention storage volume. Alternatively, an increase in average detention depth from 750 mm to 1.0 m was sufficient to achieve the acceptable level of service with no overtopping of driveways, however the respective increase in depth would require reconfiguration of the basin to suit steeper batter slopes, thus requiring an increase in footprint to maintain constructable batter slopes. It is anticipated that an increase of footprint of 20% would be required, to an overall footprint of 1680 m^2.

3.3.3. Acceptable Service Basin – Lot 5 OSD

This scenario was considered with the same overall drainage philosophy as the footprint increased scenario, with consideration of the 5% AEP storm, no overtopping of driveways, and inclusion of upgrades in Cove Hill Road to increase PSD. However, in this scenario Lot 5 has been considered to provide it's own separate stormwater detention system and is considered to be 10% pervious, giving a runoff flowrate generated from the lot of 39 L/s (down from 167 L/s), with the critical storm event being the 1.5 hour event, as opposed to the 5 minute event when considering the site as 90% impervious.

In this scenario, the peak discharge flowrate from the detention basin is 241 L/s from the underground culvert with an additional 30 L/s discharged for approximately 10 minutes over the weir of the detention basin into Cove Hill Road. By increasing detention storage volume by 10%, no weir overtopping was evident. As the net discharge from the detention basin is safely contained within the existing roadside table drain and proposed upgraded driveway culverts, this proposals 911 m^3 detention basin is satisfactory for detention storage. However, Lot 5 will require a detention basin to be constructed and installed to suit the final development of the site. Approximate detention basin requirements have been summarised in Table 1. The requirement for a detention basin can be enforced by way of a part 5 agreement or similar to be advised by Brighton Council.

We note that while the full service AEP has been identified as the 2% AEP event, the permissible site discharge for Lot 5 has been identified as 39 L/s for the AEP 5% event, due to the downstream capacity limitation of culverts in Cove Hill Road. Should a major storm event occur, overland flow will not enter the southern network, the detention basin, or Cove Hill Road where capacity is limited to the proposed upgraded driveway crossings. Instead, overland flow will follow the natural topography of the site directing flows to the east, flowing down Lot 6 into 122 Cove Hill Road, and pass under existing culverts in Cove Hill Road to enter the Jordan River.

4. STORMWATER QUALITY

The proposed development has been modelled using MUSICX software to analyse the effectiveness of the proposed stormwater network in reducing pollutants generated by the development. The effectiveness is to be measured against the standard requirements for pollutant reduction as outlined in Table 3 of *Tasmanian Stormwater Policy Guidance and Standards for Development 2021 v1* and as also summarised in Table 1 below.

It is understood that Council intends to place water sensitive urban design (WSUD) requirements upon each lot of the proposed subdivision for any future development with the requirement for this development being to provide WSUD stormwater treatment for the remaining areas only (road reserve). As such, this portion of the network only has been assessed for the purposes of determining the treatment train effectiveness.

It is also understood that Council may accept a partial cash contribution by the Developer to offset any shortfall in pollutant reduction achieved by the proposed stormwater network. A measure of % of the pollutant reduction target achieved has been provided in Table 1 to assist in determining the required Developer cash contribution. Figure 4 shows the configuration of the MUSICX model used for this development.

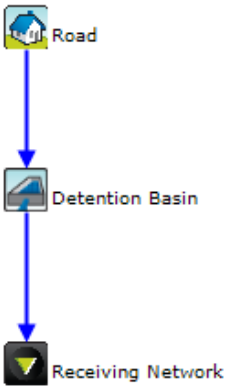


Figure 4 – MUSICX Model Configuration

Table 2 – MUSIC Analysis Results

	Sources	Residual Load	% Reduction	% Reduction Target (State Stormwater Strategy & Planning Scheme)	% of Reduction Target Achieved
Flow (ML/yr)	1.943	1.808	6.93	-	-
Total Suspended Solids (kg/yr)	646.9	37.02	94.3	80	117.9%
Total Phosphorus (kg/yr)	1.089	0.2404	77.9	45	173.1%
Total Nitrogen (TN)	4.602	2.715	41.0	45	91.1%
Gross Pollutants	82.5	0	100	90	111.1%

The required pollutant reduction targets are shown to have been achieved for TSS, TP and gross pollutants. TN requirements have not been met with approximately 91.1% of the required treatment provided by the proposed stormwater network only, which is expected to require a cash contribution by the Developer to compensate.

5. SUMMARY

It is proposed to subdivide three existing titles into 12 general industrial zoned lots along with an associated new road, stormwater management lot and required services infrastructure. A minor stormwater drainage network has been designed to accommodate flows for the 2% AEP storm event with a major stormwater network to accommodate flows up to the 1% AEP storm event. Due to the existing topography, the drainage network for the site has been divided into two catchments with two proposed discharge locations. A detention basin is proposed at the outlet for the southern catchment to limit flows below the capacity of the existing roadside drain in Cove Hill Road with the northern catchment proposed to discharge to an existing drainage course through the neighbouring property of 122 Cove Hill Road via a new easement. Options for separate detention increases or an increase to the overall basin footprint have been provided to increase the level of service provided by the proposed detention basin should they be required.

With the stormwater network and upgrades detailed in this report, it is proposed that stormwater runoff from the development can be accommodated within the existing and upgraded public stormwater infrastructure with a suitable level of hazard maintained. It is proposed and recommended that the detention storage be provided to a level of service to cater for the 5% AEP storm event as an acceptable level of service for the site, the detention basin be provided with 911 m^3 detention storage volume as currently shown on the proposal plans and Lot 5 be required to provide site specific detention as necessitated by downstream network limitations. It is also recommended that the downstream network in Cove Hill Road be upgraded to cater for an AEP 2% event underground by Brighton Council, to remove the need for detention storage for either Lot 5 or the development overall.

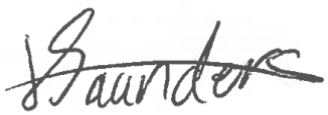
Stormwater WSUD requirements have been assessed with the proposed network shown to achieve the required pollutant removal targets for TSS, TP and gross pollutants. TN removal has not been fully met, with the Developer to provide a partial cash contribution to Council to offset the shortfall in pollutant removal.

6. RECCOMENDATIONS

Refer list of recommendations below:

- Design major and minor stormwater network generally in accordance with section 3.2.
- Install additional 5 of Ø375 culverts in Cove Hill Road driveway crossovers.
- Design detention basin to accommodate 5% AEP event as proposed in section 3.3.3
- Provision of Part 5 agreement or other enforcement mechanism for Lot 5 detention to be advised by Brighton Council.
- WSUD generally in accordance with Section 4 with developer cash contribution to compensate for Total Nitrogen reduction shortfall.

Yours Faithfully,



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MIDSON
traffic
pty ltd

Shaw Property Development

100 & 110 Cove Hill Rd, Bridgewater
Traffic Impact Assessment

May 2024

CELEBRATING 15 YEARS
2008 - 2023

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1. Introduction

1.1 Background

Midson Traffic were engaged by Shaw Property Development to prepare a traffic impact assessment for a proposed 14-lot subdivision development at 100 and 110 Cove Hill Road, Bridgewater.

1.2 Traffic Impact Assessment (TIA)

A traffic impact assessment (TIA) is a process of compiling and analysing information on the impacts that a specific development proposal is likely to have on the operation of roads and transport networks. A TIA should not only include general impacts relating to traffic management, but should also consider specific impacts on all road users, including on-road public transport, pedestrians, cyclists and heavy vehicles.

This TIA has been prepared in accordance with the Department of State Growth (DSG) publication, *Traffic Impact Assessment Guidelines*, August 2020. This TIA has also been prepared with reference to the Austroads publication, *Guide to Traffic Management,* Part 12: *Traffic Impacts of Developments*, 2019.

Land use developments generate traffic movements as people move to, from and within a development. Without a clear understanding of the type of traffic movements (including cars, pedestrians, trucks, etc), the scale of their movements, timing, duration and location, there is a risk that this traffic movement may contribute to safety issues, unforeseen congestion or other problems where the development connects to the road system or elsewhere on the road network. A TIA attempts to forecast these movements and their impact on the surrounding transport network.

A TIA is not a promotional exercise undertaken on behalf of a developer; a TIA must provide an impartial and objective description of the impacts and traffic effects of a proposed development. A full and detailed assessment of how vehicle and person movements to and from a development site might affect existing road and pedestrian networks is required. An objective consideration of the traffic impact of a proposal is vital to enable planning decisions to be based upon the principles of sustainable development.

This TIA also addresses the relevant clauses of C2.0, *Parking and Sustainable Parking Code*, and C3.0, *Road and Railway Assets Code*, of the Tasmanian Planning Scheme – Brighton, 2021.

1.3 Statement of Qualification and Experience

This TIA has been prepared by an experienced and qualified traffic engineer in accordance with the requirements of Council's Planning Scheme and The Department of State Growth's, *Traffic Impact Assessment Guidelines*, August 2020, as well as Council's requirements.

The TIA was prepared by Keith Midson. Keith's experience and qualifications are briefly outlined as follows:

- 27 years professional experience in traffic engineering and transport planning.
- Master of Transport, Monash University, 2006
- Master of Traffic, Monash University, 2004

- Bachelor of Civil Engineering, University of Tasmania, 1995
- Engineers Australia: Fellow (FIEAust); Chartered Professional Engineer (CPEng); Engineering Executive (EngExec); National Engineers Register (NER)

1.4 Project Scope

The project scope of this TIA is outlined as follows:

- Review of the existing road environment in the vicinity of the site and the traffic conditions on the road network.
- Provision of information on the proposed development with regards to traffic movements and activity.
- Identification of the traffic generation potential of the proposal with respect to the surrounding road network in terms of road network capacity.
- Review of the parking requirements of the proposed development. Assessment of this parking supply with Planning Scheme requirements.
- Traffic implications of the proposal with respect to the external road network in terms of traffic efficiency and road safety.

1.5 Subject Site

The subject site is located at 100 and 110 Cove Hill Road, Bridgewater. The land is zoned 'general industrial' and the site is currently a vacant lot.

The subject site and surrounding road network is shown in Figure 1.

Figure 1 Subject Site & Surrounding Road Network

Image Source: LIST Map, DPIPWE

1.6 Reference Resources

The following references were used in the preparation of this TIA:

- Tasmanian Planning Scheme - Brighton, 2021 (Planning Scheme)
- Austroads, *Guide to Traffic Management,* Part 12: *Traffic Impacts of Developments*, 2019
- Austroads, Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections, 2021
- Department of State Growth, *Traffic Impact Assessment Guidelines*, 2020
- Roads and Maritime Services NSW, *Guide to Traffic Generating Developments*, 2002 (RMS Guide)
- Roads and Maritime Services NSW, *Updated Traffic Surveys,* 2013 (Updated RMS Guide)
- Australian Standards, AS2890.1, *Off-Street Parking*, 2004 (AS2890.1)

2. Existing Conditions

2.1 Transport Network

For the purposes of this report, the transport network consists of Cove Hill Road only.

Cove Hill Road is a collector road that connects between East Derwent Highway at its western end and Briggs Road at its eastern end; a distance of approximately 4.7-kilometres. It provides access to commercial and industrial properties along its length (including Cove Hill Fair shopping centre). It has a sealed pavement width of approximately 6 metres and the posted speed limit is 60-km/h near the subject site. Cove Hill Road carries approximately 2,700 vehicles per day[1].

Cove Hill Road near to the subject site is shown in Figure 2.

Figure 2 Cove Hill Road

2.2 Road Safety Performance

Crash data can provide valuable information on the road safety performance of a road network. Existing road safety deficiencies can be highlighted through the examination of crash data, which can assist in determining whether traffic generation from the proposed development may exacerbate any identified issues.

Crash data was obtained from the Department of State Growth for a 5+ year period between 1st January 2018 and 30th March 2023 for the full length of Cove Hill Road.

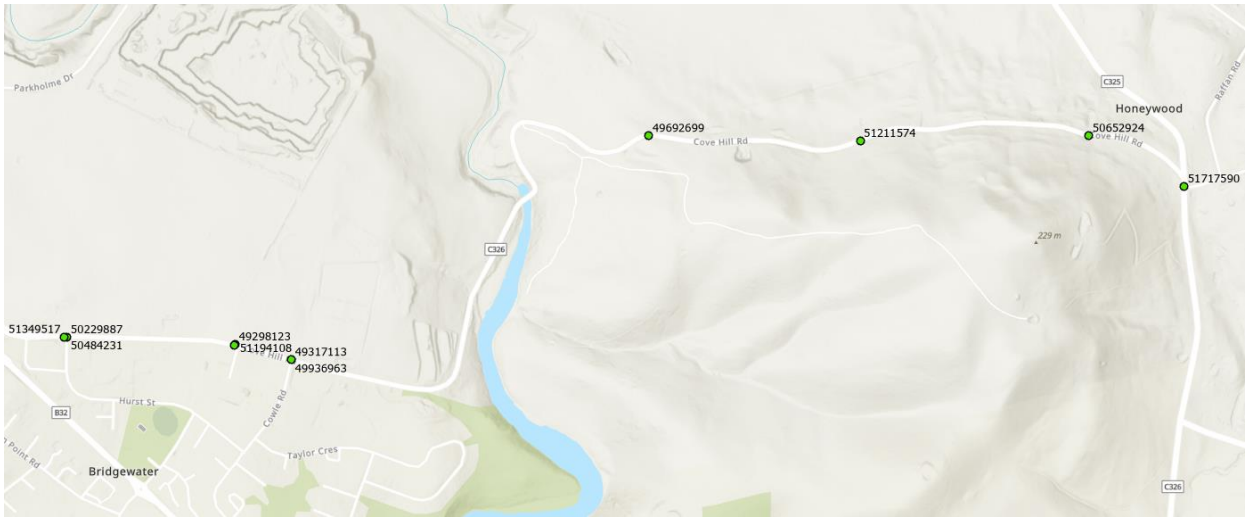
The findings of the crash data is summarised as follows:

[1] Estimated from Brighton Council traffic data: 2,522 vpd near 55 Cove Hill Road – assuming 2% per annum growth results in a 2024 volume of 2,700 vehicles per day.

- A total of 11 crashes were reported.
- Severity. 2 crashes resulted in serious injury; 2 crashes resulted in minor injury; 1 crash involved first aid at the scene; 6 crashes involved property damage only.
- Time of day. A total of 8 crashes were reported between 9:00am and 6:00pm. 1 crash was reported prior to 7:00am and 2 crashes were reported after 7:00pm.
- Day of week. 3 crashes were reported on Mondays; 2 crashes were reported on Tuesdays, Saturdays and Sundays; 1 crash was reported on a Wednesday and a Thursday; no crashes were reported on Fridays.
- Crash types. 2 crashes involved 'cross-traffic' collisions; 2 crashes involved 'other-curve' collisions; various other crashes were reported with no clear crash trends noted.
- Crash locations. Crashes were distributed relatively evenly along Cove Hill Road. 2 crashes were reported at the Cowle Road intersection; 2 crashes were reported at the Hurst Street intersection; 1 crash was reported at the Briggs Road intersection; 5 crashes were reported at midblock locations; 1 crash was reported in an off-road location. The crash locations are shown in Figure 3.
- Vulnerable road users. No crashes involved vulnerable road users (pedestrians, cyclists or motorcyclists).

The crash data does not provide an indication that there are any pre-existing road safety issues that may be exacerbated by traffic generated by the proposed development.

Figure 3 Crash Locations



Source: Department of State Growth

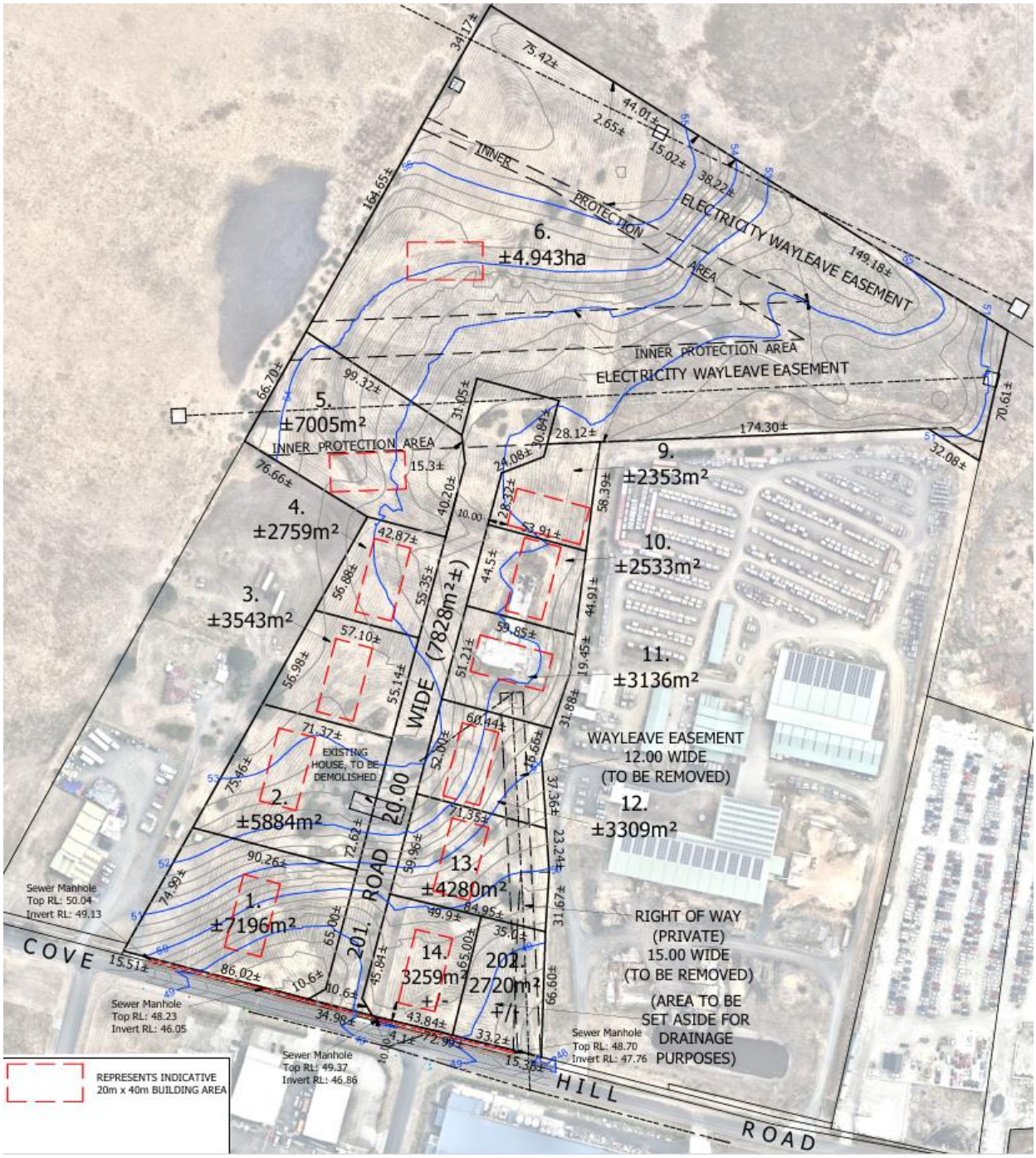
3. Proposed Development

3.1 Development Proposal

The proposed development is a 12-lot industrial subdivision (11 lots with balance of land). A new cul-de-sac road will connect the lots to Cove Hill Road. A new T-junction is proposed at Cove Hill Road.

The proposed development is shown in Figure 4.

Figure 4 Proposed Subdivision Development Plan



4. Traffic Impacts

4.1 Trip Generation

Traffic generation rates were sourced from the Roads and Traffic Authority of NSW publication, *Guide to Traffic Generating Developments,* 2002 (RTA Guide). The RTA Guide provides the following equations for the peak hour traffic generation of Business Parks:

- Equation (a)

  Peak hour vehicle trips (PVT) = 1.1 vehicles per hour two-way per 100m^2 of total gross leasable floor area.

- Equation (b)

  Peak hour vehicle trips (PVT) = 1.2 vehicles per hour two-way per 100m^2 of gross leasable office/ showroom area + 1.0 vehicle per hour two-way per 100m^2 of gross leasable factory/ warehouse area.

The RTA Guide also provides a rate for service vehicle trips:

- Peak service vehicle trips

  Peak service vehicle trips (PSVT) = 0.5 vehicles per hour two-way per 100m^2 of gross leasable factory/ warehouse area.

The total gross leasable floor area is expected to be in the order of 11,200m^2 (assuming an average building area of 800m^2 per lot). This results in a traffic generation as follows:

- Peak hour vehicle trips (PVT) = 123 vehicles per hour (equation a)
- Peak service vehicle trips (PSVT) = 55 trucks per hour (45% of total trips)

The proposed industrial subdivision is likely to generate in the order of 1,200 vehicles per day based on the total site area and peak hour rates set out in the RTA Guide when fully developed. Noting the this includes the future development of the balance of subdivision, which is likely to provide a total lot yield of 14 industrial lots.

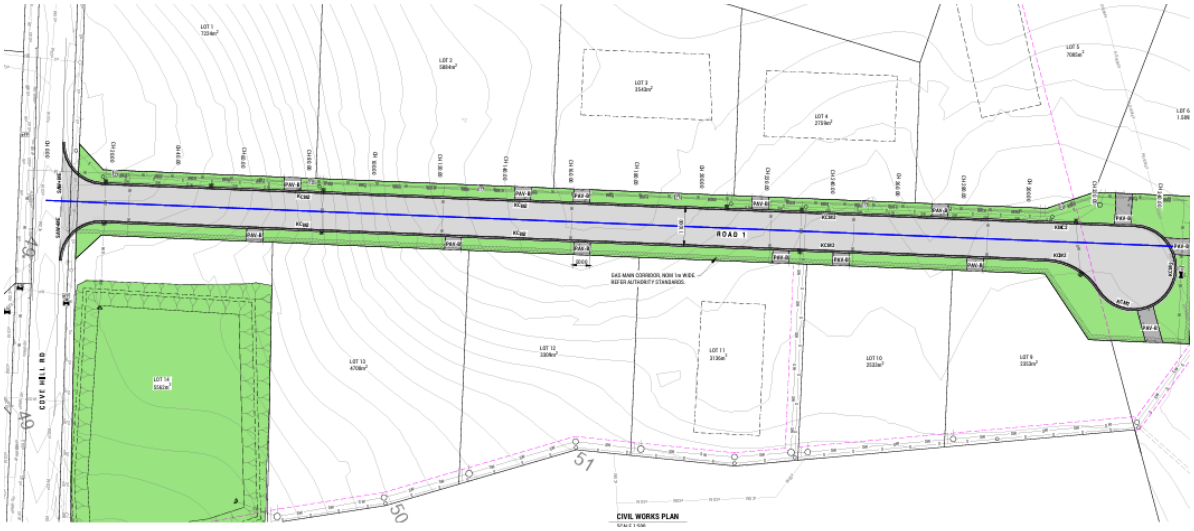
4.2 Trip Assignment

Based on the connectivity of the site with the arterial road network, the majority of traffic will access the site via left-in/ right-out manoeuvres.

4.3 Access Impacts

The subdivision will require a new T-junction to be constructed at Cove Hill Road. The access junction and internal road design are shown in Figure 5.

Figure 5 Junction and Internal Road Design



Assuming an 80% distribution of traffic generated travelling to/ from East Derwent Highway, the peak hour turning movements at the subdivision's access is summarised in Table 1.

Table 1 Subdivision Access Junction Peak Turning Movements

Peak	Left-In	Right-In	Left-Out	Right-Out
AM Peak	69 vph	17 vph	7 vph	29 vph
PM Peak	20 vph	6 vph	17 vph	78 vph

The proposed T-junction at Cove Hill Road will operate at a high level of efficiency based on the turning movements calculated in Table 1.

4.4 Network Capacity Impacts

The proposed development has the potential to generate approximately 1,200 vehicles per day, with a peak of 123 vehicles per hour. The existing traffic volume of Cove Hill Road is estimated to be 2,700 vehicles per day.

The traffic generated by the proposed development can be absorbed by Cove Hill Road, noting that the peak of 123 vehicles per day represents an average of slightly more than 2 vehicles every minute. The existing peak flow of traffic on Cove Hill Road results in a high level of service, which will continue when the additional traffic is included from the proposed subdivision.

It is noted that there are several nearby developments that will also increase the traffic volume on Cove Hill Road[2]. The potential traffic volume increase of these development will be in the order of 2,100 vehicles per day on Cove Hill Road.

Whilst the width and construction of Cove Hill Road is considered adequate and appropriate for current traffic volumes (including the traffic generated by the proposed development), the road width adjacent to the site is less than the width to the east of the site (approximately 7.5 metres compared to approximately 10.5 metres). It is recommended that Cove Hill Road be widened at a future stage to enable a consistent road width that is compatible with the function of the road and its future traffic volumes.

4.5 Internal Road Assessment

The subdivision road will connect at a new T-junction at Cove Hill Road. The layout of the internal road network consists of a single cul-de-sac that will ensure a low-speed environment, with good connectivity to the external road network. The infrastructure design is shown in Figure 5.

Council relies on the design criteria of LGAT Tasmanian Standard Drawings and Subdivision Guidelines, 2020. The requirements for residential subdivision roads are reproduced in Table 2. The following standards are applicable for the internal road network:

- Road design should be in accordance with Austroads Guidelines.
- LGAT Standard Drawings and Tasmanian Subdivision Guidelines.

Table 2 LGAT Standard Drawings – Industrial Road Requirements

ROAD CLASS	ROAD TYPE	ROAD LENGTH / NUMBER OF TENEMENTS	MINIMUM ROAD WIDTH	MINIMUM RESERVATION WIDTH	MINIMUM FOOTPATH REQUIREMENTS
3 – Collector	Through Road	Detail design required			
4 – Local	Through Road or Cul-De-Sac	Lot Size < 10,000m^2	11.0m	18.0m	(Refer note)
		Lot Size ≥ 10,000m^2	10.0m	18.0m	(Refer note)

In this case the cul-de-sac is a 'local' road that services lots of varying sizes, some of which exceed 10,000m^2. The minimum road reservation width is therefore 18 metres. The proposed reservation width is 20 metres, thus satisfying the LGAT design requirements. The minimum sealed pavement width is 11 metres.

[2] Recent developments include: 76 Cove Hill Rd precast yard (228vpd); stage 1, 115 Cove Hill Rd (550 vpd); 115 Cove Hill Rd (1,005 vpd); 115 Cove Hill Rd (part of stage 1) (302 vpd).

The junction design and cul-de-sac head designs also comply with LGAT design requirements.

4.6 Sight Distance

Austroads Part 4A provides guidelines for the provision of sight distance at a road junction. Safe Intersection Sight Distance (SISD) is the minimum sight distance which should be provided on the major road at any intersection. SISD provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle on a minor road approach moving into a collision situation (e.g. in the worst case, stalling across the traffic lanes), and to decelerate to a stop before reaching the collision point. All possible conflict points arising from vehicles entering from the minor road should be assessed.

For an 85th percentile speed of 60-km/h (assuming the design speed is equal to the posted speed limit), the required SISD at the proposed junction is 123 metres.

The available sight distance at the proposed access junction exceeds 250 metres in both directions along Cove Hill Road and therefore complies with the Austroads SISD requirements.

4.7 Road Safety Impacts

No significant adverse road safety impacts are foreseen for the proposed development. This is based on the following:

- There is sufficient spare capacity in Cove Hill Road and the surrounding road network to absorb the peak hour traffic generated from the proposed development. The traffic generation is estimated to be 123 vehicles per hour peak periods which can be adequately absorbed in the network without any loss of efficiency.
- The existing road safety performance of Cove Hill Road near the subject site does not indicate that there are any specific road safety deficiencies that might be exaggerated by traffic generated by the proposed development.
- The proposed new junction is located in a predominantly commercial and industrial area. As such, vehicle movements into and out of the site will not be seen as 'unusual' for motorists. The junction is located with good spacing between nearby junctions, thus minimising potential vehicular conflicts.
- There is adequate sight distance from the access for the prevailing vehicle speeds on Cove Hill Road in accordance with AS2890.1 requirements (refer to Section 4.6).
- The design of the proposed road junction is consistent with and compatible with other road junctions along Cove Hill Road near the subject site.

5. Conclusions

This traffic impact assessment (TIA) investigated the traffic and parking impacts of a proposed 12-lot industrial subdivision development at 100 & 110 Cove Hill Road, Bridgewater.

The key findings of the TIA are summarised as follows:

- The industrial subdivision includes 11 lots and balance of land.
- The traffic generation of the development is likely to be 1,200 vehicles per day, with a peak of 123 vehicles per hour. This is based on the full development of the full site, including the balance of land (estimated to be 14-lots in the future)
- The proposed T-junction will operate safely and efficiently based on the likely turning movements at the junction and the existing flow on Cove Hill Road.
- The available sight distance complies with Austroads SISD requirements in both directions along Cove Hill Road from the proposed subdivision T-junction.
- The width and construction of Cove Hill Road is considered adequate and appropriate for current traffic volumes. It is recommended that Cove Hill Road be widened at a future stage to enable a consistent road width that is compatible with the function of the road and its future traffic volumes, noting a forecast traffic growth of Cove Hill Road as a result of multiple developments in various stages of approval/ construction.
- The design of the internal road network complies with the requirements of LGAT standard drawings.

Based on the findings of this report the proposed development is supported on traffic grounds.

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Document Status

Revision	Author	Review	Date
0	Keith Midson	Zara Kacic-Midson	14 August 2023
1	Keith Midson	Zara Kacic-Midson	6 February 2024
2	Keith Midson	Zara Kacic-Midson	19 March 2024
3	Keith Midson	Zara Kacic-Midson	8 May 2024

WOOLCOTT SURVEYS

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CONSULTING SURVEYORS & LAND PLANNERS

BUSHFIRE HAZARD REPORT

12 Lot Subdivision

100 & 110 Cove Hill Road, Bridgewater

May 2024

Job number: L230127
Prepared by: James Stewart (james@woolcottsurveys.com.au)
Town Planner & Bushfire Hazard Practitioner 157

Rev. no	Description	Date
1	FINAL	01/09/2023
2	UPDATE	05/12/2023
3	UPDATE – Revised layout	08/05/2024

Disclaimer
This report deals with the potential bushfire risk only, all other statutory assessments sit outside of this report. This report is not to be used for future or further development on the site, other then what has been specifically provided for in the certified plans attached. Woolcott Surveys Pty Ltd accepts no responsibility to any purchaser, prospective purchaser or mortgagee of the property who in any way rely on this report. This report sets out the owner's requirements and responsibilities and does not guarantee that buildings will survive in the event of a bushfire event. If characteristics of the property change or are altered from those which have been identified, the BAL classification may be different to that which has been identified as part of this report. In this event the report is considered to be void.

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Executive Summary

Development of a 12-lot subdivision is proposed for 100 and 110 Cove Hill Road, Bridgewater. The subdivision consists of 12 industrial lots, a road lot and a drainage lot. The development will be completed in one stage. Access to lots will be off Cove Hill Road.

The site is entirely within the boundary of a bushfire prone area shown on an overlay of a planning scheme map for the *Tasmanian Planning Scheme – Brighton*. A bushfire event at this site or within the immediate area is likely to impact on future buildings at this location and subject development to considerable radiant heat and ember attack.

A bushfire hazard management plan has been prepared and is provided as an appendix to this report. The plan sets out the owner's responsibilities to maintain a managed area for each lot, taking into consideration the relevant requirements under Australian Standard *AS3959-2018 Construction of buildings in bushfire-prone areas*.

Conclusions and recommendations

a) Hazard management areas meeting the requirements of BAL LOW can be achieved for lots 1, 2, 3, 4, 10, 11, 12, 13, and 14. Minimum BAL 19 requirements can be achieved for lots 5, 6 and 9.
b) Lot 202 is assessed as insufficient increase in risk to warrant bushfire protection measures. This lot is a drainage lot which will be set aside for drainage purposes.
c) Future development on lots 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, & 14 must maintain Hazard Management Areas and follow recommendations as outlined in the Bushfire Hazard Management Plan and section 5.2 of this report. Maintenance of these hazard management areas is to be in perpetuity.
d) The proposed road must be in compliance with Table C13, Element A, outlined in section 5.3 of this report.
e) Prior to the sealing of a final plan, the entire site must be maintained as a bushfire hazard management area.
f) New hydrants are required in accordance with the TasWater Supplement to Water Supply Code of Australia WSA 03-2011-3.1 MRWA Edition 2:0. Hydrants to have a separation of not more than 60m.

Signed:

Author: James Stewart
Accreditation No: BFP-157

Table of Contents

1. Introduction

This Bushfire Hazard Report and Bushfire Hazard Management Plan (BHMP) has been prepared in support of a proposed 12 lot industrial subdivision at 100 & 110 Cove Hill Road, Bridgewater.

1.1 The subject site

The following is a summary of the application information:

Property address	100 & 110 Cove Hill Road, Bridgewater.
Certificate of title	CT136905/2, CT150349/1, CT150349/2
Property ID (PID)	2658252, 2184712.
Property Owners	Womma Road Pty Ltd.
Existing Use and Development	Existing Dwelling and Outbuildings.
Existing Zoning	General Industrial
Planning Scheme	Tasmanian Planning Scheme – Brighton
Identified on a Bushfire Overlay Map	Yes
Priority Habitat identified	No
Proposed Works	12 Lot subdivision, road, and services infrastructure.
Water Supply	Reticulated water supply
Vehicular Access	Cove Hill Road (Council maintained road)

1.2 Bushfire Assessment

A bushfire assessment is a process of analysing information about the potential impacts on a proposed development that is likely to occur in a bushfire hazard scenario. A 'bushfire-prone area' is an area where a bushfire event is potentially likely to occur, and that may result in significant adverse impact on buildings and/or lives.

In Tasmania, most local Councils have a planning scheme overlay map that identifies bushfire-prone areas. Subdivision within a bushfire-prone area triggers the assessment of the Bushfire-Prone Areas Code under the planning schemes and subsequently requires assessment against the provisions of the Code. The assessment generally requires a BHMP to be provided as part of the application.

The bushfire assessment will determine the Bushfire Attack Level (BAL) for the future lots, which measures the possible exposure of a building to bushfire hazard. The BAL is assessed in accordance with Australian Standard *AS 3959-2018 construction of buildings in bushfire-prone areas.*

The subject site falls within the municipal area of Brighton. The assessment has been undertaken in accordance with C13.0 Bushfire-Prone Areas Code and to accompany a subdivision application under the *Tasmanian Planning Scheme – Brighton.* Please refer to Section 6 of the report for detail.

A BAL assessment is required to understand the fuel management requirements for the subject site and to demonstrate that future new buildings within each proposed new lots can be constructed to a BAL19 level under the *Building Act 2016*.

1.3 References

The following documents were referred in the preparation of, and should be read in connection with, this bushfire assessment report:

- Tasmanian Government, C13.0 – Bushfire-Prone Areas Code
- Tasmanian Government, Director's Determination – Bushfire Hazard Areas: Version 1.0.
- Australian Standard, AS3959-2018 construction of buildings in bushfire-prone areas.
- Building Act 2016 & Building Regulations 2016
- Tasmanian Fire Service, Bushfire Hazard Advisory Notes

2. Site Description

2.1 Site context

A 12-lot subdivision is being undertaken at 100 and 110 Cove Hill Road, Bridgewater. The subdivision will be undertaken in one stage. The site consists of three generally irregular shaped titles, which has a total area of 10.4ha.

The site currently contains an existing single dwelling and outbuildings, all of which be demolished as part of the subdivision works. The remainder of the land currently consists of grassland.

The block of land is located on the northern side of the Bridgewater township. Land to the east, south and west is generally industrial in nature. The Bridgewater Quarry operates to the north and north west of the subject site.

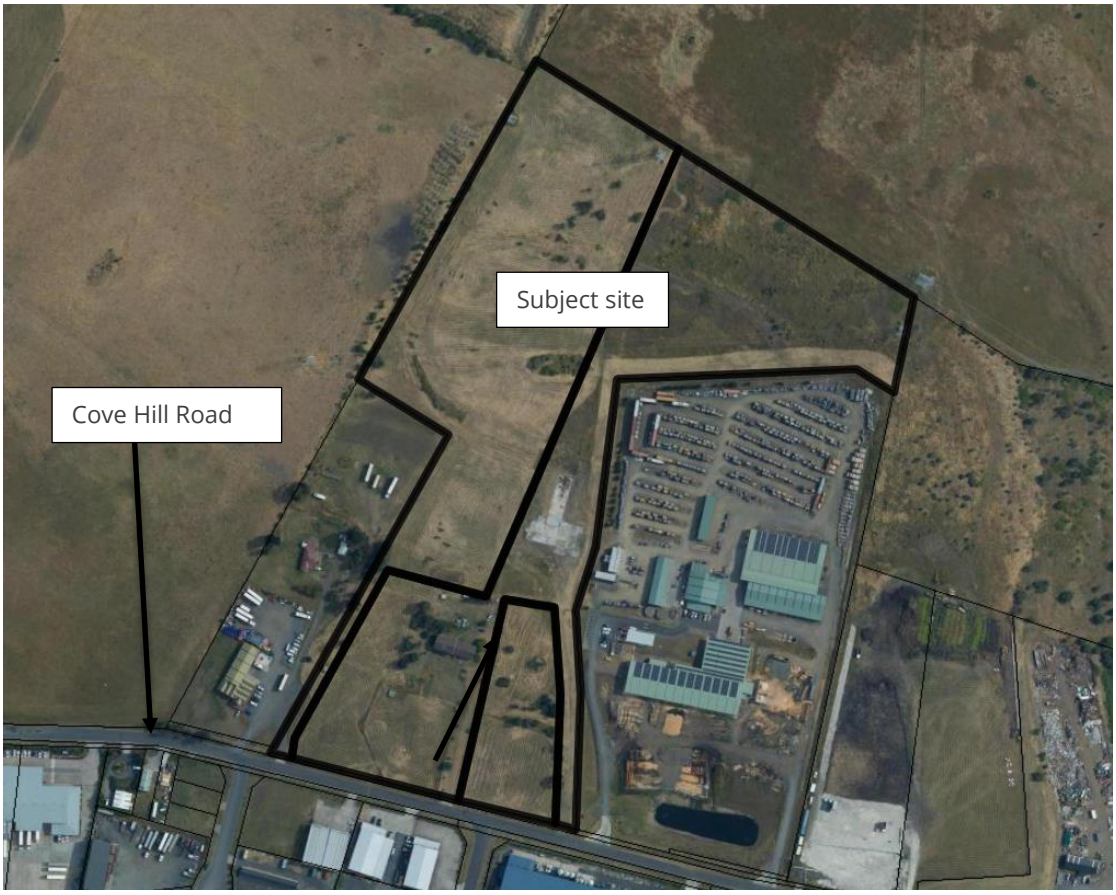

Figure 1 – Aerial view of the subject site and its surrounding area (source: The LISTMAP)

The subject site will be serviced by a reticulated water supply maintained by TasWater. There are currently hydrants located on Cove Hill Road.

2.2 Planning controls

The site is within the municipal area of the Brighton Council. Therefore, the planning instrument is the *Tasmanian Planning Scheme – Brighton* (the Scheme).

The subject site is currently within the General Industrial Zone.

The subject site adjoins the General Industrial Zone to the north, east and west. The light industrial zone is located to the south

The subject site also entirely falls within the Bushfire-Prone Areas Overlay, and within the Bridgewater Quarry overlay.

Figure 2 – Zoning Map (source: The LISTMAP)

3. The Proposal

It is proposed to subdivide the subject site into 12 industrial lots. The lots are intended for industrial development, ranging from 2353m^2 to 4.9ha in size. A new road will provide vehicular access off Cove Hill Road. All lots will be connected to reticulated water, sewer, and stormwater. The proposal includes a detention basin (lot 202) which will not be developed for industrial purposes.

Figure 3 – Proposed subdivision layout. Refer to Annexure 2 for detail.

4. Bushfire Site Assessment

4.1 Vegetation Analysis

4.1.1 TasVeg Mapping

The TasVeg map 4.0 provides general information indicating potential bushfire prone vegetation in the area.

The mapping shows the vegetation community across the subject site as FAG, being agricultural land, and FUR, being Urban Land. This is consistent with the characteristics of the subject site as grassland.

The development industrial land to the east and was appropriately classified as FUR (urban), while the land associated with the undeveloped portions of the quarry were shown as Agricultural Land. The existing quarry was shown as FUM, which was considered a modified site due to the presence of the quarry. The mapping was generally an accurate depiction of the subject site.

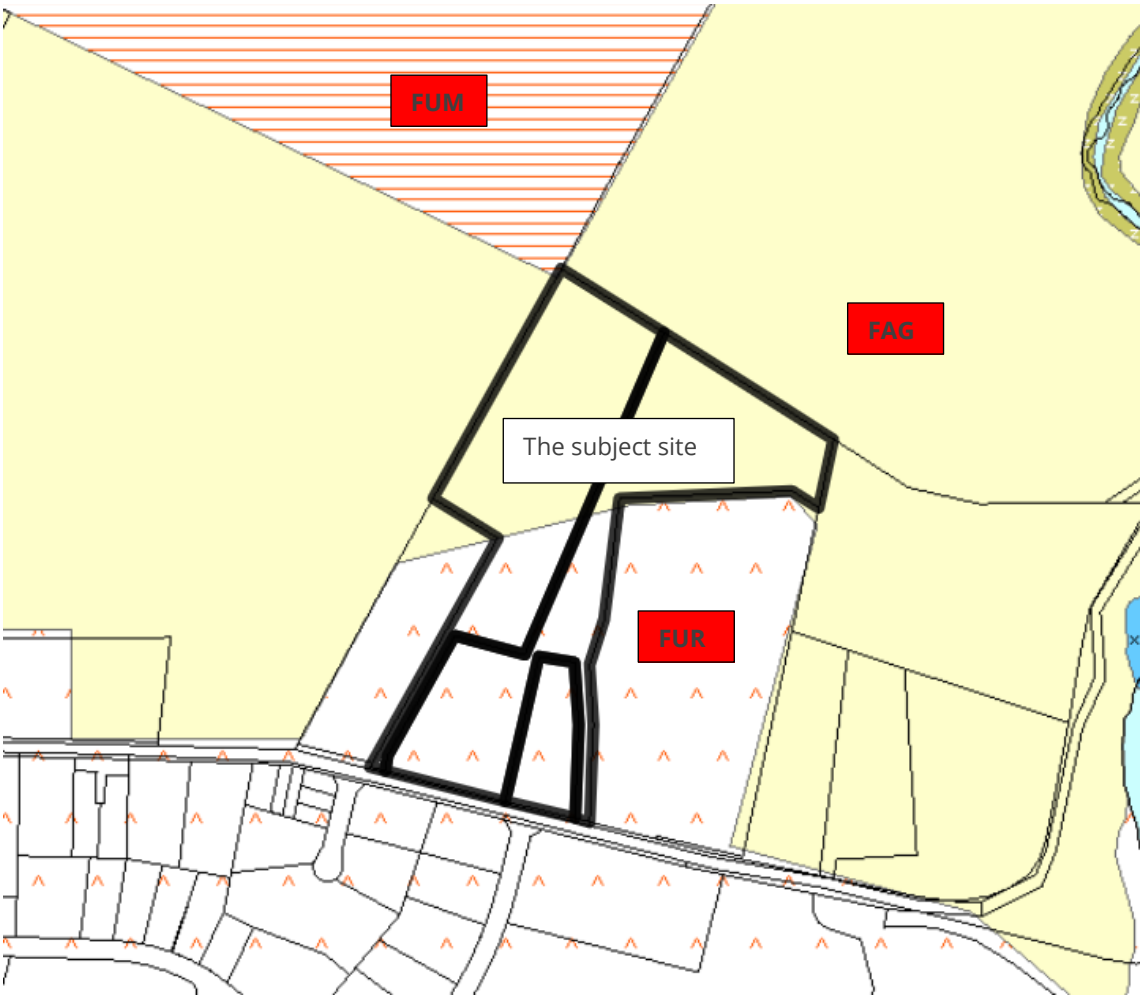

Figure 4 – TasVeg 4.0 map (source: The LISTMap)

4.1.2 Vegetation Type and Separation

A site visit was conducted on the 25th of August 2023. An analysis of the land and bushfire prone vegetation within 120m from the subject site is provided below.

Direction	Analysis
North	Land to the north was a combination of managed and grassland. The existing quarry in the north west of the adjoining site was classified as managed, while the undeveloped portions of agricultural land to the north east were classified as grassland. There was no evidence of management on the grassland portions of the adjoining site.
East	Land to the east was classified as managed and grassland. The adjoining timberyard was classified as managed land, while the vacant agricultural land to the north east was classified as grassland.
South	Managed 100+ metres.
West	The site was classified as grassland for 100m+.

Figure 5 – Vegetation analysis within 120m of site.

4.2 Slope Analysis

Figure 6 below shows the effective slope which is the slope of land under the classified vegetation **in relation to** the subject site.

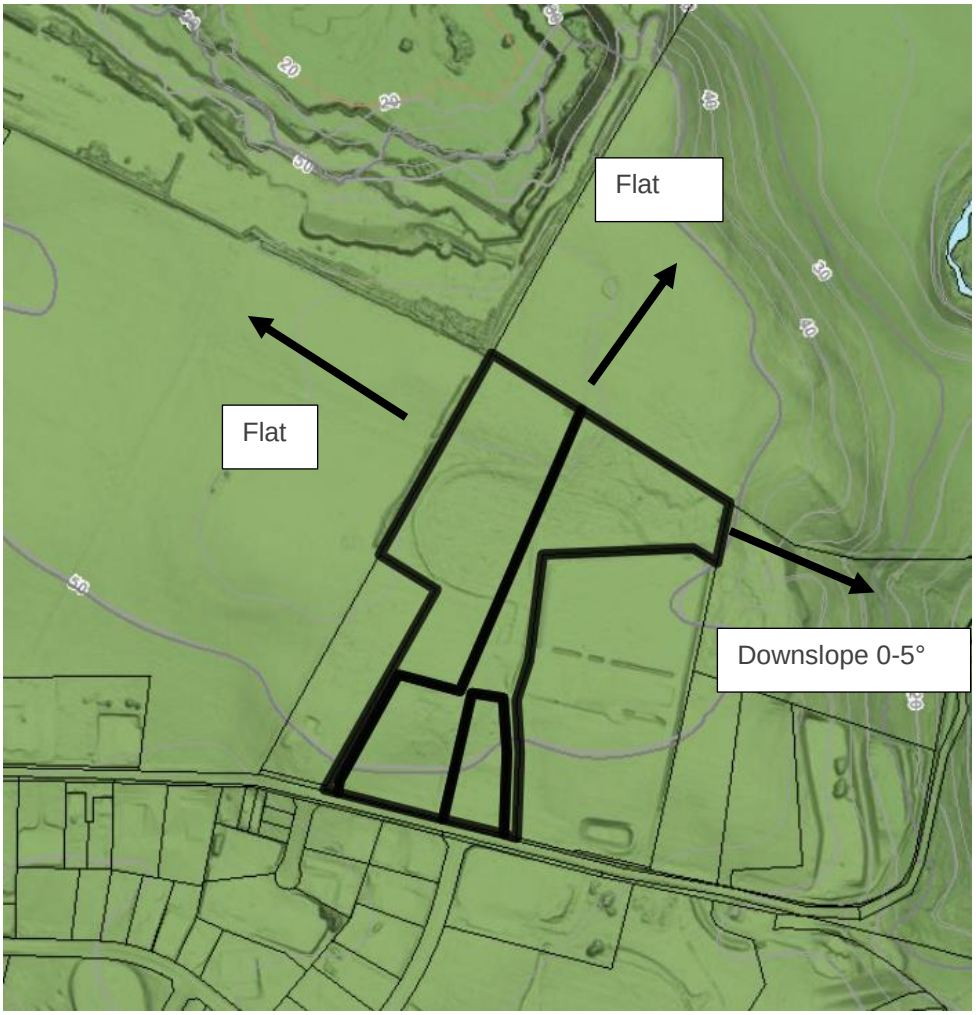

Figure 6 – Effective slope of site and surrounding bushfire prone vegetation.

4.3 Photos

Figure7 – Looking east at adjoining managed land

Figure 8 – Looking north east at adjoining grassland. Classified as downslope

Figure 9 – Looking north at adjoining grassland.

Figure 10 – Looking west at adjoining grassland.

Figure 11 – Looking across the subject site.

Figure 12 – Looking at managed land adjoining lots 3 and 4.

5. Bushfire Protection Measures

5.1 BAL Rating and Risk Assessment

The purpose of the BAL assessment is to identify the minimum separation between the bushfire prone vegetation and a building area within each proposed lot. The assessment aims to achieve the minimum requirements of **BAL 19**.

The definition of BAL 19 and 12.5 are highlighted as follows:

Bushfire attack level (BAL)	**Predicted bushfire attack and exposure level**
BAL-LOW	Insufficient risk to warrant specific construction requirements
BAL-12.5	Ember attack, radiant heat below 12.5kW/m^2
BAL-19	Increasing ember attack and burning debris ignited by windborne embers together with increasing heat flux between 12.5-19kW/m^2
BAL-29	Increasing ember attack and burning debris ignited by windborne embers together with increasing heat flux between 19-29kW/m^2
BAL-40	Increasing ember attack and burning debris ignited by windborne embers together with increasing heat flux between 29-40kW/m^2
BAL-FZ	Direct exposure to flames radian heat and embers from the fire front.

The distances from each lot to the classified vegetation is presented below, along with the slope and type of vegetation. To better demonstrate the required separation as hazard management areas, a 20m x 30m indicative building area is shown on each lot.

Lots 1-4, and 10-14 are assessed as BAL LOW, being over 50m from grassland, and over 100m from other Bushfire Prone vegetation. Subsequently, these lots have not been included in the below analysis.

Lot 5	**North**	**East**	**South**	**West**
Vegetation within 100m of site	0m -100m+ Managed	0m -100m+ Managed	0m -100m+ Managed	0m -10m Managed 10m-100m+ Grassland
Slope (degrees, over 100m)	NA	NA	NA	Flat
BAL 19 Setbacks	No setback requirement	No setback requirement	No setback requirement	10m
BAL 12.5 Setbacks	No setback	No setback	No setback	14m

	requirement	requirement	requirement	

Lot 6	North	East	South	West
Vegetation within 100m of site	0m -10m Managed 10m-100m+ Grassland	0m -10m Managed 10m-100m+ Grassland	0m -10m Managed 10m-100m+ Grassland	0m -10m Managed 10m-100m+ Grassland
Slope (degrees, over 100m)	Flat	Flat	Flat	Flat
BAL 19 Setbacks	10m	10m	10m	10m
BAL 12.5 Setbacks	14m	14m	14m	14m

Lot 9	North	East	South	West
Vegetation within 100m of site	0m -10m Managed 10m-100m+ Grassland	0m -100m+ Managed	0m -100m+ Managed	0m -100m+ Managed
Slope (degrees, over 100m)	Flat	NA	NA	NA
BAL 19 Setbacks	10m	No setback requirement	No setback requirement	No setback requirement
BAL 12.5 Setbacks	14m	No setback requirement	No setback requirement	No setback requirement

5.2 Hazard Management Areas

As outlined in *C13.0 Bushfire-Prone Areas Code*, a Bushfire Hazard Management Area (BHMA) will be managed in accordance with the provided plan. Existing vegetation needs to be strategically modified and then maintained within this area in accordance with the BHMP to achieve the following outcomes:

- to reduce the quantity of windborne sparks and embers reaching buildings;
- to reduce radiant heat at the building; and
- to halt or check direct flame attack.

The BHMA will be developed within and up to the property boundaries to provide access to a fire front for firefighting, which is maintained in a minimal fuel condition and in which there are no other hazards present that will significantly contribute to the spread of a bushfire.

The BHMA will be achieved by adoption of the following strategies:

Maintenance of Fuel Management Areas

It is the responsibility of the property owner to maintain and manage the landscaping in accordance with the Bushfire Hazard Management Plan and the current Guidelines for Development in Bushfire-Prone Areas of Tasmania.

This area is to be regularly managed and maintained. Landscaping in this area will be minimised:

- Grass maintained to a maximum height of 100mm, with fuel loads kept to less than 2 tonnes per hectare which will be maintained at this level.
- Trees and any undergrowth will be clear of (BCA) class 1 – 9 buildings on all sides.
- All undergrowth and understorey of trees (up to 2m) will be removed within the bushfire hazard management area.
- Select larger trees can be retained within the BHMA, ensuring a minimum 5m canopy separation is provided between each established tree.
- Pathways to 1 metre surrounding the buildings and landscaping material, will be non-combustible (stone, pebbles etc.).
- The total shrub cover will be a maximum of 20% of the available area.
- There will be a clear space from the buildings of at least four (4) times the mature height of any shrubs planted.
- Shrubs will not be planted in clumps; this is to avoid build-up of debris and dead vegetation materials.

Landscaping

- vegetation along the pathways to comprise non-flammable style succulent ground cover or plants (avoid plants that produce fine fuel which is easily ignited, plants that produce a lot of debris, trees and shrubs which retain dead material in branches or which shed long strips of bark, rough fibrous bark or drop large quantities of leaves in the spring and summer, vines on walls or tree canopies which overhang roofs)
- timber woodchip and flammable mulches cannot be used and brush and timber fencing should be avoided where possible

5.3 Roads

Table C13.1 - Roads must be constructed as per the following table. The road is required to be constructed as part of the subdivision works.

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

5.4 Access

Table C13.2 Private access roads must be constructed as per the following table. It is noted that private access does not need to be constructed as part of the subdivision works. Future development of lot 6 may need to comply with access requirements.

Element		Requirement
A.	Property access length is less than 30m; or access is not required for a fire appliance to access a fire fighting water point.	There are no specified design and construction requirements.
B.	Property access length is 30m or greater; or access is required for a fire appliance to a fire fighting water point.	The following design and construction requirements apply to property access: (a) all-weather construction; (b) load capacity of at least 20t, including for bridges and culverts; (c) minimum carriageway width of 4m; (d) minimum vertical clearance of 4m; (e) minimum horizontal clearance of 0.5m from the edge of the carriageway; (f) cross falls of less than 3 degrees (1:20 or 5%); (g) dips less than 7 degrees (1:8 or 12.5%) entry and exit angle; (h) curves with a minimum inner radius of 10m; (i) maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed roads; and (j) terminate with a turning area for fire appliances provided by one of the following: (i) a turning circle with a minimum outer radius of 10m; or (ii) a property access encircling the building; or (iii) a hammerhead "T" or "Y" turning head 4m wide and 8m long.
C.	Property access length is 200m or greater.	The following design and construction requirements apply to property access: (a) the requirements for B above; and (b) passing bays of 2m additional carriageway width and 20m length provided every 200m.
D.	Property access length is greater than 30m, and access is provided to 3 or more properties.	The following design and construction requirements apply to property access: (a) complies with requirements for B above; and (b) passing bays of 2m additional carriageway width and 20m length must be provided every 100m.

5.5 Fire Fighting Water Supply

Table C13.4 Reticulated water supply for firefighting. A reticulated hydrant system will be provided as part of the subdivision works. Development can be provided on each lot within 120m of a hydrant. Any development over 120m from a hydrant will be required to meet static water requirements.

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

Table 13.5 Static water supply for firefighting. Future development over 120m from a hydrant will be required to meet the below requirements.

Element		Requirement
A.	Distance between building area to be protected and water supply	The following requirements apply: (c) The building area to be protected must be located within 90 metres of the firefighting water point of a static water supply; and (d) The distance must be measured as a hose lay, between the firefighting water point and the furthest part of the building area.
B.	A static water supply:	a) May have a remotely located offtake connected to the static water supply; b) May be a supply for combined use (fire fighting and other uses) but the specified minimum quantity of fire fighting water must be available at all times; c) Must be a minimum of 10,000 litres per building area to be protected. This volume of water must not be used for any other purpose including fire fighting sprinkler or spray systems; d) Must be metal, concrete or lagged by non-combustible materials if above ground; and e) If a tank can be located so it is shielded in all directions in compliance with Section 3.5 of AS 3959-2009, the tank may be

		constructed of any material provided that the lowest 400 mm of the tank exterior is protected by: (i) metal; (ii) non-combustible material; or (c) fibre-cement a minimum of 6 mm thickness
C	Fittings, pipework and accessories (including stands and tank supports)	Fittings and pipework associated with a fire fighting water point for a static water supply must: a) Have a minimum nominal internal diameter of 50mm; b) Be fitted with a valve with a minimum nominal internal diameter of 50mm; c) Be metal or lagged by non-combustible materials if above ground; d) Where buried, have a minimum depth of 300mm; e) Provide a DIN or NEN standard forged Storz 65 mm coupling fitted with a suction washer for connection to fire fighting equipment; f) Ensure the coupling is accessible and available for connection at all times; g) Ensure the coupling is fitted with a blank cap and securing chain (minimum 220 mm length); h) Ensure underground tanks have either an opening at the top of not less than 250 mm diameter or a coupling compliant with this Table; and i) Where a remote offtake is installed, ensure the offtake is in a position that is (i) Visible; (ii) Accessible to allow connection by firefighting equipment; (iii) At a working height of 450 – 600mm above ground level; and Protected from possible damage, including damage by vehicles.
D	Signage for Static Water Connections	The firefighting water point for a static water supply must be identified by a sign permanently fixed to the exterior of the assembly in a visible location. The sign must: a) Comply with tank signage requirements within AS2304:2019; or Comply with the Tasmanian Fire Service Water Supply Signage Guidelines published by the Tasmania Fire Service.
E	Hardstand	A hardstand area for fire appliances must be: (e) no more than 3m from the firefighting water point, measured as a hose lay (including the minimum water level in dams, swimming pools and the like) (f) no closer than 6m from the building area to be protected; (g) a minimum width of 3m constructed to the same standard as the carriageway; and (h) connected to the property access by a carriageway equivalent to the standard of the property access.

6. Bushfire-Prone Areas Code Assessment

An assessment of C13.0 Bushfire-Prone Areas Code under the Scheme is provided as follows.

C13.6 Development Standards for Subdivision

C13.6.1 Subdivision: Provision of hazard management areas

Objective

Subdivision provides for hazard management areas that:

(a) facilitate an integrated approach between subdivision and subsequent building on a lot;

(b) provide for sufficient separation of building areas from bushfire-prone vegetation to reduce the radiant heat levels, direct flame attack and ember attack at the building area; and

(c) provide protection for lots at any stage of a staged subdivision.

Acceptable solutions	Proposed solutions
A1 (a) TFS or an accredited person certifies that there is an insufficient increase in risk from bushfire to warrant the provision of hazard management areas as part of a subdivision; or (b) The proposed plan of subdivision: (i) shows all lots that are within or partly within a bushfire-prone area, including those developed at each stage of a staged subdivision; (ii) shows the building area for each lot; (iii) shows hazard management areas between bushfire-prone vegetation and each building area that have dimensions equal to, or greater than, the separation distances required for BAL 19 in Table 2.4.4 of *Australian Standard AS 3959 – 2009 Construction of buildings in bushfire-prone areas*; and (iv) is accompanied by a bushfire hazard management plan for each individual lot, certified by the TFS or accredited person, showing hazard management areas equal to, or greater than, the separation distances required for BAL 19 in Table 2.4.4 of *Australian Standard AS 3959 – 2009 Construction of buildings in bushfire-prone areas*; and (c) If hazard management areas are to be located on land external to the proposed subdivision the application is accompanied by the written consent of the	A1a) Lots 1-4, and 10-14 are considered BAL LOW, and thus do not warrant provision of hazard management areas. Lot 202 is set aside for drainage purposes, and is considered an insufficient increase in risk. A1b) The acceptable solution is achieved. The BHMP: i) shows lots within the bushfire prone area. ii) shows a 20m x 30m building area each lot. iii) shows the entirety of each lot is to be maintained as a HMA. iv) is prepared by an accredited bushfire hazard practitioner. A1c) not applicable as Part 5 agreement is not required.

owner of that land to enter into an agreement under section 71 of the Act that will be registered on the title of the neighbouring property providing for the affected land to be managed in accordance with the bushfire hazard management plan.	

C13.6.2 Subdivision: Public and firefighting access

Objective

Access roads to, and the layout of roads, tracks and trails, in a subdivision:

(a) allow safe access and egress for residents, fire fighters and emergency service personnel;

(b) provide access to the bushfire-prone vegetation that enables both property to be defended when under bushfire attack and for hazard management works to be undertaken;

(c) are designed and constructed to allow for fire appliances to be manoeuvred;

(d) provide access to water supplies for fire appliances; and

(e) are designed to allow connectivity, and where needed, offering multiple evacuation points.

Acceptable solutions	**Proposed solutions**
A1 (a) TFS or an accredited person certifies that there is an insufficient increase in risk from bushfire to warrant specific measures for public access in the subdivision for the purposes of fire fighting; or (b) A proposed plan of subdivision showing the layout of roads, fire trails and the location of property access to building areas is included in a bushfire hazard management plan that: a) demonstrates proposed roads will comply with Table C13.1, proposed private accesses will comply with Table C13.2 and proposed fire trails will comply with Table C13.3; and is certified by the TFS or accredited person.	A1) a) Lots 1-4, and 10-14 are considered BAL LOW, and thus do not warrant provision of hazard management areas. Lot 202 is set aside for drainage purposes, and is considered an insufficient increase in risk. b) Acceptable solution is achieved. The road will be constructed to meet bushfire standards. A 12m outer radius cul de sac is required for the proposed road.

C13.6.3 Subdivision: Provision of water supply for firefighting purposes

Objective

Adequate, accessible and reliable water supply for the purposes of fire fighting can be demonstrated at the subdivision stage and allow for the protection of life and property associated with the subsequent use and development of bushfire-prone areas.

Acceptable solutions	Proposed solutions
A1 In areas serviced with reticulated water by the water corporation: (a) TFS or an accredited person certifies that there is an insufficient increase in risk from bushfire to warrant the provision of a water supply for fire fighting purposes; (b) A proposed plan of subdivision showing the layout of fire hydrants, and building areas, is included in a bushfire hazard management plan approved by the TFS or accredited person as being compliant with Table E4; or (c) A bushfire hazard management plan certified by the TFS or an accredited person demonstrates that the provision of water supply for fire fighting purposes is sufficient to manage the risks to property and lives in the event of a bushfire.	A1 a) Lots 1-4, and 10-14 are considered BAL LOW, and thus do not warrant provision of hazard management areas. Lot 202 is set aside for drainage purposes, and is considered an insufficient increase in risk. b) The acceptable solution is achieved, noting that the proposed plan of subdivision shows the location of hydrants. Building areas are compliant with table C13.4, being within 120m of a hydrant.
A2 In areas that are not serviced by reticulated water by the water corporation: (a) The TFS or an accredited person certifies that there is an insufficient increase in risk from bushfire to warrant provision of a water supply for fire fighting purposes; (b) The TFS or an accredited person certifies that a proposed plan of subdivision demonstrates that a static water supply, dedicated to fire fighting, will be provided and located compliant with Table E5; or (c) A bushfire hazard management plan certified by the TFS or an accredited person demonstrates that the provision of water supply for fire fighting purposes is sufficient to manage the risks to property and lives in the event of a bushfire.	A2 Not applicable as the subject site is serviced by reticulated water Should development be over 120m from a hydrant, a compliant static water supply will be required.

7. Assessment of Risk – Lot 1-4, and Lots 10-14, 202

Assessment of the above mentioned lots has been undertaken as part of the bushfire assessment. These lots are not within 100m of bushfire prone vegetation (not grassland), and are over 50m from any identified grassland. In accordance AS3959: 2018, construction of buildings in bushfire prone areas, Table 2.6 of the code allows for these lots to be considered as BAL LOW. The lots are still required to be maintained as a hazard management area, thus providing protection to adjoining industrial lots included as part of the subdivision. Future development on these lots is not required to be constructed to a BAL rating as per the standard. Lot 202 will be set aside for drainage purposes as part of the infrastructure requirements and will not provide for industrial buildings.

8. Conclusions and Recommendations

The proposal seeks planning approval for a 12-lot subdivision, road and drainage lot at 100 and 110 Cove Hill Road, Bridgewater. The proposal will construct a new road off Cove Hill Road.

All of the lots have demonstrated that a building area can be provided in an area meeting the requirements of BAL 19, with many future buildings expecting to locate in areas subject to BAL 12.5 and BAL LOW. Hydrants will be provided along the proposed road ensuring all building areas can be adequately protected in a bushfire event.

a) Hazard management areas meeting the requirements of BAL LOW can be achieved for lots 1, 2, 3, 4, 10, 11, 12, 13, and 14. Minimum BAL 19 requirements can be achieved for lots 5, 6 and 9.
b) Lot 202 is assessed as insufficient increase in risk to warrant bushfire protection measures. This lot is a drainage lot which will be set aside for drainage purposes.
c) Future development on lots 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, & 14 must maintain Hazard Management Areas and follow recommendations as outlined in the Bushfire Hazard Management Plan and section 5.2 of this report. Maintenance of these hazard management areas is to be in perpetuity.
d) The proposed road must be in compliance with Table C13, Element A, outlined in section 5.3 of this report.
e) Prior to the sealing of a final plan, the entire site must be maintained as a bushfire hazard management area.
f) New hydrants are required in accordance with the TasWater Supplement to Water Supply Code of Australia WSA 03-2011-3.1 MRWA Edition 2:0. Hydrants to have a separation of not more than 60m.

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Annexure 1 – Bushfire Hazard Management Plan

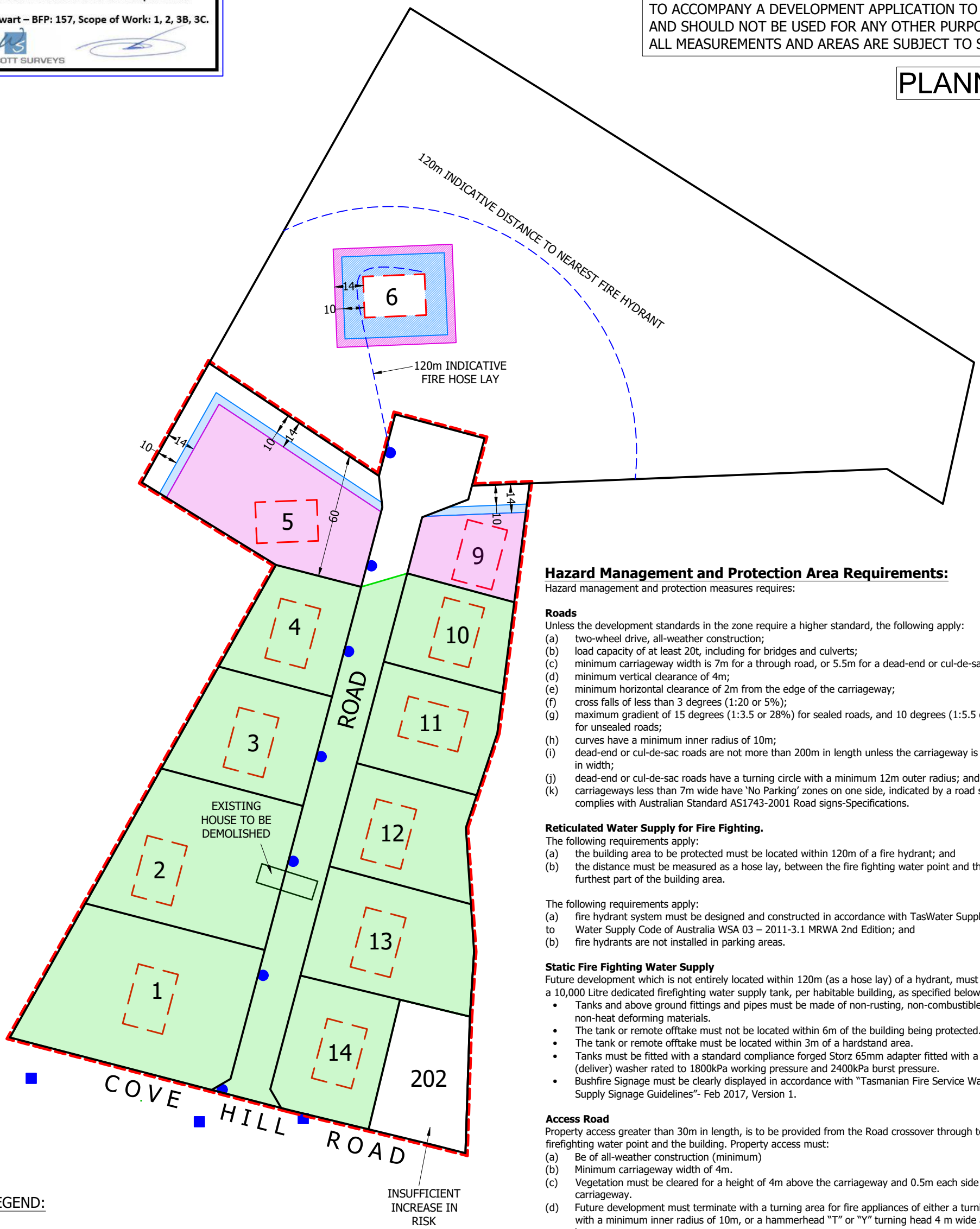
Bushfire Assessment Based on Stamped Plans

James Stewart – BFP: 157, Scope of Work: 1, 2, 3B, 3C.

WOOLCOTT SURVEYS

THIS PLAN WAS PREPARED AS A PROPOSAL PLAN
TO ACCOMPANY A DEVELOPMENT APPLICATION TO COUNCIL
AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.
ALL MEASUREMENTS AND AREAS ARE SUBJECT TO SURVEY.

PLANNING



LEGEND:

- TITLE BOUNDARIES
- BAL LOW
- 20m x 30m INDICATIVE BUILDING AREA
- BAL 12.5 BUILDING AREA
- PROPOSED FIRE HYDRANT
- BAL 19 BUILDING AREA
- EXISTING FIRE HYDRANT
- BAL 12.5 HAZARD MANAGEMENT AREA
- BAL 19 HAZARD MANAGEMENT AREA
- BUSHFIRE HAZARD MANAGEMENT AREA

Hazard Management and Protection Area Requirements:

Hazard management and protection measures requires:

Roads

Unless the development standards in the zone require a higher standard, the following apply:

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

Reticulated Water Supply for Fire Fighting.

The following requirements apply:

(a) the building area to be protected must be located within 120m of a fire hydrant; and
(b) the distance must be measured as a hose lay, between the fire fighting water point and the furthest part of the building area.

The following requirements apply:

(a) fire hydrant system must be designed and constructed in accordance with TasWater Supplement to Water Supply Code of Australia WSA 03 – 2011-3.1 MRWA 2nd Edition; and
(b) fire hydrants are not installed in parking areas.

Static Fire Fighting Water Supply

Future development which is not entirely located within 120m (as a hose lay) of a hydrant, must provide a 10,000 Litre dedicated firefighting water supply tank, per habitable building, as specified below:

- Tanks and above ground fittings and pipes must be made of non-rusting, non-combustible, non-heat deforming materials.
- The tank or remote offtake must not be located within 6m of the building being protected.
- The tank or remote offtake must be located within 3m of a hardstand area.
- Tanks must be fitted with a standard compliance forged Storz 65mm adapter fitted with a standard (deliver) washer rated to 1800kPa working pressure and 2400kPa burst pressure.
- Bushfire Signage must be clearly displayed in accordance with "Tasmanian Fire Service Water Supply Signage Guidelines"- Feb 2017, Version 1.

Access Road

Property access greater than 30m in length, is to be provided from the Road crossover through to the firefighting water point and the building. Property access must:

(a) Be of all-weather construction (minimum)
(b) Minimum carriageway width of 4m.
(c) Vegetation must be cleared for a height of 4m above the carriageway and 0.5m each side of the carriageway.
(d) Future development must terminate with a turning area for fire appliances of either a turning circle with a minimum inner radius of 10m, or a hammerhead "T" or "Y" turning head 4 m wide and 8m long.

Hazard Management – Vegetation Management

- Lots 1-5, 9-14 and 202 in their entirety are to be treated and maintained as a bushfire hazard management area.
- Vegetation in the hazard management area (as dimensioned and shown) is to managed and maintained in a minimum fuel condition (refer to section 5.2 of Bushfire Hazard Management Report).
- A future building on Lot 6 must provide a hazard management area as dimensioned and shown.

Notes:

1. Refer plans –Woolcott Surveys, Proposed Subdivision – 12 Lots, 1 Road Lot, and 1 Drainage Lot dated 08/05/2024, version 6.3, Job No L230127.
2. All future works to comply with Director's Determination – Bushfire Hazard Area's (v1.1). Table 1, 2, 3 and 4.
3. Plan to be read in conjunction with Bushfire Hazard Management Report dated 08/05/2024.

BUSHFIRE HAZARD MANAGEMENT PLAN
PROPOSED SUBDIVISION - 12 LOTS, 1 ROAD LOT, AND 1 DRAINAGE LOT
100 & 110 COVE HILL ROAD, BRIDGEWATER
C.T.136905/2, C.T.150349/1 & C.T.150349/2
PID2184712, PID2658252, & PID2658252

N

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Job Number L230127

Drawn	File Name	Date	Scale	Edition	Sheet
EGB	L230127_BHMP_080524_v1.2.dwg	08/05/24	1:2000 @ A3	v1.2	1/1

Annexure 2 – Subdivision Proposal Plan

THIS PLAN HAS BEEN PREPARED TO ACCOMPANY A PLANNING APPLICATION TO COUNCIL AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.

NOTE: Contours shown have been derived from a combination of survey data and lidar data obtained from Geoscience Australia.

Notes:
1. All dimensions and areas are approximate only and subject to survey.
2. Horizontal datum is plane based on MGA'2020.
3. Vertical datum is AHD'83.
4. Contour interval is 0.25m, index is 1.0m.
5. Not all services have been measured by this survey and some are shown for diagrammatic purposes only.

PROPOSED SUBDIVISION
12 LOTS, 1 ROAD LOT, AND 1 DRAINAGE LOT
100 & 110 COVE HILL ROAD,BRIDGEWATER
C.T.136905/2, C.T.150349/1 & C.T.150349/2

N

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Job Number L230127

Drawn	File Name	Date	Scale	Edition	Sheet
CSS/EGB	L230127_PROP_PLAN_V6.3_80524.DWG	8/05/24	1:2000 @ A3	V6.3	1/2

THIS PLAN HAS BEEN PREPARED TO ACCOMPANY A PLANNING APPLICATION TO COUNCIL AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.

- DISAPPEARING BOUNDARY.

NOTE: Contours shown have been derived from a combination of survey data and lidar data obtained from Geoscience Australia.

Notes:
1. All dimensions and areas are approximate only and subject to survey.
2. Horizontal datum is plane based on MGA'2020.
3. Vertical datum is AHD'83.
4. Contour interval is 0.25m, index is 1.0m.
5. Not all services have been measured by this survey and some are shown for diagrammatic purposes only.

PROPOSED SUBDIVISION
12 LOTS, 1 ROAD LOT AND 1 DRAINAGE LOT
100 & 110 COVE HILL ROAD,BRIDGEWATER
C.T.136905/2, C.T.150349/1 & C.T.150349/2

N

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Job Number L230127

Drawn	File Name	Date	Scale	Edition	Sheet
CSS/EGB	L230127_PROP_PLAN_V6.3_80524.DWG	8/05/24	1:2000 @ A3	V6.3	2/2

Annexure 3 – Planning Certificate

BUSHFIRE-PRONE AREAS CODE

CERTIFICATE[1] UNDER S51(2)(d) *LAND USE PLANNING AND APPROVALS ACT 1993*

1. Land to which certificate applies

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

Street address:	100 and 110 Cove Hill Road, Bridgewater.
Certificate of Title / PID:	**CT136905/2, CT150439/1, CT150349/2, PID2184712. PID2658252, PID2658252**

2. Proposed Use or Development

Description of proposed Use and Development:	12 Lot Subdivision
Applicable Planning Scheme:	Tasmanian Planning Scheme – Brighton.

3. Documents relied upon

This certificate relates to the following documents:

Title	Author	Date	Version
Bushfire Hazard Report	Woolcott Surveys	08/05/2024	3
12 Lots, 1 road lot and 1 drainage lot – proposal plan.	Woolcott Surveys	08/05/2024	6.3
Bushfire Hazard Management Plan	Woolcott Surveys	08/05/2024	1.2

[1] This document is the approved form of certification for this purpose and must not be altered from its original form.

4. Nature of Certificate

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

☐	**E1.4 / C13.4 – Use or development exempt from this Code**	
	Compliance test	**Compliance Requirement**
☐	E1.4(a) / C13.4.1(a)	Insufficient increase in risk.

☐	**E1.5.1 / C13.5.1 – Vulnerable Uses**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.5.1 P1 / C13.5.1 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.5.1 A2 / C13.5.1 A2	Emergency management strategy
☐	E1.5.1 A3 / C13.5.1 A2	Bushfire hazard management plan

☐	**E1.5.2 / C13.5.2 – Hazardous Uses**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.5.2 P1 / C13.5.2 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.5.2 A2 / C13.5.2 A2	Emergency management strategy
☐	E1.5.2 A3 / C13.5.2 A3	Bushfire hazard management plan

☒	**E1.6.1 / C13.6.1 Subdivision: Provision of hazard management areas**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.1 P1 / C13.6.1 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☒	E1.6.1 A1 (a) / C13.6.1 A1(a)	Insufficient increase in risk. Lots 1-4, 10-14 and 202
☒	E1.6.1 A1 (b) / C13.6.1 A1(b)	Provides BAL-19 for all lots
☐	E1.6.1 A1(c) / C13.6.1 A1(c)	Consent for Part 5 Agreement

☒	**E1.6.2 / C13.6.2 Subdivision: Public and fire fighting access**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.2 P1 / C13.6.2 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☒	E1.6.2 A1 (a) / C13.6.2 A1 (a)	Insufficient increase in risk. Lot 202.
☒	E1.6.2 A1 (b) / C13.6.2 A1 (b)	Access complies with relevant Tables

☒	**E1.6.3 / C13.1.6.3 Subdivision: Provision of water supply for fire fighting purposes**	
	Acceptable Solution	**Compliance Requirement**
☒	E1.6.3 A1 (a) / C13.6.3 A1 (a)	Insufficient increase in risk. Lot 202.
☒	E1.6.3 A1 (b) / C13.6.3 A1 (b)	Reticulated water supply complies with relevant Table
☐	E1.6.3 A1 (c) / C13.6.3 A1 (c)	Water supply consistent with the objective
☐	E1.6.3 A2 (a) / C13.6.3 A2 (a)	Insufficient increase in risk
☒	E1.6.3 A2 (b) / C13.6.3 A2 (b)	Static water supply complies with relevant Table
☐	E1.6.3 A2 (c) / C13.6.3 A2 (c)	Static water supply consistent with the objective

5. Bushfire Hazard Practitioner

Name:	James Stewart	**Phone No:**	0467 676 721
Postal Address:	PO BOX 593, Mowbray, Tas, 7248	**Email Address:**	james@woolcottsurveys.com.au
Accreditation No:	BFP – 157	**Scope:**	1, 2, 3B, 3C

6. Certification

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

☐ Is exempt from the requirement Bushfire-Prone Areas Code because, having regard to the objective of all applicable standards in the Code, there is considered to be an insufficient increase in risk to the use or development from bushfire to warrant any specific bushfire protection measures, or

☒ The Bushfire Hazard Management Plan/s identified in Section 3 of this certificate is/are in accordance with the Chief Officer's requirements and compliant with the relevant **Acceptable Solutions** identified in Section 4 of this Certificate.

Signed:
certifier

Name: James Stewart **Date:** 08/05/2024

Certificate Number: WS-142

(for Practitioner Use only)

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5 June 2024

Mr Tim Shaw
Shaw Property Development
"Tallentyre" 17293 Midland Hwy
LAUNCESTON Tasmania 7250

Dear Tim,

Re: 100 and 110 Cove Hill Road – Emissions Assessment

This assessment has been prepared to support a development application for an industrial subdivision at 100 and 110 Cove Hill Road, Bridgewater. The assessment is required, as the development is adjacent to the Bridgewater Quarry, so it must comply with the *Tasmanian Planning Scheme – Brighton*, BRI-S4.0 *Bridgewater Quarry Specific Area Plan.* 100 and 110 Cove Hill Road are zoned *General Industrial*. The proposed subdivision will divide the existing properties into 12 lots, intended for industrial use, as shown in the proposed site plan in Figure 1 below. As can be seen in the site plan, part of the site (closest to the quarry) is subject to easements for electricity transmission lines.

Likely permissible uses for the new lots include Emergency Services, Equipment and Machinery Sales and Hire, Manufacturing and Processing, Recycling and Waste Disposal, Resource Processing, Service Industry, Storage, Transport Depot and Distribution, Utilities and Vehicle Fuel Sales, Bulky Goods Sales and Food Services. No sensitive uses will be created as a result of the subdivision. One existing residence will be demolished.

Clause BRI-S4.8.1 provides development standards for subdivision within the Bridgewater Quarry Specific Area, that require a subdivision to be compatible with the operation of the Bridgewater Quarry. There is no acceptable solution so the Performance Criteria (reproduced below) must be met.

P1

Each lot, or a lot proposed in a plan of subdivision, must not result in potential to interfere or conflict with quarry operations having regard to:

(a) the nature of the quarry; including:

(i) operational characteristics;

(ii) scale and intensity;

(iii) degree of hazard or pollution that may be emitted from the activity;

(b) the future use and development of the lot; and

(c) any advice from the Bridgewater Quarry operator.

Potential emissions from the quarry include ground vibration, fly rock and air blast over pressure from blasting, dust, and noise. All of these emissions are limited to reasonable levels by conditions contained within Environmental Protection Notice No 9561/1, and the Tasmanian Quarrying Code of Practice, 2017, which apply to the quarry's operations. For the majority of the site emissions, levels are sufficiently low that industrial developments would not conflict or interfere with quarry operations. It is further noted that the residents living in the house on 110 Cove Hill Road, and the nearby house on 86 Cove Hill Road, have not to our knowledge lodged complaints concerning emissions from the quarry in recent years.

Correspondence with the quarry operator (Boral) has identified a concern with the potential impact of ground vibration, fly rock and air blast over pressure, especially at the lots that are closest to the quarry. These emissions are further assessed below.

Ground Vibration

The quarry EPN includes conditions that limit ground vibration from blasting to a maximum peak particle velocity of 10 mm/s, as measured at any sensitive receptor, in other ownership. The maximum ground allowable vibration level that might occur on the proposed subdivision site, has been calculated using the following approach / assumptions:

- Assume that the nearest possible blast hole location is 50m due north of the northern corner of the property boundary of 110 Cove Hill Road, as shown on the map below.
- Assume that the nearest sensitive receiver (to this blast hole) is the existing residence at 82 Cove Hill Road, as shown in Figure 2 below. (We have been advised that this residence is currently occupied and has been occupied for some years.)
- Assume that any blast at this hole, is designed so that ground vibration does not exceed 10mm/s (as per the quarry EPN) at this residence.
- Assume that maximum ground vibration levels nearby are calculated using the AS2187.2 ground vibration formula with parameters; B=1.6, K_g=1140 (as per Boral advice) and Q (which is the maximum instantaneous charge mass) is as high as possible without exceeding 10mm/s at the residence.

This results in the following predicted maximum ground vibration levels on the subdivision site:

Location	Nominal Distance from nearest blast hole (m)	Ground Vibration Level Peak Particle Velocity (mm/s)
Northern Corner of Property	50	316
Lot 6 – Southern Edge of Northern Electricity Easement	113	86
Lot 6 – Building Area	157	51
Lot 5 – Building Area	244	25
Lot 9 – Building Area	283	20

Clause J4.5 of AS2187.2 provides recommended limits for ground vibration to assure human comfort and avoid possible damage to buildings which have not been specifically designed to accommodate high levels of ground vibration. Table J4.5(A) suggests a limit of 25 mm/s for "occupied non-sensitive sites, such as factories and commercial premises". However, it also notes that higher levels may be acceptable if agreement is reached with the occupier. Table J4.5 (B) suggests a limit of 100 mm/s for avoiding damage to structures of reinforced concrete or steel construction.

The predicted maximum level of ground vibration at Lots 1 to 5 and Lots 9 to14, meets the recommended 25 mm/s limit for human comfort, and therefore may be developed for industrial use without any undue impact from ground vibration.

The predicted levels at Lot 6 exceed the recommended 25 mm/s limit for human comfort but are well below the levels where damage to reinforced concrete or steel buildings is likely, within the portion of Lot 6 where building is permissible. The maximum predicted ground vibration level at the Lot 6 indicative building area is 51 mm/s, during the nearest/largest possible blast. The majority of blasts will be further away from the subdivision and will generate substantially less ground vibration. Ground vibration occurs only during a blast and blasts are conducted less than once a day. At this level and frequency of occurrence, ground vibration is unlikely to adversely impact on the of comfort of staff employed at typical industrial uses.

To ensure that conflict/interference with quarry operations does not arise, it is recommended that the following restrictions are put on the development of Lot 6 through a Part V agreement[1] or similar instrument:

- Buildings on Lot 6 should be of reinforced concrete or steel construction, or otherwise be specifically designed for ground vibration levels of upto 86 mm/s; and
- Vibration sensitive activities should not be undertaken on Lot 6.

Clause BRI-S4.7.1 provides development standards for buildings and works within the Bridgewater Quarry Specific Area. It has similarly worded performance criteria to BRI-S4.8.1, which means that a development application for approval of each individual activity on the proposed lots will be required, and compliance with these restrictions can be evaluated at the time of these applications.

Fly Rock

Fly rock refers to small shards of rock which can be thrown into the air and travel considerable distances when a blast is fired. There is a potential for serious injury if a person or an animal is hit by fly rock. There is also potential for damage to glass windows or vehicle windscreens, although steel and concrete structures including industrial buildings are unlikely to be damaged. The quarry operator has a responsibility under Section 7.4.4 “Safety” of the Quarry Code to ensure that; “Blasts must be designed to prevent fly-rock from leaving the site.”

Generally, blasts are designed so there is very little or no fly rock generated. The owner of 100/110 Cove Hill Road is not aware of fly rock ever affecting these or neighbouring properties. Various measures can be employed in blast design and execution to minimise the potential for fly rock. However, there is always some potential for a blast to not go exactly as planned. To guard against this possibility, it is industry practice to establish an “exclusion zone” around a blast while it is fired. The size of the exclusion zone is set conservatively to a distance that is large enough, that the risk of fly rock reaching the edge of the exclusion zone is considered to be acceptably low. Typically, exclusion zones of 200m to 300m are required. Ideally the exclusion zone should be contained within the quarry property boundaries. If a quarry operator needs to blast with an exclusion zone that extends onto an adjoining property, an agreement needs to be reached with the owner of that property, as the owner of the property is under no obligation to vacate the required exclusion zone, when the quarry operator wants to blast.

The vast majority of blasting required at the Bridgewater Quarry will be located more than 300m from the boundary of 110 Cove Hill Road. However, over the remaining life of the quarry a small number of blasts is likely to be required within the southern corner of the quarry site. For these to be safely undertaken, part of the exclusion zone would need to extend onto Lot 6 of the proposed subdivision. It should be practical to design blasts such that the exclusion zone does not need to extend into Lot 5 which is about 230m from the southern corner of the pit, at its nearest point. It may be possible to design blasts so as to limit the required exclusion zone to not extend beyond the electricity transmission line easement.

[1] A legal agreement between a Council and a landholder that can be used to protect specific values on private land in perpetuity. Under the Land Use Planning and Approvals Act 1993, a planning permit does not become effective until any Part V Agreements required under that permit are executed.

To ensure that future operation of the quarry is not hampered, it is recommended that a Part V agreement (or similar) is developed, that obliges the future owners of Lot 6 to cooperate with the operator of the quarry to implement an exclusion zone on the small number of occasions when it is likely to be required. This would involve moving people outside the affected part of Lot 6, for a few minutes while a blast is fired.

If such an arrangement is in place Boral's security of operation would be improved compared with the current situation, where the owner of the property or occupants of the residence (including children) could be present in the blasting exclusion zone at any time.

Air Blast Over Pressure

The quarry EPN also includes conditions that limit air blast over pressure to a maximum of 115 dBL (for 95% of blasts) or 120 dBL for all blasts, as measured at any sensitive receptor, in other ownership. The maximum air blast over pressure level that might occur on the proposed subdivision site, has been calculated using the Air Blast Model developed by Terrock Consulting Engineers, which is widely used by the Australian quarrying and mining industry for predicting air blast over pressure, including Orica, who are Boral's blasting subcontractor at the Bridgewater Quarry. The model initially calculates the distance of the 115 dBL air blast over pressure contour, from the blast site. Air blast over pressure can then be calculated at other distances, as the level reduces at an approximate rate of 9dBL, with each doubling of distance. Orica advised that appropriate parameters for the nearest possible blast would be:

- Blast Hole Diameter: 102 mm
- Max Charge Mass: 65kg
- Stemming Depth: 3.2m
- Ka Factor (Back): 220

This results in the 115 dBL contour being 524m behind the face of the blast. Predicted air blast over pressure levels at other distances on the subdivision site are:

Location	Nominal Distance from nearest blast hole (m)	Air Blast Over Pressure (dBL)
Northern Corner of Property	50	145
Lot 6 – Southern Edge of Northern Electricity Easement	113	134
Lot 6 – Building Area	157	130
Lot 5 – Building Area	244	125
Lot 9 – Building Area	283	123

Clause J5.4 of AS2187.2 provides recommended limits for air blast over pressure to assure human comfort and avoid possible damage to buildings. Table J5.4(A) suggests a limit of 125 dBL for "occupied non-sensitive sites, such as factories and commercial premises" and Table J5.4(B) suggests 133 dBL. However, it also notes that higher levels may be acceptable if an agreement is reached with the occupier.

For context the 133 dBL limit includes a significant safety margin as the air blast over pressure required to cause building damage is highly variable. Damage such as cracks to plaster or glass is possible, but unlikely at levels between 133 dBL and 140 dBL. Window breakage does not become "likely" until levels above 150 dBL are reached. The likelihood of injury, such as damage to a person's eardrums is similarly variable but does not become a concern until levels over 160 dBL are reached.

The predicted maximum air blast over pressure level at Lots 1 to 5 and Lots 9 to14, meets the recommended 125 dBL limit for human comfort. These lots may be developed for industrial use without any undue impact from air blast over pressure.

The predicted level at the indicative building area of Lot 6 exceeds the recommended 125 dBL limit for human comfort but does not exceed the recommended level of 133 dBL for avoiding building damage.

The predicted air blast over pressure levels on the northern part of Lot 6, that is covered by the electricity transmission line easement, range from 134 to 145 dBL. Note that building is not permitted in this area.

It should be further noted that air blast over pressure levels will very rarely reach the levels predicted. The vast majority of blasts that are undertaken, will occur at locations further back in the pit, at much greater distances and will not reach levels of concern. For blasts that do reach these levels, the occupants of Lot 6 would most likely need to vacate the site to implement the required fly rock exclusion zone, as per a Part V agreement or similar, proposed in the previous section.

Conclusion

On this basis, it is concluded that the proposed industrial subdivision of 100 and 110 Cove Hill Road is compatible with the operation of the Bridgewater Quarry, and that the requirements of BRI-S4.7.1 *Bridgewater Quarry Specific Area Plan* are met.

Some restrictions are required on the use of Lot 6, relating to the close proximity of blasting, which may be required in the southern corner of the quarry, on a small number of occasions over the future life of the quarry. The opportunity exists for additional detail on these requirements to be developed and approved, when a development application is made to approve a specific future use for Lot 6 after subdivision.

Please do not hesitate to contact me if you have any queries regarding this assessment.

Yours sincerely

Douglas Ford
Noise and Air Emissions Specialist

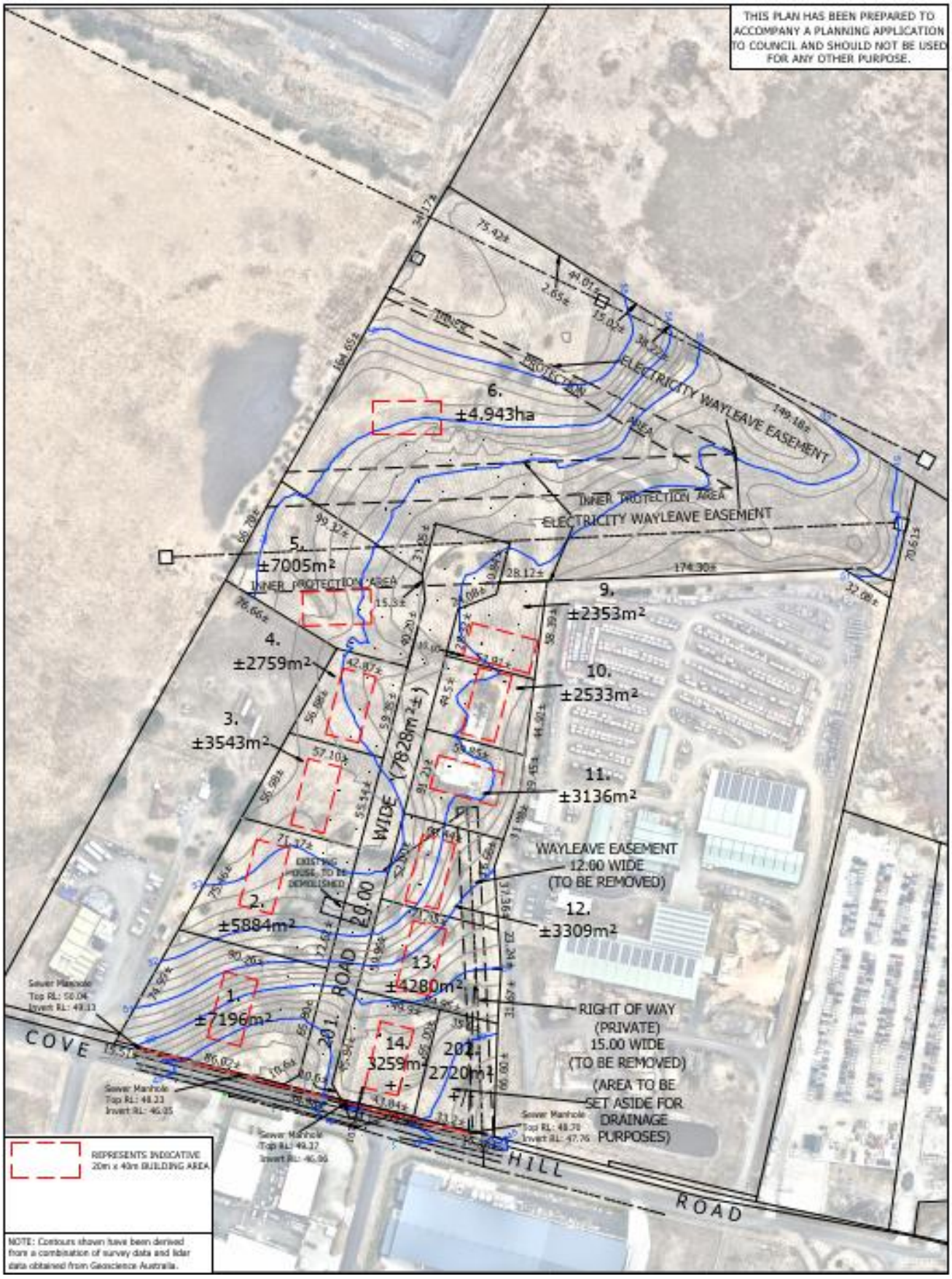

Figure 1 - Proposed Subdivision Site Plan

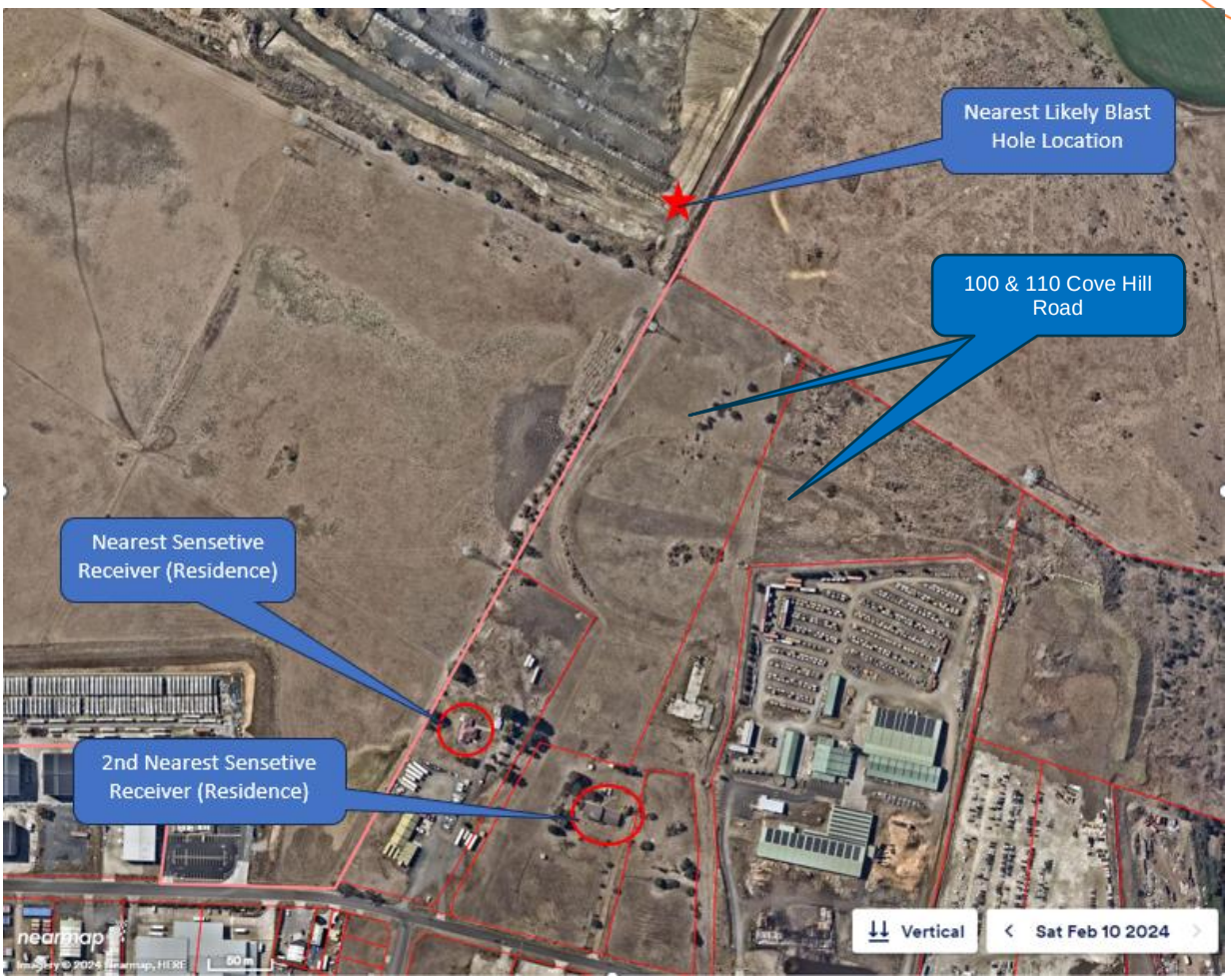

Figure 2 - Nearest Blast Hole Location and Sensitive Receivers (Base Image from Nearmap)

07 June 2024

Boral Limited

ABN 13 008 421 761

251 Salmon Street
Port Melbourne, VIC, 3207

T: (03) 9981 2800

boral.com.au

Kelly Min
Planning Officer
Brighton Council

SA2023/00043
100 & 110 Cove Hill Road, Bridgewater

Dear Kelly,

Boral Construction Materials Group Ltd (Boral) own and operate the Bridgewater Quarry (the Quarry). Further to our ongoing correspondence with Shaw Property Development (permit applicant) and Brighton Council (Council) we acknowledge the submission of the revised Emissions Assessment prepared by Pitt&Sherry dated 05 June 2024.

Boral confirms that the information provided in the Emissions Assessment is satisfactory and we are comfortable with the application proceeding to public notice. This is on the basis that the Emissions Assessment now correctly identifies all risks between the Quarry and the proposed subdivision.

We note that the Emissions Report suggests the conflicts could be managed through a Part V agreement which Boral supports as an appropriate mechanism. Boral would like to discuss the drafting of this agreement with Council and the permit applicant before the Development Approval (DA) is issued.

Please contact me on the details below should you have any further questions.

Regards,

Liam Riordan
Planning & Approvals Manager
Boral Property Group

Liam.Riordan@boral.com.au
0431 231 218

Amended Submission to Planning Authority Notice

Council Planning Permit No.	SA 2023 / 00043	**Council notice date**	2/01/2024
TasWater details			
TasWater Reference No.	TWDA 2024/00008-BTN	**Date of response** **Date of amended**	09/02/2024 16/05/2024
TasWater Contact	Huong Pham	**Phone No.**	0427 471 748
Response issued to			
Council name	BRIGHTON COUNCIL		
Contact details	development@brighton.tas.gov.au		
Development details			
Address	100 COVE HILL RD, BRIDGEWATER	**Property ID (PID)**	2184712
Description of development	Subdivision - 14 lots + road		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Wooloctt Surveys	L230127 sheets 1/2 & 2/2	V6.3	08/05/2024
Rare	241005 sheets C501, C521, C522 & C601	2	08/05/2024

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connections and sewerage system and connections to each lot of the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.
2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.
3. Prior to commencing construction of the subdivision, any water connection utilised for construction must have a backflow prevention device and water meter installed, to the satisfaction of TasWater.

ASSET CREATION & INFRASTRUCTURE WORKS

4. Plans submitted with the application for Engineering Design Approval must, to the satisfaction of TasWater show, all existing, redundant and/or proposed property services and mains.

   Note: The water mains must be DN150mm, extending from the existing DN300mm water main to the development, as the modelling advice. A section of existing DN100 asset A201233 must be upgraded to DN150.
5. Prior to applying for a Permit to construct new infrastructure the developer must obtain from TasWater Engineering Design Approval for new TasWater infrastructure. The application for Engineering Design Approval must include engineering design plans prepared by a suitably qualified person showing the hydraulic servicing requirements for water and sewerage to TasWater's satisfaction.
6. Prior to works commencing, a Permit to Construct must be applied for and issued by TasWater. All infrastructure works must be inspected by TasWater and be to TasWater's satisfaction.

7. In addition to any other conditions in this permit, all works must be constructed under the supervision of a suitably qualified person in accordance with TasWater's requirements.

8. Prior to the issue of a Consent to Register a Legal Document all additions, extensions, alterations or upgrades to TasWater's water and sewerage infrastructure required to service the development, are to be completed generally as shown on, and in accordance with, the plans listed in the schedule of drawings, and are to be constructed at the expense of the developer to the satisfaction of TasWater, with live connections performed by TasWater.

9. After testing/disinfection, to TasWater's requirements, of newly created works, the developer must apply to TasWater for connection of these works to existing TasWater infrastructure, at the developer's cost.

10. At practical completion of the water and sewerage works and prior to TasWater issuing a Consent to a Register Legal Document, the developer must obtain a Certificate of Practical Completion from TasWater for the works that will be transferred to TasWater. To obtain a Certificate of Practical Completion:

    a. Written confirmation from the supervising suitably qualified person certifying that the works have been constructed in accordance with the TasWater approved plans and specifications and that the appropriate level of workmanship has been achieved.

    b. A request for a joint on-site inspection with TasWater's authorised representative must be made.

    c. Security for the twelve (12) month defects liability period to the value of 10% of the works must be lodged with TasWater. This security must be in the form of a bank guarantee.

    d. Work As Constructed drawings and documentation must be prepared by a suitably qualified person to TasWater's satisfaction and forwarded to TasWater.

    Upon TasWater issuing a Certificate of Practical Completion, the newly constructed infrastructure is deemed to have transferred to TasWater.

11. After the Certificate of Practical Completion has been issued, a 12-month defects liability period applies to this infrastructure. During this period all defects must be rectified at the developer's cost and to the satisfaction of TasWater. A further 12-month defects liability period may be applied to defects after rectification. TasWater may, at its discretion, undertake rectification of any defects at the developer's cost. Upon completion, of the defects liability period the developer must request TasWater to issue a "Certificate of Final Acceptance". TasWater will release any security held for the defect's liability period.

12. The developer must take all precautions to protect existing TasWater infrastructure. Any damage caused to existing TasWater infrastructure during the construction period must be promptly reported to TasWater and repaired by TasWater at the developer's cost.

13. Ground levels over the TasWater assets and/or easements must not be altered without the written approval of TasWater.

14. A construction management plan must be submitted with the application for TasWater Engineering Design Approval. The construction management plan must detail how the new TasWater infrastructure will be constructed while maintaining current levels of services provided by TasWater to the community. The construction plan must also include a risk assessment and contingency plans covering major risks to TasWater during any works. The construction plan must be to the satisfaction of TasWater prior to TasWater's Engineering Design Approval being issued.

FINAL PLANS, EASEMENTS & ENDORSEMENTS

15. Prior to the Sealing of the Final Plan of Survey, a Consent to Register a Legal Document must be

obtained from TasWater as evidence of compliance with these conditions when application for sealing is made.
Advice: Council will refer the Final Plan of Survey to TasWater requesting Consent to Register a Legal Document be issued directly to them on behalf of the applicant.

16. Pipeline easements to TasWater's satisfaction, must be created over any existing or proposed TasWater infrastructure and be in accordance with TasWater's standard pipeline easement conditions.

17. Prior to the issue of a TasWater Consent to Register a Legal Document, the applicant must submit a .dwg file, prepared by a suitably qualified person to TasWater's satisfaction, showing:

    a. the exact location of the existing water/sewerage infrastructure,

    b. the easement protecting that infrastructure.

    The developer must locate the existing TasWater infrastructure and clearly show it on the .dwg file. Existing TasWater infrastructure may be located by a surveyor and/or a private contractor engaged at the developers cost.

DEVELOPER CHARGES

18. Prior to TasWater issuing a Consent to Register a Legal Document, the applicant or landowner as the case may be, must pay a developer charge totalling $21,084.00 to TasWater for water infrastructure for 12.00 additional Equivalent Tenements, indexed by the Consumer Price Index All groups (Hobart) from the date of this Submission to Planning Authority Notice until the date it is paid to TasWater.

19. Prior to TasWater issuing a Consent to Register a Legal Document, the applicant or landowner as the case may be, must pay a developer charge totalling $21,084.00 to TasWater for sewerage infrastructure for 12.00 additional Equivalent Tenements, indexed by the Consumer Price Index All groups (Hobart) from the date of this Submission to Planning Authority Notice until the date it is paid to TasWater.

DEVELOPMENT ASSESSMENT FEES

20. The applicant or landowner as the case may be, must pay a development assessment fee of $1,263.70 and a Consent to Register a Legal Document fee of $248.30 to TasWater, as approved by the Economic Regulator and the fees will be indexed, until the date paid to TasWater.

    The payment is required within 30 days of the issue of an invoice by TasWater.

Advice

Water modelling advice

The network held up quite well keeping pressures in hydrant A199556 above 300 kPa. Refer to the table below:

Location	H.G.L. Peak hour	H.G.L Peak day (m)+ 20 l/s fire flow	Pressure Peak day (kPa) + 20 l/s fire flow
A199556	N/A	81	313

Note that elevation is estimated to be approximately 49 m. These are heads and pressures within the Taswater network, so they do not account for losses in customer piping and fittings. This result is based on a sound but imperfect knowledge of conditions on the field and those who use this information should allow an appropriate margin of error in their design. They may well decide 315 kPa is too close to the minimum of 250 kPa for new hydrants. Note also that there will be hydrants in the new street where

pressure will be lower still.
The diagram below shows pressure drops in the network near the site during the fire. Losses in the pipes nearest the hydrant in use are 17 to 20 times that usually allowed in our designs (shown in red). These pipes are also undersized and should be replaced with NB150 mains in what is rapidly becoming a commercial/industrial zone where NB 150 is the minimum size allowed. This also applies to new pipes within the proposal and it is reassuring to see that this is the size shown, for all pipes but the individual connections in the proponent's drawing. This work will ensure network capacity for all but the most demanding of industrial end uses.

General
For information on TasWater development standards, please visit https://www.taswater.com.au/building-and-development/technical-standards
For application forms please visit https://www.taswater.com.au/building-and-development/development-application-form

Developer Charges
For information on Developer Charges please visit the following webpage - https://www.taswater.com.au/building-and-development/developer-charges

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

(a) A permit is required to work within TasWater's easements or in the vicinity of its infrastructure. Further information can be obtained from TasWater.
(b) TasWater has listed a number of service providers who can provide asset detection and location services should you require it. Visit https://www.taswater.com.au/building-and-development/service-locations for a list of companies.
(c) Sewer drainage plans or Inspection Openings (IO) for residential properties are available from your local council.

NOTE: In accordance with the WATER AND SEWERAGE INDUSTRY ACT 2008 - SECT 56ZB A regulated entity may charge a person for the reasonable cost of –

(a) a meter; and

(b) installing a meter.

Declaration

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

TasWater Contact Details

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