Wallum Estate
Torakina Road, Brunswick Heads
Lot 13 DP 1251383

Revised Vegetation Management Plan

Client	: Clarence Property Pty Ltd
Prepared by	: Australian Wetlands Consulting Pty Ltd
Project #	: 1-211400
Date	: November 2022

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Wallum Estate
Torakina Road, Brunswick Heads
Lot 13 DP 1251383

Revised Vegetation Management Plan

Project control

Project name: **Wallum Estate**
Torakina Road, Brunswick Heads
Revised Vegetation Management Plan

Project #: 1-211400
Client: Clarence Property Pty Ltd
Contact: James Fletcher

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09/11/2022	J	Ian Colvin	Damian McCann	James Fletcher

Table of Contents

List of Tables

List of Figures

1 Introduction and Background

1.1 Background Information

Australian Wetlands Consulting (AWC) has prepared this *Revised Vegetation Management Plan* (VMP) to comply with consent conditions in the Concept Approval issued 9 July 2013 by the NSW Department of Planning and Infrastructure (DPI) (now Department of Planning and Environment [DPE]) for a residential development at Lot 13 DP 1251383 15 Torakina Road, Brunswick Heads, originally known as Major Project (MP05 0091) or DA 05-0091.

Since the Concept Approval was issued, the subdivision concept has been refined with regard to layout, lot numbers etc (refer Section 1.4).

AWC (2018) prepared a VMP for Stage 1A of Bayside Brunswick (a 12-lot subdivision on Omega Circuit) which has been approved. Stage 1A has been completed and works completed for the approved VMP. This VMP relates to Lot 13 DP1251383 Torakina Road Brunswick Heads and is guided by the requirements of the Concept Approval and the Draft Statement of Commitments.

NOTE: AWC have prepared two other documents of relevance to vegetation works at the site:

1. *Revised Wallum Froglet Management Plan* ('WFMP'; AWC 2022a): this plan addresses various requirements for the restoration and enhancement of habitat for the threatened Wallum Froglet (*Crinia tinnula*). Areas subject to works in WFMP are not covered by this VMP.
2. Landscaping Plan (AWC 2022b): a landscaping and streetscape plan has been prepared for the site. Plantings in the landscaping plan are separate to any provisions in this VMP.

Any management activities related to landscape plantings or stormwater control (e.g. swales, detention areas) will be completed in accordance with engineering and/or landscape requirements – these are generally not subject to this VMP but are referenced where necessary.

1.2 VMP Requirements

Consent Condition C6 of the Concept Approval states:

The proponent is to submit with the first development application, a Vegetation Management Plan to apply to the land that comprises public reserve on the site. The plan shall be prepared in consultation with OEH and council and shall include, but not be limited to:

a) dimensions of the reserves
b) details of how any rehabilitation within the reserve is to occur
c) actions required to protect and improve habitat for threatened species including Koala, Glossy Black-Cockatoo and Wallum Froglet as well as actions to re-establish habitat for threatened species on cleared lands
d) measures to control weeds
e) details of any fencing to protect the reserves
f) identification of timeframes and responsibilities for each action
g) bushfire management
h) measures to control public access within the reserves to minimise damage
i) details of future management and funding arrangements for the areas and measures to be implemented for the long-term protection of the areas, for example, through dedication.

Objective B2 in the Statement of Commitments states:

A Vegetation Management Plan will be prepared. The plan will outline both mitigation and compensatory strategies. The plan will set out a strategy for the rehabilitation and management of the Environmental Protection Zones (i.e. the areas covering approximately 11.5 ha between the development footprint and Simpson's creek) and outline a compensatory replacement planting strategy to offset the loss of the ecologically significant trees. All Koala and Glossy black cockatoo food trees impacted by the development will be replaced at a ratio of 2:1.

Objective P6 in the Statement of Commitments states:

The VMP is to include restoration plan of existing track.

As noted, these requirements were addressed in the approved Stage 1A VMP and will now be addressed in this VMP for Lot 13.

1.3 Property Details

The subject site (Lot 13 DP1251383) is located immediately south of the township of Brunswick Heads and has an area of approximately 30.5 ha (refer Figure 1.1). The majority of the site is dominated by low heath which is maintained by slashing. The site is bound by residential development to the north with areas of undisturbed forest to the west and south of the site. The eastern boundary of the site is bound by Simpsons Creek. The property is bisected north-south by a constructed drainage line ('the central drain') which feeds into Everitts Creek to the south which connects to Simpsons Creek in the east. A road reserve of 20 metres width occurs in the eastern portion of the site (refer Figure 1.1) and continues into adjacent land to the south (Lot 4 DP576360).

Coastal Wetlands gazetted under State Environmental Planning Policy (Resilience and Hazards) 2021 occur in the east of the site flanking Simpsons Creek.

1.4 Proposed Development

Development consent is sought to undertake a staged subdivision to create 131 lots upon land described as 15 Torakina Road, Brunswick Heads (Lot 13 in DP 1251383). The application proposes the subdivision of the land in 3 stages comprising, 123 residential lots, three (3) medium density lots, and four (4) public reserves together with associated public roads and infrastructure services (water, sewer, drainage and stormwater management works), bulk earthworks, tree removal and vegetation management works (refer concept plan at Figure 1.2).

The development occupies approximately 13.33 ha (43.7 %) of the site. Residual land outside of the development footprint (~17.2 ha) will be managed for biodiversity and comprises reserves P1, P2, and P3. Reserve P2 will be dedicated to Council. The majority of residue land in the east and west of the site is addressed via this VMP via designated Management Zones.

Subdivision plans are provided in Appendix A.

1.5 Bushfire Matters

A Bush Fire Safety Authority (BFSA) was issued for the development by NSW Rural Fire Service (RFS) on 23/12/2021. The BFSA included general terms of approval with which this VMP is compliant. Asset Protection Zones (APZs) for the development are shown at Figure 1.3. Vegetation management required for biodiversity management (refer Section 6.1) is consistent with APZ requirements.

Figure:	1.1 Subject Site
File:	1-211400-BaysideBrunswick_ClarenceProperty
Source:	Aerial Image - Near Maps 2021

0 50 100 150 200 250 m

Legend

Site Boundary

A3 Scale 1:4000
Coordinate System: MGA 56 Projection: Transverse Mercator

Date: 17-8-21

AWC
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CLIENT: CLARENCE PROPERTY

DRAWING:
FIGURE 1.2
LAND DEDICATION PLAN

PROJECT:
WALLUM ESTATE

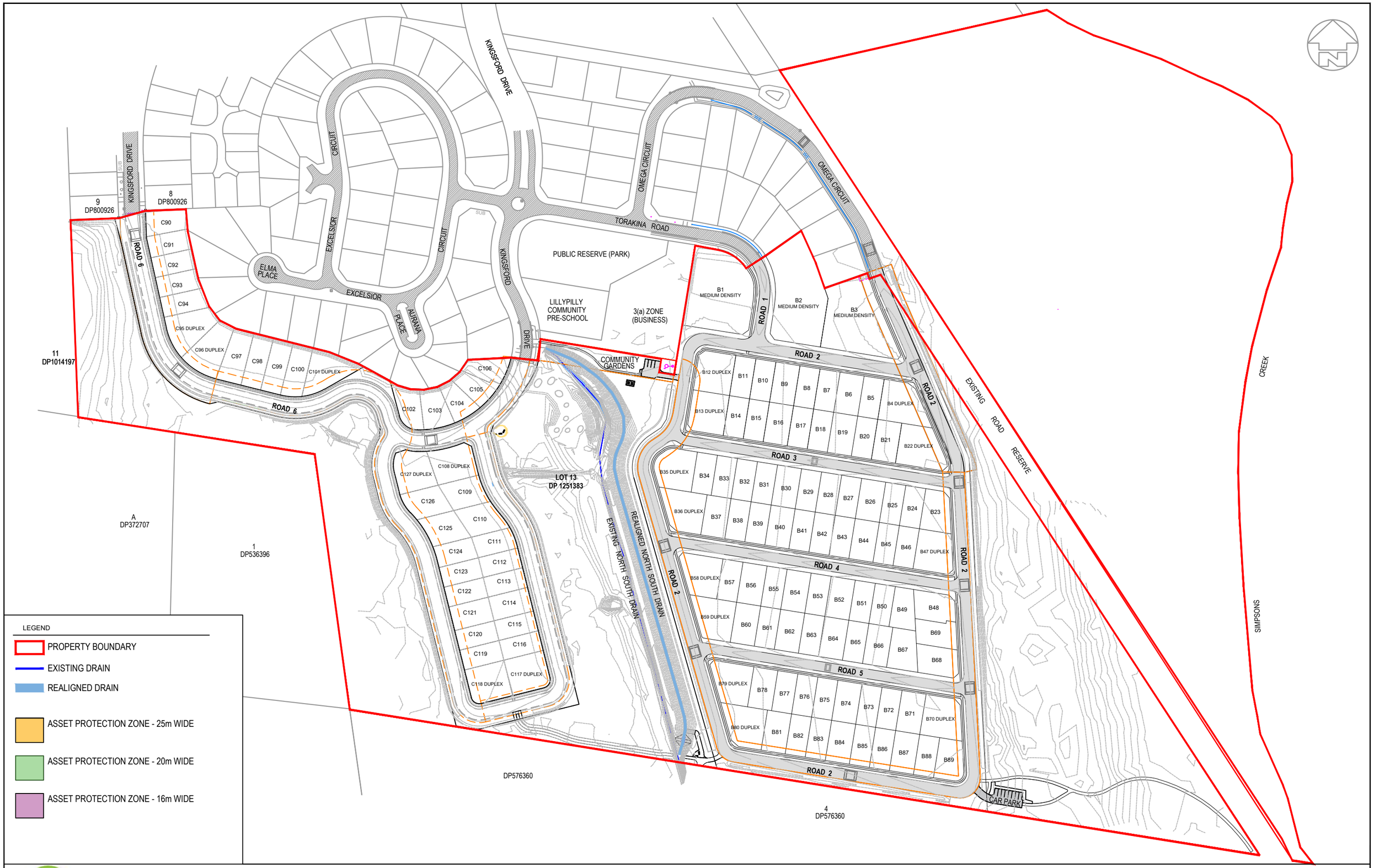
REV.	ISSUE / AMENDMENTS	DATE
A	*FOR APPROVAL*	*21.09.22*

ADDRESS:
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

SCALE 0 50 100m

REV. **A**

DESIGNED	IC/SS	CAD FILE No. **1-211400_WALLUM.DWG**
DRAWN	SS	
CHECKED	DMc	DWG No. **1-211400_WALLUM_**



LEGEND

- PROPERTY BOUNDARY
- EXISTING DRAIN
- REALIGNED DRAIN
- ASSET PROTECTION ZONE - 25m WIDE
- ASSET PROTECTION ZONE - 20m WIDE
- ASSET PROTECTION ZONE - 16m WIDE

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CLIENT: CLARENCE PROPERTY

DRAWING:
FIGURE 1.3
ASSET PROTECTION ZONE PLAN

PROJECT:
WALLUM ESTATE

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR APPROVAL*	*21.09.22*

ADDRESS:
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

SCALE 0 50 100m

REV. **A**

DESIGNED	IC/SS	CAD FILE No. **1-211400_WALLUM.DWG**
DRAWN	SS	
CHECKED	DMc	DWG No. **1-211400_WALLUM_**

2 Aim and Objectives

2.1 Aims

The aim of this VMP is to retain consolidated vegetation communities, re-establish degraded areas of vegetation outside of the development footprint within designated Management Zones and thereby improve threatened species habitat.

2.2 Objectives

To achieve the aim of the VMP the following management objectives apply:

- Protect and maintain existing vegetation outside of the development footprint
- Undertake rehabilitation works in areas of degraded native vegetation
- Restore degraded/disturbed native vegetation to a level that reflects the cover, diversity and density of existing intact native vegetation
- Introduce measures to control human impacts to areas of retained and restored vegetation
- Manage and maintain vegetation to provide suitable habitat for fauna, particularly where habitat for acid frogs requires intervention to maintain biodiversity values.

3 Site Attributes

3.1 Geology and Soils

Soil landscapes (Morand 1994) at the site include:

Tyagarah Aeolian

- Landscape— sediment basins of mixed estuarine and aeolian origin forming level to gently undulating plains. Relief is <3 m, elevation <5 m and slopes <1%. Extensively cleared open- and closed-forest.
- Soils— deep (>150 cm), moderately well-drained minimal Prairie Soils near basaltic areas. Deep (>150 cm), well-drained Podzols and Acid Peats near barrier systems.
- Limitations— very strongly acid, permeable, often waterlogged soils of low fertility and low waterholding capacity with localised salinity. Permanently high watertables and moderate wind erosion hazard.

Black Rock Aeolian

- Landscape—extremely low level to gently undulating beach ridge plains on Pleistocene beaches and dune sand. Elevation and relief are 1–2 m, slopes <5%. The topography is characterised by dune/swale systems aligned parallel to the coast. Dunes are very low (<3 m) and narrow to moderately broad (20–500 m), swales narrow to moderately broad (100–500 m). Dry and wet heathland occurs in dunes and swales respectively.
- Soils—deep (>300 cm), well-drained Podzols on dunes. Deep (>300 cm), imperfectly drained Humus Podzols and Peaty Podzols in depressions and deep (>200 cm), waterlogged Acid Peats (O) in swales. Deep (>300 cm), rapidly drained Siliceous Sands on newer, seaward dunes.
- Limitations—non-cohesive, highly permeable, highly acid soils of very low fertility. Organic soils in swales with permanently high watertables. High wind erosion hazard.

3.2 Topography and Hydrology

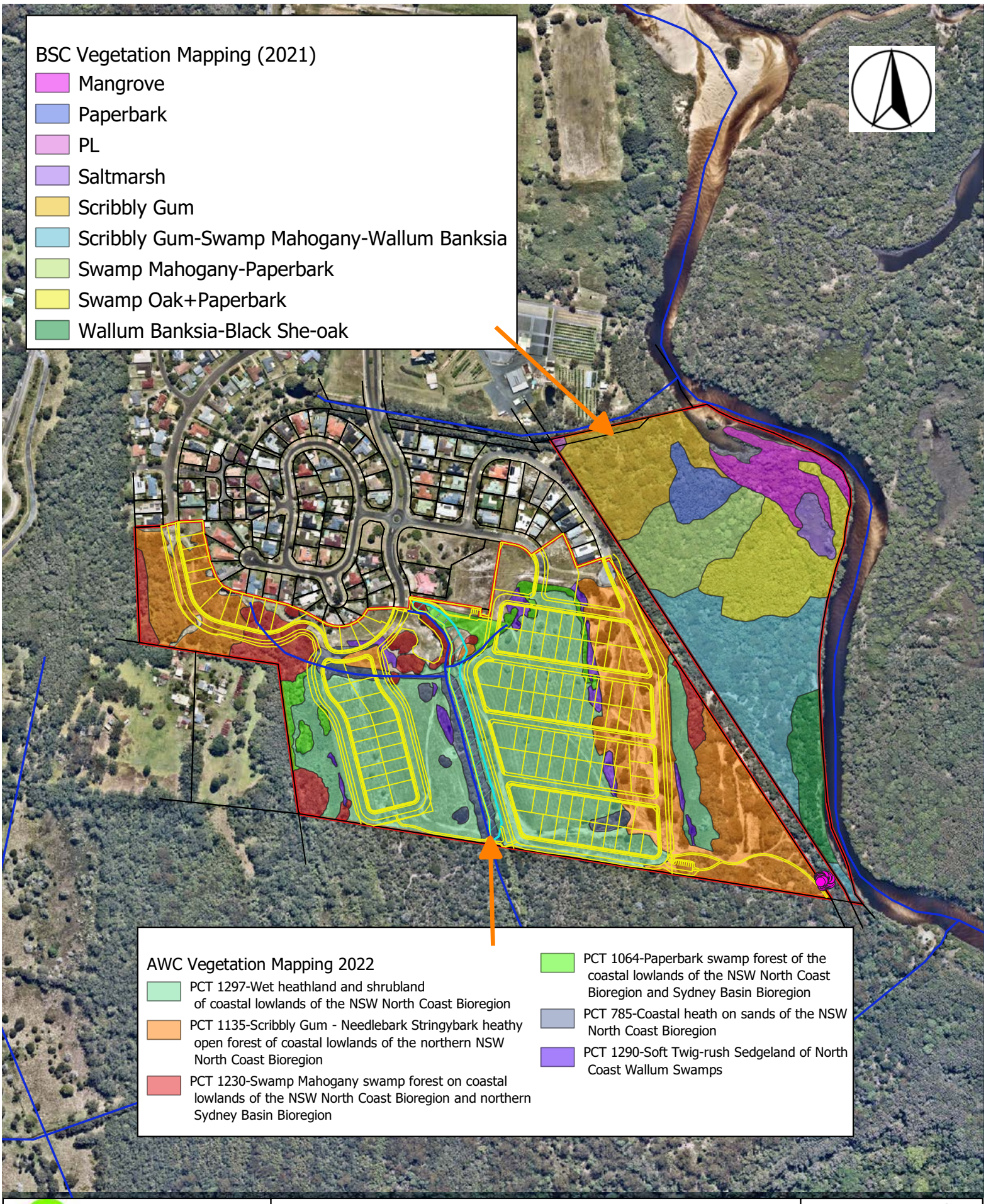
The site comprises low lying relativity flat land defined by two low, flat ridges (old dune systems) running north-south on the eastern and western side of the site. A central excavated drain runs from the north to the south of the site and eventually flows into Simpson Creek via Everitts Creek. The area east of the site drains towards the coastal zone and into the existing drain to the north. Land west of the site on the western ridge generally drains south into the adjacent low-lying areas. Ground water at shallow depths is typically between 0.3 - 0.8m in lower lying areas.

3.3 Vegetation Communities

The BDAR (AWC 2022) confirmed and mapped a number of vegetation communities at the site. Vegetation types are expressed in terms of plant community types (as per the BioNet Vegetation Classification) at Table 3-1. Figure 3.1 shows PCT mapping within the development footprint, with Council vegetation mapping adopted for undeveloped land in the east of the site.

Table 3-1 Plant Community Types

PCT ID	Formation	Class	Plant Community Type (PCT)
Development footprint			
1230	Forested Wetlands	Coastal Swamp Forest	Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion.
1064	Forested Wetlands	Coastal Swamp Forests	Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion
1135	Dry Sclerophyll Forests (Shrubby sub-formation)	North Coast Dry Sclerophyll Forests	Scribbly Gum - Needlebark Stringybark heathy open forest of coastal lowlands of the northern NSW North Coast Bioregion
785	Heathlands	Northern Montane Heaths	Coastal heath on sands of the NSW North Coast Bioregion
1290	Freshwater Wetlands	Coastal Heath Swamps	Soft Twig-rush Sedgeland of North Coast Wallum Swamps
1297	Freshwater Wetlands	Coastal Heath Swamps	Wet heathland and shrubland of coastal lowlands of the NSW North Coast Bioregion
Residual land (eastern conservation land)			
916	Saline Wetlands	Mangrove Swamps	Mangrove – Grey Mangrove low closed forest of the NSW Coastal Bioregion
1297	Freshwater Wetlands	Coastal Heath Swamps	Wet heathland and shrubland of coastal lowlands of the NSW North Coast Bioregion
1125	Saline Wetlands	Saltmarshes	Saltmarsh complex of the NSW North Coast Bioregion
1235	Forested Wetlands	Coastal Swamp Forests	Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion
663	Heathlands	Coastal Heath Swamps	Banksia dry shrubland on coastal sands of the NSW North Coast Bioregion



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Legend

- Site
- Layout
- Side Swale
- Drainage Lines
- Pink Nodding Orchids

0 100 200 300 m

A4 Scale 1:6,000
Coordinate System: MGA 56 Projection: Transverse Mercator

Figure 3.1 Plant Community Types

Data source:
Aerial - Near Maps 2022
Plant Community Types: AWC and BSC 2021

Date:20-09-22
Job No:211400
Drawn:ED
Checked:IC

3.4 Threatened Flora and Communities

Threatened flora

One threatened flora species has been identified at the site; a small population (~100 plants) of Pink Nodding Orchid (*Geodorum densiflorum*) occurs within residual land in the south-east corner of the property. The location of these plants is shown at Figure 3.1.

Threatened communities

Three Threatened Ecological Communities (TECs) occur at the site:

- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (consistent with PCT 1064 and PCT 1230)
- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions (consistent with PCT 1235)
- Coastal Saltmarsh in the North Coast, Sydney Basin and South East Corner Bioregions (consistent with PCT 1125).

3.5 Vegetation Condition

With the exception of the highly modified (slashed) heathland in the central portion of the site (much of the development footprint), vegetation communities are generally in good condition, are relatively undisturbed and environmental weeds occur very infrequently. A network of informal tracks and open sandy areas occur in the east of the site where vegetation has been removed and vehicles have accessed Simpsons Creek. These areas are highly degraded from disturbance by unauthorised motorbike riders.

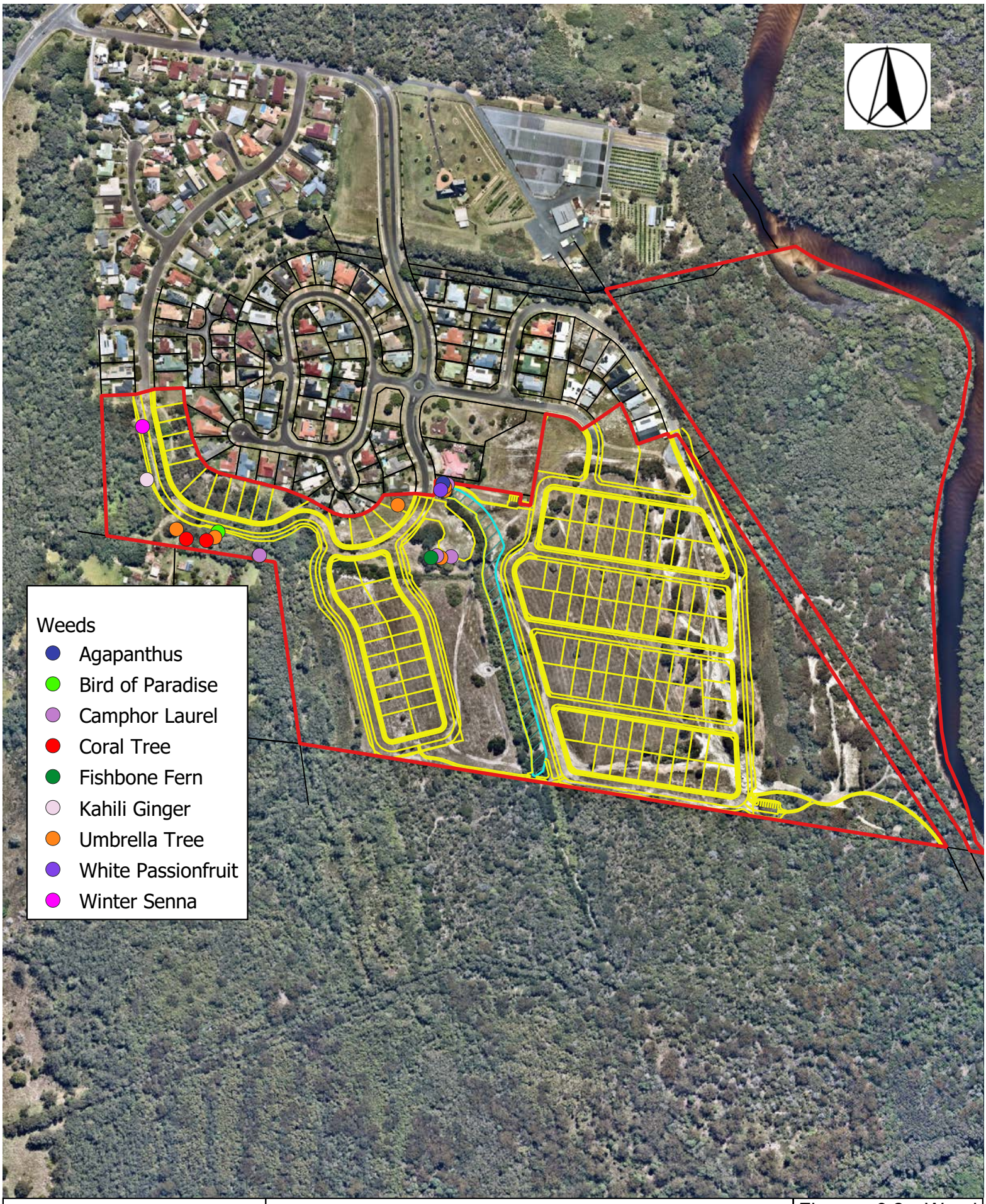
3.6 Weeds

Vegetation at the site is generally in excellent condition, showing high resilience and weeds occur at very low incidences. This is primarily due to the sites occurrence on low fertility soils which do not provide suitable conditions for broadscale establishment of common woody weeds such as Camphor Laurel, Privet or Lantana). Weed species outside of the development footprint are largely limited to the west of the site and include Umbrella Tree, Coral Tree and an infestation of Kahili Ginger. A vehicle track along the powerline in this area is dominated by pasture grass. The eastern portion of the site is very clean and woody weeds are absent; Whiskey Grass occurs very infrequently along tracks and disturbed areas. In the north of the site adjacent to the pre-school, two small patches of PCT 1230 support occasional woody weeds (Camphor Laurel, Umbrella Tree); Fishbone Fern is also present.

Weed mapping is shown at Figure 3.2. Within the development footprint in the west of the site disturbed areas supports Umbrella Tree, Lantana and Camphor Laurel. These are not depicted and will be removed mechanically (along with native vegetation) as the site is developed. Weed species within residual land are listed in Table 3-2. No species are listed as priority weeds for the North Coast.

Table 3-2 Exotic species at the site

Common Name	Scientific Name
Agapanthus	*Agapanthus praecox*
Billygoat Weed	*Ageratum houstonianum*
Bird of Paradise	*Strelitzea sp.*
Broad-leaved Paspalum	*Paspalum mandiocanum*
Camphor Laurel	*Cinnamomum camphora*
Cocos Palm	*Syagrus romanzoffiana*
Coral Tree	*Erythrina x sykesii*
Fishbone Fern	*Pteridium esculentum*
Kahili Ginger	*Hedychium gardnerianum*
Kikuyu	*Cenchrus clandestinum*
Setaria	*Setaria sphacelata*
Umbrella Tree	*Schefflera actinophylla*
Whiskey Grass	*Andropogon virginicus*
White Passionfruit	*Passiflora subpeltata*
Winter Senna	*Senna pendula var. glabrata*



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Legend

Site

Side Swale

Layout

0 100 200 300 m

A4 Scale 1:5,000

Coordinate System: MGA 56 Projection: Transverse Mercator

Figure 3.2 Weed Mapping

Data source:
Aerial - Nearmaps 2022
Layout - Cilviltech
Weeds - AWC

Date:5-09-22
Job No:211400
Drawn:ED
Checked:IC

4 Threatened Fauna Considerations

4.1 Introduction

The following threatened fauna species have been recorded at the site (JWA 2011, AWC 2022):

- Common Planigale (*Planingale maculata*)
- Eastern Osprey (*Pandion cristatus*)
- Glossy Black-cockatoo (*Calyptorhynchus lathami*)
- Greater Broad-nosed Bat (*Scoteanax rueppellii*)
- Grey-headed Flying-fox (*Pteropus poliocephalus*)
- Koala (*Phascolarctos cinereus*)
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)
- Little Bent-winged Bat (*Miniopterus australis*)
- Olongburra Frog (*Litoria olongburensis*)
- Pale-vented Bush-hen (*Amaurornis moluccana*)
- Southern Myotis (*Myotis macropus*)
- Wallum Froglet (*Crinia tinnula*)
- White-bellied Sea-eagle (*Haliaeetus leucogaster*)
- White-throated Needletail (*Hirundapus caudacutus*).

Threatened species habitat directly affected by the development include the Wallum Froglet, Koala and Glossy Black-cockatoo. This VMP incorporates compensation measures (as required under the Statement of Commitments) to mitigate adverse impacts to the Glossy Black-cockatoo and Koala* via:

- Planting of Glossy Black-cockatoo feed trees (Black She-oak *Allocasuarina littoralis*) will be implemented at a 2:1 ratio (as per Objective B2 in the Statement of Commitments) to compensate for trees removed from within the development footprint (refer Section 4.2 for further details).
- Planting of Koala feed trees (Swamp Mahogany) will also be planted at a 2:1 ratio as a compensatory measure (refer Section 4.2 for further details) to address Objective B2.

*Note: surveys by AWC in 2021 failed to record Koalas at the site; the most recent record (BioNet) for the species at the site is from 2011.

Compensatory measures for the Wallum Froglet are provided in the *Revised Wallum Froglet Management Plan* (AWC 2022).

Habitat for other threatened fauna species recorded at the site is retained within forested residual land in the east and west of the site where resources for all species will be maintained; refer summary at Table 4-1.

Table 4-1 Threatened fauna impacts and habitat protection/compensation

Species	Habitat Impacts	Compensation
Common Planigale	Slashed heath in development footprint impacted, other habitats unaffected.	None proposed. Habitat retained and protected within residual land.
Eastern Osprey	Foraging and nesting resources unaffected.	None proposed.
Glossy Black-cockatoo	Minor reduction of feed trees (Black She-oak) within development footprint. Foraging and potential breeding resources (hollow-bearing trees) retained within residue land.	Compensation plantings of Black She-oak. Nest boxes installed in east of site under Stage 1 VMP.
Grey-headed Flying-fox	Minor loss of foraging resources within development footprint.	None proposed. Substantial foraging habitat retained and protected within residual land.
Koala	Loss of 29 scattered Swamp Mahogany (primary feed tree) within development footprint. Minor loss of secondary foraging resources (Scribbly Gum).	Compensation plantings of primary feed tree Swamp Mahogany and infill plantings of Scribbly Gum within residual land.
Microbats	Foraging and breeding resources largely unaffected.	None proposed.
Olongburra Frog	Habitat retained adjacent to development footprint.	Habitat compensation proposed – refer WFMP.
Pale-vented Bush-hen	Habitat largely unaffected.	None proposed.
Wallum Froglet	Habitat impacted within development footprint.	Habitat compensation proposed – refer WFMP.
White-bellied Sea-eagle	Habitat unaffected.	None proposed.
White-throated Needletail	Habitat unaffected.	None proposed.

4.2 Compensation

4.2.1 Glossy Black-Cockatoo

A total of 38 food trees (Black She-Oak *A. littoralis*) will require removal within the revised development footprint and compensation is therefore required to address Objective B2. Based on the prescribed 2:1 compensation ratio, 76 Black She-Oak will be planted. Details of compensation plantings are included within management actions in Section 5.

4.2.2 Koala

The proposed development requires the removal of 27 of the primary Koala food tree Swamp Mahogany. These trees will be offset by the planting of 54 Swamp Mahogany as part of restoration works to address Objective B2.

Details of compensation plantings are included within management actions in Section 5.

5 Restoration and Establishment Activities

5.1 Introduction

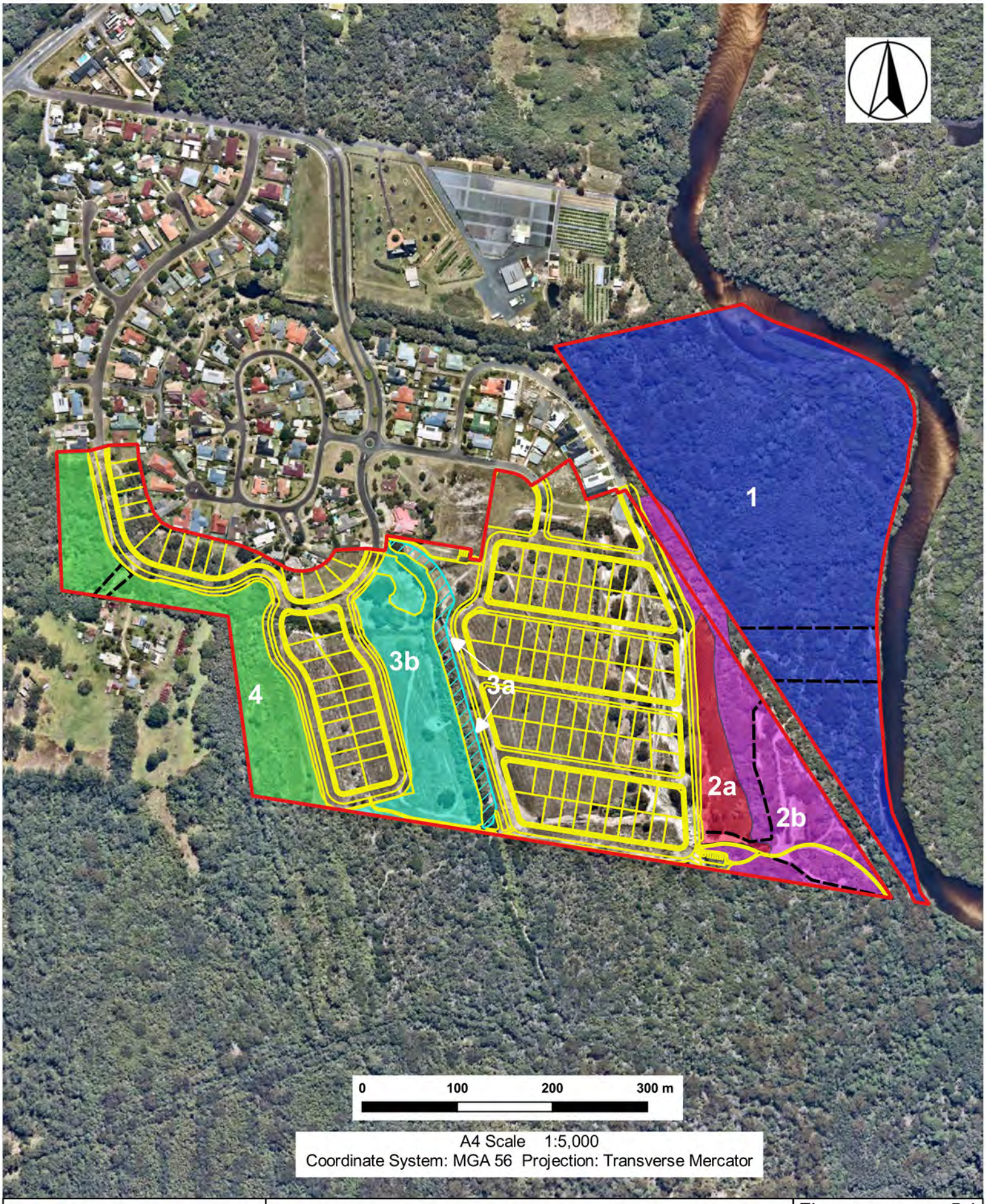
Four broad Management Zones (MZs) have been identified at the site (refer Figure 5.1). As noted, Management Zone 3 will be dedicated to Byron Shire Council once works are satisfactorily completed. Management Zones total approximately 17 ha and comprise approximately 57% of the site.

Details of MZs are described in Table 5-1. Note that within MZ 3b substantial works within frog habitat west of the central drain fall under the remit of the WFMP and so are not discussed further in this VMP except to note that management of frog habitat must ensure wallum and heath vegetation communities are maintained in perpetuity to maintain biodiversity values. Similarly an area in MZ 2b also include actions prescribed in the WFMP. These matters are excluded from this VMP. MZ 3a includes landscaping works following construction of the new stormwater drain and other drainage features (swales etc).

The north-eastern portion of MZ 3b will be maintained as open space and no infill planting is proposed; management actions in this area are limited to weed and regrowth control only. Management actions within each zone are discussed in the following Sections.

Table 5-1 Vegetation Management Zones

MZ	Details	Vegetation
1	Largest VMZ, occupying residual land in the east of the site (10.3 ha). Lot B128 in the Concept Plan.	Mangrove forest (*Avicennia marina*, *Aegiceras corniculatum*), Swamp forest (*Casuarina glauca* +/- *Melaleuca quinquenervia*) and brackish swamp (*Juncus kraussii, Acrostichum speciosum*), Dune sclerophyll forest (*Eucalyptus racemosa, Allocasuarina littoralis, Banksia aemula*).
2a	South-east corner of the site west of the road reserve. Identified Wallum Froglet habitat; Lot P1 in the Concept Plan.	Sedge swamp/wet heath
2b	South-east corner of the site west of the road reserve. Additional plantings will be implemented within degraded tracks. Lot P1 in the Concept Plan.	Dune sclerophyll forest
3a	Drainage reserve (to be constructed).	Slashed heath and regrowth
3b	Central drainage area Northern portion where weed management will be completed comprises approximately (0.3 ha). Lot P2 in the Concept Plan.	North: Slashed grassland; two isolated patches of *Eucalyptus robusta*. Central drain: Regrowth vegetation retained (*Allocasuarina littoralis, Nematolepis squamea*)
4	Western portion of site. Includes Wallum Froglet habitat; additional plantings will be implemented along degraded access track. Lot P3 in the Concept Plan.	Swamp forest, Dune sclerophyll forest



A4 Scale 1:5,000
Coordinate System: MGA 56 Projection: Transverse Mercator

AWC

Legend

- Site Boundary
- Layout
- Existing Access Track - Planting Area

Management Zones

- 1
- 2a
- 2b
- 3a
- 3b
- 4

Figure 5.1 Management Zones

Data source:
Aerial - Nearmaps 2022
Management Zones - AWC
Existing Acess Track - AWC
Layout - Cilviltech

Date:27-10-22
Job No:211400
Drawn:ED
Checked:IC

5.2 Management Action Overview

Various management actions are prescribed within each zone with the aim of restoring existing vegetation/habitat and re-establishing vegetation within formerly cleared areas. Management actions have been based on consideration of several factors including:

- Existing threats to vegetation and mitigation measures to reduce these threats
- Existing vegetation community
- Existing seed banks and ability to utilise the existing seed bank
- Threatened species habitat
- Topography and landform
- Flooding and hydroperiod.

On this basis a range of general actions are prescribed in the following Sections including fencing, weed control and assisted regeneration by ripping and planting.

In the construction period, the following points apply to all of the MZs to protect existing vegetation and habitat:

- No stockpiling or storage (etc) is permitted within any MZs.
- No works (except for tracks for pedestrian access or for essential environmental management purposes) is permitted within any MZs.
- Vehicular access, apart from for essential environmental management purposes, is not permitted within any MZs.
- These measures, in addition to protocols for the clearing of any vegetation within the development footprint will be detailed in the project Construction Environmental Management Plan (CEMP).

5.3 Management Zone 1

Vegetation within VMZ 1 is generally in very good condition, with disturbance along the western margins from historic track making and disturbance by vehicles and motorbikes. The boundary of MZ 1 must be clearly marked by a registered surveyor prior to commencing works so that no works are competed within the adjacent road reserve which comprises Council land.

Management actions for MZ 1 include:

- Install temporary exclusion fencing along the western border of VMZ 1 (once identified by a registered surveyor) prior to the construction phase to prohibit entry by vehicles/plant. For the operational stage of the development informal entry by the public will be dissuaded by fencing and signage stating *"Regeneration area, no entry"* (or words of similar intention).
- Control of Whiskey Grass by a professional experienced bush regenerator.
- Shallow ripping (multi-tine ripper to 300 mm depth) of exposed sand on informal tracks to stimulate germination. If regeneration rates are low, infill plantings (refer Section 5.8) shall be implemented.
- Installation of compensatory and infill plantings (refer Section 5.8) if regeneration response is poor.
- Monitoring of plantings and ripping actions.
- Maintenance of wetland and heath communities.
- Protection of Pink Nodding Orchids. Key risks to these plants are theft and trampling. The orchid colony will be protected by temporary construction fencing during installation of the

eastern walkway and a buffer planting installed to screen the orchids from view. Signage stating 'Protected habitat – please keep out' (or words of similar intention) shall be installed along the walkway and at the walkway entry point.

A species schedule for infill plantings within degraded areas and the orchid buffer in MZ 1 is provided at Section 5.8.

5.4 Vegetation Management Zone 2a and 2b

MZ 2 is highly disturbed from many informal tracks exposing large areas of compacted sand. Much of this area has been previously cleared with regrowth occurring patchily throughout. The key aspect of restoration works outside of Wallum Froglet habitat (Zone 2a) is the restoration of these degraded areas via a combination of planting and assisted regeneration (via ripping). As for MZ 1, prior to construction works the road reserve and western zone boundary must be clearly marked in the field by a registered surveyor and temporary fencing installed to restrict entry by vehicles/plant and personnel.

Management actions for MZ 2 include:

- Fence the perimeter of MZ 2 to prohibit entry by vehicles during construction. Informal entry to MZ 1 will be restricted during the occupation phase to control public access. This will be achieved by installation of bollards and rock along the edge of the perimeter road and carpark to restrict vehicle access and installation of dense planting along the proposed creek access pathway to restrict resident access to bushland and discourage opportunities for the creation of informal pathways.
- Installation of signage at strategic locations stating *"Regeneration area, no entry"* (or words of similar intention).
- Control of Whiskey Grass by a professional experienced bush regenerator.
- Ripping sandy soils on informal tracks (as per MZ 1) (2b).
- Installation of compensatory and infill plantings (refer Section 5.8) (2b).
- Maintenance of heath and wetland habitats (2a).
- Monitoring of plantings and ripping actions (2b).

The delineation of MZ 2a and 2b is shown in Figure 5.1.

Notes:

- Proposed eucalypt plantings fringing the proposed carpark (MZ 2a) in the landscape plan may require refinement, as it must be demonstrated that the canopy of mature trees cannot overhang heathland. If this is the case some trees may require relocation to more appropriate locations which will be attended to in the detailed landscape plans.
- For the long term habitat maintenance of wet heath and sedgeland habitat within MZ 2a (acid frog habitat), incursions of woody vegetation (eg. eucalypts, wattles etc which may form a closed canopy) must be removed to maintain biodiversity values associated with existing high quality habitat.

5.5 Management Zone 3a

MZ 3a comprises the drainage reserve east of the existing drain, where a second stormwater channel and swales will be constructed. Drain construction will require disturbance of all existing vegetation in this zone, therefore post construction planting may only occur when works are complete and signed off by the project engineer and stormwater consultant. Management actions for MZ 3a are limited to landscape plantings to establish wallum sand heath and a treatment swale, as specified in the landscape plan at Appendix B. Monitoring of the plantings will be required following installation.

Notes:

- For the long term habitat maintenance of wet heath and sedgeland habitat within MZ 3a (acid frog habitat), incursions of woody vegetation (eg. eucalypts, wattles etc which may form a closed canopy) must be removed to maintain biodiversity values associated with adjacent existing high quality habitat.

5.6 Management Zone 3b

The majority of MZ 3b will be managed as Wallum Froglet habitat (refer WFMP). In the northeast of MZ 3b two isolated patches of Swamp mahogany occur within mown grassland. Several woody weeds occur within this area along with some dumped building refuse and concrete. Areas of mown grassland will be retained as open space. In addition, landscape plantings will be installed within the bioswale and new drain to be constructed east of the existing drain. These plantings are detailed in the Landscape Plan (refer Appendix B) however consistent with this VMP landscapes works must ensure designated vegetation communities are maintained.

Note that the existing central drain will not be subject to any works and all existing regrowth flanking the drain will be retained in-situ. This vegetation is in good condition, weed free and is regenerating well; no further management is required.

Management actions for MZ 3b therefore are limited to:

- Removal/control of exotic species (refer Figure 3.2) by a professional experienced bush regenerator.
- Rubbish removal.
- Maintaining Wallum Froglet habitat.

Notes:

- For the long term habitat maintenance of wet heath and sedgeland habitat within MZ 3b (acid frog habitat), incursions of woody vegetation (eg. eucalypts, wattles etc which may form a closed canopy) must be removed to maintain biodiversity values associated with adjacent existing high quality habitat.

5.7 Management Zone 4

MZ 4 flanks the western boundary of the site and is partly bisected by a powerline and access track in the northern portion. Vegetation in the north outside of these disturbed areas is in excellent condition. At the boundary with the adjacent property to the south several mature Coral Tree and Umbrella Tree occur. Old vehicle tracks in this area have regenerated significantly with Bracken and regenerating heath. The southern portion of MZ 4 is in excellent condition and no works are required. Substantial regeneration of Prickly Teatree (*Leptospermum juniperinum*) flanks the eastern edge of adjacent swamp forest. The southern portion of MZ 4 comprises acid frog habitat as acknowledged in the WFMP.

Management actions for MZ 4 include:

- Installation of rock/boulders along the edge of the perimeter road to restrict vehicle access.
- Installation of signage at strategic locations stating *"Regeneration area, no entry"* (or words of similar intention).
- Removal/control of exotic species (refer Figure 3.2) by a professional experienced bush regenerator.
- Ripping sandy soils on informal tracks (as per MZ 1).
- Installation of compensatory and infill plantings (refer Section 5.8).
- Monitoring of plantings and ripping actions.
- Maintenance of appropriate heath and wetland vegetation.

5.8 Summary of Actions

A summary of management actions prescribed within prescribed Management Zones is provided at Table 5-2.

Table 5-2 Summary of management actions

MZ	Weed control	Planting	Ripping	Habitat Maintenance*	Rubbish Removal	Fencing (Construction)	Exclusion (Occupation)
1	✓ (minor)	✓	✓			✓	✓
2a		✓	✓	✓*		✓	✓
2b	✓ (minor)					✓	✓
3a		✓		✓*		✓	✓
3b		✓		✓*	✓	✓	✓
4	✓	✓	✓			✓	✓

*For the long term habitat maintenance of wet heath and sedgeland (acid frog and threatened species habitat), incursions of woody vegetation (eg. eucalypts, wattles etc which may form a closed canopy) must be removed to maintain biodiversity values.

5.9 Planting Specifications

5.9.1 Infill plantings (MZ 1, MZ 2b, MZ 4)

All trees planted within formed tracks will be planted at spacings of 5 metre centres. Tree plantings will be installed following initial ripping works and provide immediate cover for degraded areas if native regeneration is delayed. All trees will be installed as planted tubestock, be sourced from a reputable supplier of native plants, be in good health and free of pests and disease and ideally be of native provenance. Each planting will be installed with a tree guard, mulched with straw and thoroughly watered in at the time of planting.

Note the requirement regarding eucalypt landscaping around the carpark in the south-east of the site (MZ 2b): Proposed eucalypt plantings fringing the proposed carpark (MZ 2a) in the landscape plan may require refinement, as it must be demonstrated that the canopy of mature trees cannot overhang heathland. If this is the case some trees may require relocation to more appropriate locations which will be attended to in the detailed landscape plans.

A watering regime applies to all planted trees as follows:

- Initial watering and daily watering for five days
- Watering every 3 days for four weeks.

Additional watering may be required should adverse conditions occur; this will be completed at the discretion of the appointed contractor. A planting schedule is provided at Table 5-3 and represents common species within Scribbly Gum open forest at the site. Species chosen include resources for the Koala and Glossy Black-cockatoo – these are additional to compensation requirements (refer Section 4.2).

Note: Infill planting must not alter the composition of vegetation communities as described in this plan.

Table 5-3 Infill plantings – species schedule

Scientific name	Common name
Acacia suaveolens	Sweet Wattle
*Allocasuarina littoralis**	Black She-oak
Banksia aemula	Wallum Banksia
Elaeocarpus reticulatus	Blueberry Ash
*Eucalyptus racemosa^*	Scribbly Gum
*Eucalyptus robusta***	Swamp Mahogany
Leptospermum polygalifolium	Tantoon
Persoonia stradbrokensis	Geebung

*Glossy Black-cockatoo feed tree

**Primary Koala feed tree (Note: not to be planted in Pink Nodding Orchid buffer planting)

^ Secondary Koala feed tree

5.9.2 Landscape plantings (MZ 3a)

Establishment of wallum sand heath and swale plantings will be completed in accordance with landscape specifications (refer Appendix B) following construction of stormwater facilities.

5.10 Licensing and Qualifications

A scientific license is required when completing bush regeneration works in Threatened Ecological Communities. All contractors completing works under the provisions of this VMP must be appropriately qualified (minimum Certificate II in Bush Regeneration).

6 Implementation

6.1 Key Performance Indicators

Management outcomes must be specific and measurable such that objectives summarised in Section in 2.2 of this Plan are demonstrably achieved. Key Performance Indicators (KPIs) associated within each management action are detailed in Table 6-1.

NOTES:

- **Works may not commence until this VMP has been approved by Byron Shire Council.**
- **A summary of the management actions and zones are presented for easy reference for contractors/land managers at Appendix C.**

6.2 Implementation and Funding

Table 6-2 provides a schedule for implementation of prescribed management actions. In order to achieve optimal environmental outcomes, implementation of management actions within this VMP should follow the sequence below:

1. Weed control and rubbish removal
2. Erect exclusion fencing around all zones prior to construction works
3. Ripping and planting within degraded informal tracks of Management Zones 1, 2 & 4
4. Installation of exclusion bollards/fencing and signage at the completion of the above works.

Note: Planting within MZ 3a can only commence following completion of engineering works for the stormwater drain. Once works are completed and signed off by project engineers/Council, planting of wallum sand heath (as per landscape specifications – Appendix B) can commence.

All works will be funded by the proponent with all prescribed management actions maintained for a period of five years, or until nominated KPIs have been achieved. Once KPIs have been met to Council's satisfaction, management of Management Zone 3 will be transferred to Council.

Table 6-1 Management actions and KPIs for VMZs

Phase	Actions	Location*	Timing	KPIs	Responsibility
1 (Establishment phase)	Remove environmental weeds and implement ripping within degraded areas/ informal tracks.	MZ 1-4	Prior to construction works and be completed within one year. YEAR 1	• 90% of woody weeds and exotic groundcover removed. • Ripping completed within all areas of degraded land/informal tracks. • Existing and emergent weeds controlled by initial treatment following ripping. • Rubbish removed (where relevant).	Appointed contractor
1 (Establishment phase)	Installation of 'no go' fencing prior to and during construction.	MZ 1-4	Prior to construction works. YEAR 1	• Vegetation management zones fenced off to restrict access by vehicle/plant and signage installed stating all MZs are 'no go' zones	Project manager/developer
2 (Establishment phase)	Follow up removal of environmental weeds and monitor areas where ripping has been completed	MZ 1-4	To be continued during the second year of construction. Monitoring to be completed. YEAR 2	• 95% of woody weeds and exotic groundcover removed. • Initial ripping of sandy areas produces a minimum native groundcover of 20% within monitoring plots, • 90% survival of planted trees. • Any dead plants are replaced as required. • Fencing maintained.	Appointed contractor
3 (Maintenance phase)	Follow up removal of environmental weeds and monitor areas where ripping has been conducted to assess required plant densities has been achieved.	MZ 1-4	To be continued during the third year of construction and completed prior to the end of second year of construction. YEAR 3	• Native cover of 30% achieved within ripped areas. • 90% survival of planted trees. • Emergent weeds controlled and comprise ⩽5% total cover within all MZs. • Any dead plants are replaced as required. • Fencing maintained.	Appointed contractor
4 (Maintenance phase)	Prescribed densities of plants from ripping and/or planting sandy areas are achieved as per	MZ 1-4	All actions to be completed by the end of 4th year from construction initiation date. YEAR 4	• Native cover of 40% achieved within ripped areas. • Minimum 90% native plant survivorship (plantings) achieved by end of 4th year of on ground works, • Emergent weeds continue to be controlled and comprise ⩽5% total cover within all MZs	Appointed contractor

Phase	Actions	Location*	Timing	KPIs	Responsibility
	monitoring requirements			• Any dead plants are replaced as required. • Removal of tree guards.	
5 (Completion phase)	Prescribed densities of plants from ripping and/or planting sandy areas are achieved as per monitoring requirements	MZ 1-4	All actions to be completed by the end of 4th year from construction initiation date. YEAR 5	• Native cover of 50% achieved within ripped areas. • Minimum 90% native plant survivorship (plantings) achieved by end of 5th year of on ground works, • Emergent weeds continue to be controlled and comprise ⩽5% total cover within all MZs • Any dead plants are replaced as required.	Appointed contractor
Occupation – vegetation management	Removal of all non-heath vegetation within MZ 2a and MZ 3a/3b to maintain biodiversity values.	MZ 2a, MZ 3a/3b	Annually	• MZ 2a must remain as a wetland/wet heath community (acid frog habitat). Any encroachment of Eucalypts or other sclerophyllous trees which may close out the canopy must be managed by the removal of these trees (ie. intervention management). • MZ 3a/3b must remain as heath which provides acid frog and threatened species habitat. Any encroachment of Eucalypts or other sclerophyllous trees which may close out the canopy must be managed by the removal of these trees (ie. intervention management).	MZ owner

*refer Figure 5.1

Table 6-2 Implementation Schedule

Activity		MZ	Month															
			1	2	3	4	6	9	10	12	18	24	30	36	42	48	54	60
Monitoring	Baseline vegetation monitoring (prior to works)	All	■															
	Vegetation monitoring event	All								■		■		■		■		■
Weed Control	Primary weed control	All	■															
	Secondary weed control	All		■			■		■									
	Follow up weed control	All								■	■	■	■	■	■	■	■	■
Habitat Protection	Fencing	All	■															■
	Signage	All	■															■
	Ripping	All	■															
Planting	Site preparation	All	■															
	Plantings	All	■															
	Planting Maintenance	All		■			■			■	■	■	■	■	■	■	■	■
	Final maintenance, monitoring & evaluation report	All																■

7 Monitoring and Reporting

7.1 Introduction

Monitoring is essential to ensure the success of all on ground works. Should monitoring reveal that KPIs are not being met, adaptive management will be necessary in order to rectify performance shortcomings.

Baseline monitoring within each Management Zone will be completed prior to initial works taking place via the establishment of permanent plots and photo points. Following commencement of works, monitoring will be completed at 12 months intervals for a total period of five years (5 monitoring events). A brief report should be produced annually that outlines the progress of revegetation and restoration works over each monitoring event.

7.2 Monitoring

As there are various methods for revegetation and restoration works prescribed within this VMP, monitoring methods differ for planting and ripping. Monitoring requirements are as follows:

7.2.1 Infill Plantings

Monitoring methods include:

- Two 5 x 5 m plots will be established within each Management Zone to monitor areas that have been planted.
- Each plot will be surveyed with a GPS unit and permanently marked with star pickets. Permanent photo points will be established at each plot.
- Inspection of plots site at 12-month intervals with tasks including:
  - Inspection of plant health and vigour
  - Identify any plant mortalities within the plot and within each Management Zone in general
  - Assessment of weed cover
  - Photographs from set photo points (locations to be agreed at project inception)
  - Assess mulch cover and tree guards.

7.2.2 Ripping (Assisted Regeneration)

Monitoring methods include:

- Two 5 x 5 m plots will be established within each Management Zone where areas have been ripped in order to determine the success of seed germination following disturbance.
- Each plot will be surveyed with a GPS unit and permanently marked with star pickets. Permanent photo points will be established at each plot.
- Inspection of the plots at 12-month intervals with tasks including:
  - Inspection of plant health and vigour
  - Identify species regenerating and species cover
  - Assessment of weed cover (if relevant)
  - Photographs from set photo points (locations to be agreed at project inception).

7.3 Reporting

Reporting on the progress of works relating to this VMP is required to demonstrate that KPIs are being met. Annual monitoring reports are to be completed by either a qualified bush regenerator or ecologist and reports will be supplied to the proponent and Council. Annual reports shall include the following information:

- A timetable of restoration and maintenance works completed in that year
- Details on the replacement of any dead or unhealthy stock where relevant
- The results of the monitoring completed regarding KPIs
- Comments on any problems at the site (e.g. vandalism, informal track making, rubbish dumping etc.) and how these have been managed
- Photographs from fixed photo points comparing the progress of the planting and ripping
- A log of herbicide uses during maintenance operations
- Any other relevant information or recommendations for future maintenance.

8 Ongoing Management Following Establishment

Once the restoration and establishment phases are complete, management zones will be transferred to their respective owners for management. It is anticipated that monitoring and management activities will be periodic and minor assuming all KPI's have been achieved in previous phases, however issues may arise periodically or over time which must be addressed to ensure management objectives are maintained (eg. maintaining a canopy free zones in acid frog habitats to maintain biodiversity values).

Ongoing monitoring and management actions in the post-establishment phase are detailed in Table 8-1.

Table 8-1 Summary of monitoring and management actions required

Phase	Actions	Location	Timing	KPIs	Responsibility
Occupation	Monitoring including: • Rubbish and weeds • Wallum and heath vegetation	All MZs	Quarterly	• All rubbish and weeds are controlled and removed. • Sensitive species and habitats are protected. • Wallum and heath vegetation do not contain forest species (MZ 2a, MZ 3)	MZ owner
Occupation	Wallum froglet habitat is protected and sustained as wallum habitat.	MZ 2 & 3a	Annually	• Ensure inappropriate access is prevented. • Remove any regenerating vegetation not consistent with wallum habitat (refer below). This includes colonising eucalypts (in a broad sense) and rainforest trees.	MZ owner
Occupation	Removal of all non-heath vegetation within MZ 2a and MZ 3a/3b to maintain biodiversity values.	MZ 2a, MZ 3a/3b	Annually	• MZ 2a must remain as a wetland/wet heath community (acid frog habitat). Any encroachment of Eucalypts or other sclerophyllous trees which may close out the canopy must be managed by the removal of these trees (ie. intervention management). • MZ 3a/3b must remain as heath which provides acid frog and threatened species habitat. Any encroachment of Eucalypts or other sclerophyllous trees which may close out the canopy must be managed by the removal of these trees (ie. intervention management).	MZ owner

9 Compliance

This VMP address requirements of the Concept Approval and Statement of Commitments, through the various actions prescribed. A summary response to VMP requirements is provided at Table 9-1.

Table 9-1 Compliance with Concept Approval

Requirement	Demonstration of Compliance
Concept Approval	
a) dimensions of the reserves	Refer Section 5.1, Table 5-1.
b) details of how any rehabilitation within the reserve is to occur	Refer Section 5. Various rehabilitation methods are described.
c) actions required to protect and improve habitat for threatened species including Koala, Glossy Black-Cockatoo and Wallum Froglet as well as actions to re-establish habitat for threatened species on cleared lands	Refer Section 5. Compensation plantings are discussed for the Koala and Glossy Black-Cockatoo. Actions to improve Wallum Froglet habitat are discussed in the stand alone WFMP. Justification for additional compensation actions is provided in Table 4-1. Habitat for these species is maintained within residual land in the east and west of the site, totalling approximately 17 ha.
d) measures to control weeds	Refer Section 3.6 and Sections 5.3 – 5.5. Due to low fertility soils, weeds occur at very low frequencies.
e) details of any fencing to protect the reserves	Refer Sections 5.3 – 5.5. Bollards will be installed along the outer edges of perimeter roads (and the eastern car park) to exclude vehicles from entering adjacent bushland. The creek walking track will be fenced to discourage residents from accessing adjacent bushland. Signage will be installed at various locations noting restoration and regeneration areas and that entry is prohibited.
f) identification of timeframes and responsibilities for each action	Refer Section 6.2. Timeframes for implementation of all works have been nominated.
g) bushfire management	Refer Section 5.1. Vegetation restoration and protection works require consideration with regard to bushfire management as Asset Protection Zones (APZs) for MZ 3. This area is designated as wallum heath and must remain so. On this basis, any non-heath regeneration (ie. eucalypts) which establish in this area must be removed in perpetuity. No management of vegetation within any other MZs is required to reduce bushfire hazard.
h) measures to control public access within the reserves to minimise damage	Refer Sections 5.3 – 5.5. Exclusion fencing will be installed during the construction phase, with bollards and signage to be installed to limit public access during the occupation stage.
i) details of future management and funding arrangements for the areas and measures to be implemented for the long-term protection of the areas, for example, through dedication.	Refer Section 6.2. All actions in this VMP will be funded by the developer. All management zones will be dedicated to Council following the end of the five year maintenance period and/or meeting KPIs.

Requirement	Demonstration of Compliance
Statement of Commitments	
B2: A Vegetation Management Plan will be prepared. The plan will outline both mitigation and compensatory strategies. The plan will set out a strategy for the rehabilitation and management of the Environmental Protection Zones (i.e. the areas covering approximately 11.5 ha between the development footprint and Simpson's creek) and outline a compensatory replacement planting strategy to offset the loss of the ecologically significant trees. All Koala and Glossy black cockatoo food trees impacted by the development will be replaced at a ratio of 2:1.	Complies; refer entire VMP, particularly Section 5 regarding compensation plantings for the Koala and Glossy Black-Cockatoo.
P6: The VMP is to include restoration plan of existing track.	Existing tracks within MZ 1, 2 & 4 will be ripped and planted out; refer Section 5.

10 References

Australian Wetlands Consulting (2018) *Bayside Way Stage 1A Vegetation Management Plan.* A report to Codlea Pty Ltd.

Australian Wetlands Consulting (2022a) *Wallum Estate Torakina Road, Brunswick Heads Revised Wallum Froglet Management Plan.* A report to Clarence Property Pty Ltd.

Australian Wetlands Consulting (2022b) *Bayside Brunswick Landscape Documentation and habitat Creation for Development Application*. Report to Clarence Property Pty Ltd.

Bushfire Certifiers (2021). *Bushfire Assessment Report Lot 13 DP1251383, 131 Lot Residential Subdivision (s100B).* Prepared for Bayside Brunswick Pty Ltd, August 2021.

Morand, D.T. (1994). *Soil Landscapes of the Lismore-Ballina 1: 100 000 Sheet*. Department of Land and Water Conservation, Sydney, NSW.

Appendix A: Subdivision Plans

CivilTech
Consulting Engineers

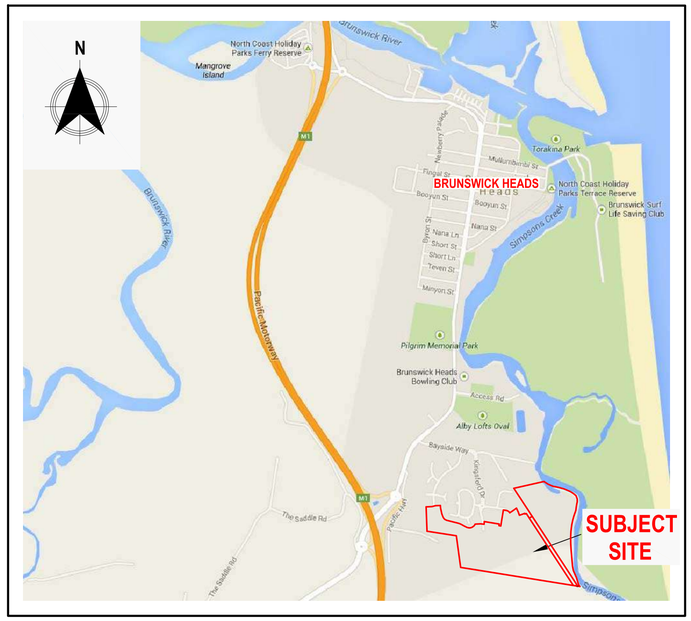
Subdivision Design · Civil Engineering · Town Planning · Project Management

BAYSIDE BRUNSWICK
130 Lot Residential Subdivision
15 Torakina Road, Brunswick Heads
Lot 13 DP 1251383

for

BAYSIDE BRUNSWICK Pty Ltd

LOCALITY PLAN:



INDEX:

CIVIL ENGINEERING

DEVELOPMENT APPLICATION

INDEX SHEET
1133-DA1B

August 2022

20 10 0 20 40 60 80 100

SCALE 1:1,000 AT A1, 1:2,000 AT A3

N

LEGEND

- SUBJECT SITE BOUNDARY
- B18 450m² — NEW LOT POLYGON & LOT AREA
- EASEMENT (PROPOSED TBC)
- PUBLIC ROAD PAVEMENT (PROPOSED)

LOT AREAS AND DIMENSIONS SUBJECT TO D.A. APPROVAL AND DETAILED DESIGN AS PART OF SUBDIVISION WORKS CERTIFICATE

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	15.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

DRAWING STATUS: Unless there is an approved signature in the space provided, this plan is not verified.

CAUTION: The information shown on this plan may be insufficient for some types of detailed design. CivilTech Consulting Engineers should be consulted as to the suitability of the information shown herein prior to the commencement of any works based on this plan.

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

SUBDIVISION LAYOUT PLAN

Scale: 1:2,000 at A3 CAD file: 1133-DA3B.dwg

Datum: AHD CivilCAD file: 1133-ENG

CivilTech Consulting Engineers
• Subdivision Design • Civil Engineering • Town Planning • Project Management

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Goonellabah NSW 2480
www.civiltech.net.au

Sheet No.
3 of 29

Dwg. No. **1133-DA3** Issue **B**

20 10 0 20 40 60 80 100

SCALE 1:1,000 AT A1, 1:2,000 AT A3

N

LEGEND

	SUBJECT SITE BOUNDARY
	CONSTRUCTION STAGE BOUNDARY
STAGE 1	53 LOTS + 3 M.D. LOTS
STAGE 2	33 LOTS
STAGE 3	37 LOTS + P1, P2, P3 & B128

EASTERN PRECINCT EARTHWORKS & N-S-DRAIN TO BE CONSTRUCTED IN STAGE 1

WESTERN PRECINCT EARTHWORKS TO BE CONSTRUCTED IN STAGE 3

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	15.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

DRAWING STATUS: Unless there is an approved signature in the space provided, this plan is not verified.
CAUTION: The information shown on this plan may be insufficient for some types of detailed design. CivilTech Consulting Engineers should be consulted as to the suitability of the information shown herein prior to the commencement of any works based on this plan.

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

SUBDIVISION STAGING PLAN

Scale: 1:2,000 at A3 CAD file: 1133-DA4B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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Sheet No.
4 of 29

Dwg. No. **1133-DA4** Issue **B**

20 10 0 20 40 60 80 100

SCALE 1:1,000 AT A1, 1:2,000 AT A3

N

LEGEND

- SUBJECT SITE BOUNDARY
- EXISTING NORTH SOUTH DRAIN INVERT
- REALIGNED NORTH SOUTH DRAIN
- EXTENT OF EARTHWORKS
- +0.50 CUT DEPTH
- +0.50 FILL DEPTH

EARTHWORKS VOLUMES

CUT	+ 8,990 m³
FILL	- 53,010 m³
TOPSOIL IMPORT (100mm)	+ 8,020 m³
ROAD PAVEMENT (425mm)	+ 9,590 m³
FILTER MEDIA (400-600mm)	+ 3,520 m³
CLEAN SAND TO IMPORT	22,890 m³

PRELIMINARY EARTHWORK VOLUMES ONLY. NO ALLOWANCE HAS BEEN MADE FOR STRIPPING, COMPACTION, BULKING, UNSUITABLE OR TRENCHING EFFECTS.

EARTHWORKS VOLUMES AND EXTENT TO CONFIRMED BY DETAILED DESIGN AS PART OF SUBDIVISION WORKS CERTIFICATE APPLICATION.

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	1.09.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

EARTHWORKS CUT FILL PLAN

0.2m DESIGN CONTOURS

Scale: 1:2,000 at A3 CAD file: 1133-DA5B.dwg

Datum: AHD CivilCAD file: 1133-ENG

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Sheet No.
5 of 29

Dwg. No. **1133-DA5** Issue **B**

20 10 0 20 40 60 80 100

SCALE 1:1,000 AT A1, 1:2,000 AT A3

N

TRANSITION FROM EXISTING CROWN ROAD TO ONE-WAY CROSSFALL.

KINGSFORD DRIVE

MOUNTABLE KERB FLUSH EDGE

ROAD 6

EXCELSIOR CIRCUIT

ELMA PLACE

AURANA PLACE

KINGSFORD CIRCUIT

PUBLIC RESERVE (PARK)

LILLYPILLY COMMUNITY PRE-SCHOOL

3m WIDE CONCRETE ACCESS RAMP, MAX 25%, INTO DRAIN.

3(a) ZONE (BUSINESS)

REFER TO AWG PLANS FOR COMMUNITY GARDEN & CARPARK DETAILS.

COMMUNITY GARDENS

SPS ACCESS

FOOTPATH

TRANSITION FROM EXISTING CROWN ROAD TO ONE-WAY CROSSFALL.

TORAKINA ROAD

OMEGA CIRCUIT

EXISTING

PROPOSED

EXISTING ROAD RESERVE

ROAD 1

ROAD 2

ROAD 3

ROAD 4

ROAD 5

ROAD 7

LAYBACK K&G

FLUSH EDGE MOUNTABLE KERB

B1 - MD

B2 - MD DISH CROSSING DIRECT K&G FLOWS WEST ACROSS INTERSECTION, SEE DA29.

B3 - MD

P1

P2

P3

P4

1000 DISH CROSSING DIRECT K&G FLOWS WEST TO SWALE.

1000 DISH CROSSING DIRECT K&G FLOWS EAST TO SWALE.

LOT 13 DP 1251383

EXISTING NORTH SOUTH DRAIN

REALIGNED NORTH SOUTH DRAIN

REFER TO 1133-DA29 FOR DETAIL OF KERB FLOW DRAINAGE ACROSS INTERSECTION

3m WIDE CONCRETE ACCESS RAMP, MAX 25%, INTO DRAIN.

OSD WEIR. 3x 600DIA RCP WITH COBBLE WEIR AT RL3.5 (DA28)

RAMP

2m WIDE COMPACTED GRAVEL ACCESS PATH LINKING EAST & WEST PRECINCTS.

PEDESTRIAN BRIDGE. 2m WIDE & 7m LONG. REFER TO AWC PLANS (DA28) FOR PRELIMINARY DETAILS

CONCRETE CARPARK WITH 8 SPACES. 2.6m WIDE AND 5.4m LONG. FALL SOUTH TO BIO-RETENTION SWALE.

CAR PARK

BIO SWALE

A DP372707

1 DP536396

4 DP576360

4 DP576360

LEGEND

- SUBJECT SITE BOUNDARY
- ROAD CENTRELINE
- ROAD PAVEMENT
- BIO-RETENTION SWALE
- LOCAL STREET TRAFFIC CALMING (SEE DETAIL ON 1133-DA12)
- BUS ROUTE TRAFFIC CALMING (SEE DETAIL ON 1133-DA12)
- 1.2m CONCRETE PEDESTRIAN FOOTPATH
- 2.0m GRAVEL PEDESTRIAN PATH
- EXTENT OF EARTHWORKS
- EXISTING NORTH SOUTH DRAIN INVERT
- REALIGNED NORTH SOUTH DRAIN

REFER TO CIVILTECH PLANS 1133-DA13 TO 1133-DA27 FOR ALL ROAD LONG SECTIONS, TYPICAL SECTIONS & CROSS SECTIONS

DETAILED DESIGN OF ROADWORKS & EARTHWORKS TO BE UNDERTAKEN AS PART OF SUBDIVISION WORKS CERTIFICATE APPLICATION.

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.09.2021	

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BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROADWORKS PLAN

0.2m DESIGN CONTOURS

Scale: 1:2,000 at A3 — CAD file: 1133-DA6B.dwg

Datum: AHD — CivilCAD file: 1133-ENG

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Sheet No. **6 of 29**

Dwg. No. **1133-DA6** — Issue **B**

20 10 0 20 40 60 80 100

SCALE 1:1,000 AT A1, 1:2,000 AT A3

N

LEGEND

- SUBJECT SITE BOUNDARY
- EXISTING NORTH SOUTH DRAIN INVERT
- REALIGNED NORTH SOUTH DRAIN
- 5.40 FINISHED SURFACE LEVEL
- CROWNED ROAD WITH KERB & GUTTER
- ROAD WITH ONE-WAY CROSSFALL OUT TO BIO-RETENTION SWALE
- ROAD WITH ONE-WAY CROSSFALL AND KERB & GUTTER
- BIO-RETENTION SWALE WITH NO UNDER DRAIN (REFER DA28)
- BIO-RETENTION SWALE WITH UNDER DRAIN (REFER DA28)
- SWALE UNDER DRAINAGE OUTLET (TBC) (AGGREGATE WRAPPED IN GEOFABRIC)

NO STORMWATER PIPES OR PIT NETWORKS TO BE CONSTRUCTED. ALL SURFACE STORMWATER FLOWS WILL DRAIN TO PERIMETER BIO-RETENTION SWALES VIA KERB & GUTTERS, DISH DRAINS & ONE-WAY CROSSFALL ROADS.

ROOF WATER FROM DWELLINGS TO BE DETAINED IN DETENTION TANKS BEFORE DRAINING TO RUBBLE INFILTRATION PITS (DETAILS TBC). PITS THAT SURCHARGE IN LARGE EVENTS WILL BE DRAINED TO KERB VIA RHS PIPES.

DETAILED DESIGN OF STORMWATER MANAGEMENT AND SWALES TO BE UNDERTAKEN AS PART OF SUBDIVISION WORKS CERTIFICATE APPLICATION.

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.09.2021	

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ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

STORMWATER MANAGEMENT PLAN

0.2m DESIGN CONTOURS

Scale: 1:2,000 at A3 CAD file: 1133-DA7B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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Sheet No.
7 of 29

Dwg. No. **1133-DA7** Issue **B**

20 10 0 20 40 60 80 100

SCALE 1:1,000 AT A1, 1:2,000 AT A3

N

LEGEND

- SUBJECT SITE BOUNDARY
- 13,000m² — STORMWATER CATCHMENT BOUNDARY, AREA & FLOW DIRECTION
- EXISTING N-S DRAIN INVERT
- REALIGNED N-S DRAIN INVERT
- BIO-RETENTION SWALE

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	1.09.2021	

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ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

STORMWATER CATCHMENT PLAN

0.2m DESIGN CONTOURS

Scale: 1:2,000 at A3 CAD file: 1133-DA8B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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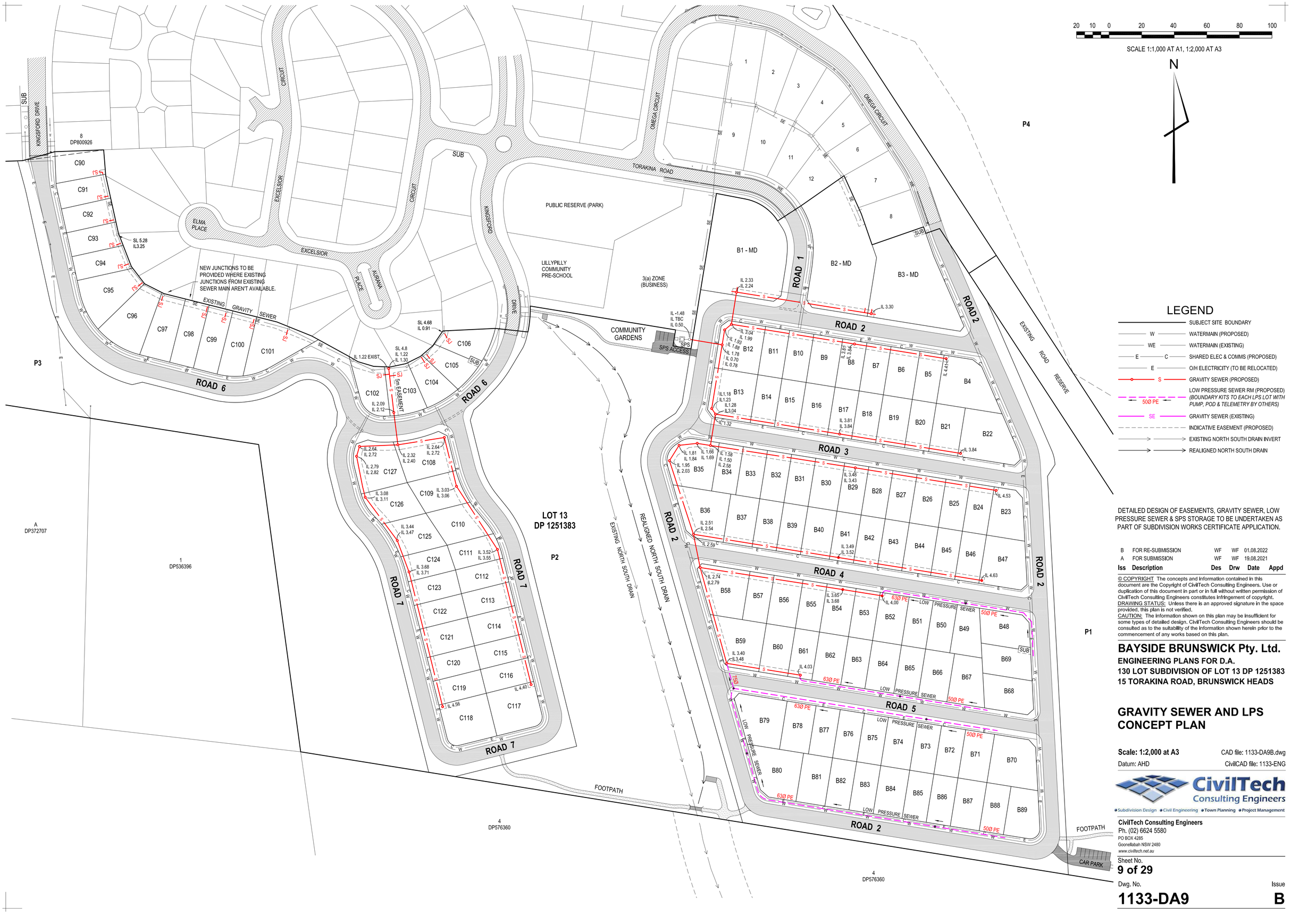
Sheet No.
8 of 29

Dwg. No. **1133-DA8** Issue **B**



LEGEND

- SUBJECT SITE BOUNDARY
- W — WATERMAIN (PROPOSED)
- WE — WATERMAIN (EXISTING)
- E C — SHARED ELEC & COMMS (PROPOSED)
- E — O/H ELECTRICITY (TO BE RELOCATED)
- S — GRAVITY SEWER (PROPOSED)
- LOW PRESSURE SEWER RM (PROPOSED) *(BOUNDARY KITS TO EACH LPS LOT WITH PUMP, POD & TELEMETRY BY OTHERS)*
- 50Ø PE
- SE — GRAVITY SEWER (EXISTING)
- INDICATIVE EASEMENT (PROPOSED)
- EXISTING NORTH SOUTH DRAIN INVERT
- REALIGNED NORTH SOUTH DRAIN

DETAILED DESIGN OF EASEMENTS, GRAVITY SEWER, LOW PRESSURE SEWER & SPS STORAGE TO BE UNDERTAKEN AS PART OF SUBDIVISION WORKS CERTIFICATE APPLICATION.

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	19.08.2021	

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ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

GRAVITY SEWER AND LPS CONCEPT PLAN

Scale: 1:2,000 at A3 CAD file: 1133-DA9B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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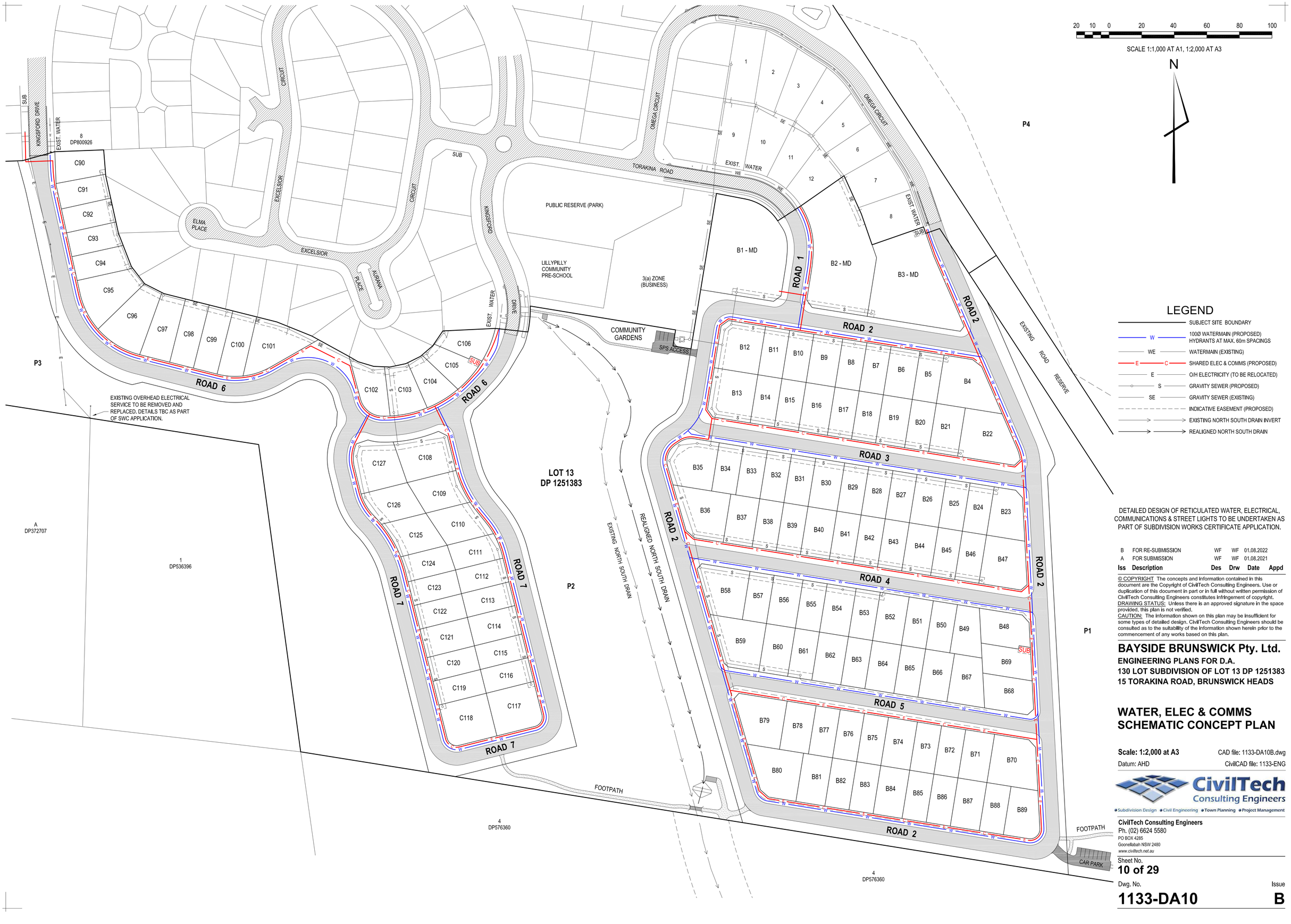
Sheet No.
9 of 29

Dwg. No. **1133-DA9** Issue **B**



DETAILED DESIGN OF RETICULATED WATER, ELECTRICAL, COMMUNICATIONS & STREET LIGHTS TO BE UNDERTAKEN AS PART OF SUBDIVISION WORKS CERTIFICATE APPLICATION.

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

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ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

WATER, ELEC & COMMS SCHEMATIC CONCEPT PLAN

Scale: 1:2,000 at A3 CAD file: 1133-DA10B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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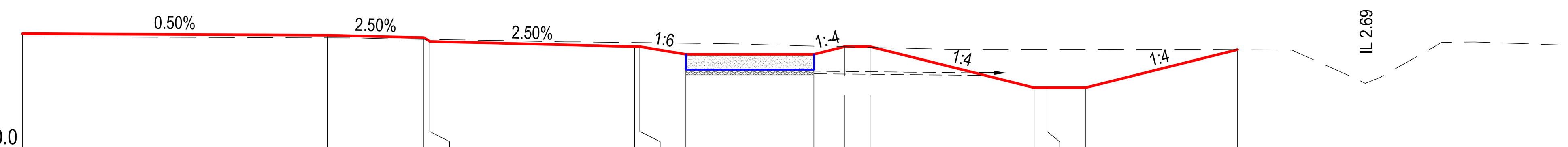
10 of 29

Dwg. No. **1133-DA10** Issue **B**



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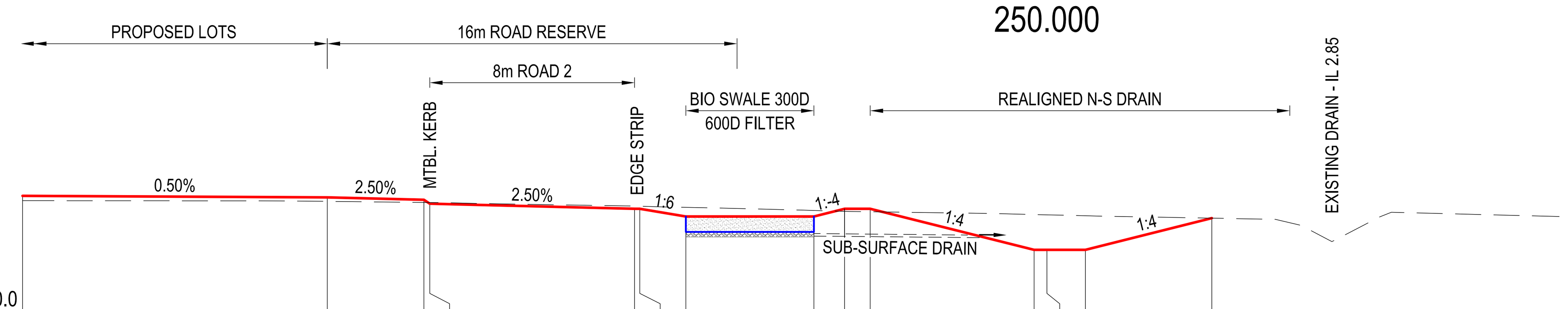
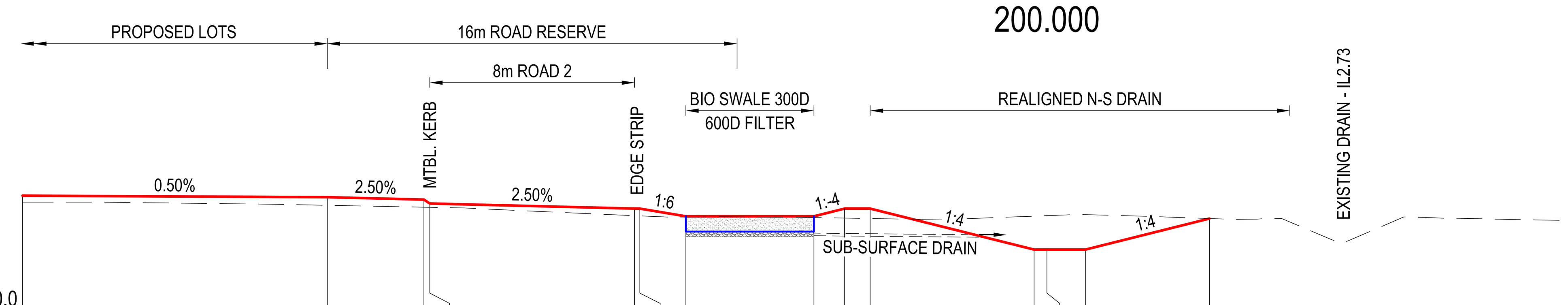
EXISTING	4.48	4.44	4.38	4.38	4.26	4.25	4.23	4.12	4.09	4.07	4.00	3.99	3.99	3.98	4.16
OFFSETS	40.00	28.10	24.33	24.10	16.10	15.90	14.10	9.10	7.90	6.90	0.50	0.00	1.50	7.43	20.00

250.000



HT. DIFF	0.19	0.16	0.10	-0.04	-0.11	-0.10	-0.36	-0.23	0.10	0.12	-1.38	-1.36	-1.33	0.00	
DESIGN	4.60	4.54	4.45	4.30	4.10	4.10	3.80	3.80	4.10	4.10	2.50	2.50	2.50	3.73	
EXISTING	4.42	4.39	4.35	4.34	4.21	4.20	4.16	4.03	4.00	3.98	3.88	3.86	3.83	3.73	3.80
OFFSETS	40.00	28.10	24.33	24.10	16.10	15.90	14.10	9.10	7.90	6.90	0.50	0.00	1.50	6.44	20.00

200.000



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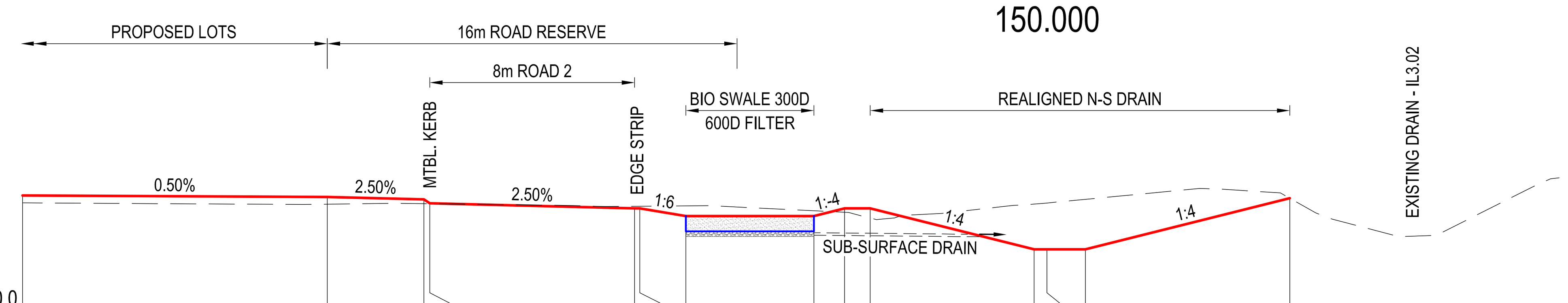
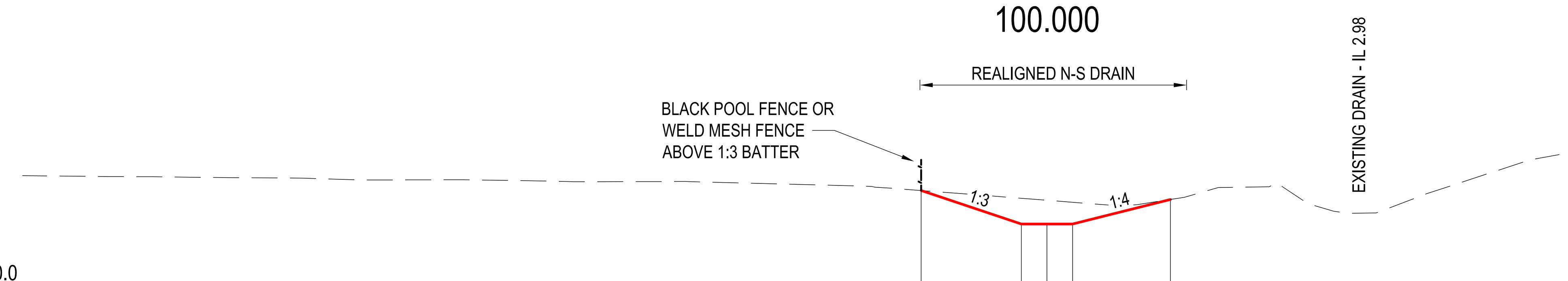
DESIGN	4.60	4.54	4.45	4.30	4.10	4.10	3.80	3.80	4.10	4.10	2.50	2.50	2.50	3.71	
EXISTING	4.35	4.23	4.15	4.15	3.82	3.82	3.77	3.75	3.73	3.71	3.81	3.82	3.86	3.71	3.64
OFFSETS	40.00	28.10	24.32	24.10	16.10	15.90	14.10	9.10	7.90	6.90	0.50	0.00	1.50	6.35	20.00

150.000



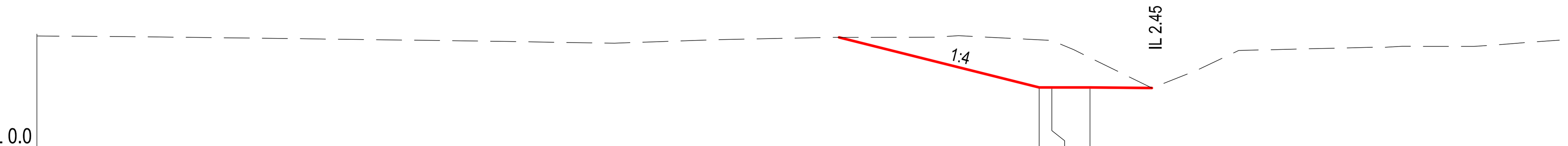
HT. DIFF	0.29	0.28	0.17	0.02	-0.08	-0.08	-0.40	-0.21	0.15	0.38	-1.77	-1.81	-1.95	0.00	
DESIGN	4.60	4.54	4.45	4.30	4.10	4.10	3.80	3.80	4.10	4.10	2.50	2.50	2.50	4.50	
EXISTING	4.31	4.26	4.28	4.28	4.18	4.18	4.20	4.01	3.95	3.72	4.27	4.31	4.45	4.50	5.29
OFFSETS	40.00	28.10	24.33	24.10	16.10	15.90	14.10	9.10	7.90	6.90	0.50	0.00	1.50	9.48	20.00

100.000



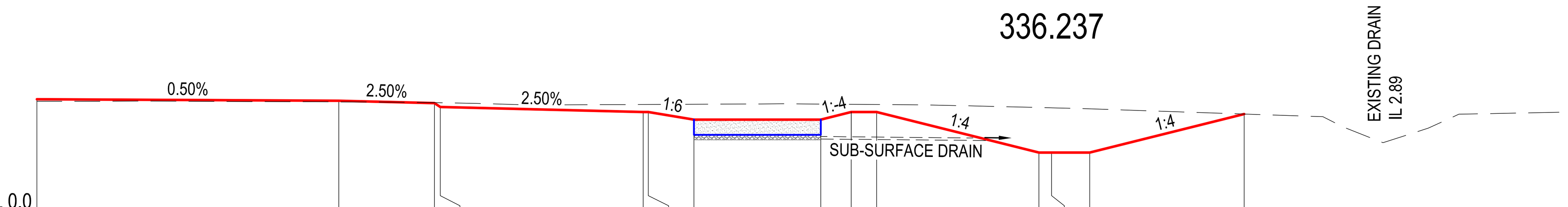
HT. DIFF		0.00	-1.00	-0.92	-0.85	0.00	
DESIGN		3.80	2.50	2.50	2.50	3.46	
EXISTING	4.39	3.80	3.50	3.42	3.35	3.46	5.21
OFFSETS	40.00	4.90	1.00	0.00	1.00	4.82	20.00

50.000



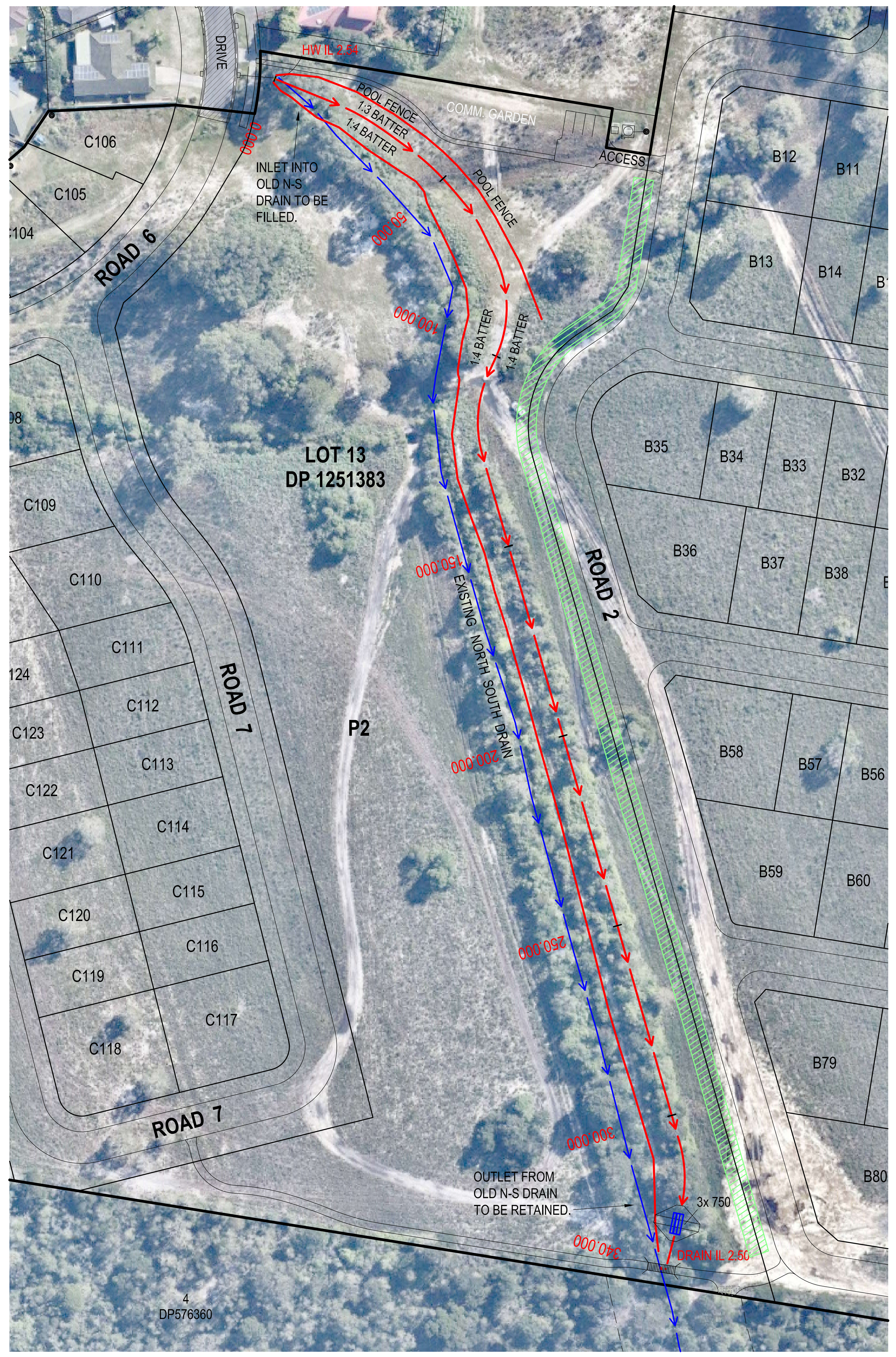
HT. DIFF		-1.88	-1.85	-1.17	
DESIGN		2.50	2.50	2.50	
EXISTING	4.53	4.38	4.35	3.67	4.36
OFFSETS	40.00	0.50	0.00	1.50	20.00

336.237



HT. DIFF	0.08	0.04	-0.02	-0.17	-0.30	-0.30	-0.61	-0.61	-0.31	-0.30	-1.78	-1.77	-1.73	0.00	
DESIGN	4.60	4.54	4.45	4.30	4.10	4.10	3.80	3.80	4.10	4.10	2.50	2.50	2.50	4.02	
EXISTING	4.52	4.50	4.47	4.47	4.40	4.40	4.41	4.41	4.41	4.40	4.28	4.27	4.23	4.02	4.09
OFFSETS	40.00	28.10	24.33	24.10	16.10	15.90	14.10	9.10	7.90	6.90	0.50	0.00	1.50	7.59	20.00

300.000



20 10 0 20 40 60 80 100

SCALE 1:1,000 AT A1, 1:2,000 AT A3

N

LEGEND

- SUBJECT SITE BOUNDARY
- EXISTING NORTH SOUTH DRAIN INVERT
- REALIGNED NORTH SOUTH DRAIN
- BATTER EXTENT
- BIO-RETENTION SWALE

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	23.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.
ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

NORTH - SOUTH DRAIN REALIGNMENT PLAN & SECTIONS

Scale: 1:2,000 at A3 CAD file: 1133-DA11B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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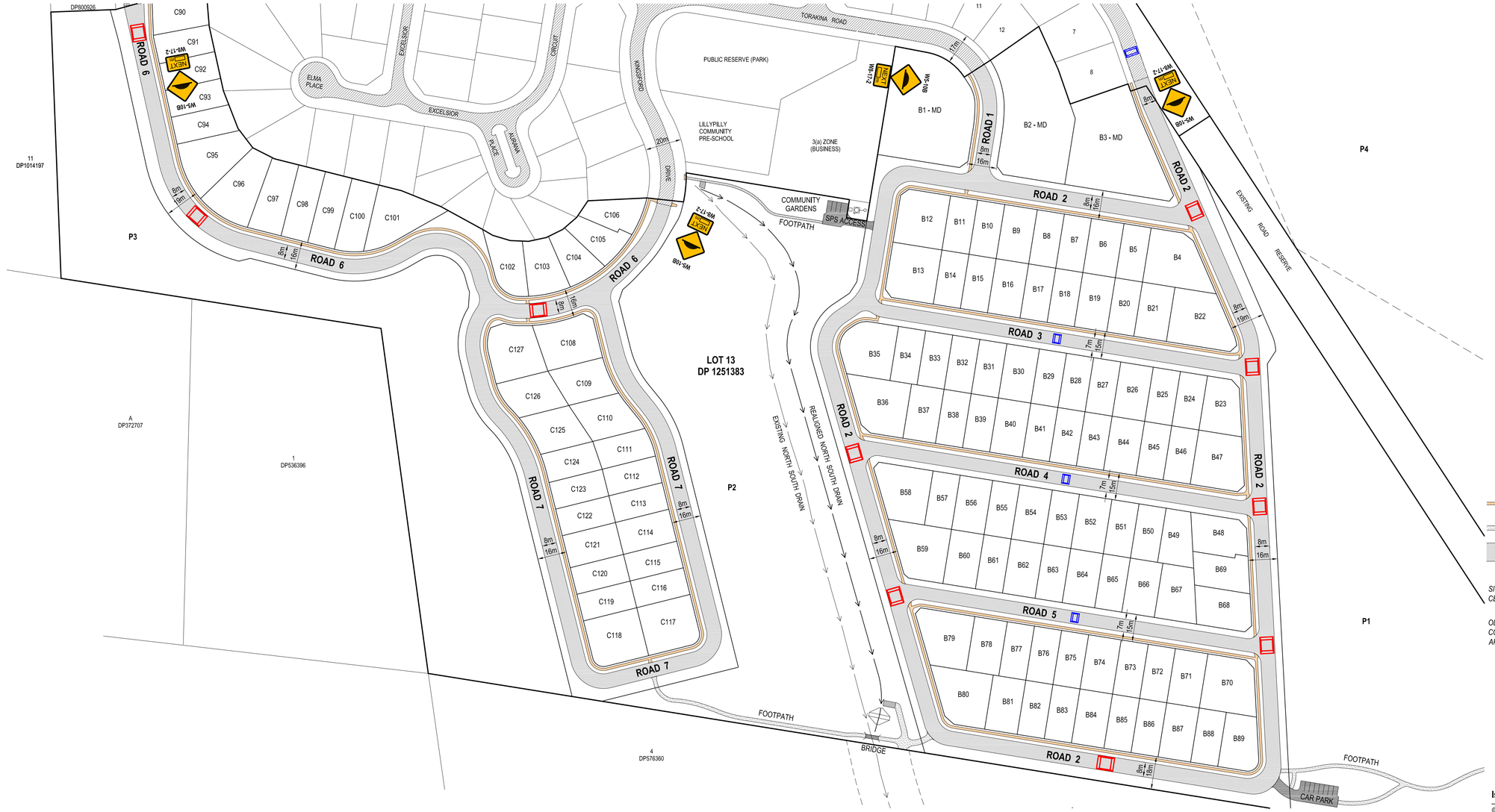
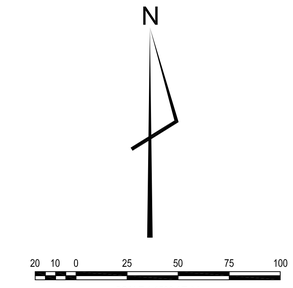
Dwg. No. **1133-DA11** Issue **B**



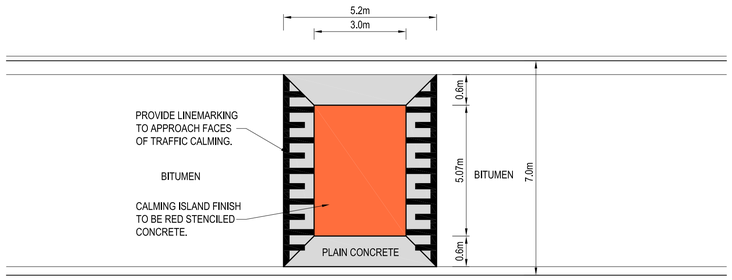


LEGEND

- LOCAL STREET TRAFFIC CALMING
- BUS ROUTE TRAFFIC CALMING
- 1.2m CONCRETE PEDESTRIAN FOOTPATH
- 2.0m GRAVEL PEDESTRIAN FOOTPATH
- PUBLIC ROAD PAVEMENT (PROPOSED)

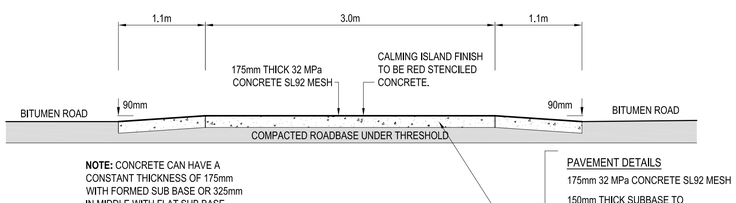
SIGNAGE DETAILS TO BE CONFIRMED AS PART OF CONSTRUCTION CERTIFICATE APPLICATION.

OLD PACIFIC HIGHWAY INTERSECTION UPGRADE DETAILS TO BE CONFIRMED AS PART OF SUBDIVISION WORKS CERTIFICATE APPLICATION IN ACCORDANCE WITH CONCEPT PLAN APPROVAL.



LOCAL STREET - TRAFFIC CALMING - PLAN VIEW

Not to Scale



NOTE: CONCRETE CAN HAVE A CONSTANT THICKNESS OF 175mm WITH FORMED SUB BASE OR 325mm IN MIDDLE WITH FLAT SUB BASE.

LOCAL STREET - TRAFFIC CALMING - SECTION

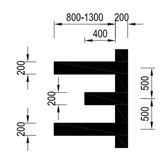
Not to Scale

PAVEMENT DETAILS

175mm 32 MPa CONCRETE SL92 MESH

150mm THICK SUBBASE TO 95% MODIFIED COMPACTION.

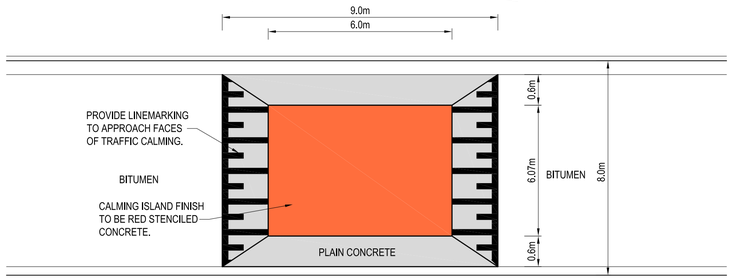
SUBGRADE TO 98% STANDARD COMPACTION. (FILL SUBGRADES TO 100% STANDARD COMPACTION).



LINE MARKING DETAIL

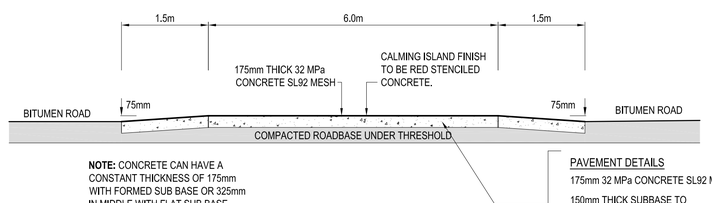
Not to Scale

LINE MARKING TO BE IN ACCORDANCE WITH AS1742.



BUS ROUTE - TRAFFIC CALMING - PLAN VIEW

Not to Scale



NOTE: CONCRETE CAN HAVE A CONSTANT THICKNESS OF 175mm WITH FORMED SUB BASE OR 325mm IN MIDDLE WITH FLAT SUB BASE.

BUS ROUTE - TRAFFIC CALMING - SECTION

Not to Scale

PAVEMENT DETAILS

175mm 32 MPa CONCRETE SL92 MESH

150mm THICK SUBBASE TO 95% MODIFIED COMPACTION.

SUBGRADE TO 98% STANDARD COMPACTION. (FILL SUBGRADES TO 100% STANDARD COMPACTION).

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

TRAFFIC MANAGEMENT PLAN

Scale: 1:1500 at A1
CAD file: 1133-DA12B.dwg
Datum: AHD
CivilCAD file: 1133-ENG

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12 of 29

Dwg. No.
1133-DA12

Issue
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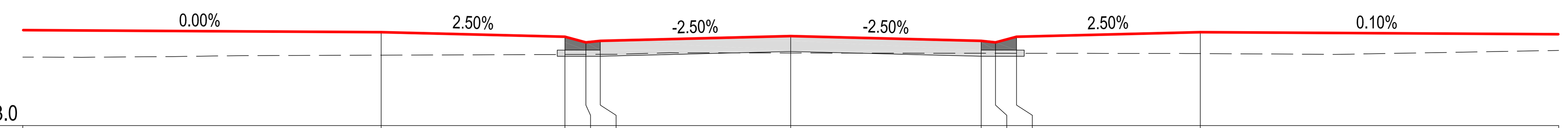
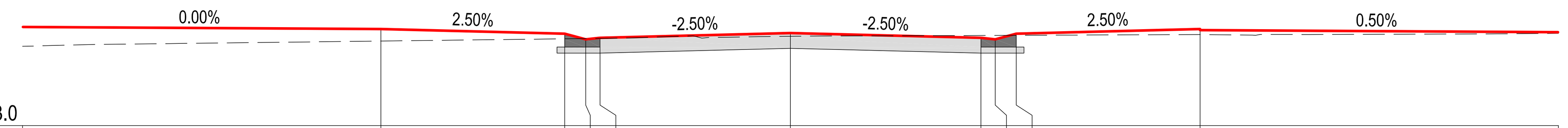


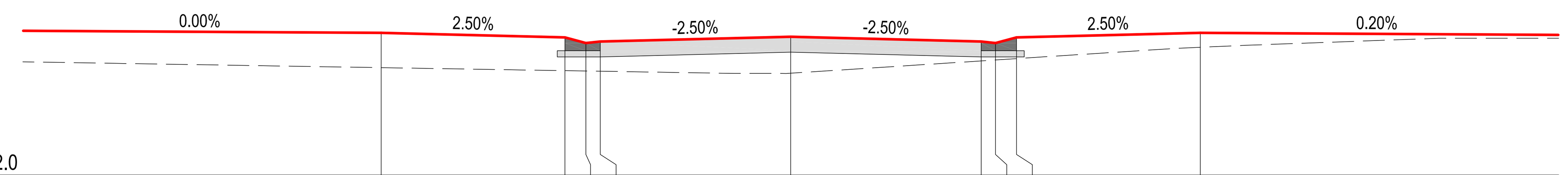
HT. DIFF	0.49	0.45	0.35	0.23	0.26	0.33	0.24	0.21	0.32	0.42	0.35
DESIGN	4.82	4.82	4.73	4.62	4.65	4.75	4.65	4.62	4.73	4.82	4.83
EXISTING	4.33	4.37	4.39	4.39	4.39	4.42	4.41	4.41	4.41	4.40	4.47
OFFSETS	15.00	8.00	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.00	15.00

30.000



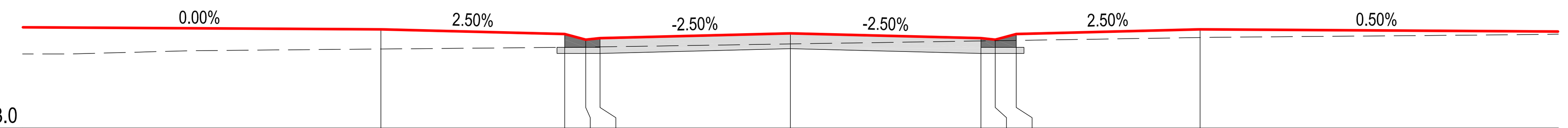
HT. DIFF	0.33	0.23	0.10	-0.01	0.01	0.06	-0.05	-0.08	0.03	0.11	0.09
DESIGN	4.88	4.88	4.79	4.68	4.71	4.81	4.71	4.68	4.79	4.88	4.91
EXISTING	4.55	4.65	4.69	4.70	4.70	4.74	4.76	4.76	4.76	4.78	4.79
OFFSETS	15.00	8.00	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.00	15.00

60.000



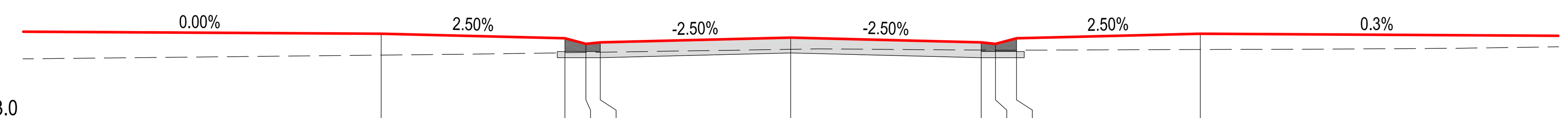
HT. DIFF	0.57	0.68	0.65	0.54	0.58	0.71	0.38	0.33	0.41	0.28	0.10
DESIGN	4.77	4.77	4.68	4.57	4.60	4.70	4.60	4.57	4.68	4.77	4.79
EXISTING	4.20	4.09	4.03	4.03	4.02	3.99	4.22	4.24	4.27	4.49	4.67
OFFSETS	15.00	8.00	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.00	15.00

20.000



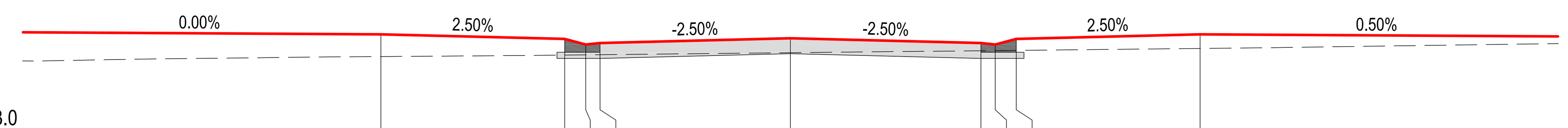
HT. DIFF	0.48	0.38	0.26	0.15	0.17	0.21	0.06	0.02	0.12	0.16	0.09
DESIGN	4.92	4.92	4.83	4.72	4.75	4.85	4.75	4.72	4.83	4.92	4.95
EXISTING	4.44	4.54	4.57	4.58	4.58	4.64	4.70	4.70	4.71	4.76	4.83
OFFSETS	15.00	8.00	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.00	15.00

50.000



HT. DIFF	0.50	0.42	0.28	0.17	0.19	0.23	0.15	0.12	0.23	0.31	0.26
DESIGN	4.70	4.70	4.61	4.50	4.53	4.62	4.53	4.50	4.61	4.70	4.72
EXISTING	4.20	4.28	4.33	4.33	4.34	4.39	4.38	4.38	4.37	4.39	4.44
OFFSETS	15.00	8.00	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.00	15.00

10.000

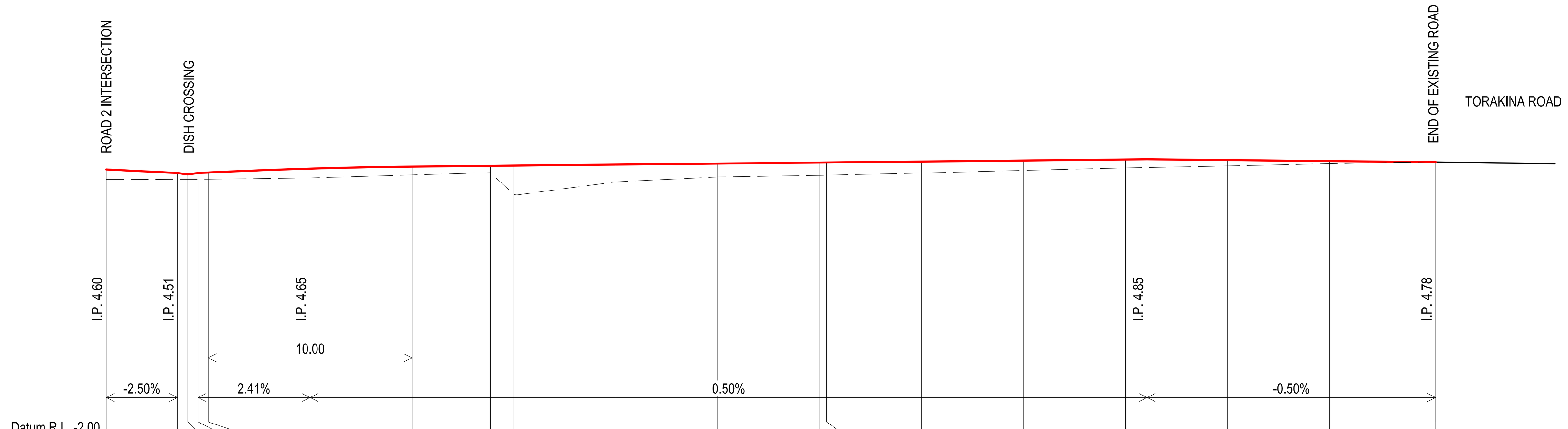


HT. DIFF	0.52	0.43	0.31	0.20	0.23	0.28	0.15	0.12	0.22	0.28	0.18
DESIGN	4.87	4.87	4.78	4.67	4.70	4.80	4.70	4.67	4.78	4.87	4.90
EXISTING	4.35	4.44	4.47	4.47	4.48	4.51	4.55	4.56	4.56	4.60	4.69
OFFSETS	15.00	8.00	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.00	15.00

40.000

ROAD 1 - CROSS SECTIONS

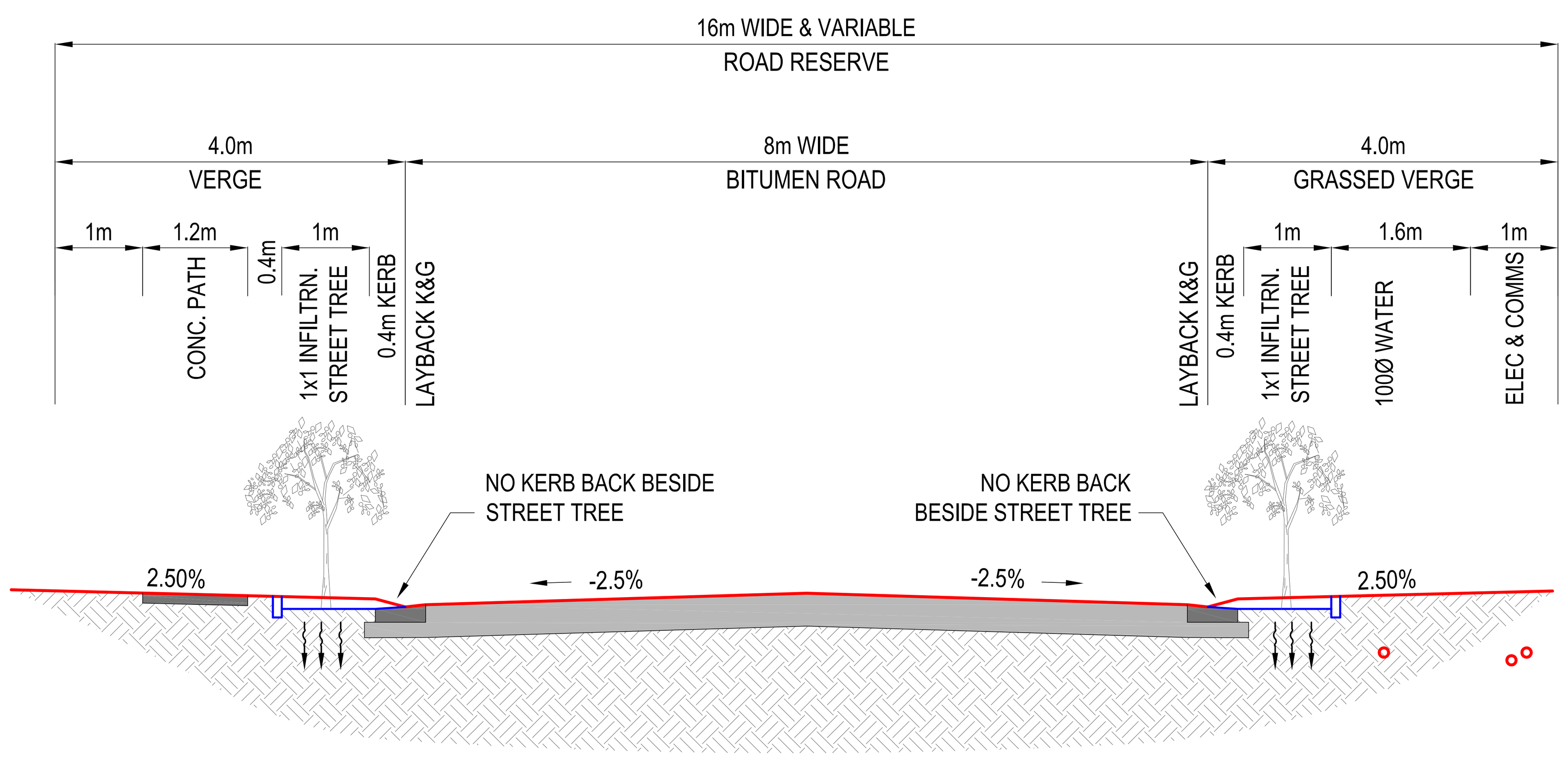
Scale Horizontal 1:100 Vertical 1:100



CUT/FILL	+0.25				+0.16	+0.23	+0.20	+0.17	+0.71	+0.42	+0.33	+0.31	+0.31	+0.28	+0.24	+0.21		+0.14	+0.06	-0.01
DESIGN	4.60	4.51	4.48	4.51	4.53	4.62	4.67	4.69	4.70	4.72	4.75	4.77	4.77	4.80	4.82	4.85	4.85	4.83	4.81	4.78
EXISTING	4.35				4.36	4.39	4.47	4.52	3.98	4.30	4.42	4.46	4.46	4.51	4.58	4.64		4.69	4.74	4.79
Chainage	0.000	3.500	4.000	4.500	5.000	10.000	15.000	18.839	20.000	25.000	30.000	35.000	35.328	40.000	45.000	50.000	51.053	55.000	60.000	65.205
Alignment	B=9°05'50" D=35.33													R=40.55 L=29.88						

ROAD 1 - LONG SECTION

Scale Horizontal 1:200 Vertical 1:100



ROAD 1 TYPICAL SECTION

Not to Scale

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 1 LONG SECTION & CROSS SECTIONS

Scale: As Shown at A1 CAD file: 1133-DA13B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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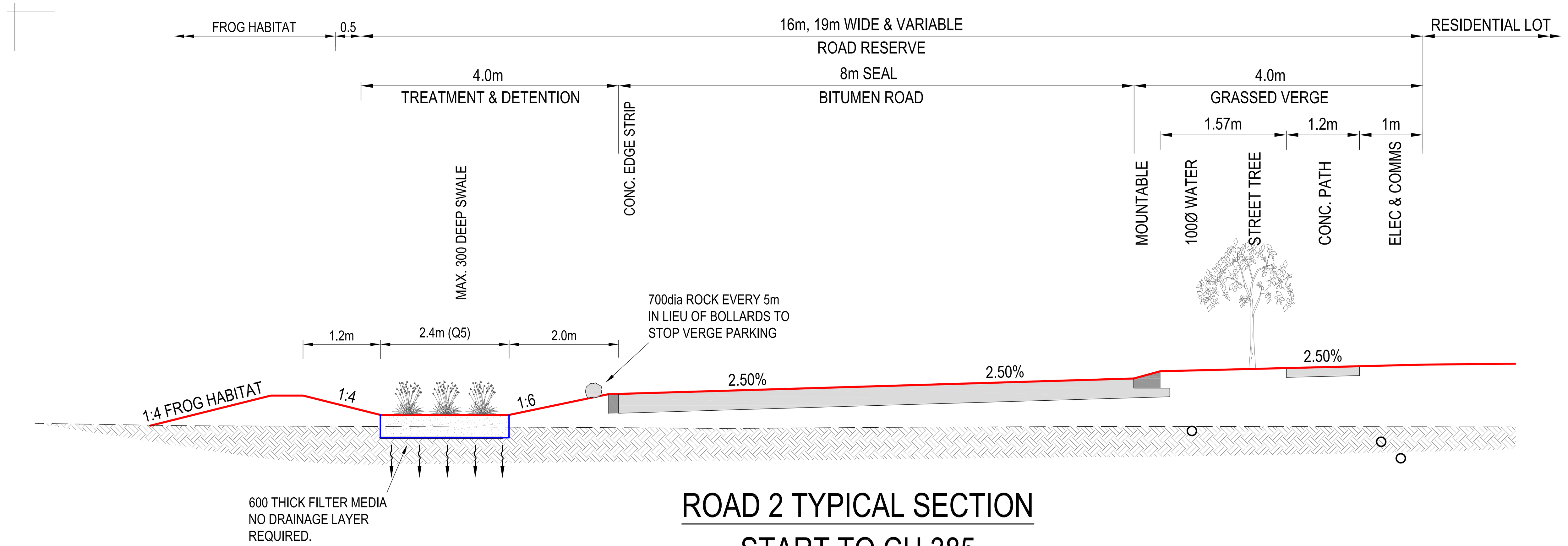
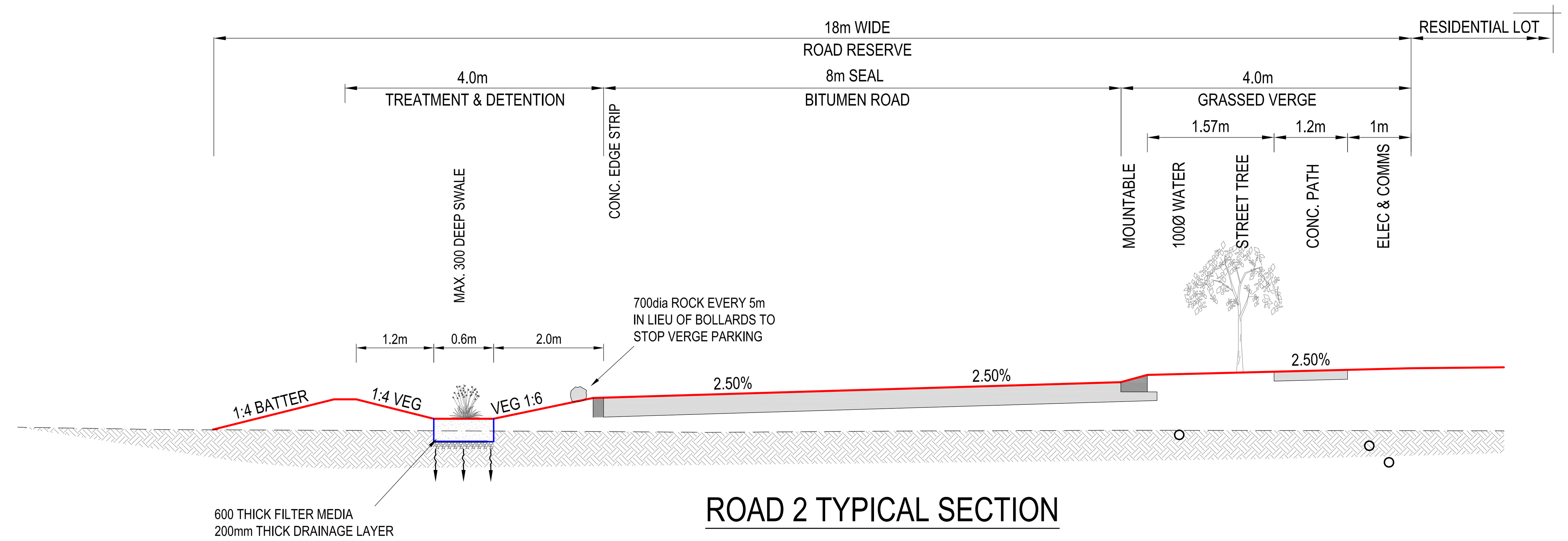
Sheet No.
13 of 29

Dwg. No. **1133-DA13** Issue **B**



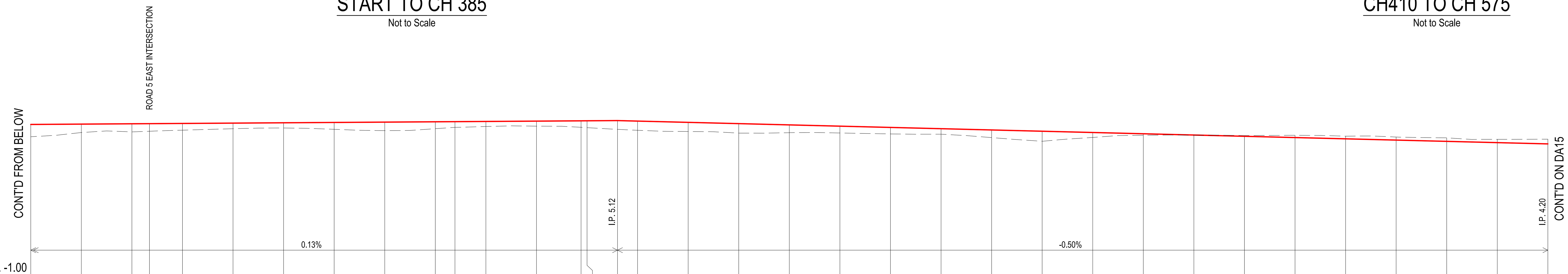
ROAD 2 TYPICAL SECTION
START TO CH 385

Not to Scale



ROAD 2 TYPICAL SECTION
CH410 TO CH 575

Not to Scale

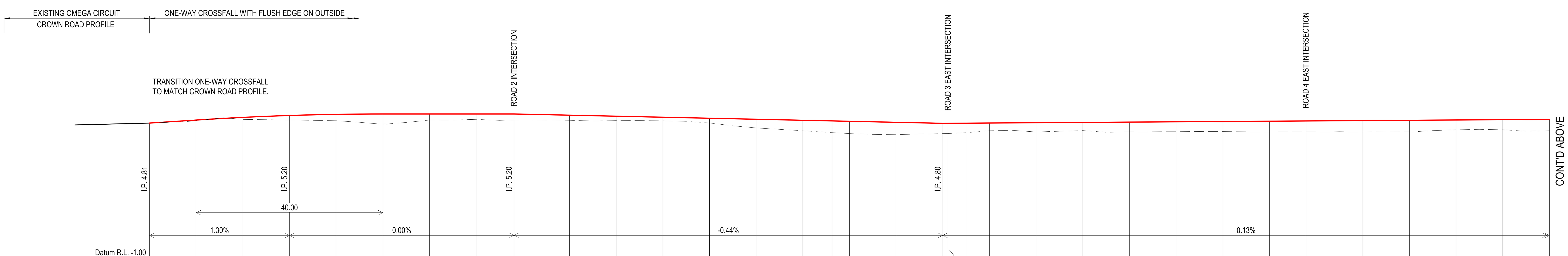


Chainage	CUT/FILL	DESIGN SURFACE	EXISTING SURFACE
300.000	+0.49	4.97	4.48
310.000	+0.33	4.98	4.65
320.000	+0.32	4.99	4.67
323.479	+0.30	5.00	4.70
330.000	+0.27	5.01	4.74
340.000	+0.22	5.02	4.80
350.000	+0.20	5.03	4.83
360.000	+0.27	5.05	4.78
370.000	+0.34	5.06	4.72
380.000	+0.27	5.07	4.80
383.884	+0.22	5.08	4.85
390.000	+0.20	5.09	4.89
400.000	+0.20	5.10	4.90
408.821	+0.25	5.11	4.86
410.000	+0.27	5.11	4.84
416.032		5.12	
420.000	+0.36	5.10	4.74
430.000	+0.36	5.05	4.69
440.000	+0.37	5.00	4.63
450.000	+0.31	4.95	4.64
460.000	+0.27	4.90	4.63
470.000	+0.26	4.85	4.59
480.000	+0.22	4.80	4.58
490.000	+0.30	4.75	4.45
500.000	+0.40	4.70	4.30
510.000	+0.20	4.65	4.45
520.000	+0.06	4.60	4.54
530.000	+0.01	4.55	4.54
540.000	-0.03	4.50	4.53
550.000	-0.09	4.45	4.54
560.000	-0.11	4.40	4.51
570.000	-0.12	4.35	4.47
580.000	-0.14	4.30	4.44
590.000	-0.13	4.25	4.38
600.000	-0.19	4.20	4.39

Alignment Details: B=177°00'00" D=75.68 | B=177°02'05" D=60.41 | R=13.95 L=24.94 | B=279°05'50" D=161.82 | R=14.00 L=15.86 | B=344°00'00" D=75.02

ROAD 2 - LONG SECTION cont'd

Scale Horizontal 1:500 Vertical 1:100



Chainage	CUT/FILL	DESIGN SURFACE	EXISTING SURFACE
0.000	+0.00	4.81	4.81
10.000	+0.03	4.94	4.91
20.000	+0.09	5.05	4.97
30.000	+0.19	5.13	4.94
40.000	+0.27	5.18	4.91
50.000	+0.44	5.20	4.76
60.000	+0.26	5.20	4.94
70.000	+0.23	5.20	4.97
78.106	+0.25	5.20	4.95
90.000	+0.22	5.15	4.93
100.000	+0.19	5.10	4.92
110.000	+0.15	5.06	4.91
120.000	+0.20	5.02	4.81
130.000	+0.37	4.97	4.60
140.000	+0.45	4.93	4.48
146.238	+0.50	4.90	4.40
150.000	+0.53	4.89	4.36
160.000	+0.53	4.84	4.32
170.000	+0.44	4.80	4.36
171.095	+0.44	4.80	4.36
175.000	+0.41	4.81	4.40
180.000	+0.33	4.81	4.48
190.000	+0.40	4.83	4.43
200.000	+0.35	4.84	4.49
210.000	+0.43	4.85	4.43
220.000	+0.42	4.86	4.44
230.000	+0.43	4.88	4.45
240.000	+0.46	4.89	4.43
247.798	+0.47	4.90	4.43
260.000	+0.48	4.92	4.43
270.000	+0.50	4.93	4.43
280.000	+0.42	4.94	4.52
290.000	+0.43	4.96	4.52
300.000	+0.49	4.97	4.48

Alignment Details: B=160°50'40" D=8.06 | R=104.00 L=7.80 | B=156°32'48" D=62.24 | B=156°32'48" D=68.13 | R=40.00 L=14.28 | B=177°00'00" D=10.58 | B=177°00'00" D=76.70 | B=177°00'00" D=75.68

ROAD 2 - LONG SECTION

Scale Horizontal 1:500 Vertical 1:100

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.09.2021	

BAYSIDE BRUNSWICK Pty. Ltd.
ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 2 LONG SECTION
START TO CH 600.00

Scale: As Shown at A1 CAD file: 1133-DA14B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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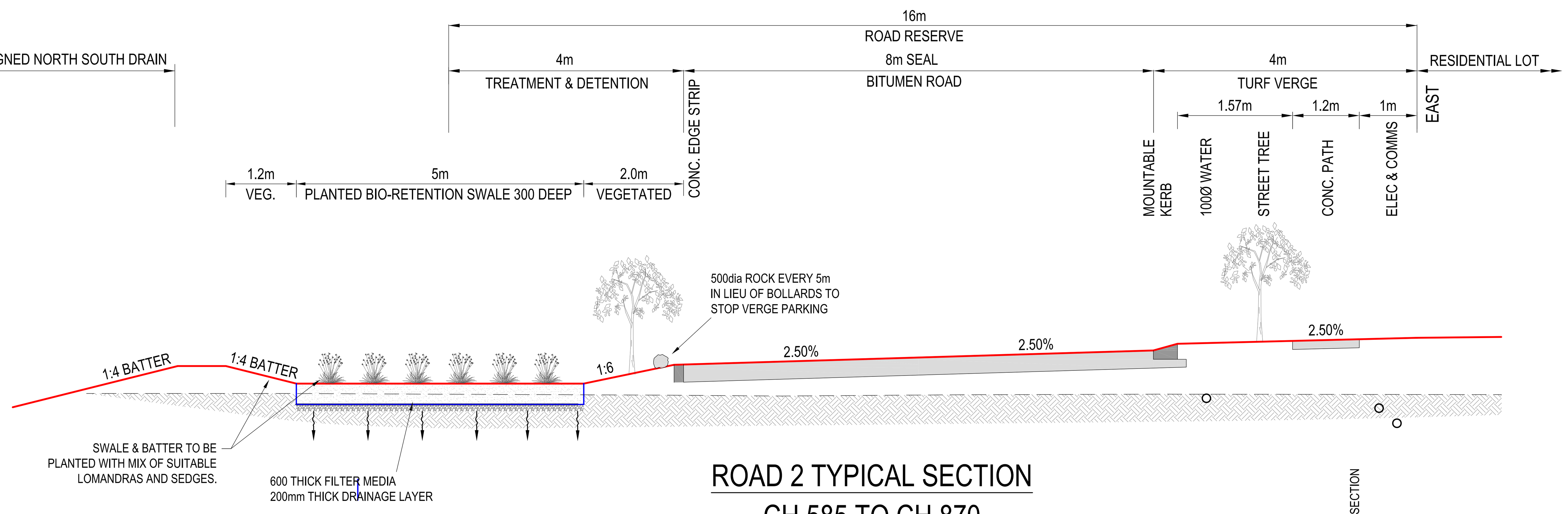
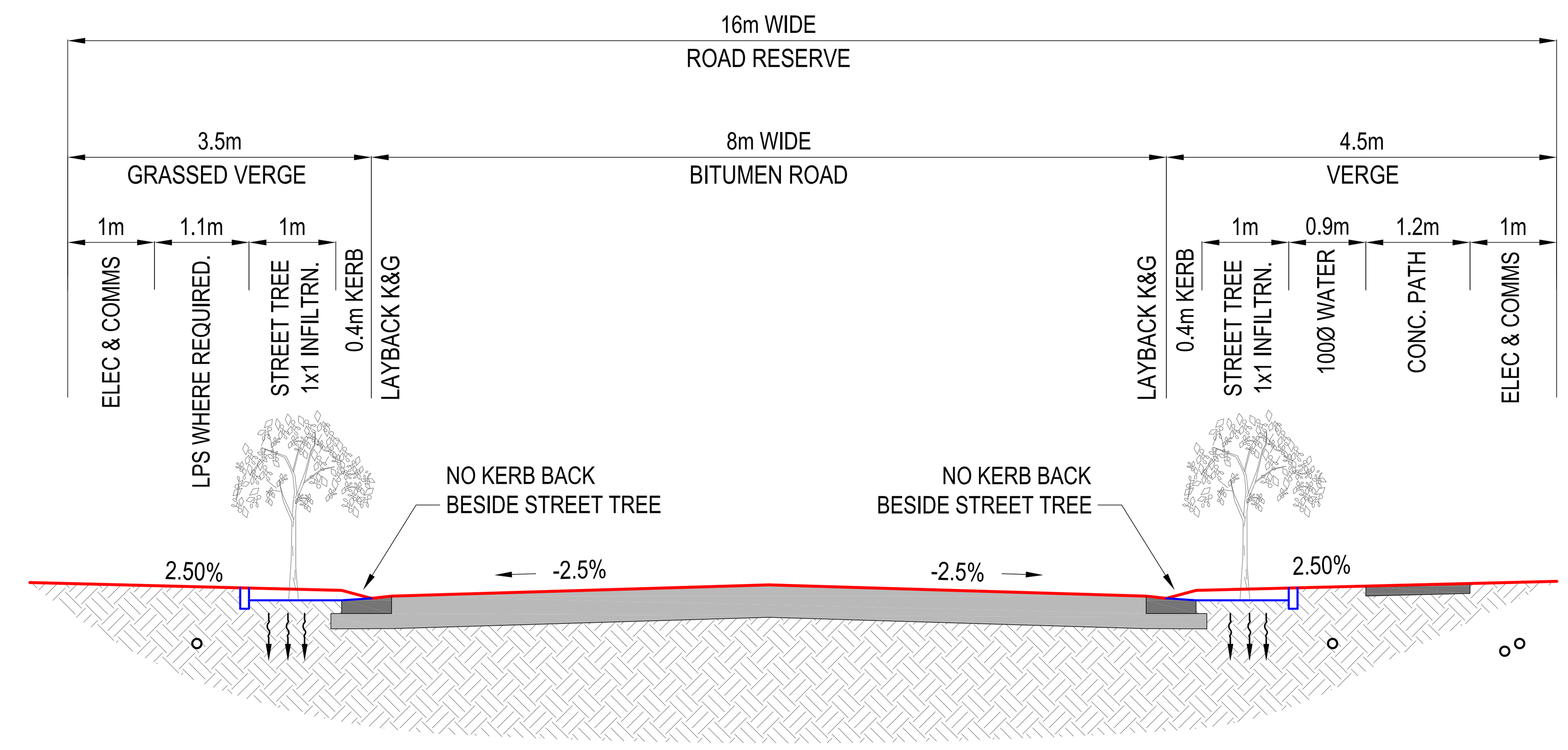
Sheet No.
14 of 29

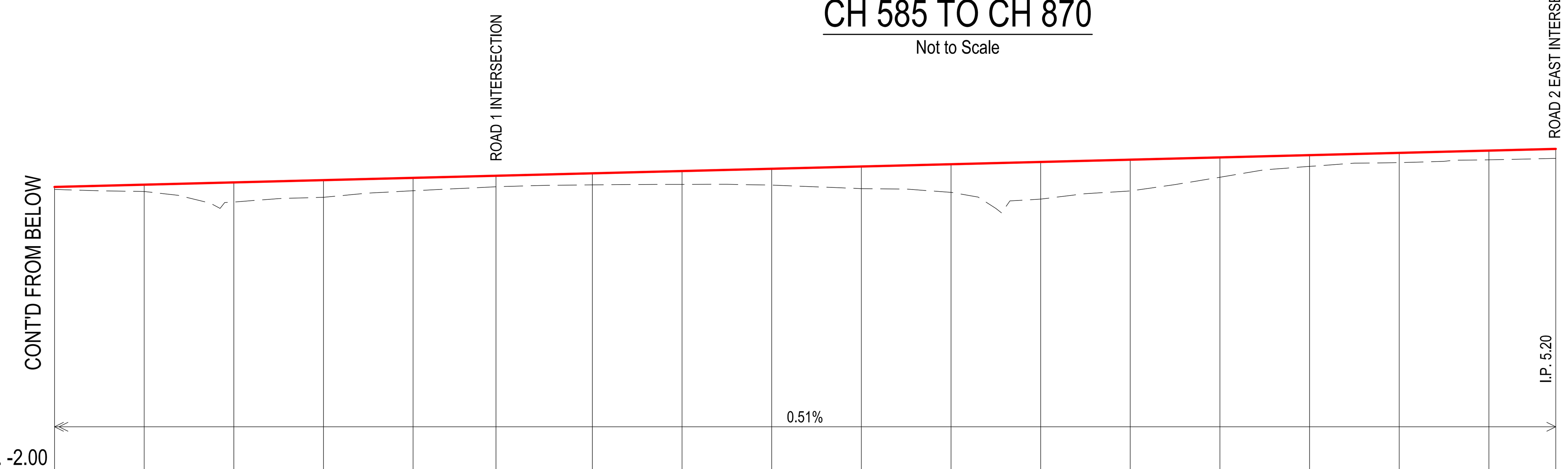
Dwg. No. **1133-DA14** Issue **B**



ROAD 2 TYPICAL SECTION
CH 585 TO CH 870
Not to Scale

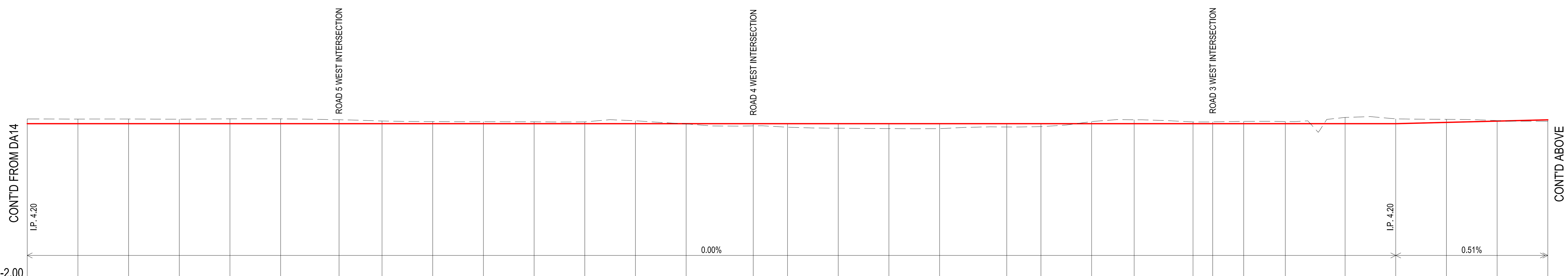


ROAD 2 TYPICAL SECTION
CH 880 TO END
Not to Scale



CUT/FILL	+0.06	+0.15	+0.44	+0.38	+0.29	+0.25	+0.26	+0.30	+0.36	+0.49	+0.63	+0.83	+0.70	+0.44	+0.25	+0.22	+0.21	
DESIGN SURFACE	4.35	4.40	4.45	4.50	4.55	4.60	4.66	4.71	4.76	4.81	4.86	4.91	4.96	5.01	5.06	5.11	5.16	5.20
EXISTING SURFACE	4.30	4.25	4.01	4.12	4.27	4.35	4.40	4.41	4.39	4.31	4.23	4.08	4.26	4.57	4.81	4.89	4.96	
Chainage	900.000	910.000	920.000	930.000	940.000	949.241	960.000	970.000	980.000	990.000	1000.000	1010.000	1020.000	1030.000	1040.000	1050.000	1060.000	1067.458
Alignment Details	R=14.00 L=21.94		B=99°05'50" D=35.39								B=99°05'50" D=106.85						R=20.00 L=11.36	

ROAD 2 - LONG SECTION cont'd
Scale Horizontal 1:500 Vertical 1:100



CUT/FILL	-0.19	-0.18	-0.18	-0.18	-0.19	-0.19	-0.15	-0.11	-0.08	-0.08	-0.07	-0.07	-0.11	+0.01	+0.09	+0.14
DESIGN SURFACE	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
EXISTING SURFACE	4.39	4.38	4.38	4.38	4.39	4.39	4.35	4.31	4.28	4.28	4.27	4.27	4.31	4.19	4.11	4.06
Chainage	600.000	610.000	620.000	630.000	640.000	650.000	661.526	670.000	680.000	690.000	700.000	710.000	720.000	730.000	743.240	750.000
Alignment Details				B=344°00'00" D=75.02							B=344°00'00" D=81.71					

CUT/FILL	+0.18	+0.19	+0.20	+0.13	+0.12	-0.08	-0.15	-0.07	-0.07	-0.09	-0.08	-0.25	-0.19	-0.12	-0.02	+0.06
DESIGN SURFACE	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.25	4.30	4.35
EXISTING SURFACE	4.02	4.01	4.00	4.07	4.08	4.28	4.35	4.27	4.27	4.29	4.28	4.45	4.39	4.37	4.32	4.30
Chainage	760.000	770.000	780.000	793.253	800.000	810.000	818.387	830.000	833.883	840.000	848.204	860.000	870.000	880.000	890.000	900.000
Alignment Details	B=344°00'00" D=50.01				R=19.99 L=25.13		B=56°00' D=5.37	R=30.00 L=10.13		R=30.00 L=14.32			B=9°18'20" D=43.71			R=14.00 L=21.94

ROAD 2 - LONG SECTION cont'd
Scale Horizontal 1:500 Vertical 1:100

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

DRAWING STATUS: Unless there is an approved signature in the space provided, this plan is not verified.
CAUTION: The information shown on this plan may be insufficient for some types of detailed design. CivilTech Consulting Engineers should be consulted as to the suitability of the information shown herein prior to the commencement of any works based on this plan.

BAYSIDE BRUNSWICK Pty. Ltd.
ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 2 LONG SECTION cont'd
CH 600.00 TO END

Scale: As Shown at A1 CAD file: 1133-DA15B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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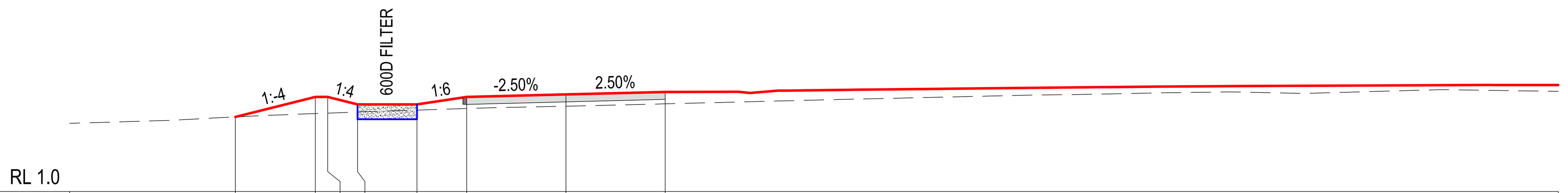
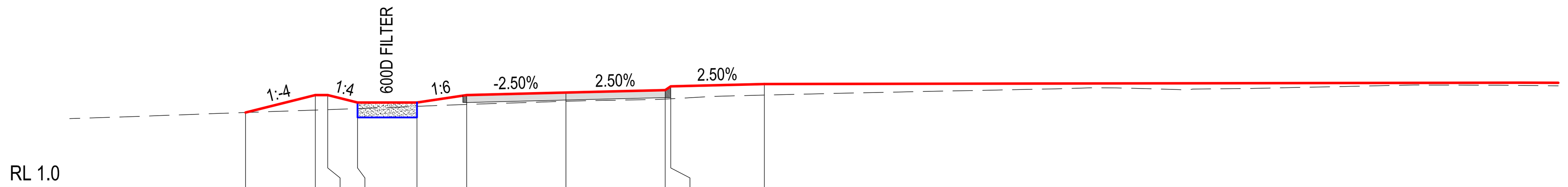
Sheet No.
15 of 29

Dwg. No. **1133-DA15** Issue **B**



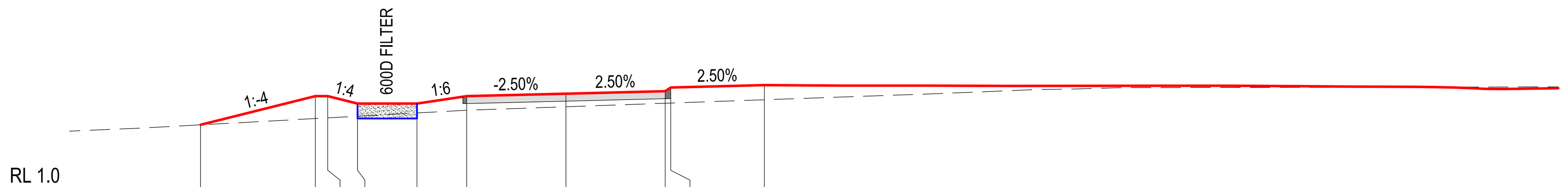
HT. DIFF		0.00	0.67	0.65	0.31	0.23	0.47	0.47	0.48	
DESIGN		4.00	4.80	4.80	4.50	4.50	4.80	4.90	5.00	5.28
EXISTING	3.74	4.00	4.13	4.15	4.20	4.27	4.34	4.43	4.53	5.03
OFFSETS	20.00	13.32	10.10	9.60	8.40	6.00	4.00	0.00	4.00	40.00

250.000



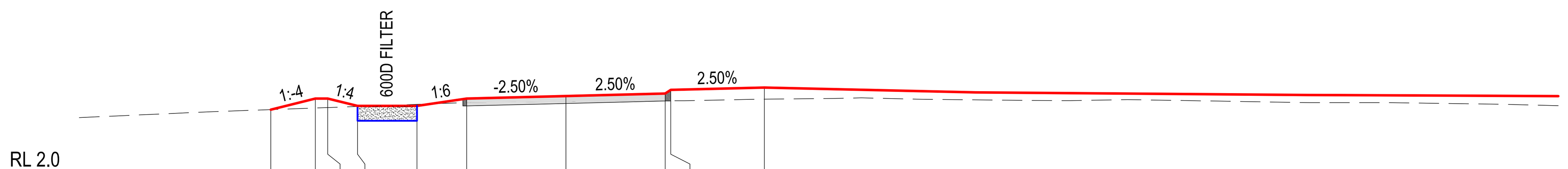
HT. DIFF		0.00	0.60	0.59	0.24	0.15	0.38	0.35	0.36	0.50	0.45	
DESIGN		4.04	4.74	4.74	4.44	4.44	4.74	4.84	4.94	5.09	5.18	5.23
EXISTING	3.79	4.04	4.13	4.15	4.19	4.28	4.36	4.49	4.58	4.59	4.74	5.11
OFFSETS	20.00	12.91	10.10	9.60	8.40	6.00	4.00	0.00	4.00	4.22	8.00	40.00

200.000



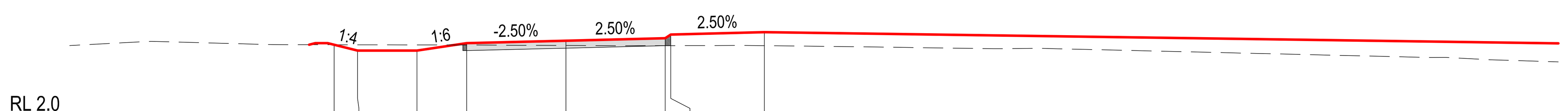
HT. DIFF		-0.00	0.90	0.87	0.51	0.38	0.57	0.53	0.49	0.63	0.59	
DESIGN		3.63	4.79	4.79	4.49	4.49	4.79	4.89	4.99	5.14	5.23	5.23
EXISTING	3.38	3.63	3.88	3.91	3.98	4.11	4.22	4.36	4.50	4.51	4.64	5.16
OFFSETS	20.00	14.73	10.10	9.60	8.40	6.00	4.00	0.00	4.00	4.22	8.00	40.00

150.000



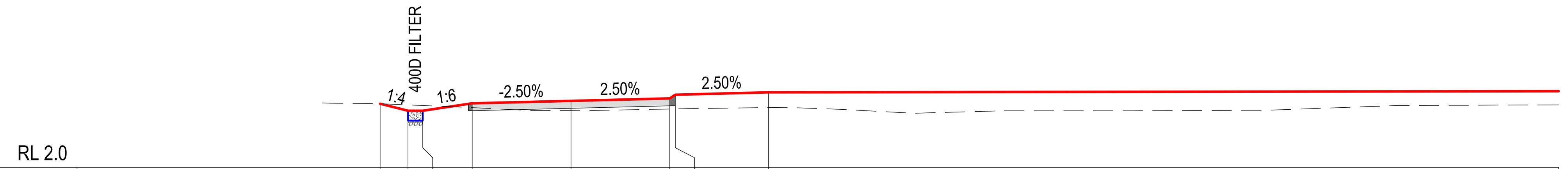
HT. DIFF		0.00	0.38	0.37	0.02	-0.06	0.17	0.22	0.29	0.44	0.47	
DESIGN		4.60	5.05	5.05	4.75	4.75	5.05	5.15	5.25	5.40	5.49	5.14
EXISTING		4.60	4.66	4.68	4.73	4.81	4.88	4.93	4.96	4.96	5.02	4.76
OFFSETS	20.00	11.89	10.10	9.60	8.40	6.00	4.00	0.00	4.00	4.22	8.00	40.00

90.000



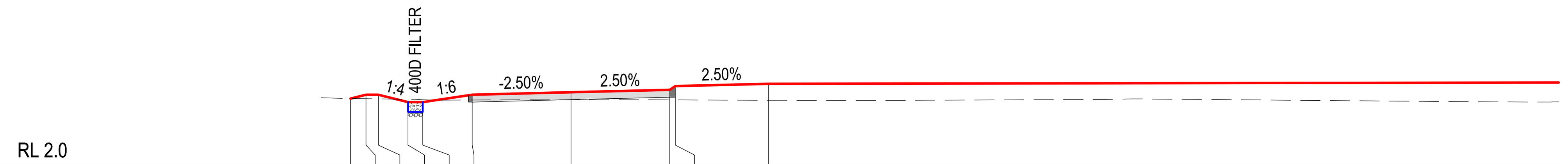
HT. DIFF		0.00	-0.23	-0.23	0.07	0.19	0.30	0.45	0.54	
DESIGN		4.97	4.74	4.74	5.04	5.13	5.23	5.38	5.48	5.03
EXISTING	4.94	4.97	4.97	4.97	4.96	4.94	4.94	4.94	4.93	4.28
OFFSETS	20.00	9.34	8.40	6.00	4.00	0.00	4.00	4.22	8.00	40.00

30.000



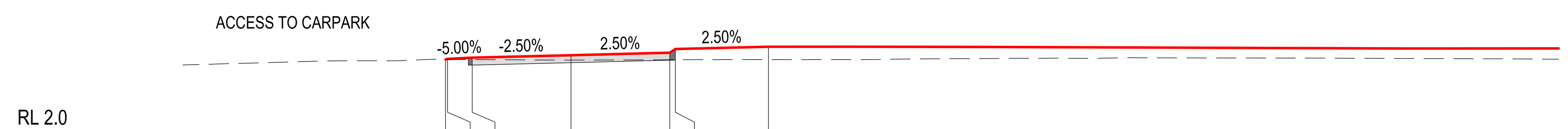
HT. DIFF		0.00	-0.24	-0.21	0.17	0.40	0.43	0.58	0.62	
DESIGN		4.58	4.30	4.30	4.60	4.70	4.80	4.95	5.04	5.09
EXISTING		4.58	4.54	4.51	4.43	4.30	4.37	4.37	4.43	4.54
OFFSETS	20.00	7.73	6.60	6.00	4.00	0.00	4.00	4.22	8.00	40.00

500.000



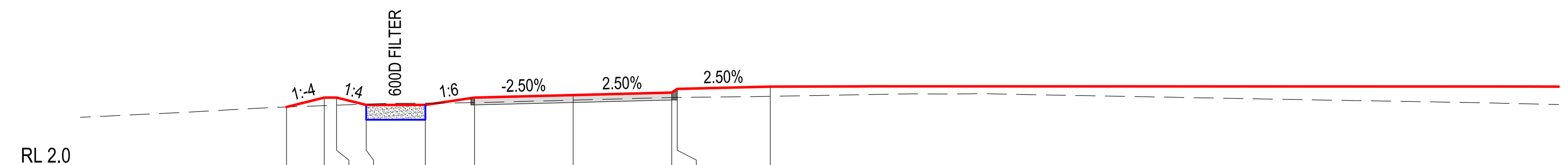
HT. DIFF		0.00	0.16	0.17	-0.12	-0.09	0.22	0.31	0.41	0.56	0.67	
DESIGN		4.69	4.85	4.85	4.55	4.55	4.85	4.95	5.05	5.20	5.29	5.34
EXISTING		4.69	4.69	4.68	4.67	4.64	4.63	4.64	4.64	4.64	4.63	4.56
OFFSETS	20.00	8.93	8.30	7.80	6.60	6.00	4.00	0.00	4.00	4.22	8.00	40.00

450.000



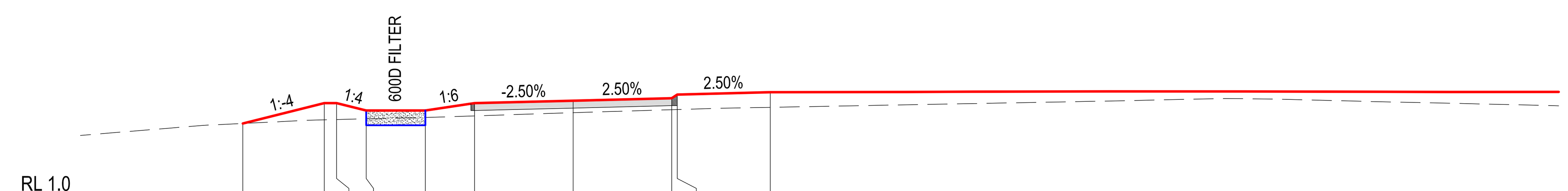
HT. DIFF		0.00	0.02	0.08	0.20	0.28	0.43	0.52	
DESIGN		4.93	4.95	5.00	5.10	5.20	5.35	5.44	5.37
EXISTING		4.93	4.93	4.92	4.90	4.91	4.92	4.92	4.94
OFFSETS	20.00	5.08	5.00	4.00	0.00	4.00	4.22	8.00	40.00

400.000



	0.00	0.33	0.31	-0.03	-0.07	0.21	0.20	0.20	0.34	0.40	
	4.55	4.93	4.93	4.63	4.63	4.93	5.03	5.13	5.28	5.38	5.38
4.13	4.55	4.61	4.62	4.67	4.71	4.73	4.83	4.93	4.94	4.98	4.65
20.00	11.63	10.10	9.60	8.40	6.00	4.00	0.00	4.00	4.22	8.00	40.00

350.000



	0.00	0.68	0.67	0.34	0.28	0.52	0.49	0.47	0.61	0.61	
	4.04	4.87	4.87	4.57	4.57	4.87	4.97	5.07	5.22	5.31	5.33
3.56	4.04	4.19	4.20	4.23	4.29	4.35	4.48	4.60	4.61	4.70	4.76
20.00	13.41	10.10	9.60	8.40	6.00	4.00	0.00	4.00	4.22	8.00	40.00

300.000

ROAD 2 - CROSS SECTIONS

Scale Horizontal 1:200 Vertical 1:200

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.09.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 2 CROSS SECTIONS
START TO CH 500

Scale: As Shown at A1 CAD file: 1133-DA16B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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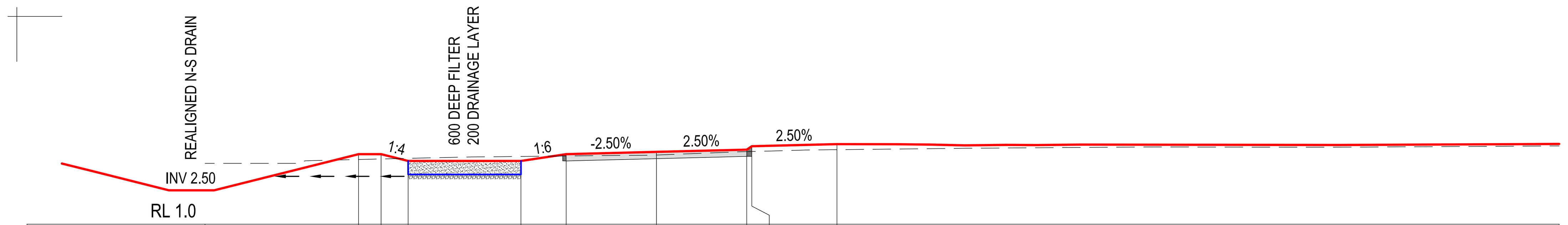
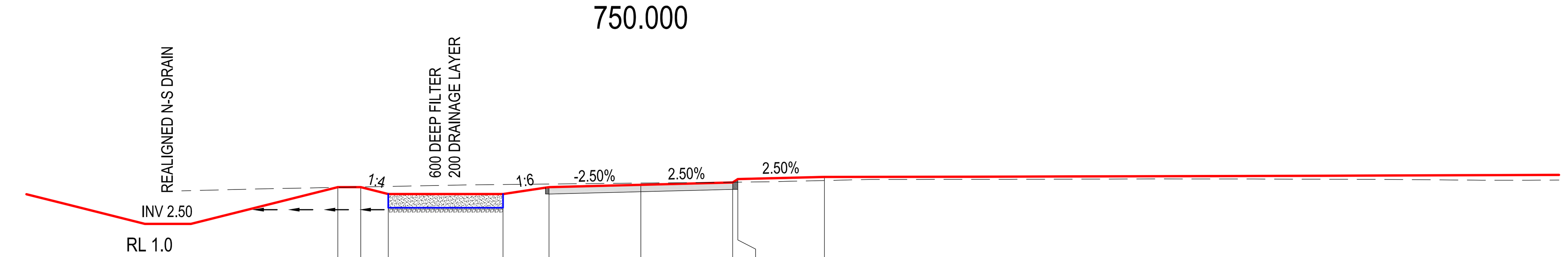
Sheet No.
16 of 29

Dwg. No. **1133-DA16** Issue **B**



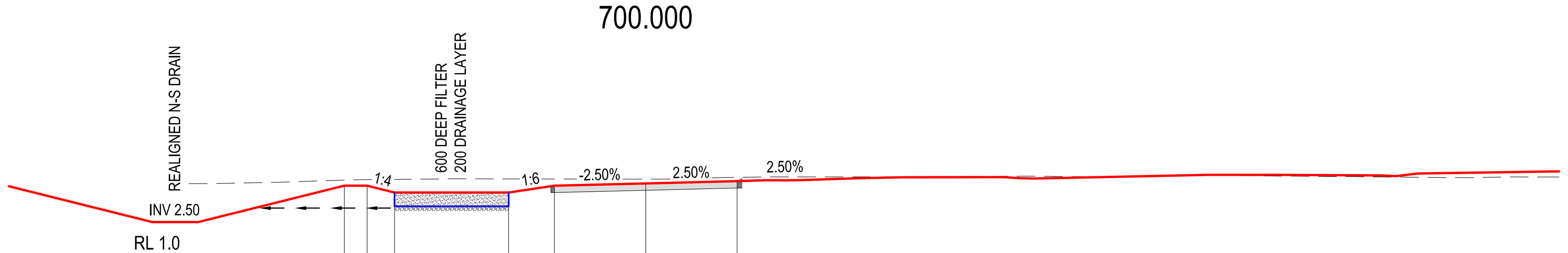
HT. DIFF		0.24	0.21	-0.11	-0.20	0.08	0.14	0.09	0.23	0.25	
DESIGN		4.10	4.10	3.80	3.80	4.10	4.20	4.30	4.45	4.54	4.55
EXISTING	3.69	3.86	3.89	3.91	4.00	4.02	4.06	4.21	4.22	4.30	4.47
OFFSETS	20.00	13.20	12.20	11.00	6.00	4.00	0.00	4.00	4.22	8.00	40.00

750.000



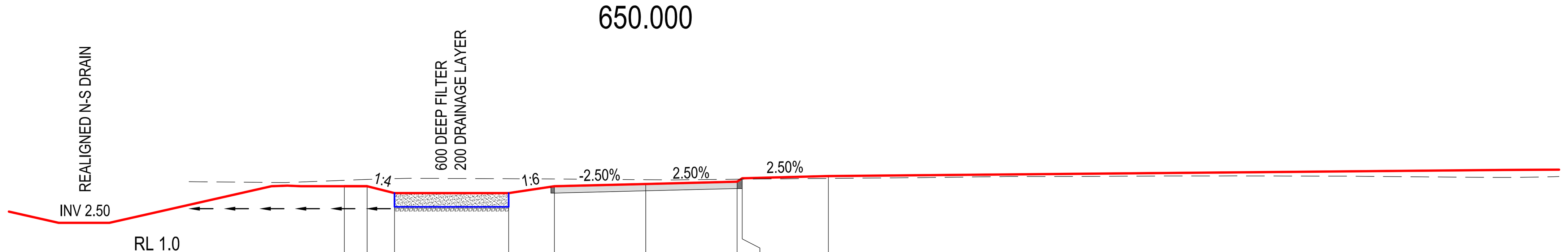
HT. DIFF		0.01	-0.01	-0.33	-0.41	-0.13	-0.07	-0.01	0.13	0.16	
DESIGN		4.10	4.10	3.80	3.80	4.10	4.20	4.30	4.45	4.54	4.76
EXISTING	3.94	4.09	4.11	4.13	4.21	4.23	4.27	4.31	4.32	4.39	4.41
OFFSETS	20.00	13.20	12.20	11.00	6.00	4.00	0.00	4.00	4.22	8.00	40.00

700.000



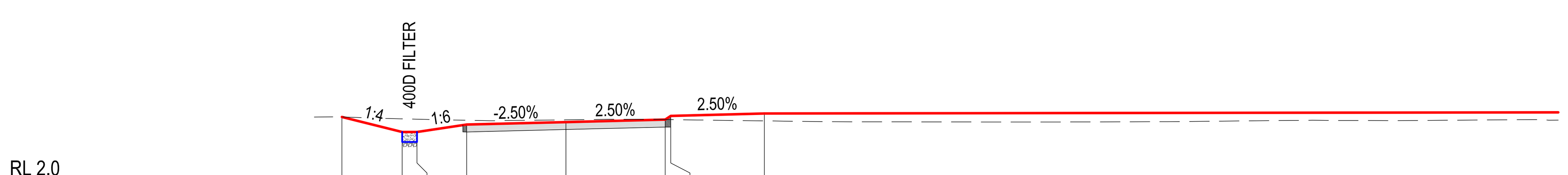
HT. DIFF		-0.25	-0.27	-0.58	-0.60	-0.30	-0.19	-0.17	
DESIGN		4.10	4.10	3.80	3.80	4.10	4.20	4.30	4.73
EXISTING	4.19	4.35	4.37	4.38	4.40	4.40	4.39	4.47	4.48
OFFSETS	20.00	13.20	12.20	11.00	6.00	4.00	0.00	4.00	40.00

650.000



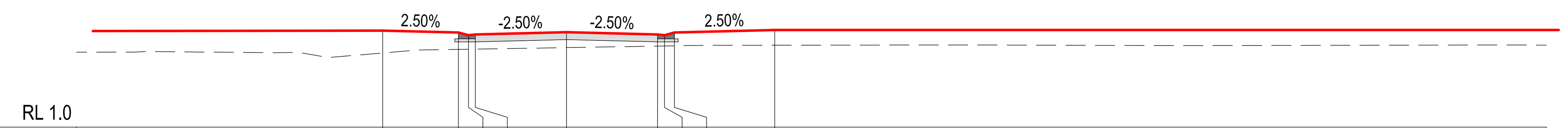
HT. DIFF		-0.26	-0.30	-0.64	-0.63	-0.32	-0.19	-0.11	0.04	0.10	
DESIGN		4.10	4.10	3.80	3.80	4.10	4.20	4.30	4.45	4.54	4.83
EXISTING	4.30	4.36	4.40	4.44	4.43	4.42	4.39	4.41	4.41	4.44	4.52
OFFSETS	20.00	13.20	12.20	11.00	6.00	4.00	0.00	4.00	4.22	8.00	40.00

600.000



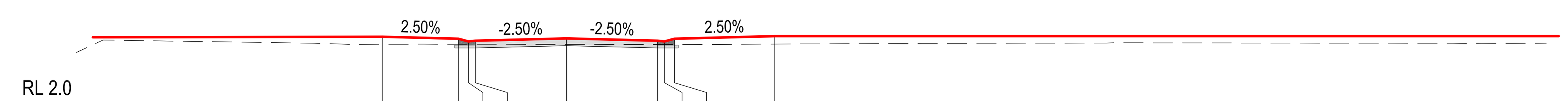
HT. DIFF		0.00	-0.53	-0.52	-0.17	-0.09	-0.00	0.15	0.30	
DESIGN		4.66	4.05	4.05	4.35	4.45	4.55	4.70	4.79	4.85
EXISTING		4.66	4.58	4.57	4.52	4.54	4.55	4.55	4.50	4.53
OFFSETS	20.00	9.03	6.60	6.00	4.00	0.00	4.00	4.22	8.00	40.00

550.000



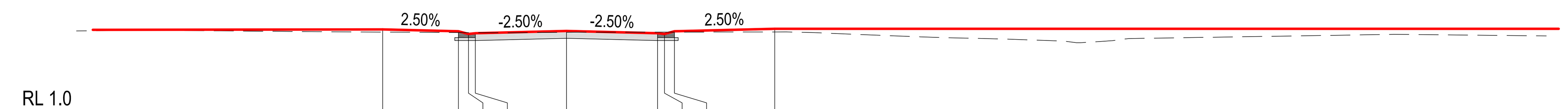
HT. DIFF		0.91	0.69	0.57	0.60	0.63	0.47	0.44	0.54	0.62	
DESIGN		4.92	4.85	4.74	4.77	4.86	4.77	4.74	4.85	4.95	4.95
EXISTING	4.04	4.01	4.16	4.17	4.17	4.23	4.29	4.30	4.30	4.33	4.33
OFFSETS	20.00	7.50	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.50	40.00

1000.000



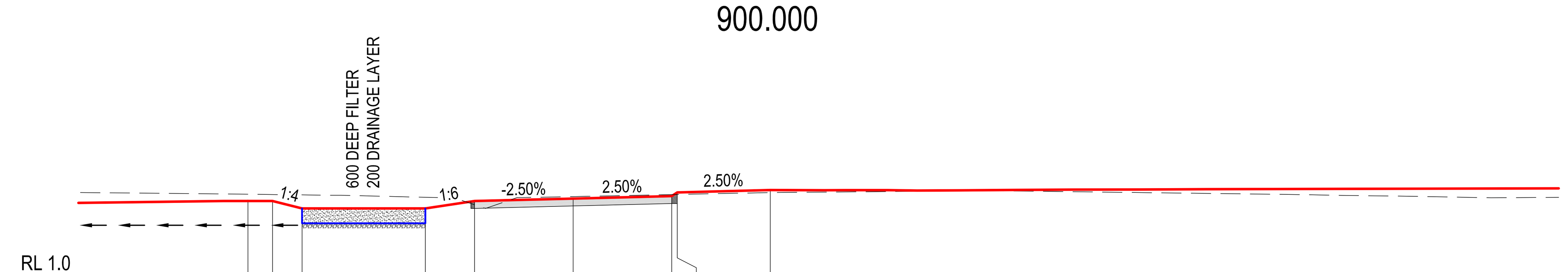
HT. DIFF		0.30	0.22	0.12	0.15	0.24	0.16	0.13	0.24	0.32	
DESIGN		4.67	4.59	4.48	4.51	4.61	4.51	4.48	4.59	4.69	4.69
EXISTING	4.03	4.37	4.37	4.37	4.37	4.36	4.36	4.36	4.36	4.37	4.38
OFFSETS	20.00	7.50	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.50	40.00

950.000



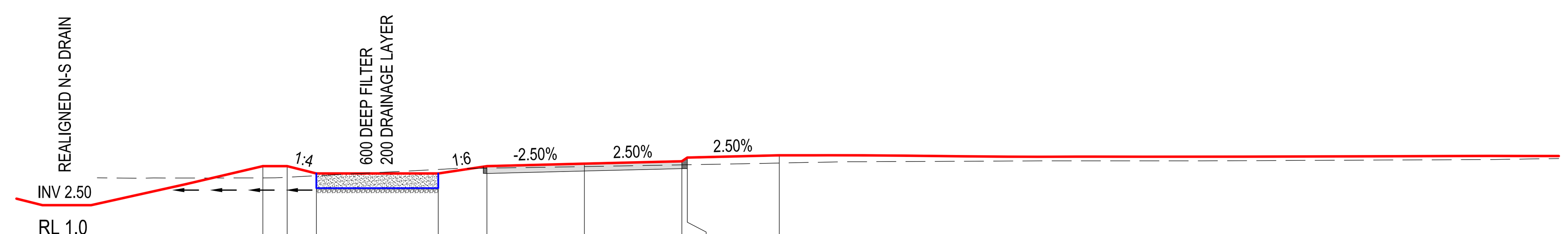
HT. DIFF		0.11	0.05	-0.06	-0.02	0.06	-0.05	-0.08	0.03	0.13	
DESIGN		4.42	4.34	4.23	4.26	4.35	4.26	4.23	4.34	4.44	4.44
EXISTING	4.35	4.31	4.29	4.29	4.28	4.30	4.30	4.30	4.31	4.31	4.15
OFFSETS	20.00	7.50	4.41	4.00	3.72	0.00	3.72	4.00	4.41	8.50	40.00

900.000



	-0.27	-0.26	-0.55	-0.45	0.15	-0.08	-0.06	0.08	0.10	
	4.10	4.10	3.80	3.80	4.10	4.20	4.30	4.45	4.54	4.61
4.44	4.37	4.36	4.35	4.25	3.95	4.28	4.36	4.37	4.44	4.25
20.00	13.20	12.20	11.00	6.00	4.00	0.00	4.00	4.22	8.00	40.00

850.000



	0.48	0.46	0.09	-0.16	0.08	0.12	0.15	0.29	0.32	
	4.10	4.10	3.80	3.80	4.10	4.20	4.30	4.45	4.54	4.54
3.62	3.62	3.64	3.71	3.96	4.02	4.08	4.15	4.16	4.23	4.41
20.00	13.20	12.20	11.00	6.00	4.00	0.00	4.00	4.22	8.00	40.00

800.000

ROAD 2 - CROSS SECTIONS cont'd

Scale Horizontal 1:200 Vertical 1:200

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.
ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 2 CROSS SECTIONS
CH550 TO END

Scale: As Shown at A1 CAD file: 1133-DA17B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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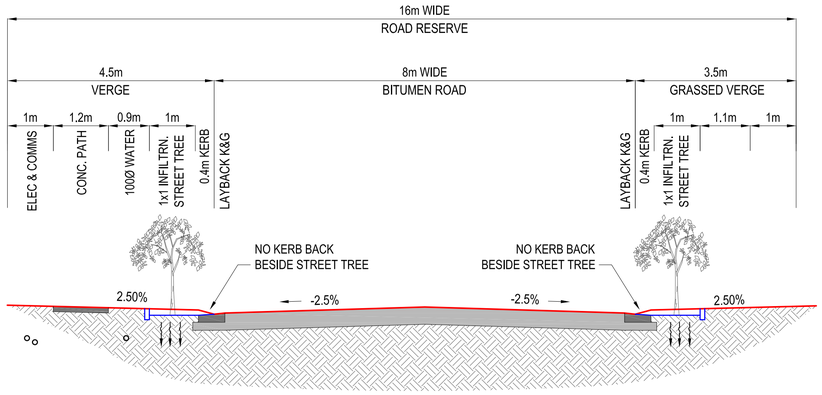
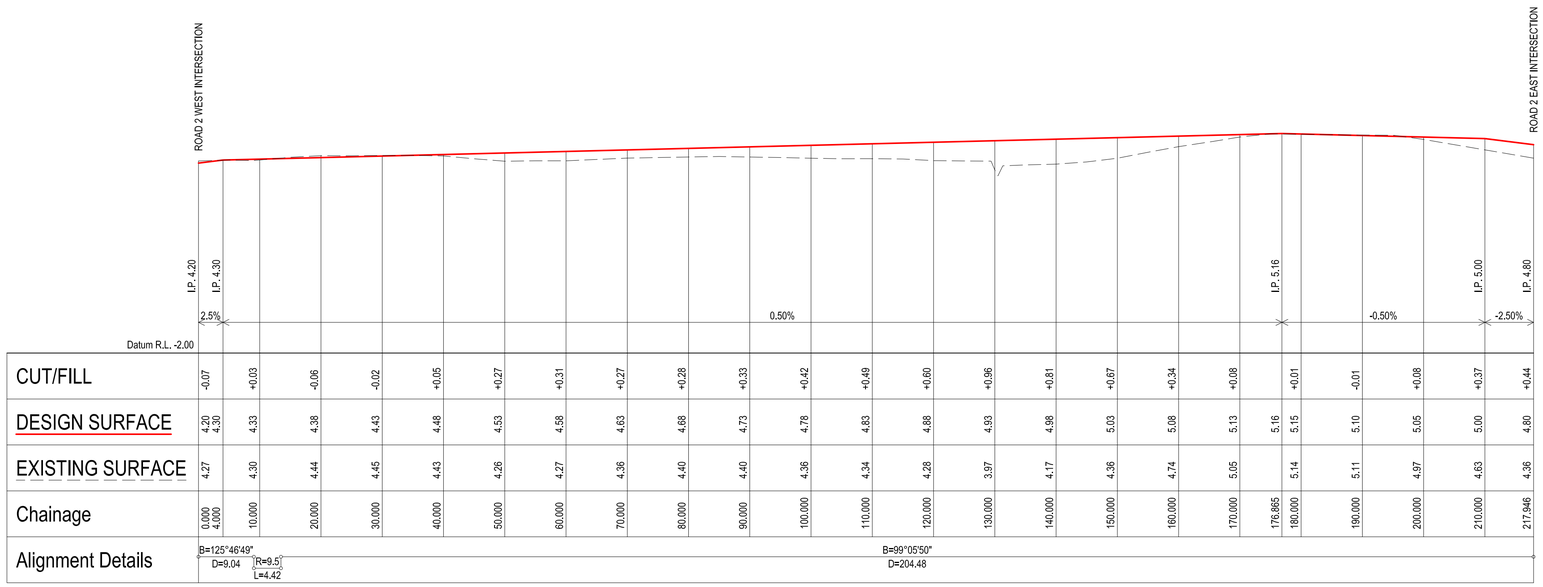
Sheet No.
17 of 29

Dwg. No. **1133-DA17** Issue **B**



ROAD 3 TYPICAL SECTION

Not to Scale



ROAD 3 - LONG SECTION

Scale Horizontal 1:500 Vertical 1:100

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 3 LONG SECTION & TYPICAL SECTION

Scale: As Shown at A1 CAD file: 1133-DA18B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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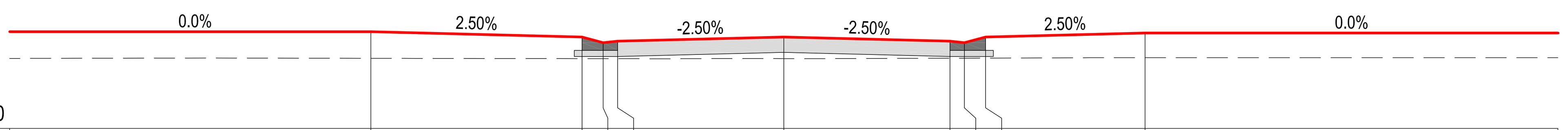
Sheet No.
18 of 29

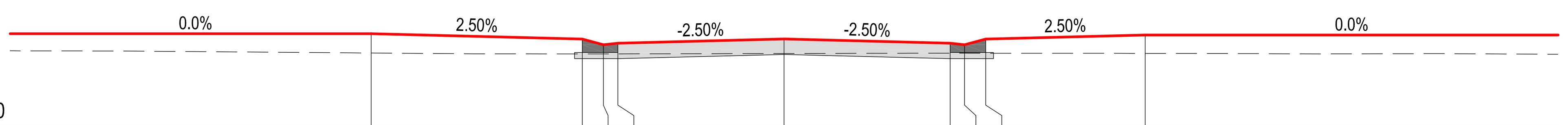
Dwg. No. **1133-DA18** Issue **B**



RL 3.0

HT. DIFF		0.52	0.42	0.31	0.34	0.42	0.33	0.30	0.41	0.48	
DESIGN		4.88	4.78	4.67	4.70	4.78	4.70	4.67	4.78	4.86	
EXISTING	4.36	4.36	4.36	4.36	4.36	4.36	4.37	4.37	4.37	4.38	4.38
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

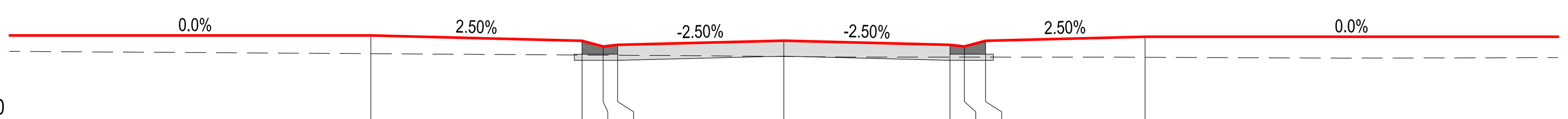
100.000



RL 3.0

HT. DIFF		0.37	0.29	0.18	0.21	0.28	0.19	0.16	0.28	0.35	
DESIGN		4.78	4.68	4.57	4.60	4.68	4.60	4.57	4.68	4.76	
EXISTING	4.45	4.41	4.39	4.39	4.39	4.40	4.40	4.40	4.40	4.40	4.38
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

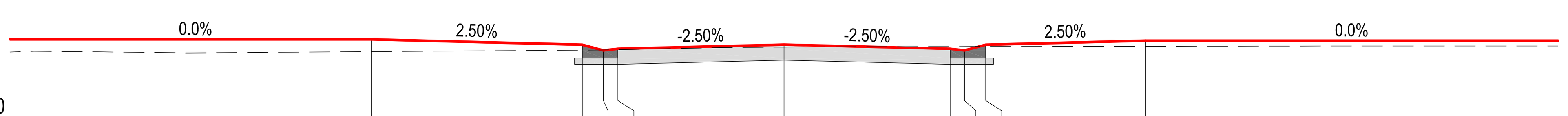
80.000



RL 3.0

HT. DIFF		0.35	0.28	0.17	0.20	0.31	0.24	0.21	0.32	0.40	
DESIGN		4.68	4.58	4.47	4.50	4.58	4.50	4.47	4.58	4.66	
EXISTING	4.37	4.33	4.30	4.30	4.30	4.27	4.26	4.26	4.26	4.26	4.25
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

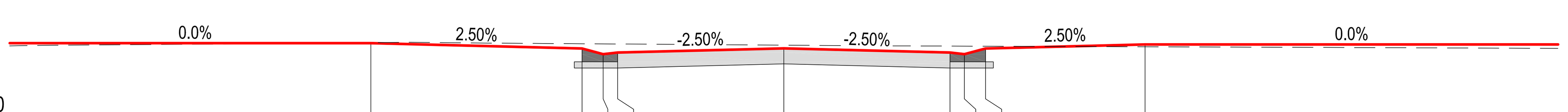
60.000



RL 3.0

HT. DIFF		0.24	0.11	-0.01	0.02	0.05	-0.04	-0.07	0.04	0.11	
DESIGN		4.58	4.48	4.37	4.40	4.48	4.40	4.37	4.48	4.56	
EXISTING	4.34	4.35	4.37	4.38	4.38	4.43	4.44	4.44	4.44	4.45	4.46
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

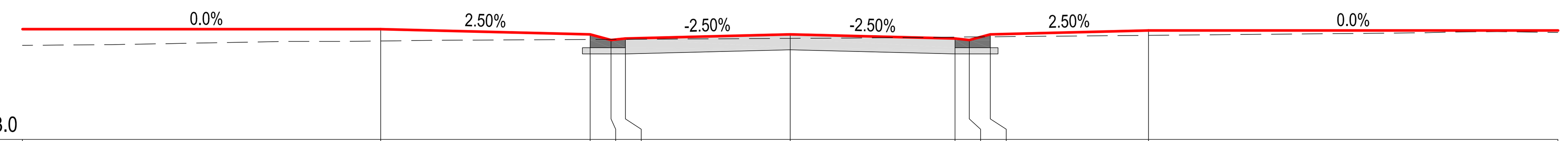
40.000



RL 3.0

HT. DIFF		-0.01	-0.09	-0.20	-0.17	-0.06	-0.13	-0.16	-0.04	0.04	
DESIGN		4.48	4.38	4.27	4.30	4.38	4.30	4.27	4.38	4.46	
EXISTING	4.43	4.49	4.47	4.47	4.47	4.44	4.43	4.42	4.42	4.41	4.38
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

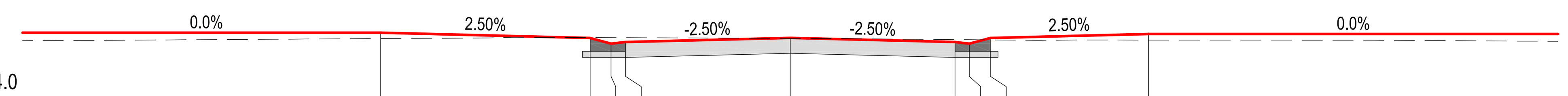
20.000



RL 3.0

HT. DIFF		0.23	0.10	-0.01	0.01	0.08	-0.03	-0.06	0.05	0.10	
DESIGN		5.15	5.05	4.94	4.97	5.05	4.97	4.94	5.05	5.13	
EXISTING	4.84	4.92	4.95	4.95	4.95	4.97	5.00	5.00	5.00	5.03	5.09
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

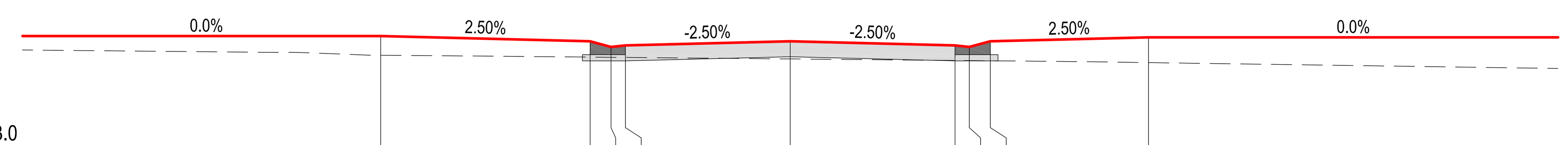
200.000



RL 4.0

HT. DIFF		0.11	-0.01	-0.12	-0.09	0.01	-0.05	-0.08	0.04	0.12	
DESIGN		5.25	5.15	5.04	5.07	5.15	5.07	5.04	5.15	5.23	
EXISTING	5.10	5.14	5.16	5.16	5.15	5.14	5.12	5.11	5.11	5.11	5.08
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

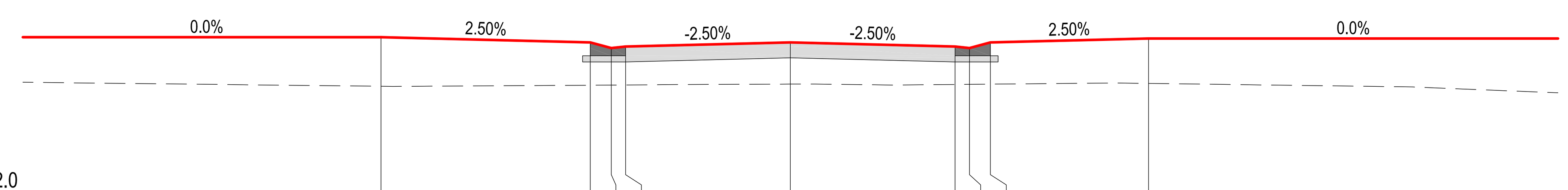
180.000



RL 3.0

HT. DIFF		0.37	0.31	0.20	0.23	0.34	0.29	0.26	0.38	0.49	
DESIGN		5.18	5.08	4.97	5.00	5.08	5.00	4.97	5.08	5.16	
EXISTING	4.91	4.81	4.77	4.77	4.77	4.74	4.71	4.70	4.70	4.67	4.55
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

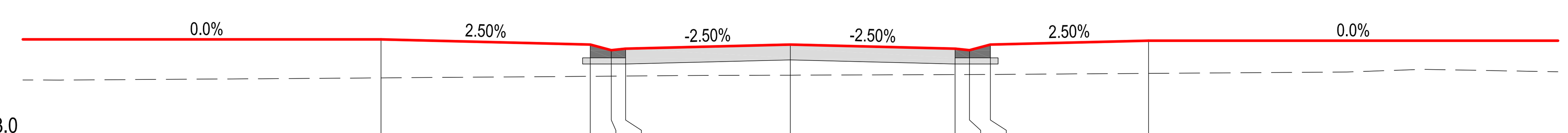
160.000



RL 2.0

	0.96	0.84	0.72	0.75	0.81	0.74	0.71	0.81	0.88	
	5.08	4.98	4.87	4.90	4.98	4.90	4.87	4.98	5.06	
4.20	4.12	4.14	4.15	4.15	4.17	4.16	4.16	4.17	4.18	4.00
15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

140.000



RL 3.0

	0.75	0.62	0.51	0.54	0.60	0.51	0.48	0.59	0.64	
	4.98	4.88	4.77	4.80	4.88	4.80	4.77	4.88	4.96	
4.19	4.23	4.26	4.26	4.26	4.28	4.29	4.29	4.29	4.32	4.35
15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

120.000

ROAD 3 - CROSS SECTIONS

Scale Horizontal 1:200 Vertical 1:200

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 3
CROSS SECTIONS

Scale: As Shown at A1 CAD file: 1133-DA19B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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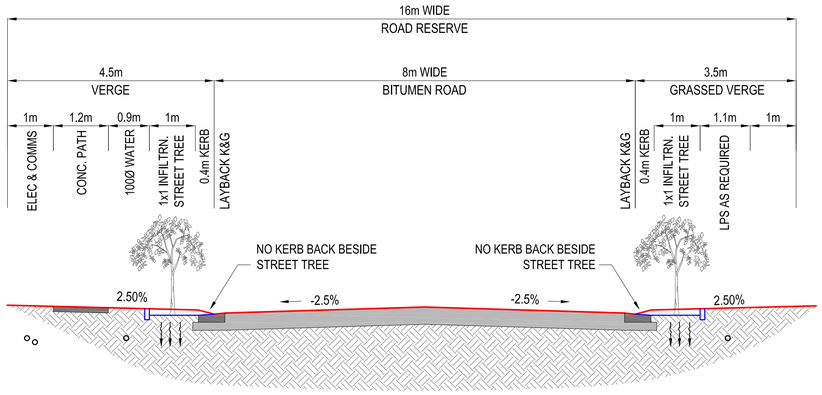
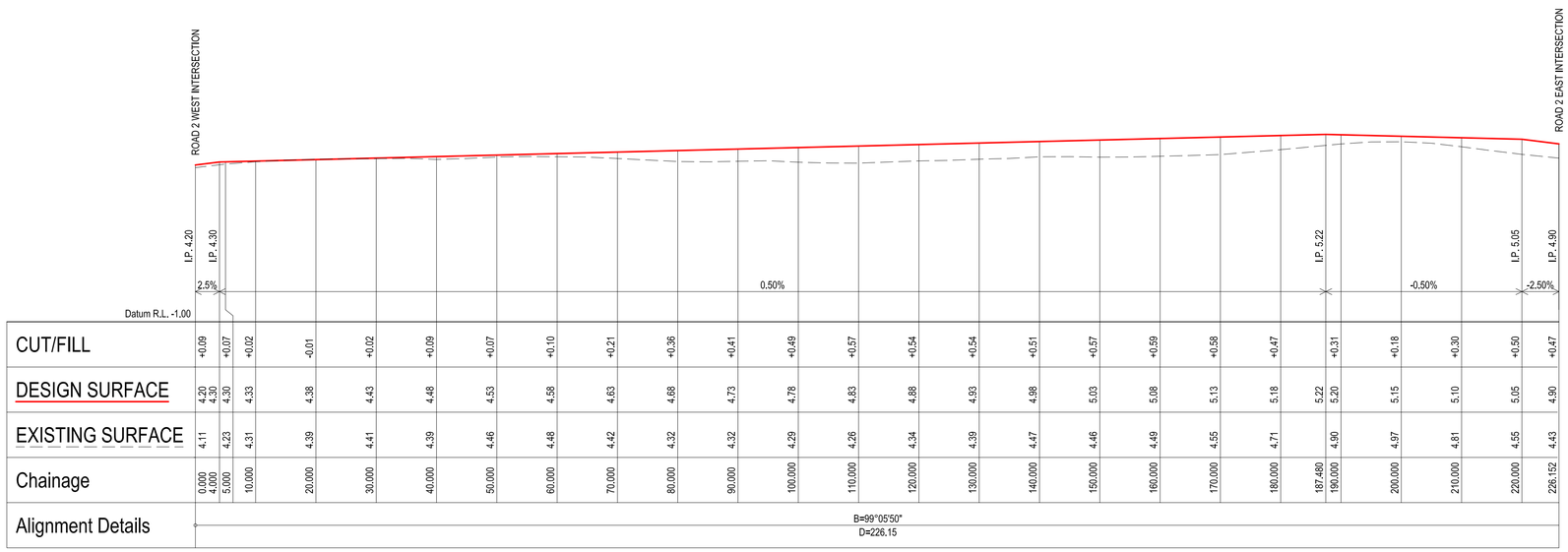
Sheet No.
19 of 29

Dwg. No. **1133-DA19** Issue **B**



ROAD 4 TYPICAL SECTION

Not to Scale



ROAD 4 - LONG SECTION

Scale Horizontal 1:500 Vertical 1:100

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 4 LONG SECTION & TYPICAL SECTION

Scale: As Shown at A1 CAD file: 1133-DA20B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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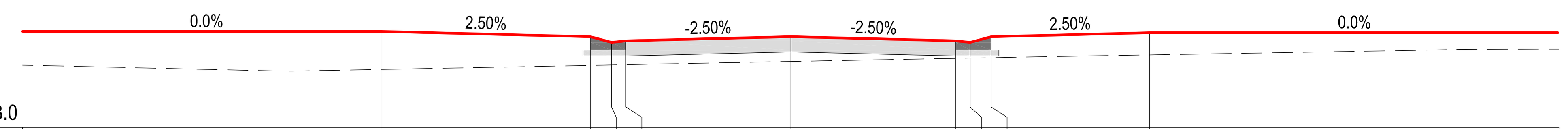
Sheet No.
20 of 29

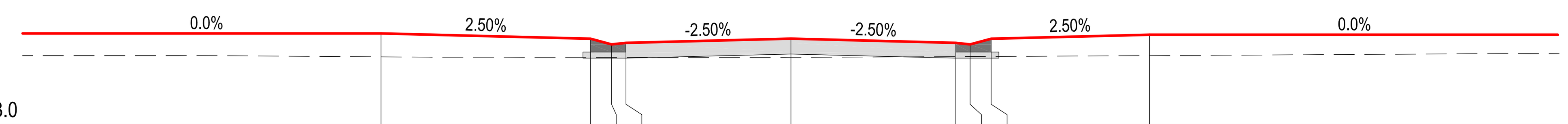
Dwg. No. **1133-DA20** Issue **B**



RL 3.0

HT. DIFF		0.74	0.56	0.44	0.47	0.49	0.35	0.31	0.41	0.43	
DESIGN		4.88	4.78	4.67	4.70	4.78	4.70	4.67	4.78	4.86	
EXISTING	4.22	4.14	4.22	4.23	4.23	4.29	4.35	4.36	4.37	4.42	4.52
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

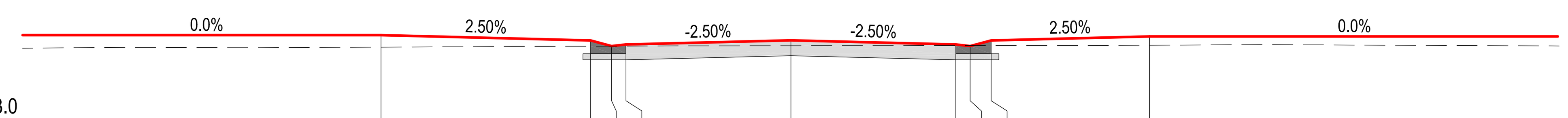
100.000



RL 3.0

HT. DIFF		0.46	0.36	0.25	0.28	0.36	0.27	0.24	0.35	0.41	
DESIGN		4.78	4.68	4.57	4.60	4.68	4.60	4.57	4.68	4.76	
EXISTING	4.35	4.33	4.32	4.32	4.32	4.32	4.33	4.33	4.33	4.35	4.40
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

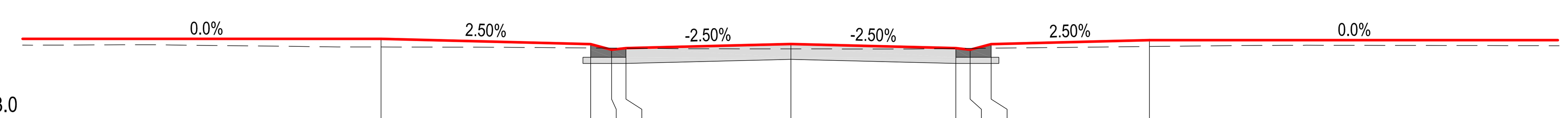
80.000



RL 3.0

HT. DIFF		0.23	0.11	0.00	0.03	0.10	0.02	-0.01	0.10	0.17	
DESIGN		4.68	4.58	4.47	4.50	4.58	4.50	4.47	4.58	4.66	
EXISTING	4.43	4.45	4.47	4.47	4.47	4.48	4.48	4.48	4.48	4.49	4.47
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

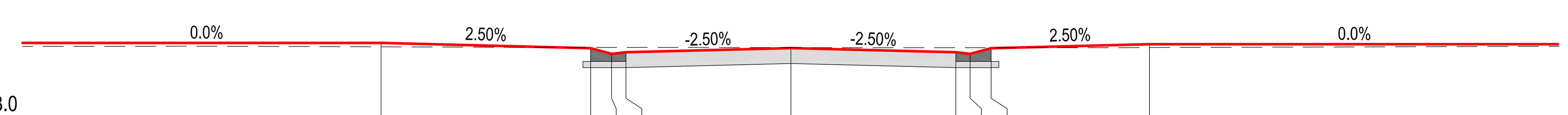
60.000



RL 3.0

HT. DIFF		0.16	0.08	-0.03	0.00	0.09	0.01	-0.03	0.08	0.13	
DESIGN		4.58	4.48	4.37	4.40	4.48	4.40	4.37	4.48	4.56	
EXISTING	4.46	4.42	4.40	4.40	4.40	4.39	4.39	4.39	4.40	4.43	4.45
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

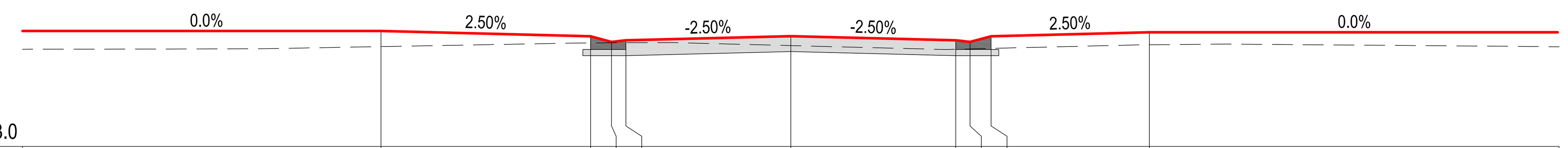
40.000



RL 3.0

HT. DIFF		0.08	-0.01	-0.12	-0.09	-0.01	-0.09	-0.12	-0.01	0.07	
DESIGN		4.48	4.38	4.27	4.30	4.38	4.30	4.27	4.38	4.46	
EXISTING	4.41	4.41	4.39	4.39	4.39	4.39	4.39	4.39	4.39	4.39	4.42
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

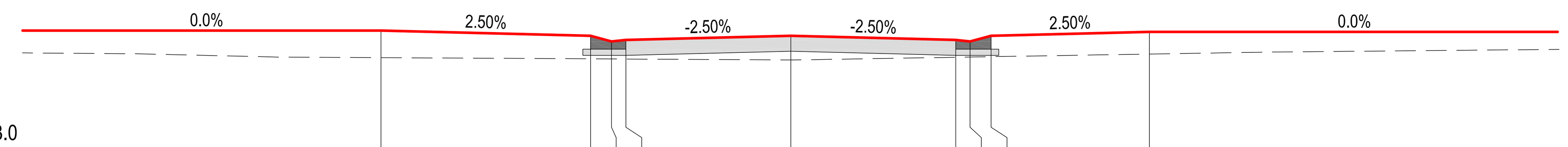
20.000



RL 3.0

HT. DIFF		0.30	0.13	0.02	0.05	0.18	0.17	0.14	0.24	0.24	
DESIGN		5.26	5.15	5.04	5.07	5.15	5.07	5.04	5.15	5.23	
EXISTING	4.90	4.95	5.02	5.03	5.03	4.97	4.90	4.91	4.92	4.99	4.95
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

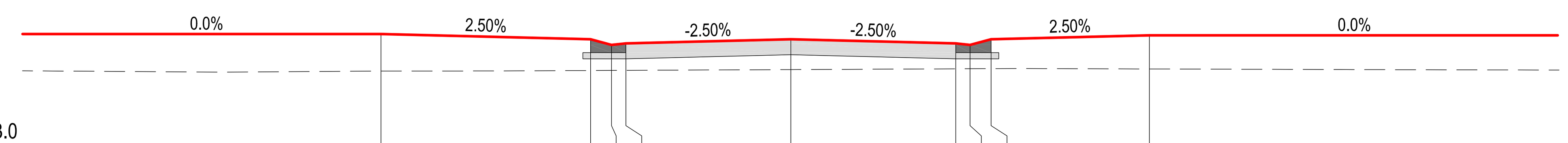
200.000



RL 3.0

HT. DIFF		0.53	0.45	0.34	0.37	0.47	0.34	0.30	0.41	0.43	
DESIGN		5.28	5.18	5.07	5.10	5.18	5.10	5.07	5.18	5.26	
EXISTING	4.85	4.76	4.73	4.73	4.73	4.71	4.76	4.77	4.77	4.82	4.92
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

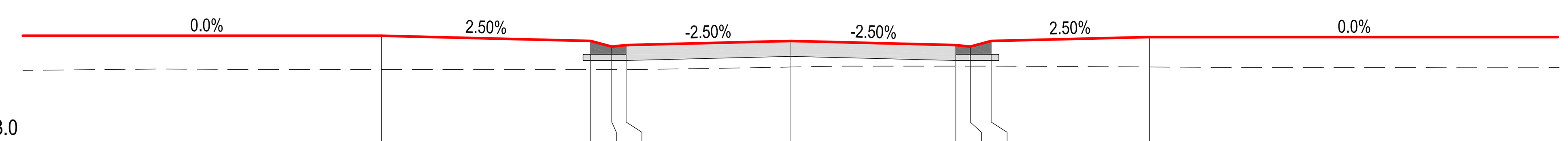
180.000



RL 3.0

HT. DIFF		0.72	0.61	0.50	0.52	0.59	0.49	0.46	0.57	0.65	
DESIGN		5.18	5.08	4.97	5.00	5.08	5.00	4.97	5.08	5.16	
EXISTING	4.47	4.46	4.47	4.47	4.48	4.49	4.51	4.51	4.51	4.50	4.48
OFFSETS	15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

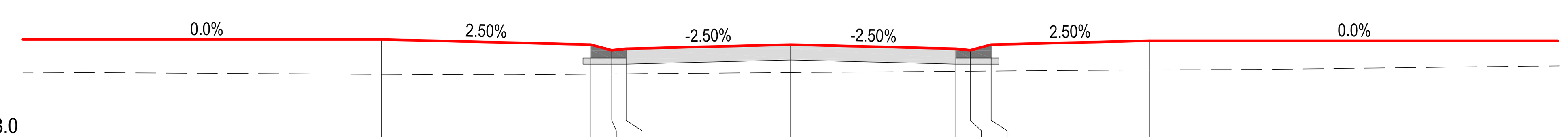
160.000



RL 3.0

	0.66	0.56	0.45	0.48	0.51	0.41	0.38	0.49	0.58	
	5.08	4.98	4.87	4.90	4.98	4.90	4.87	4.98	5.06	
4.41	4.42	4.42	4.42	4.42	4.47	4.49	4.49	4.49	4.47	4.47
15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

140.000



RL 3.0

	0.68	0.57	0.46	0.49	0.54	0.44	0.41	0.51	0.57	
	4.98	4.88	4.77	4.80	4.88	4.80	4.77	4.88	4.96	
4.34	4.30	4.31	4.31	4.31	4.34	4.36	4.36	4.37	4.39	4.46
15.00	8.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	7.00	15.00

120.000

ROAD 4 - CROSS SECTIONS

Scale Horizontal 1:200 Vertical 1:200

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 4
CROSS SECTIONS

Scale: As Shown at A1 CAD file: 1133-DA21B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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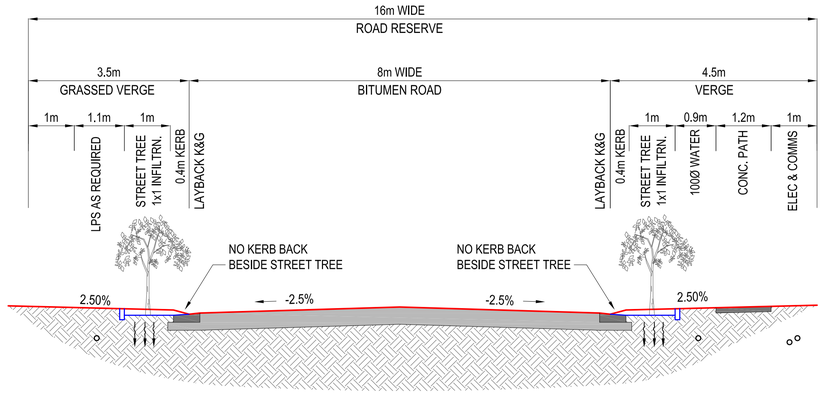
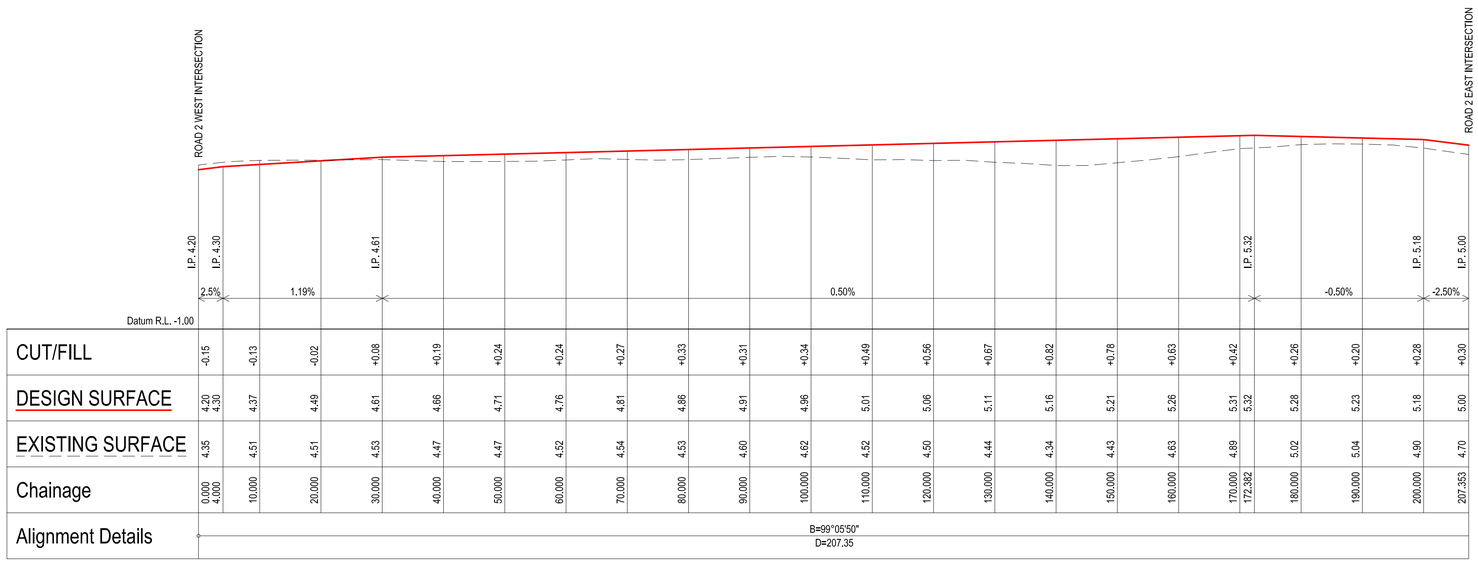
Sheet No.
21 of 29

Dwg. No. **1133-DA21**
Issue **B**



ROAD 5 TYPICAL SECTION

Not to Scale



ROAD 5 - LONG SECTION

Scale Horizontal 1:500 Vertical 1:100

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

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ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 5 LONG SECTION & TYPICAL SECTION

Scale: As Shown at A1 CAD file: 1133-DA22B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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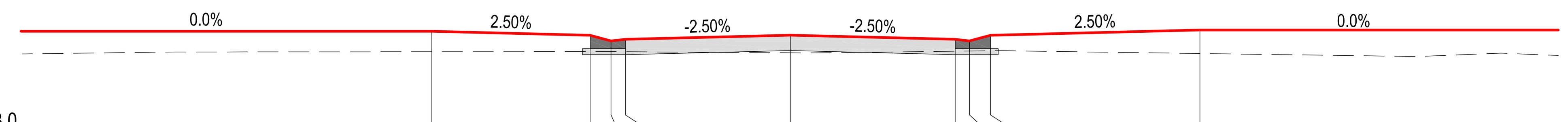
22 of 29

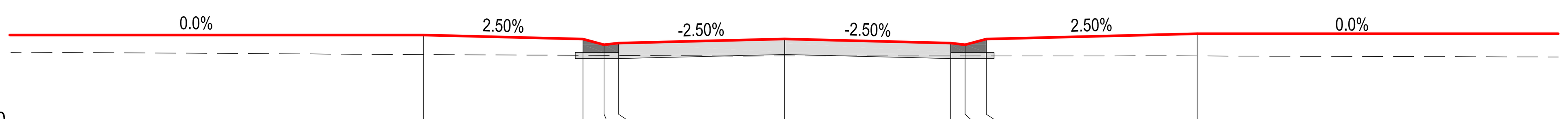
Dwg. No. **1133-DA22** Issue **B**



RL 3.0

HT. DIFF		0.40	0.32	0.21	0.24	0.34	0.23	0.20	0.30	0.46	
DESIGN		5.04	4.96	4.85	4.88	4.96	4.88	4.85	4.96	5.06	
EXISTING	4.60	4.64	4.64	4.64	4.64	4.62	4.65	4.65	4.66	4.60	4.56
OFFSETS	15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

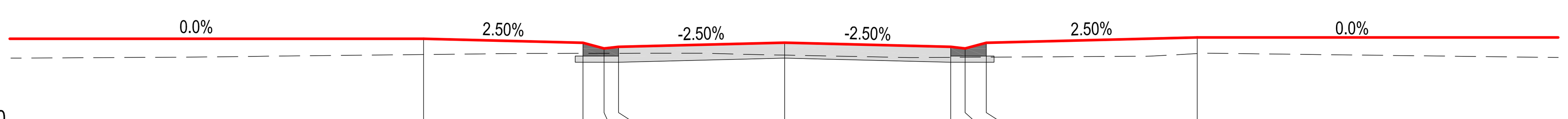
100.000



RL 3.0

HT. DIFF		0.38	0.32	0.21	0.24	0.33	0.25	0.22	0.33	0.43	
DESIGN		4.94	4.86	4.75	4.78	4.86	4.78	4.75	4.86	4.96	
EXISTING	4.60	4.56	4.54	4.54	4.54	4.53	4.53	4.53	4.53	4.53	4.51
OFFSETS	15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

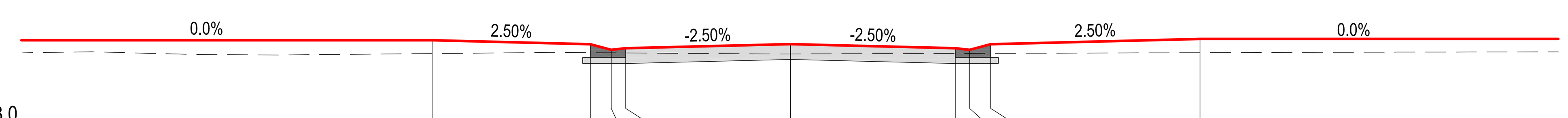
80.000



RL 3.0

HT. DIFF		0.31	0.21	0.10	0.13	0.24	0.20	0.17	0.28	0.31	
DESIGN		4.84	4.76	4.65	4.68	4.76	4.68	4.65	4.76	4.86	
EXISTING	4.46	4.53	4.55	4.55	4.55	4.52	4.48	4.48	4.48	4.55	4.47
OFFSETS	15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

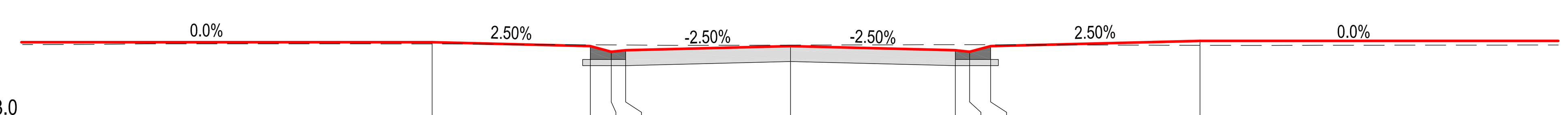
60.000



RL 3.0

HT. DIFF		0.26	0.17	0.06	0.09	0.19	0.10	0.07	0.18	0.27	
DESIGN		4.74	4.66	4.55	4.58	4.66	4.58	4.55	4.66	4.76	
EXISTING	4.49	4.48	4.49	4.49	4.49	4.47	4.48	4.48	4.48	4.49	4.51
OFFSETS	15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

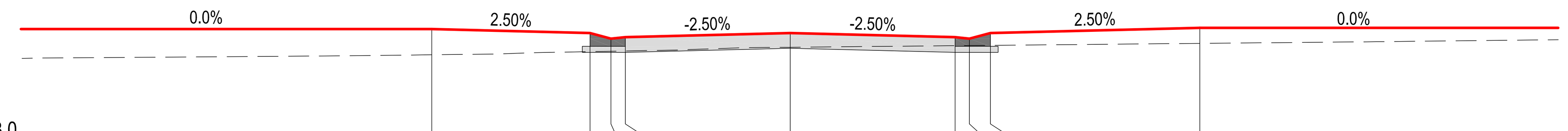
40.000



RL 3.0

HT. DIFF		0.03	-0.03	-0.13	-0.10	-0.02	-0.11	-0.14	-0.03	0.09	
DESIGN		4.57	4.49	4.38	4.41	4.49	4.41	4.38	4.49	4.59	
EXISTING	4.52	4.53	4.52	4.51	4.51	4.51	4.52	4.52	4.52	4.51	4.51
OFFSETS	15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

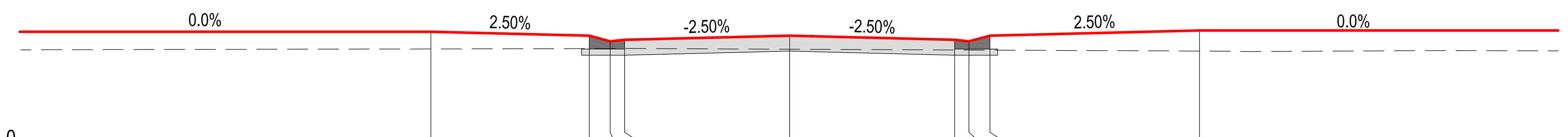
20.000



RL 3.0

HT. DIFF		0.50	0.36	0.25	0.27	0.28	0.17	0.14	0.24	0.31	
DESIGN		5.26	5.18	5.07	5.10	5.18	5.10	5.07	5.18	5.29	
EXISTING	4.69	4.76	4.82	4.83	4.83	4.90	4.94	4.94	4.94	4.98	5.05
OFFSETS	15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

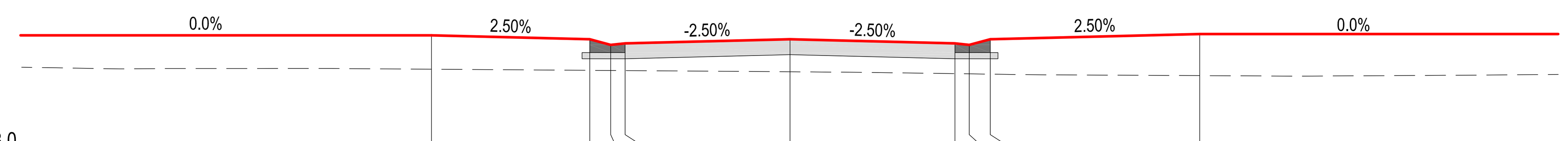
200.000



RL 3.0

HT. DIFF		0.33	0.25	0.14	0.17	0.26	0.20	0.17	0.28	0.40	
DESIGN		5.36	5.28	5.17	5.20	5.28	5.20	5.17	5.28	5.39	
EXISTING	5.01	5.03	5.03	5.03	5.03	5.02	5.01	5.00	5.00	4.98	4.99
OFFSETS	15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

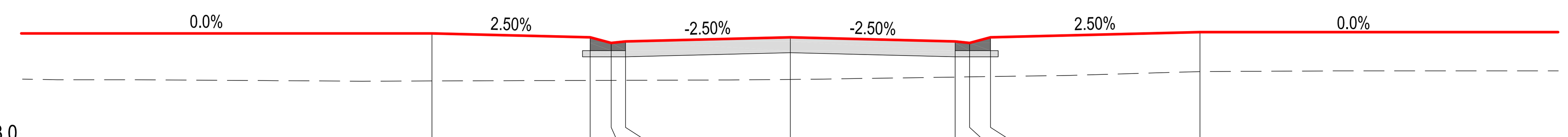
180.000



RL 3.0

HT. DIFF		0.66	0.61	0.50	0.53	0.63	0.59	0.56	0.68	0.81	
DESIGN		5.34	5.26	5.15	5.18	5.26	5.18	5.15	5.26	5.36	
EXISTING	4.71	4.68	4.65	4.65	4.65	4.63	4.59	4.59	4.58	4.55	4.58
OFFSETS	15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

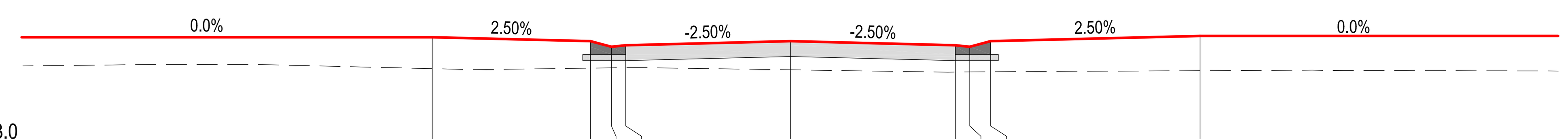
160.000



RL 3.0

	0.93	0.84	0.73	0.76	0.82	0.70	0.66	0.77	0.77	
	5.24	5.16	5.05	5.08	5.16	5.08	5.05	5.16	5.26	
4.34	4.31	4.32	4.32	4.32	4.34	4.38	4.39	4.39	4.49	4.50
15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

140.000



RL 3.0

	0.61	0.53	0.41	0.44	0.56	0.52	0.49	0.60	0.68	
	5.14	5.06	4.95	4.98	5.06	4.98	4.95	5.06	5.16	
4.58	4.52	4.53	4.54	4.54	4.50	4.45	4.46	4.46	4.48	4.48
15.00	7.00	3.91	3.50	3.22	0.00	3.22	3.50	3.91	8.00	15.00

120.000

ROAD 5 - CROSS SECTIONS

Scale Horizontal 1:200 Vertical 1:200

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 5
CROSS SECTIONS

Scale: As Shown at A1 CAD file: 1133-DA23B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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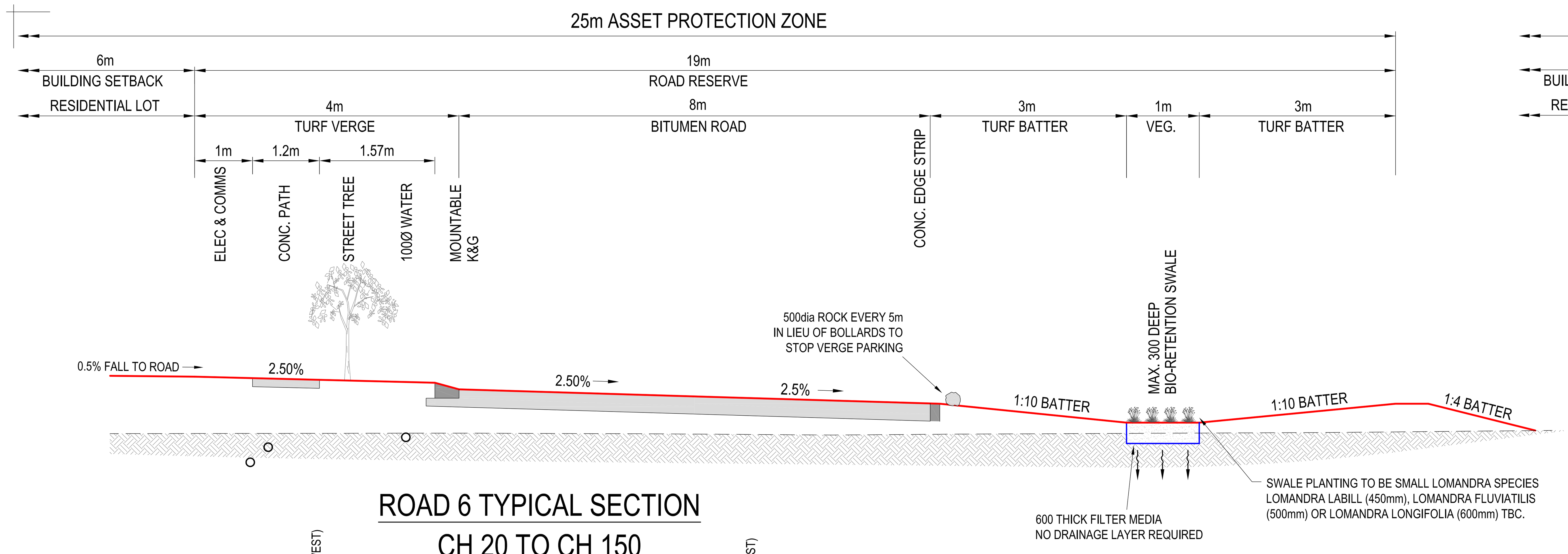
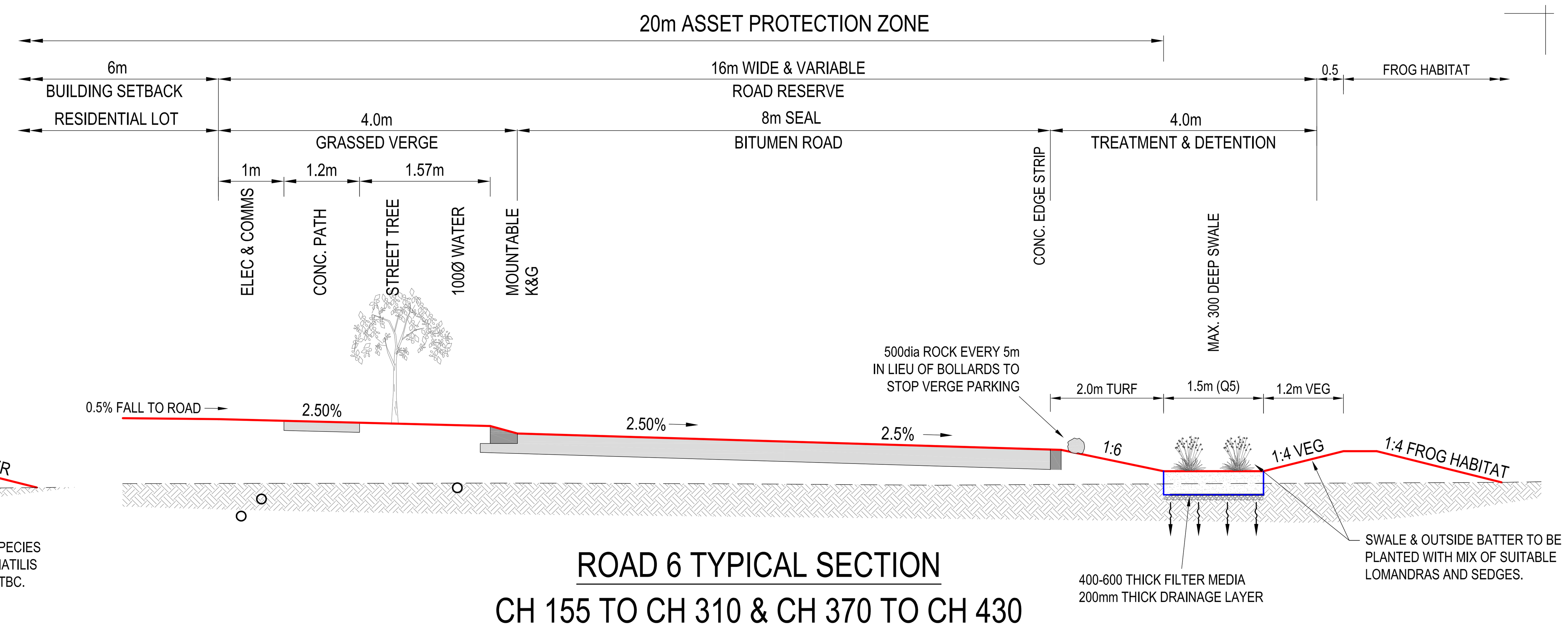
Sheet No.
23 of 29

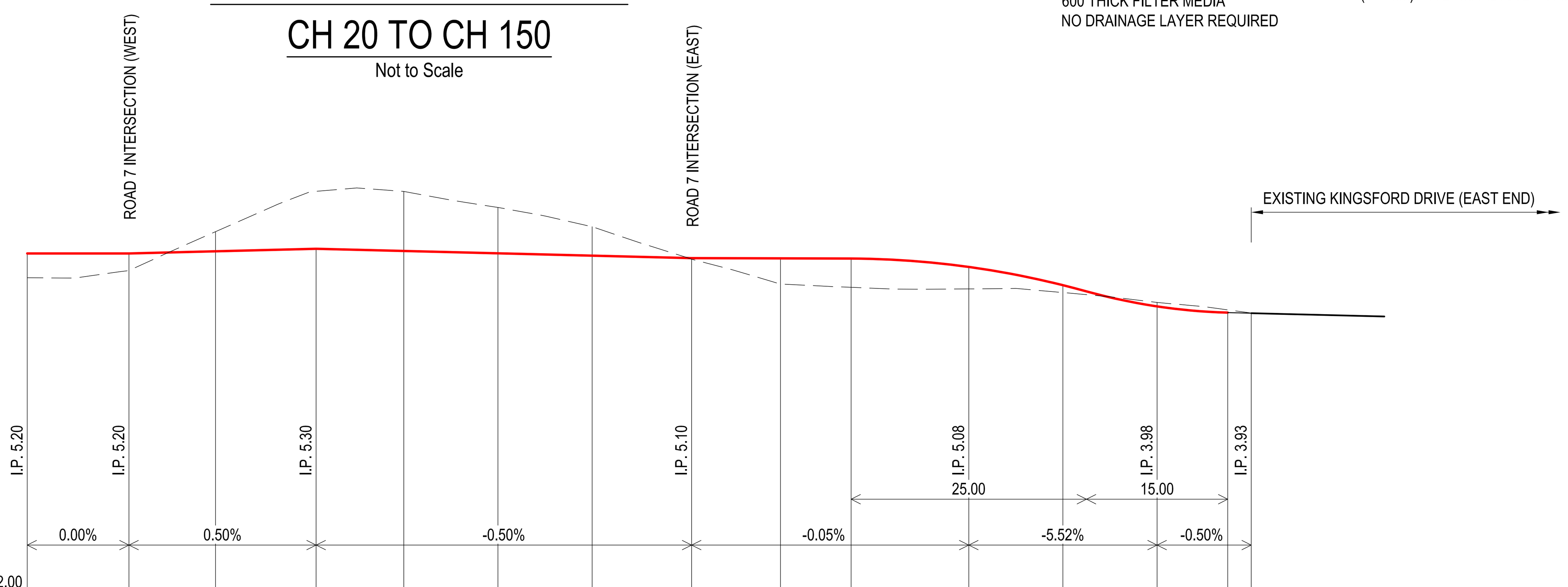
Dwg. No. **1133-DA23** Issue **B**



ROAD 6 TYPICAL SECTION
CH 20 TO CH 150
Not to Scale



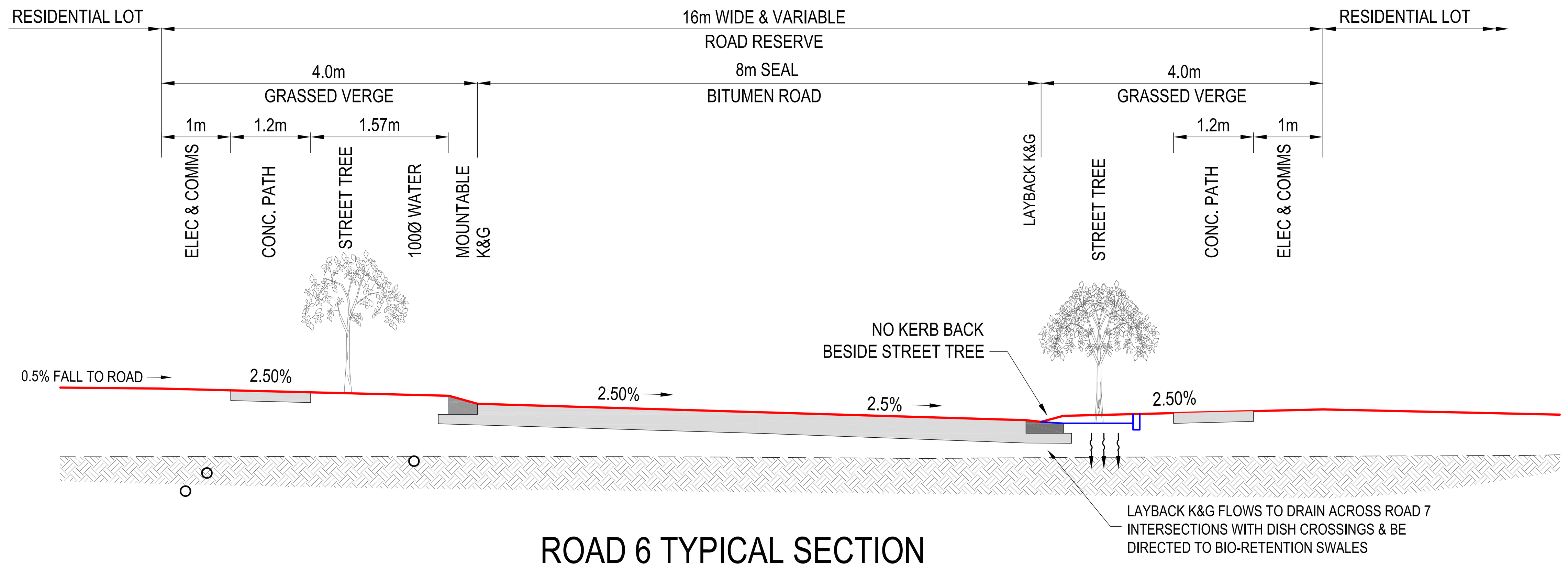
ROAD 6 TYPICAL SECTION
CH 155 TO CH 310 & CH 370 TO CH 430
Not to Scale



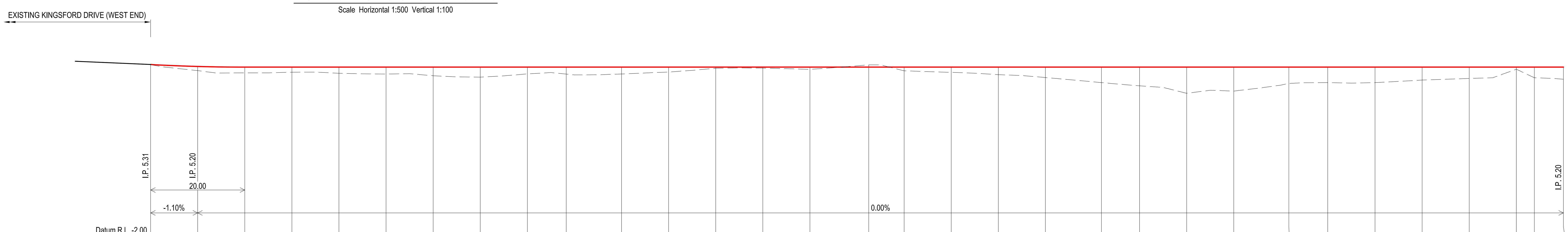
Chainage	CUT/FILL	DESIGN SURFACE	EXISTING SURFACE
300.000	+0.52	5.20	4.68
310.806	+0.36	5.20	4.84
320.000	-0.42	5.25	5.66
330.685		5.30	6.51
340.000	-1.27	5.25	6.52
350.000	-0.98	5.20	6.18
360.000	-0.62	5.15	5.77
370.565	-0.01	5.10	5.12
380.000	+0.55	5.09	4.55
387.500	+0.59	5.09	4.50
400.000	+0.47	4.91	4.45
410.000	+0.16	4.53	4.37
420.000	-0.08	4.07	4.16
427.500		3.94	
430.000	-0.00	3.93	3.93

Alignment Details: R=22.00 L=12.41 | R=22.00 L=15.80 | R=78.00 L=21.98 | R=78.00 L=21.98 | R=78.00 L=21.60 | B=43°06'08" D=8.69 | R=63.96 L=33.83

ROAD 6 - LONG SECTION cont'd
Scale Horizontal 1:500 Vertical 1:100



ROAD 6 TYPICAL SECTION
CH 320 TO CH 360
Not to Scale



Chainage	CUT/FILL	DESIGN SURFACE	EXISTING SURFACE
0.000	+0.01	5.31	5.30
10.000	+0.18	5.23	5.05
20.000	+0.24	5.20	4.96
30.000	+0.22	5.20	4.98
40.000	+0.26	5.20	4.94
50.000	+0.30	5.20	4.90
60.000	+0.37	5.20	4.83
70.000	+0.43	5.20	4.77
80.000	+0.29	5.20	4.91
88.256	+0.30	5.20	4.90
100.000	+0.29	5.20	4.91
110.000	+0.21	5.20	4.99
120.000	+0.05	5.20	5.15
130.000	+0.04	5.20	5.16
140.000	+0.10	5.20	5.10
152.491	-0.09	5.20	5.29
160.000	+0.16	5.20	5.04
170.000	+0.22	5.20	4.98
180.000	+0.32	5.20	4.88
190.000	+0.44	5.20	4.76
201.901	+0.66	5.20	4.54
210.000	+0.80	5.20	4.40
220.000	+1.11	5.20	4.09
230.000	+1.02	5.20	4.18
241.694	+0.69	5.20	4.51
249.950	+0.66	5.20	4.54
260.000	+0.66	5.20	4.54
270.000	+0.55	5.20	4.65
280.000	+0.48	5.20	4.72
290.000	+0.09	5.20	5.11
293.824	+0.45	5.20	4.75
300.000	+0.52	5.20	4.68

Alignment Details: B=178°15'53" D=22.61 | R=60.00 L=11.23 | B=167°32'40" D=74.42 | R=58.00 L=64.23 | B=104°05'20" D=49.41 | R=52.00 L=39.79 | B=60°14'37" D=8.26 | R=24.00 L=43.87 | B=164°59'05" D=4.57 | R=22.00 L=12.41

ROAD 6 - LONG SECTION
Scale Horizontal 1:500 Vertical 1:100

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.
ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 6 LONG SECTION & TYPICAL SECTIONS

Scale: As Shown at A1 CAD file: 1133-DA24B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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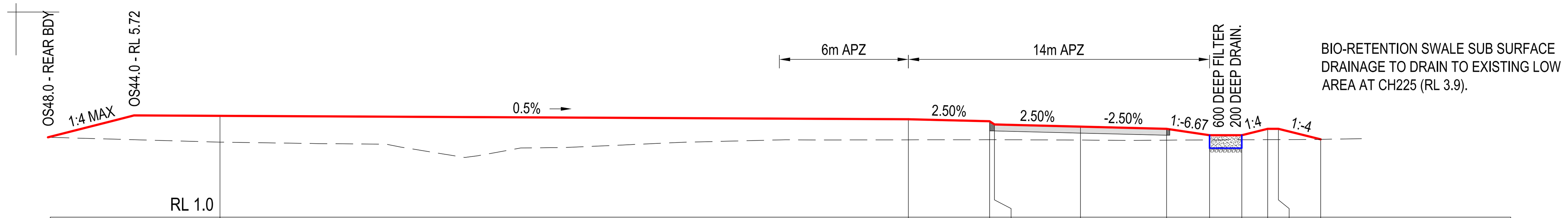
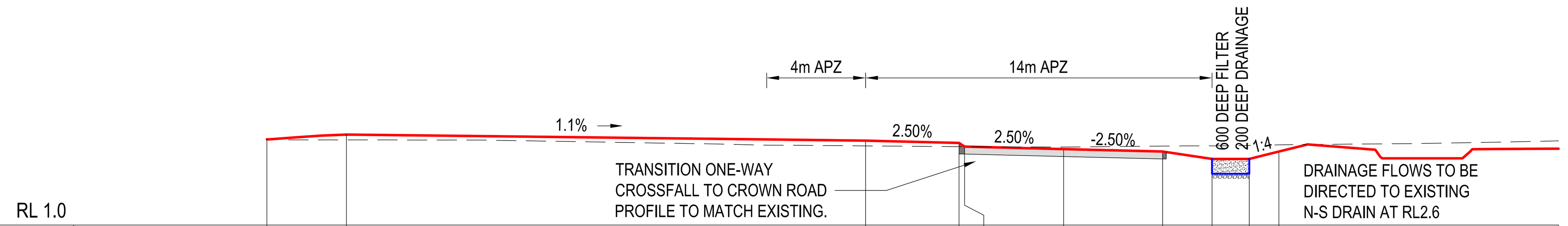
Sheet No.
24 of 29

Dwg. No. **1133-DA24** Issue **B**



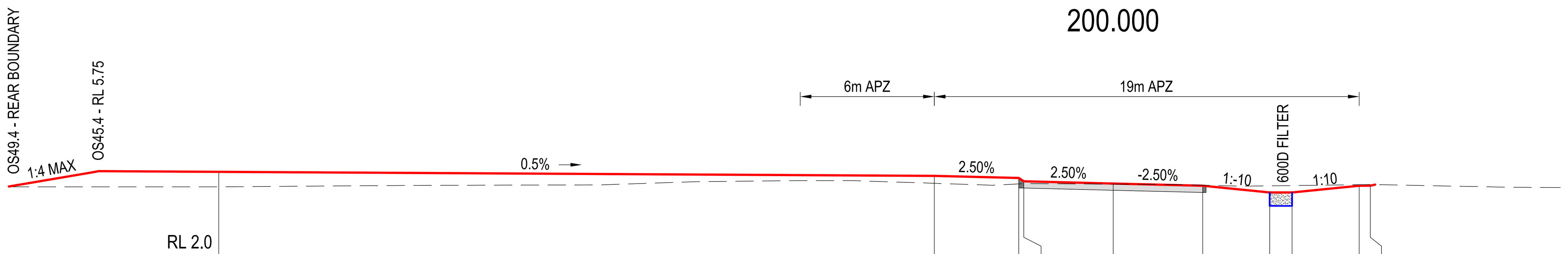
HT. DIFF	1.06	0.96	0.86	0.71	0.62	0.53	0.22	0.21	0.51	0.50	0.00	
DESIGN	5.54	5.54	5.45	5.30	5.20	5.10	4.80	4.80	5.10	5.10	4.61	
EXISTING	4.48	4.59	4.59	4.59	4.58	4.57	4.58	4.59	4.59	4.60	4.61	
OFFSETS	40.00	8.00	4.22	4.00	0.00	4.00	6.00	7.50	8.70	9.20	11.16	20.00

200.000



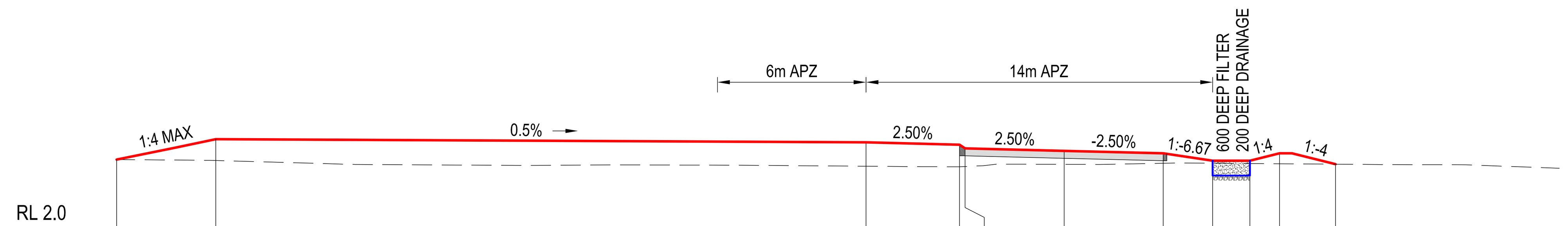
HT. DIFF		0.00	0.22	0.21	0.15	0.00	-0.08	-0.22	-0.53	-0.55	-0.27	
DESIGN		4.47	4.66	4.42	4.32	4.17	4.07	3.97	3.67	3.67	3.97	
EXISTING		4.47	4.44	4.20	4.17	4.17	4.16	4.20	4.21	4.22	4.24	4.41
OFFSETS	40.00	32.19	29.00	8.00	4.22	4.00	0.00	4.00	6.00	7.50	8.70	20.00

420.000



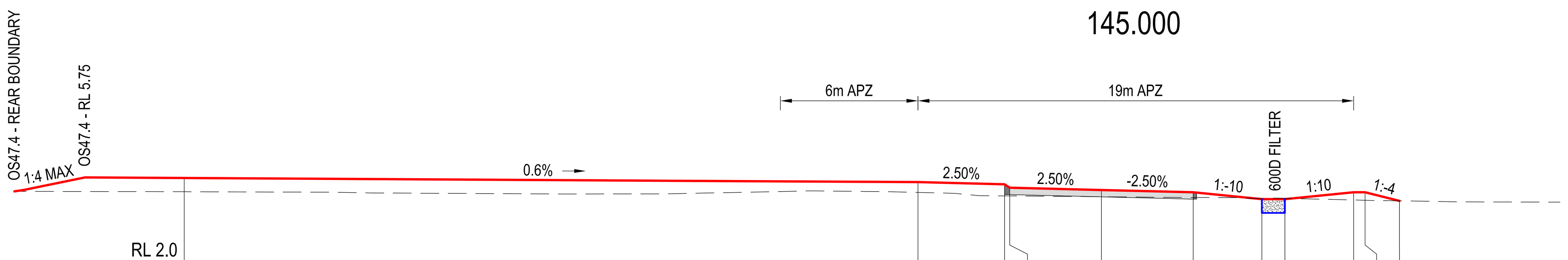
HT. DIFF	0.67	0.33	0.27	0.11	0.03	-0.03	-0.30	-0.31	-0.05	-0.06	
DESIGN	5.72	5.54	5.45	5.30	5.20	5.10	4.80	4.80	5.10	5.10	
EXISTING	5.05	5.21	5.18	5.19	5.17	5.13	5.10	5.11	5.15	5.16	5.02
OFFSETS	40.00	8.00	4.22	4.00	0.00	4.00	7.00	8.00	11.00	11.50	20.00

145.000



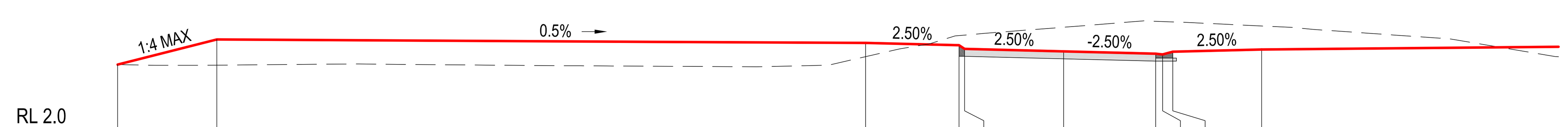
HT. DIFF	0.00	0.86	0.97	0.89	0.73	0.55	0.40	0.10	0.11	0.42	0.00	
DESIGN	4.74	5.57	5.44	5.34	5.19	5.09	4.99	4.69	4.69	4.99	4.55	
EXISTING	4.74	4.70	4.47	4.45	4.46	4.55	4.59	4.59	4.58	4.57	4.55	4.39
OFFSETS	40.00 38.30	34.20	8.00	4.22	4.00	0.00	4.00	6.00	7.50	8.70	10.96	20.00

380.000



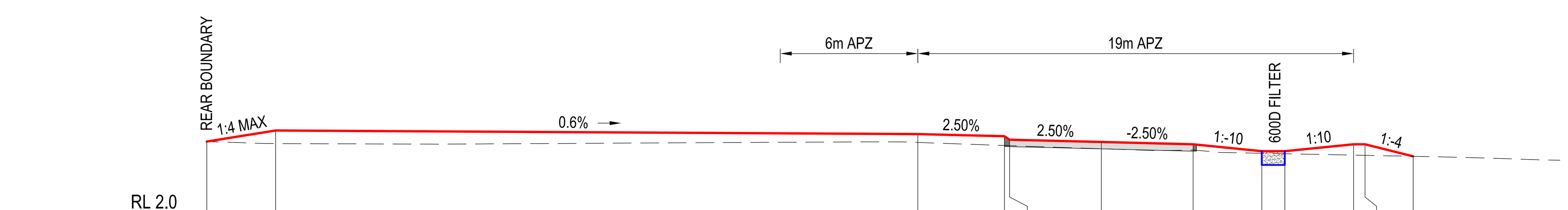
HT. DIFF	0.42	0.45	0.51	0.36	0.29	0.23	-0.02	-0.04	0.34	0.35	0.00	
DESIGN	3.72	5.54	5.45	5.30	5.20	5.10	4.80	4.80	5.10	5.10	4.73	
EXISTING	5.12	5.09	4.94	4.94	4.91	4.87	4.82	4.84	4.76	4.75	4.73	4.67
OFFSETS	40.00	8.00	4.22	4.00	0.00	4.00	7.00	8.00	11.00	11.50	13.00	20.00

100.000



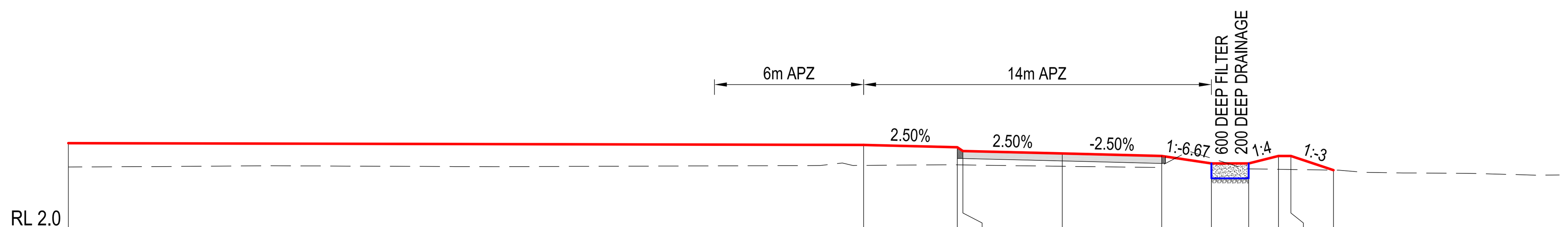
HT. DIFF	0.00	1.04	0.56	-0.39	-0.56	-0.98	-1.31	-1.33	-1.20	-0.95	
DESIGN	4.65	5.68	5.55	5.45	5.30	5.20	5.11	5.08	5.19	5.28	
EXISTING	4.65	4.64	4.99	5.84	5.86	6.18	6.42	6.41	6.39	6.23	4.98
OFFSETS	40.00 38.20	34.20	8.00	4.22	4.00	0.00	3.72	4.00	4.41	8.00	20.00

350.000



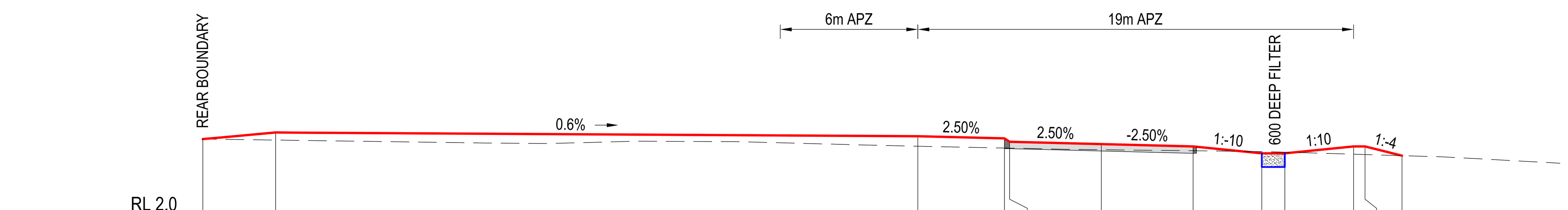
HT. DIFF	0.00	0.57	0.36	0.40	0.26	0.30	0.25	0.09	0.11	0.47	0.48	0.00	
DESIGN	5.21	5.70	5.54	5.45	5.30	5.20	5.10	4.80	4.80	5.10	5.10	4.58	
EXISTING	5.21	5.13	5.18	5.05	5.04	4.90	4.85	4.71	4.69	4.63	4.62	4.58	4.41
OFFSETS	39.00	36.00	8.00	4.22	4.00	0.00	4.00	7.00	8.00	11.00	11.50	13.60	20.00

50.000



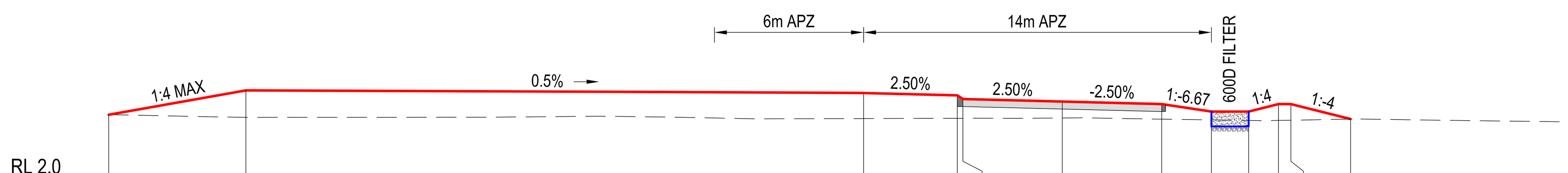
HT. DIFF	0.96	0.83	0.71	0.56	0.52	0.38	-0.21	0.22	0.54	0.55	0.00	
DESIGN	5.62	5.54	5.45	5.30	5.20	5.10	4.80	4.80	5.10	5.10	4.53	
EXISTING	4.66	4.72	4.74	4.74	4.68	4.72	5.01	4.58	4.56	4.55	4.53	4.33
OFFSETS	40.00	8.00	4.22	4.00	0.00	4.00	6.00	7.50	8.70	9.20	10.91	20.00

300.000



HT. DIFF	0.00	0.15	0.44	0.42	0.28	0.24	0.19	-0.07	-0.05	0.34	0.36	0.00	
DESIGN	5.42	5.54	5.54	5.45	5.30	5.20	5.10	4.80	4.80	5.10	5.10	4.70	
EXISTING	5.42	5.39	5.11	5.03	5.02	4.96	4.91	4.87	4.85	4.76	4.74	4.70	4.37
OFFSETS	39.10	36.00	8.00	4.22	4.00	0.00	4.00	7.00	8.00	11.00	11.50	13.11	20.00

20.000



HT. DIFF	0.00	1.08	1.03	0.92	0.77	0.66	0.61	0.34	0.36	0.66	0.65	0.00	
DESIGN	4.67	5.65	5.54	5.45	5.30	5.20	5.10	4.80	4.80	5.10	5.10	4.50	
EXISTING	4.67	4.56	4.52	4.53	4.53	4.54	4.49	4.46	4.44	4.44	4.45	4.50	4.39
OFFSETS	40.00 38.40	32.80	8.00	4.22	4.00	0.00	4.00	6.00	7.50	8.70	9.20	11.60	20.00

250.000

ROAD 6 - CROSS SECTIONS

Scale Horizontal 1:200 Vertical 1:200

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 6
CROSS SECTIONS

Scale: As Shown at A1 CAD file: 1133-DA25B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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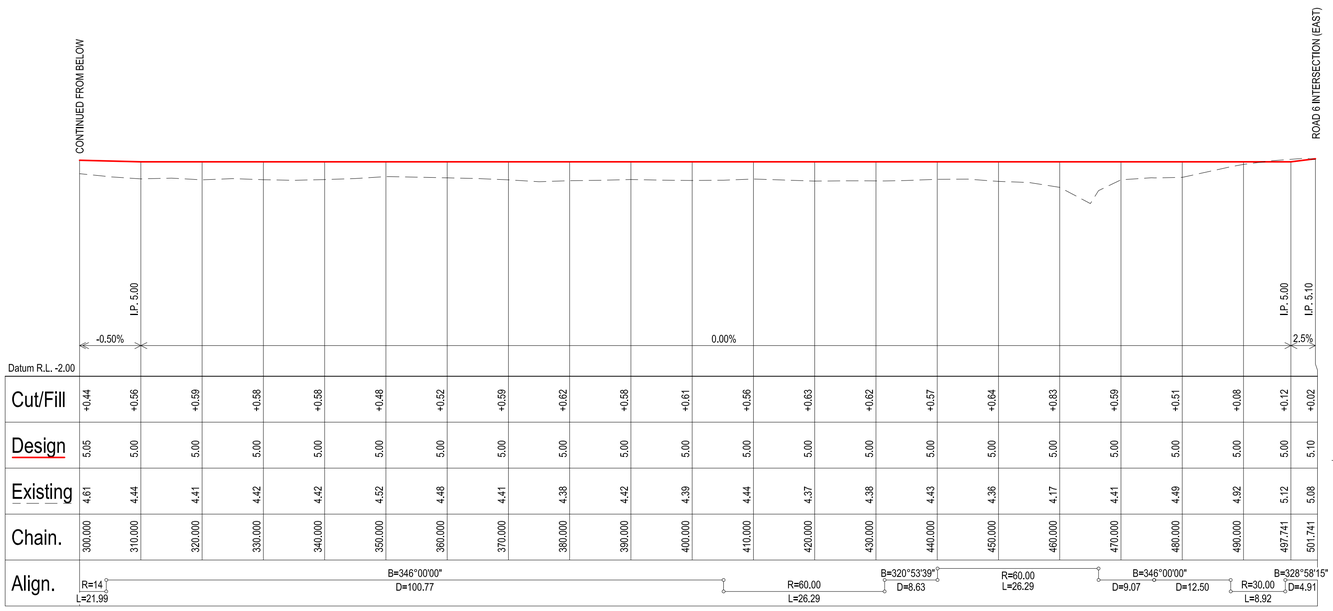
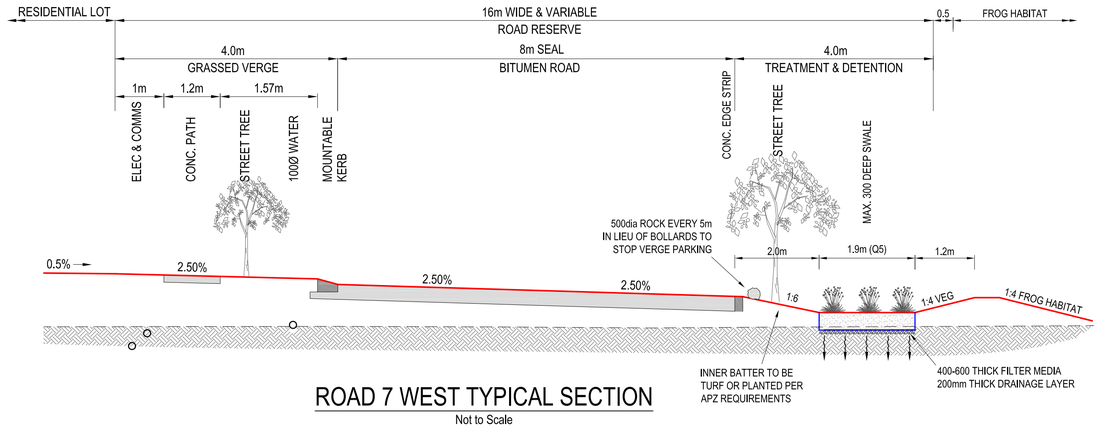
Sheet No.
25 of 29

Dwg. No. **1133-DA25** Issue **B**



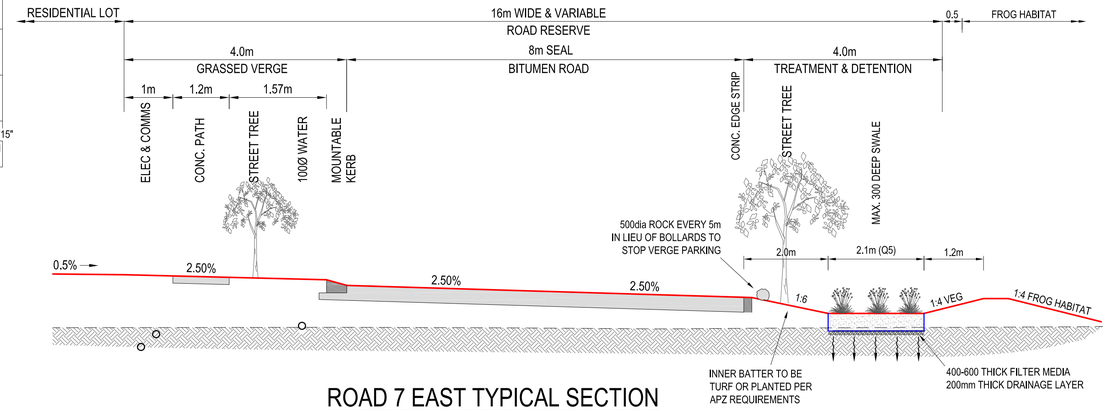
ROAD 7 - LONG SECTION cont'd

Scale Horizontal 1:500 Vertical 1:100



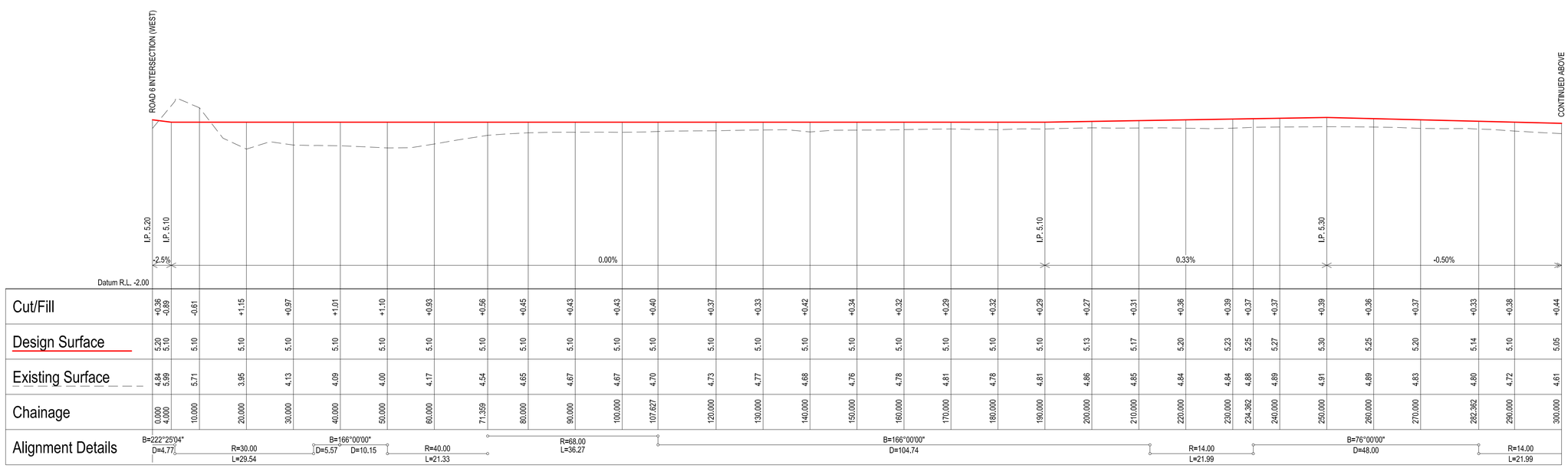
ROAD 7 WEST TYPICAL SECTION

Not to Scale



ROAD 7 EAST TYPICAL SECTION

Not to Scale



ROAD 7 - LONG SECTION

Scale Horizontal 1:500 Vertical 1:100

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.09.2021	

BAYSIDE BRUNSWICK Pty. Ltd.

ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 7 LONG SECTION & TYPICAL SECTIONS

Scale: As Shown at A1 CAD file: 1133-DA26B.dwg
Datum: AHD CivilCAD file: 1133-ENG

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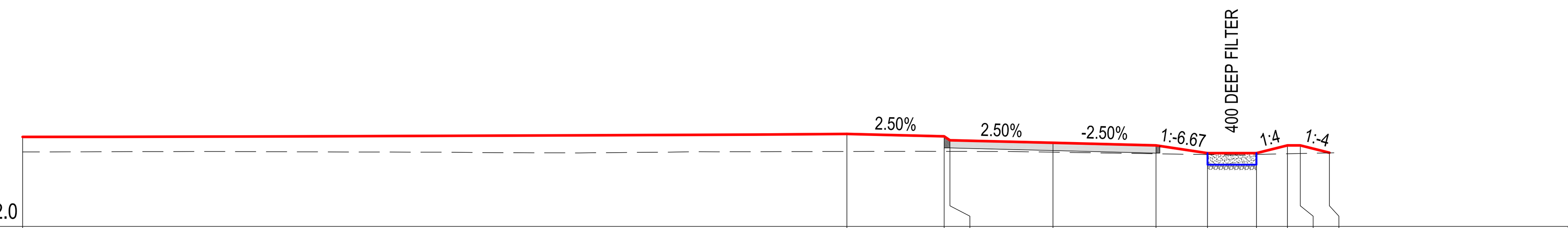
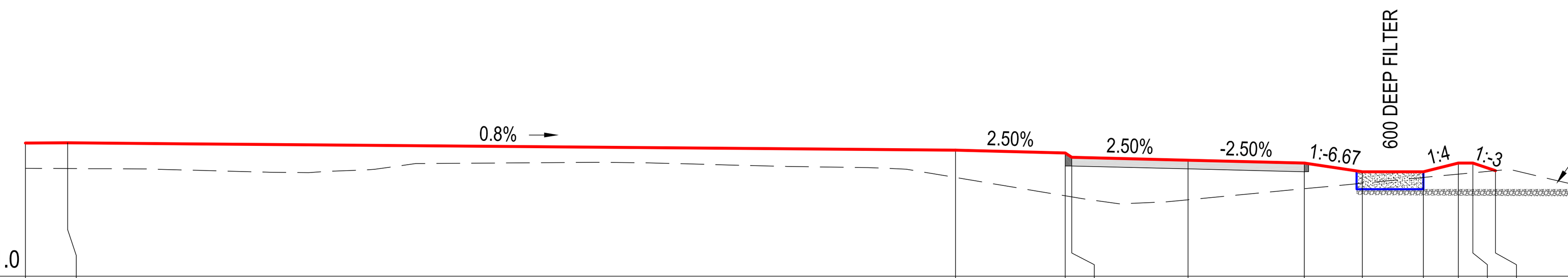
Sheet No.
26 of 29

Dwg. No. **1133-DA26** Issue **B**



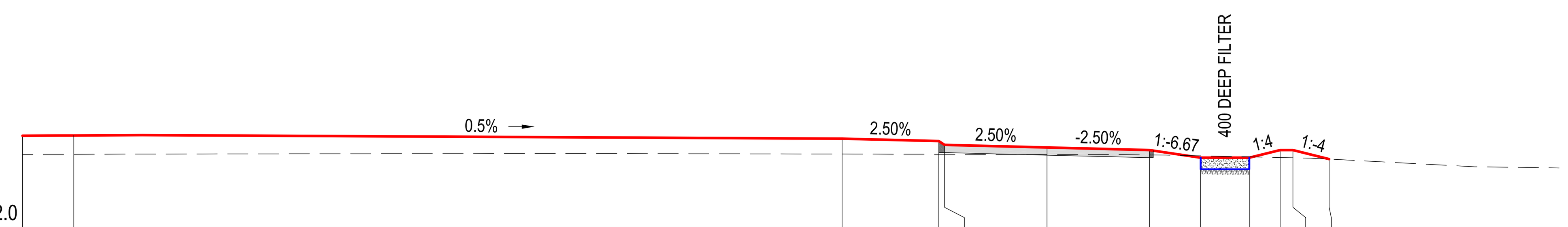
HT. DIFF	0.59	0.68	0.58	0.43	0.37	0.33	0.06	0.04	0.31	0.30	0.000004.86	
DESIGN	5.48	5.59	5.50	5.35	5.25	5.15	4.85	4.85	5.15	5.15	[illegible]	
EXISTING	4.89	4.91	4.91	4.91	4.88	4.82	4.79	4.81	4.84	4.85		
OFFSETS	40.00	8.00	4.22	4.00	0.00	4.00	6.00	7.90	9.10	9.60	10.73	20.00

235.000



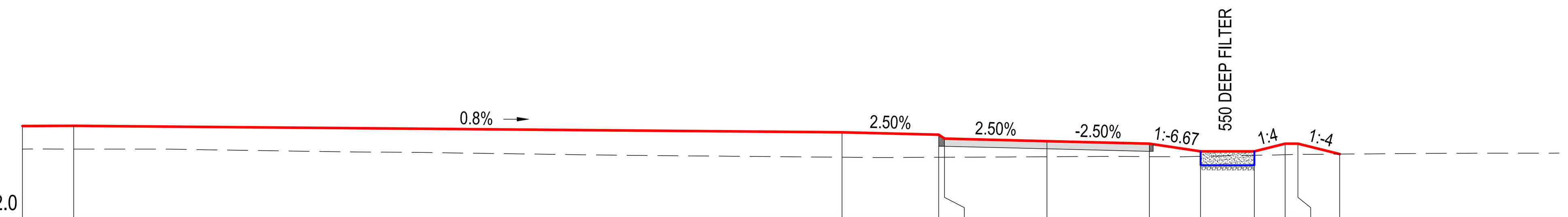
HT. DIFF	0.87	0.88	0.94	1.48	1.37	1.36	0.88	0.39	0.19	0.38	0.33	-0.00	
DESIGN	5.59	5.60	5.34	5.25	5.10	5.00	4.90	4.60	4.60	4.90	4.90	4.64	
EXISTING	4.71	4.71	4.40	3.77	3.73	3.64	4.02	4.21	4.41	4.52	4.57	4.64	4.34
OFFSETS	40.00	38.50	8.00	4.22	4.00	0.00	4.00	6.00	8.10	9.30	9.80	10.58	20.00

465.000



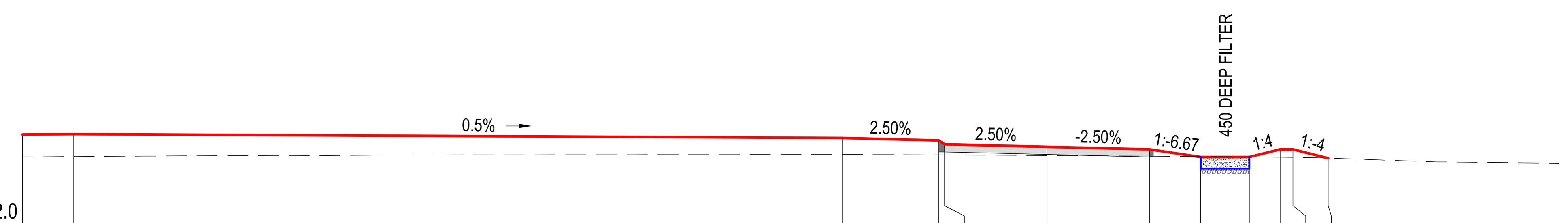
HT. DIFF	0.73	0.73	0.60	0.52	0.37	0.27	0.19	-0.07	-0.03	0.29	0.30	0.00	
DESIGN	5.59	5.60	5.48	5.38	5.23	5.13	5.03	4.73	4.73	5.03	5.03	4.68	
EXISTING	4.86	4.87	4.88	4.87	4.87	4.86	4.84	4.81	4.77	4.74	4.73	4.68	4.33
OFFSETS	40.00	38.00	8.00	4.22	4.00	0.00	4.00	6.00	7.90	9.10	9.60	11.02	20.00

200.000



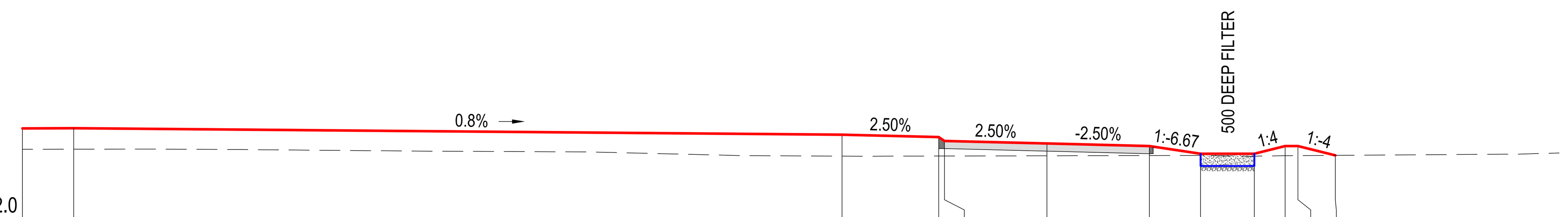
HT. DIFF	0.90	0.89	0.97	0.88	0.73	0.61	0.51	0.20	0.15	0.43	0.42	0.00	
DESIGN	5.59	5.60	5.34	5.25	5.10	5.00	4.90	4.60	4.60	4.90	4.90	4.49	
EXISTING	4.69	4.69	4.37	4.37	4.37	4.39	4.39	4.40	4.45	4.47	4.48	4.49	4.53
OFFSETS	40.00	38.00	8.00	4.22	4.00	0.00	4.00	6.00	8.10	9.30	9.80	11.43	20.00

400.000



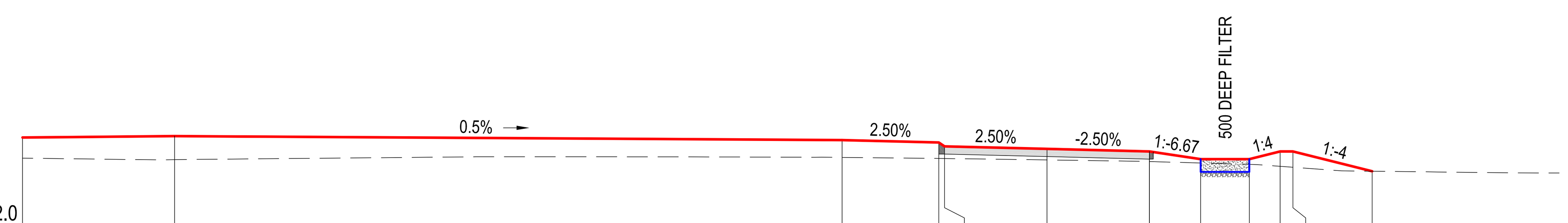
HT. DIFF	0.88	0.88	0.64	0.57	0.42	0.34	0.27	-0.02	-0.00	0.31	0.31	0.00	
DESIGN	3.58	3.60	5.44	5.35	5.20	5.10	5.00	4.70	4.70	5.00	5.00	4.66	
EXISTING	4.70	4.72	4.80	4.78	4.78	4.76	4.73	4.72	4.70	4.69	4.69	4.66	4.46
OFFSETS	40.00	38.00	8.00	4.22	4.00	0.00	4.00	6.00	7.90	9.10	9.60	10.98	20.00

150.000



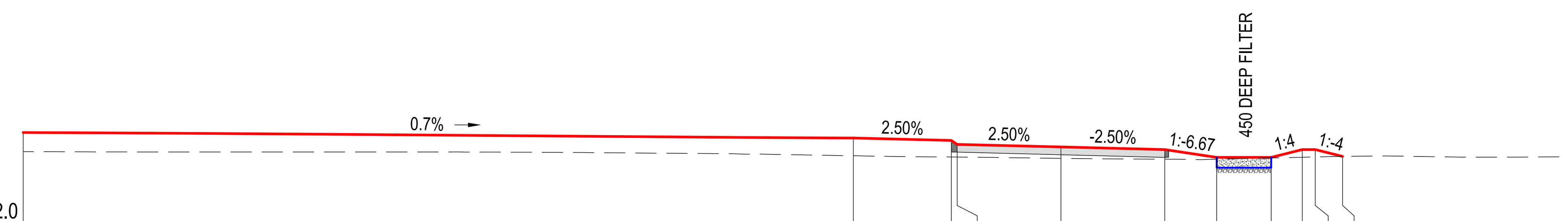
HT. DIFF	0.81	0.82	0.84	0.74	0.59	0.48	0.37	0.07	0.10	0.38	0.38	0.00	
DESIGN	5.59	5.60	5.34	5.25	5.10	5.00	4.90	4.60	4.60	4.90	4.90	4.54	
EXISTING	4.77	4.78	4.50	4.51	4.51	4.52	4.53	4.53	4.50	4.52	4.52	4.54	4.63
OFFSETS	40.00	38.00	8.00	4.22	4.00	0.00	4.00	6.00	8.10	9.30	9.80	11.26	20.00

350.000



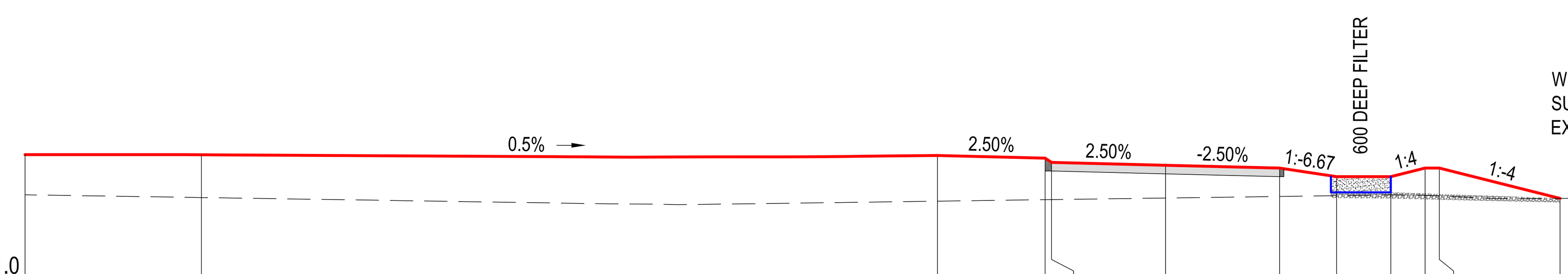
HT. DIFF	0.81	0.92	0.68	0.62	0.48	0.43	0.39	0.15	0.21	0.58	0.62	0.00	
DESIGN	5.55	5.60	5.44	5.35	5.20	5.10	5.00	4.70	4.70	5.00	5.00	4.23	
EXISTING	4.74	4.68	4.77	4.73	4.72	4.67	4.61	4.55	4.49	4.42	4.38	4.23	4.16
OFFSETS	40.00	34.10	8.00	4.22	4.00	0.00	4.00	6.00	7.90	9.10	9.60	12.69	20.00

85.000



0.73	0.68	0.64	0.49	0.44	0.37	0.07	0.02	0.30	0.29	0.00	
5.60	5.39	5.30	5.15	5.05	4.95	4.65	4.65	4.95	4.95	4.69	
4.87	4.71	4.66	4.66	4.61	4.58	4.58	4.63	4.65	4.66	4.69	4.68
40.00	8.00	4.22	4.00	0.00	4.00	6.00	8.10	9.30	9.80	10.85	20.00

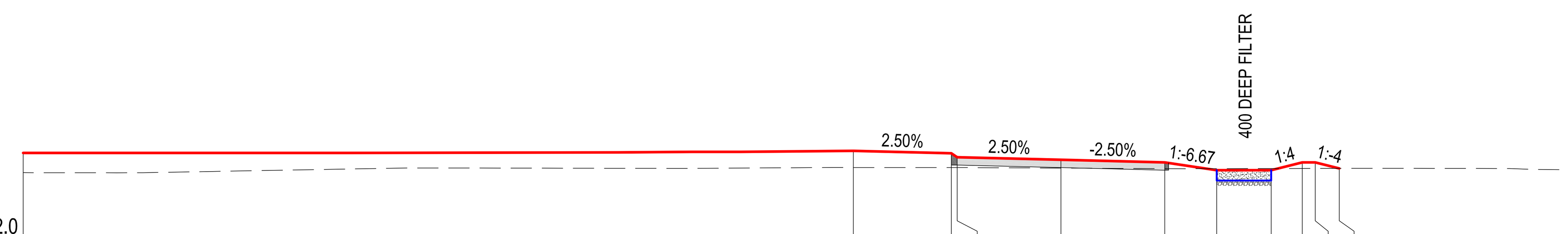
300.000



WESTERN BIO-RETENTION SWALE SUB
SURFACE DRAINAGE TO DRAIN TO
EXISTING LOW AREA AT CH20 (RL 3.5).

HT. DIFF	1.40	1.50	1.60	1.46	1.30	1.15	0.99	0.66	0.64	0.95	0.98	0.00	
DESIGN	5.46	5.47	5.44	5.35	5.20	5.10	5.00	4.70	4.70	5.00	5.00	3.94	
EXISTING	4.06	3.97	3.84	3.89	3.90	3.95	4.01	4.04	4.06	4.05	4.02	3.94	3.99
OFFSETS	40.00	33.80	8.00	4.22	4.00	0.00	4.00	6.00	7.90	9.10	9.60	13.84	20.00

20.000



0.76	0.64	0.55	0.40	0.32	0.24	-0.06	-0.06	0.24	0.23	0.00	
5.42	5.49	5.40	5.25	5.15	5.05	4.75	4.75	5.05	5.05	4.82	
4.65	4.85	4.85	4.85	4.83	4.81	4.81	4.81	4.81	4.82	4.82	4.76
40.00	8.00	4.22	4.00	0.00	4.00	6.00	8.10	9.30	9.80	10.72	20.00

280.000

ROAD 7 - CROSS SECTIONS

Scale Horizontal 1:200 Vertical 1:200

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.09.2021	

BAYSIDE BRUNSWICK Pty. Ltd.
ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

ROAD 7
CROSS SECTIONS

Scale: As Shown at A1 — CAD file: 1133-DA27B.dwg
Datum: AHD — CivilCAD file: -

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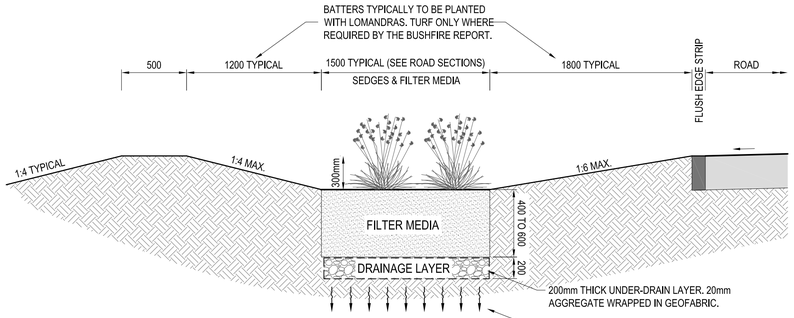
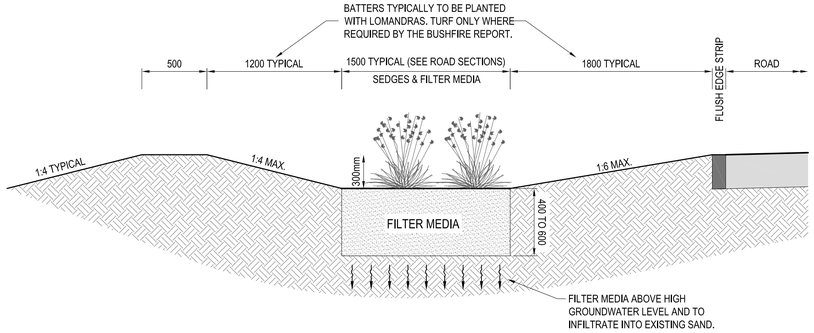
Sheet No. 27 of 29

Dwg. No. 1133-DA27 — Issue B



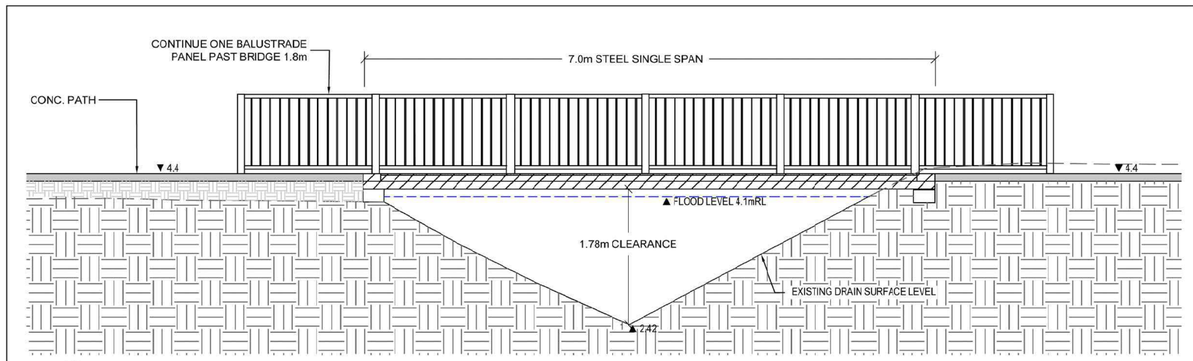
BIO-RETENTION SWALE WITH UNDER-DRAIN

Not to Scale

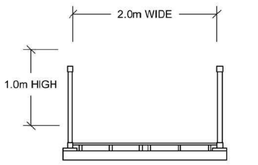


BIO-RETENTION SWALE WITH NO UNDER-DRAIN

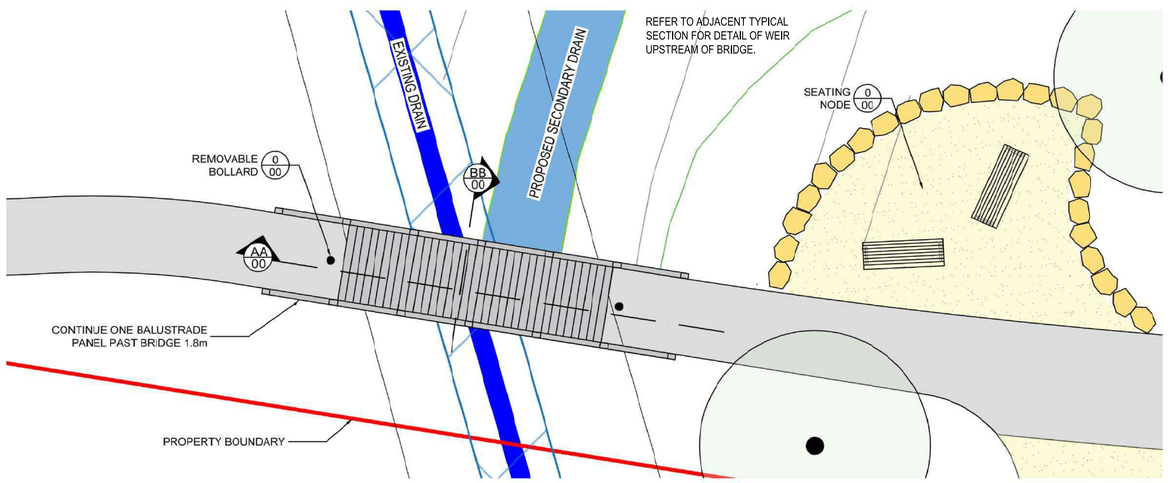
Not to Scale



AA 12 **PEDESTRIAN BRIDGE - ELEVATION**
SCALE 1:50



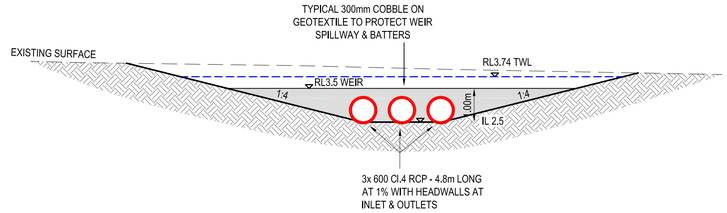
BB 10 **PEDESTRIAN BRIDGE - CROSS SECTION**
SCALE 1:50



1 12 **PEDESTRIAN BRIDGE - ELEVATION**
SCALE 1:100

CONDAMINE BRIDGE - PRECEDENT IMAGE

BRIDGE SPECIFICATION
- CONDAMINE BY LANDMARK PRODUCTS PTY LTD
- 2M WIDE 7M LONG
- LOADING 3kPa (PEDESTRIAN USE ONLY)
- FLAT SINGLE SPAN
- POWDERCOATED DULUX 'SATIN BLACK'
- COMPOSITE TIMBER DECKING



N-S DRAIN OSD WEIR SECTION

Not to Scale

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CLIENT: CLARENCE PROPERTY

DRAWING: PEDESTRIAN BRIDGE SOUTHERN DRAIN CROSSING
PROJECT: BAYSIDE BRUNSWICK
LOT 12 DP 1251383, BAYSIDE WAY BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	FOR DISCUSSION	14.05.21
	WORKING FILE	

DO NOT SCALE FROM PLANS, TO BE ADAPTED ON SITE BY CONTRACTOR & CONFIRMED BY THE PROJECT SUPERVISOR, SIZING, CALCULATIONS, STRUCTURES, & COMPACTION TO BE CONFIRMED BY ENGINEER OR SUITABLY QUALIFIED PERSONS. ENGINEERS CERTIFICATE BY OTHERS.

SCALE | REV. A
DESIGNED DM/SS
DRAWN SS
CHECKED DM
CAD FILE No. 1-211400_BAYSIDE_LD.DWG
DWG No. 1-211400_BAYSIDE_LD_11

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	23.08.2021	

BAYSIDE BRUNSWICK Pty. Ltd.
ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

TYPICAL SECTIONS & ENGINEERING DETAILS 1

Scale: As Shown at A1 CAD file: 1133-DA28B.dwg
Datum: AHD CivilCAD file: -

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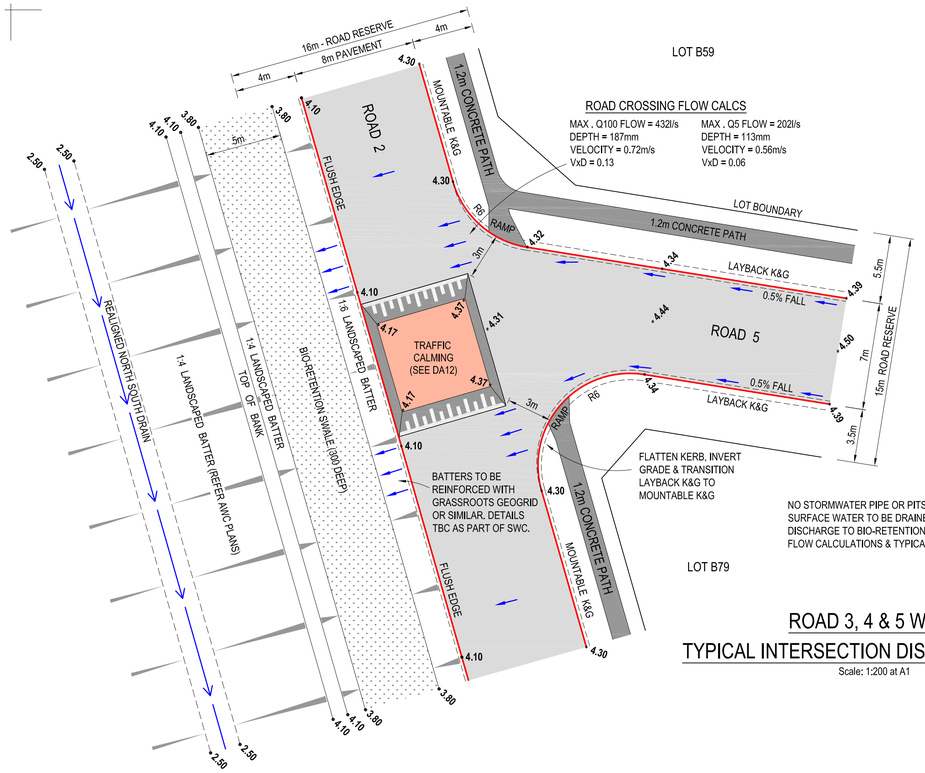
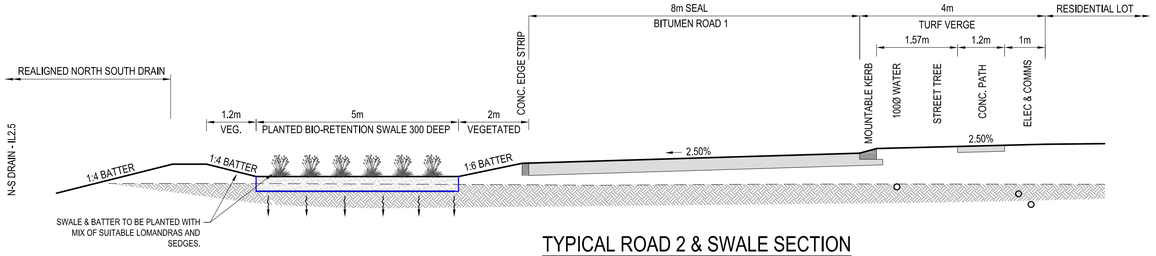
Sheet No.
28 of 29

Dwg. No. **1133-DA28** Issue **B**



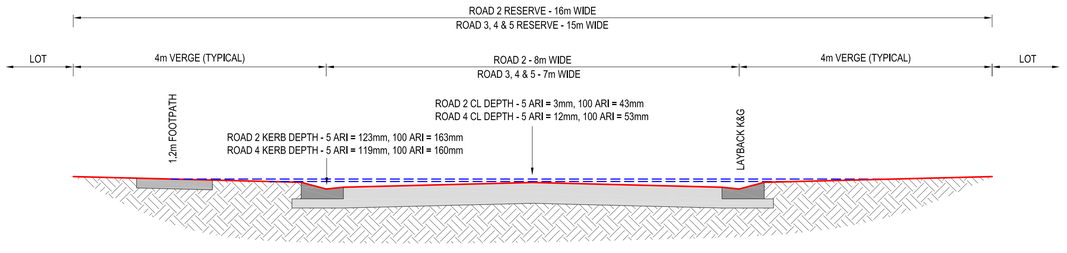
ROAD 3, 4 & 5 WEST
TYPICAL INTERSECTION DISCHARGE DETAIL

Scale: 1:200 at A1



TYPICAL ROAD 2 & SWALE SECTION

Not to Scale



5 & 100 YEAR KERB FLOW SECTION
ROAD 2, 3, 4 & 5

Not to Scale

Q5 Catchment Hydrology

Max Catchment Area (sq.m)	Q5 T/c (mins)	C5
6900	14	0.76

Q100 Catchment Hydrology

Max Catchment Area (sq.m)	Q100 T/c (mins)	C100
6900	11	0.96

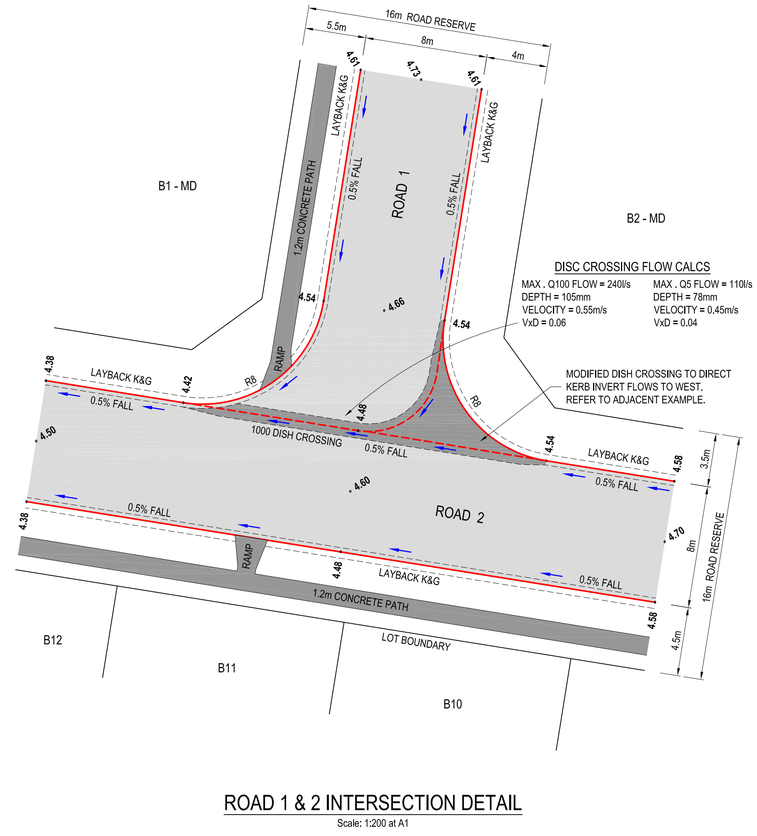
Kerb Flows (half of road catchment)

ARI	C	Rainfall Intensity (mm/hr)	Flow (l/s)
5	0.76	139	202
100	0.96	235	432

Kerb Hydraulics

ARI	Kerb Flows (l/s)	Profile Slopes	Min. Longitudinal Grade (%)	Bitumen Mannings Roughness (n) NRLG DS.13 - 10.2	Flow Depth (mm)	Flow Velocity (m/s)	Vxd
5	202	25% Kerb & 2.5% Road	0.5	0.018	123	0.60	0.08
100	432	25% Kerb & 2.5% Road	0.5	0.018	163	0.74	0.12

ROAD 1 & 2 INTERSECTION EXAMPLE



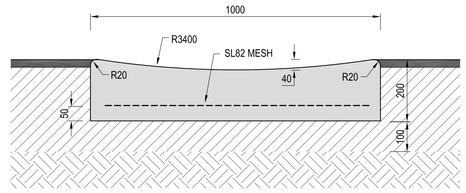
DISC CROSSING FLOW CALCS

MAX . Q100 FLOW = 240l/s
DEPTH = 105mm
VELOCITY = 0.55m/s
VxD = 0.06

MAX . Q5 FLOW = 110l/s
DEPTH = 78mm
VELOCITY = 0.45m/s
VxD = 0.04

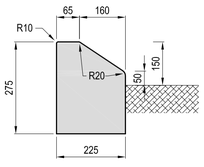
ROAD 1 & 2 INTERSECTION DETAIL

Scale: 1:200 at A1

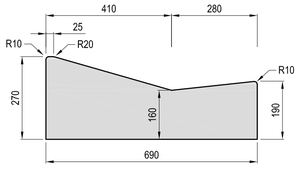


DISH CROSSING DETAIL - ROAD 6 & 7 INTERSECTIONS

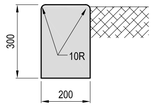
Not to Scale



MOUNTABLE MEDIAN KERB



LAYBACK KERB AND GUTTER



FLUSH EDGE KERB

Iss	Description	Des	Drw	Date	Appd
B	FOR RE-SUBMISSION	WF	WF	01.08.2022	
A	FOR SUBMISSION	WF	WF	01.08.2021	

DRAWING STATUS: Unless there is an approved signature in the space provided, this plan is not verified.
CAUTION: The information shown on this plan may be insufficient for some types of detailed design. CivilTech Consulting Engineers should be consulted as to the suitability of the information shown herein prior to the commencement of any works based on this plan.

BAYSIDE BRUNSWICK Pty. Ltd.
ENGINEERING PLANS FOR D.A.
130 LOT SUBDIVISION OF LOT 13 DP 1251383
15 TORAKINA ROAD, BRUNSWICK HEADS

TYPICAL SECTIONS & ENGINEERING DETAILS 2

Scale: As Shown at A1 CAD file: 1133-DA29B.dwg
Datum: AHD CivilCAD file: -

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Sheet No.
29 of 29

Dwg. No. **1133-DA29** Issue **B**

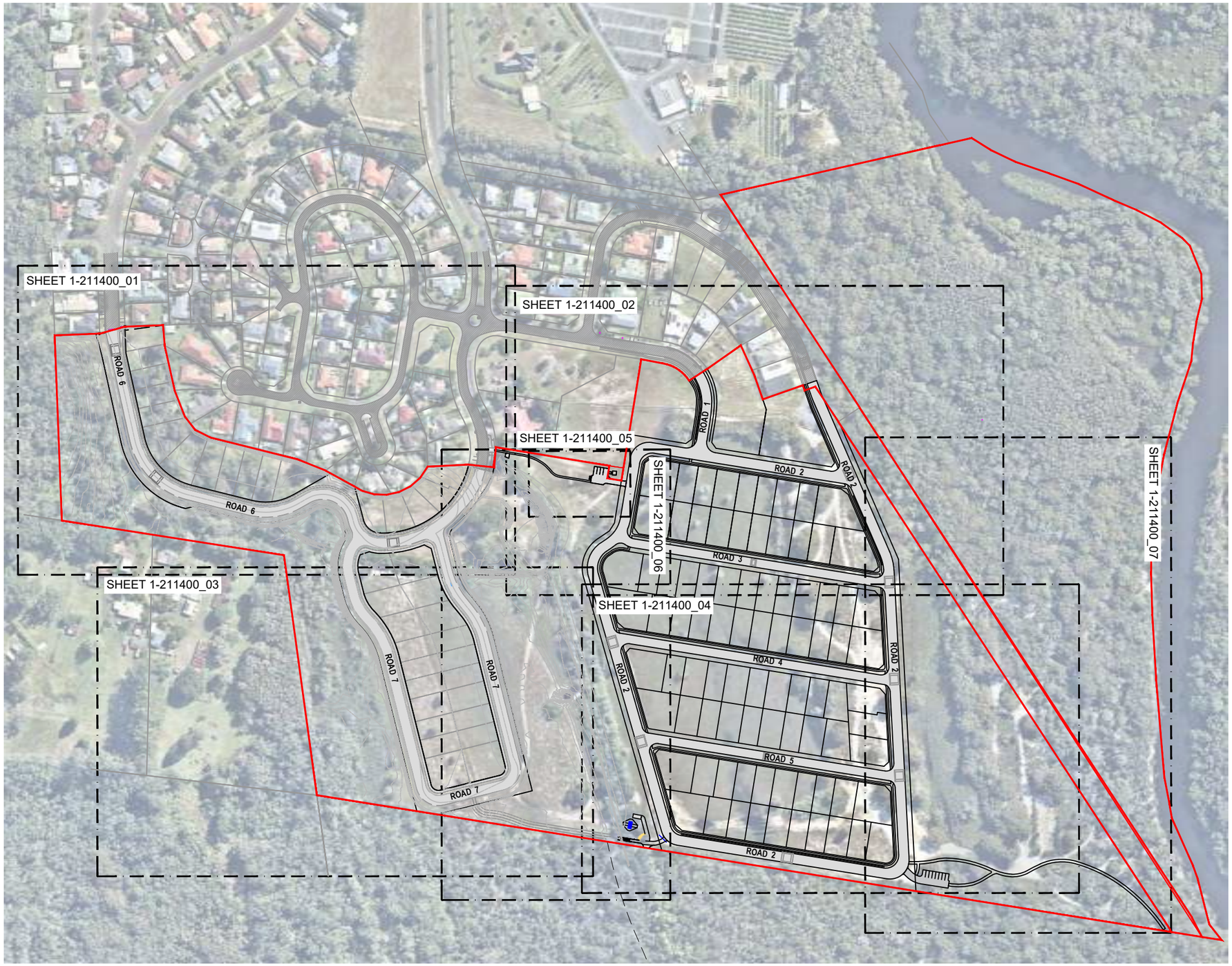
Appendix B: Landscape Plan

BAYSIDE BRUNSWICK

LANDSCAPE DOCUMENTATION
AND HABITAT CREATION
FOR DEVELOPMENT APPLICATION

REV C.2 - FOR APPROVAL

DRAWING LIST



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CLIENT: CLARENCE PROPERTY

DRAWING: **LOCALITY PLAN AND DRAWING INDEX**

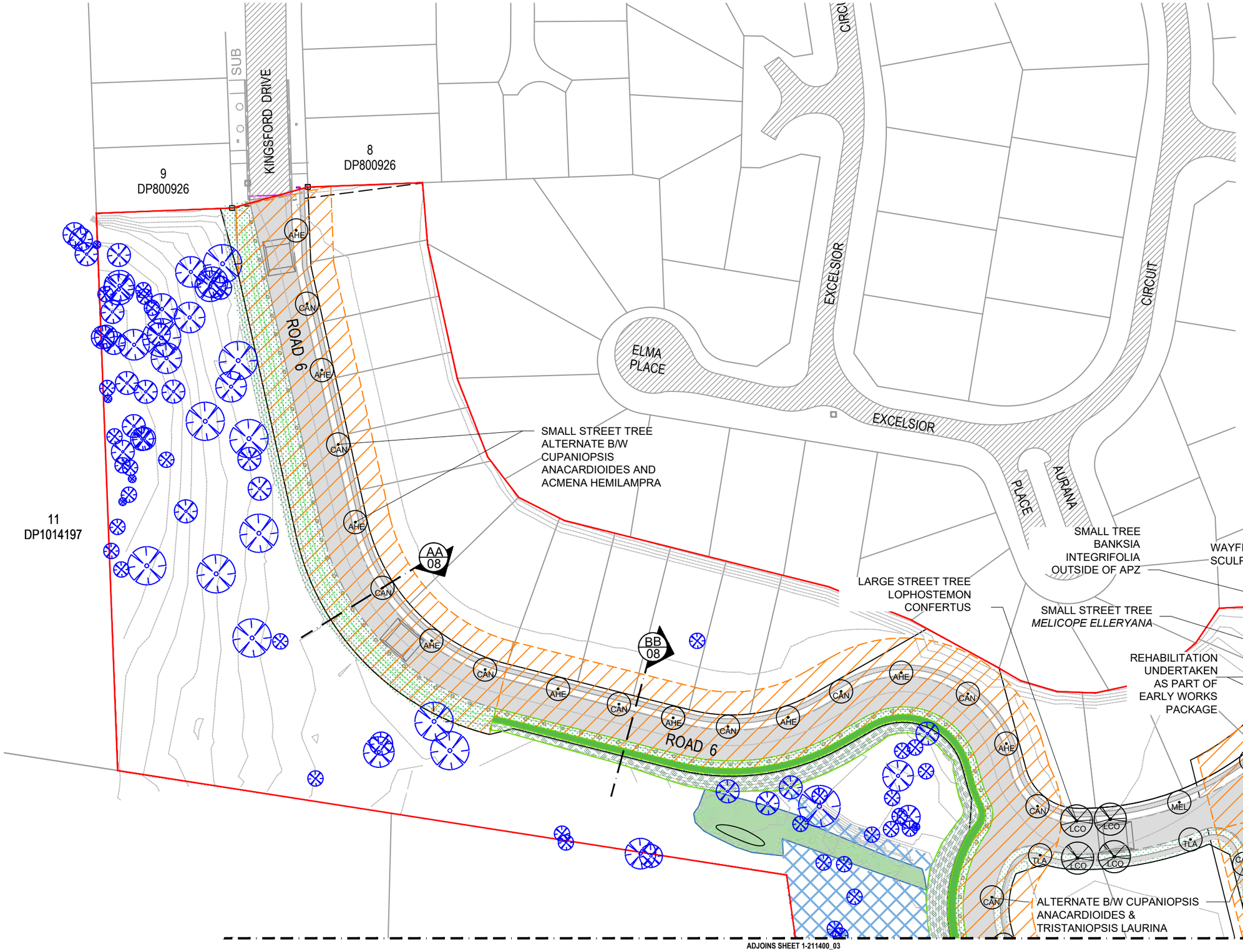
PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR
BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE 0 50 100m

REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_00**



LEGEND

- APZ - ASSET PROTECTION ZONE
- DEVELOPMENT BOUNDARY
- 1.2m WIDE CONC. FOOTPATH
- VEHICLE RESTRICTION BOULDER
- LARGE STREET TREE — PLANT 15m SPACING
- LARGE STREET TREE — PLANT AS SHOWN ON PLAN OR 10m SPACING
- EXISTING TREE — TO BE RETAINED AND PROTECTED
- EUCALYPTUS ROBUSTA — KOALA FEED TREE - 10m SPACINGS
- ALLOCASUARINA LITTORALIS — COCKATOO FEED TREE - 5m SPACINGS
- EXISTING WF HABITAT
- OFFSET WF HABITAT AREA
- CONSTRUCTED WF BREEDING POND
- BIORETENTION SWALE - NOT MOWN
- BIORETENTION TURF MOWN — MAINTAINED AS PER ROAD RESERVE
- TURF - MOWN — MAINTAINED AS PER ROAD RESERVE
- SWALE BATTER PLANTING - NOT MOWN
- WALLUM SAND HEATH PLANTING
- FIRE RETARDANT LOW PLANTING

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CLIENT: CLARENCE PROPERTY

DRAWING: **NORTH WEST LANDSCAPE PLAN**

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR
BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE 1:1000 @ A3 (0, 10, 20, 30, 40m)
REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
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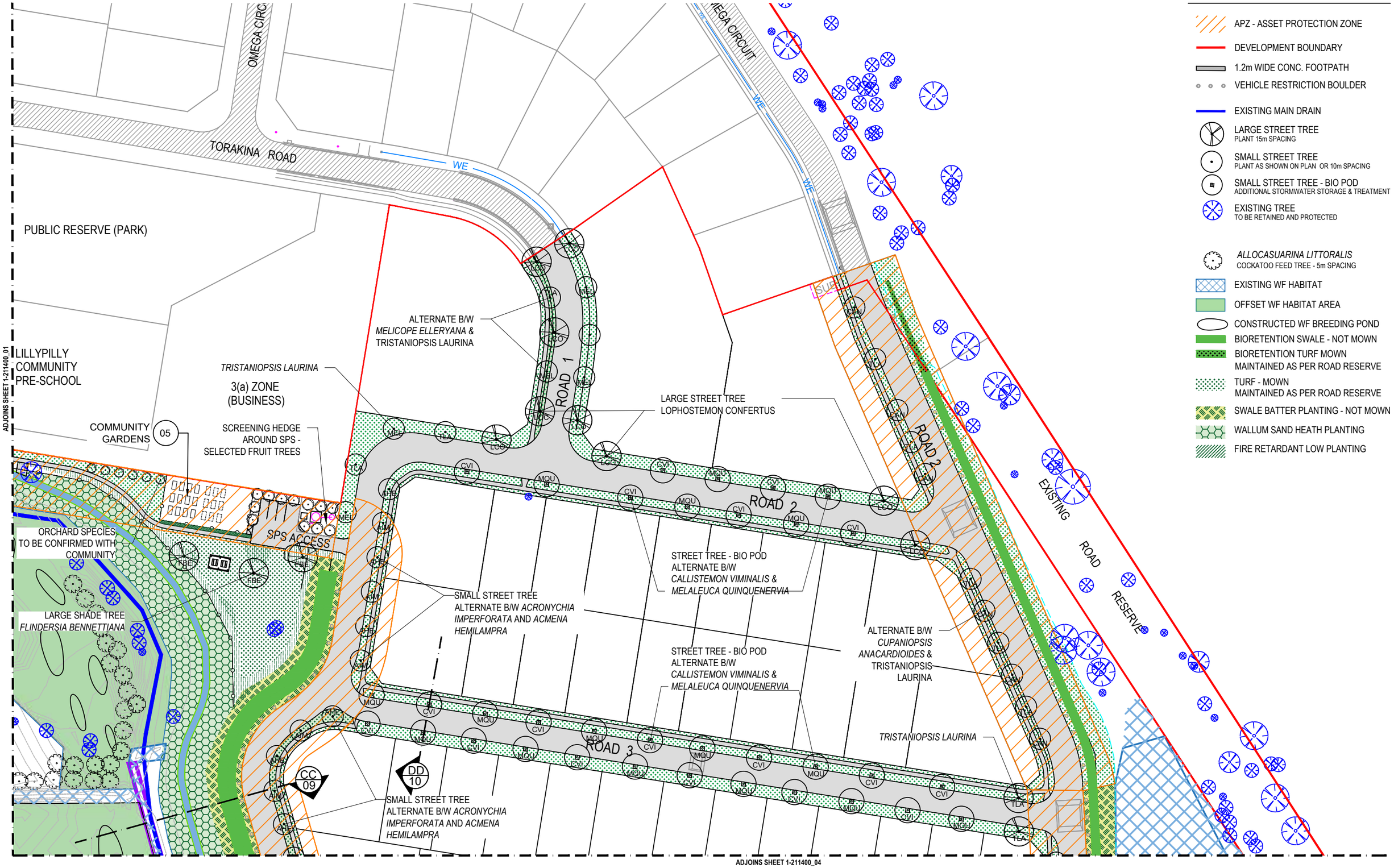
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_01**



LEGEND

- APZ - ASSET PROTECTION ZONE
- DEVELOPMENT BOUNDARY
- 1.2m WIDE CONC. FOOTPATH
- VEHICLE RESTRICTION BOULDER
- EXISTING MAIN DRAIN
- LARGE STREET TREE — PLANT 15m SPACING
- SMALL STREET TREE — PLANT AS SHOWN ON PLAN OR 10m SPACING
- SMALL STREET TREE - BIO POD — ADDITIONAL STORMWATER STORAGE & TREATMENT
- EXISTING TREE — TO BE RETAINED AND PROTECTED
- *ALLOCASUARINA LITTORALIS* — COCKATOO FEED TREE - 5m SPACING
- EXISTING WF HABITAT
- OFFSET WF HABITAT AREA
- CONSTRUCTED WF BREEDING POND
- BIORETENTION SWALE - NOT MOWN
- BIORETENTION TURF MOWN MAINTAINED AS PER ROAD RESERVE
- TURF - MOWN MAINTAINED AS PER ROAD RESERVE
- SWALE BATTER PLANTING - NOT MOWN
- WALLUM SAND HEATH PLANTING
- FIRE RETARDANT LOW PLANTING

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CLIENT: CLARENCE PROPERTY

DRAWING: **NORTH EAST LANDSCAPE PLAN**

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE 1:1000 @ A3 (0, 10, 20, 30, 40m)
REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_02**

ADJOINS SHEET 1-211400_01

ADJOINS SHEET 1-211400_04

ALTERNATE B/W
CUPANIOPSIS ANACARDIOIDES &
TRISTANIOPSIS LAURINA

REHABILITATION UNDERTAKEN AS PART OF EARLY WORKS PACKAGE

ROAD 7

EE 11

ELAEOCARPUS OBVATUS

INTERPRETIVE SIGNAGE 02 17

FF 11

WAYFINDER SCULPTURE 02 16

2.0m WIDE COMPACTED DECO GRANITIC SAND PATH

2m WIDE HEIGHT RESTRICTED WALLUM SAND HEATH PLANTING ALONG PATHS EDGE

LEGEND

- APZ - ASSET PROTECTION ZONE
- DEVELOPMENT BOUNDARY
- 1.2m WIDE CONC. FOOTPATH
- VEHICLE RESTRICTION BOULDER
- LARGE STREET TREE — PLANT 15m SPACING
- SMALL STREET TREE — PLANT AS SHOWN ON PLAN OR 10m SPACING
- EXISTING TREE — TO BE RETAINED AND PROTECTED
- EUCALYPTUS ROBUSTA — KOALA FEED TREE - 10m SPACINGS
- ALLOCASUARINA LITTORALIS — COCKATOO FEED TREE - 5m SPACINGS
- EXISTING MAIN DRAIN
- EXISTING WF HABITAT
- OFFSET WF HABITAT AREA
- CONSTRUCTED WF BREEDING POND
- BIORETENTION SWALE - NOT MOWN
- TURF - MOWN MAINTAINED AS PER ROAD RESERVE
- SWALE BATTER PLANTING - NOT MOWN
- WALLUM SAND HEATH PLANTING
- FIRE RETARDANT LOW PLANTING

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CLIENT: CLARENCE PROPERTY

DRAWING: **SOUTH WEST LANDSCAPE PLAN**

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE 1:1000 @ A3 (0, 10, 20, 30, 40m)

REV. **C.2**

DESIGNED DM/SS
DRAWN SS
CHECKED DM

CAD FILE No. **1-211400_BAYSIDE_LD.DWG**

DWG No. **1-211400_BAYSIDE_LD_03**

ADJOINS SHEET 1-211400_02

ADJOINS SHEET 1-211400_03

ROAD 2

ROAD 4

ROAD 5

ROAD 2

ROAD 2

STREET TREE - BIO POD
ALTERNATE B/W
CALLISTEMON VIMINALIS &
MELALEUCA QUINQUENERVIA

LARGE TREE
LOPHOSTEMON CONFERTUS

SMALL STREET TREE
ALTERNATE B/W *ACRONYCHIA*
IMPERFORATA AND *ACMENA*
HEMILAMPRA

STREET TREE - BIO POD
ALTERNATE B/W
CALLISTEMON VIMINALIS &
MELALEUCA QUINQUENERVIA

SMALL STREET TREE ALTERNATE B/W
CUPANIOPSIS ANACARDIOIDES &
TRISTANIOPSIS LAURINA

SMALL STREET TREE
ALTERNATE BETWEEN
CUPANIOPSIS ANACARDIOIDES
& TRISTANIOPSIS LAURINA

EXISTING DRAIN

PROPOSED SECONDARY DRAIN

LARGE SWALE

GG 11

HH 12

PEDESTRIAN BRIDGE 13

SEATING NODE #2 14

FEATURE TREE
BANKSIA INTEGRIFOLIA

ACCESS TO PROPERTY
SOUTH

ELAEOCARPUS
OBVATUS

LEGEND

- APZ - ASSET PROTECTION ZONE
- DEVELOPMENT BOUNDARY
- 1.2m WIDE CONC. FOOTPATH
- 2.0m WIDE CONC. FOOTPATH
- 2.0 X 7.0m PEDESTRIAN BRIDGE
- VEHICLE RESTRICTION BOULDER
- LARGE STREET TREE
  PLANT 15m SPACING
- SMALL STREET TREE
  PLANT AS SHOWN ON PLAN OR 10m SPACING
- SMALL STREET TREE - BIO POD
  ADDITIONAL STORMWATER STORAGE & TREATMENT
- SUB STATION SCREENING HEDGE
  WESTRINGIA FRUTICOSA - FIRE RETARDANT SPECIES
- EXISTING TREE
  TO BE RETAINED AND PROTECTED
- EUCALYPTUS ROBUSTA
  KOALA FEED TREE - 10m SPACINGS
- ALLOCASUARINA LITTORALIS
  COCKATOO FEED TREE - 5m SPACINGS
- EXISTING WF HABITAT
- OFFSET WF HABITAT AREA
- CONSTRUCTED WF BREEDING POND
- BIORETENTION SWALE - NOT MOWN
- TURF - MOWN
  MAINTAINED AS PER ROAD RESERVE
- SWALE BATTER PLANTING - NOT MOWN
- WALLUM SAND HEATH PLANTING
- FIRE RETARDANT LOW PLANTING

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CLIENT: CLARENCE PROPERTY

DRAWING:
SOUTH WEST LANDSCAPE PLAN

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR
BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE 1:1000 @ A3
0 10 20 30 40m

REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_04**

ORCHARD SPECIES
TO BE CONFIRMED WITH
COMMUNITY

BLACK PVC COATED WIRE MESH FENCE
WILDLIFE EXCLUSION FENCE 1M HIGH

ORCHARD
FIRE RETARDANT
SPECIES

**STAGE 1 - RAISED
GARDEN BEDS
1.2 X 2.4m**

**STAGE 2 - RAISED
GARDEN BEDS
1.2 X 2.4m**

SCREENING HEDGE
AROUND SPS -
SELECTED FRUIT TREES

**SEWER
PUMP
STATION**

SPS ACCESS

LARGE SHADE TREE
FLINDERSIA BENNETTIANA

PICNIC SHELTER

KICK ABOUT AREA

BLACK PVC COATED
WIRE MESH FENCE
1m HIGH

PROPOSED SECONDARY DRAIN

EXISTING DRAIN

LEGEND

- APZ - ASSET PROTECTION ZONE
- DEVELOPMENT BOUNDARY
- 1.2m WIDE CONC. FOOTPATH
- BLACK PVC COATED WIRE MESH FENCE
- VEHICLE RESTRICTION BOULDER
- LARGE STREET TREE
  PLANT 15m SPACING
- SMALL STREET TREE
  PLANT AS SHOWN ON PLAN OR 10m SPACING
- ORCHARD TREES
  FIRE RETARDANT SPECIES
- EXISTING TREE
  TO BE RETAINED AND PROTECTED
- OFFSET WF HABITAT AREA
- BIORETENTION SWALE - NOT MOWN
- TURF - MOWN
  MAINTAINED AS PER ROAD RESERVE
- SWALE BATTER PLANTING - NOT MOWN
- WALLUM SAND HEATH PLANTING
- FIRE RETARDANT LOW PLANTING

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CLIENT: CLARENCE PROPERTY

DRAWING: **COMMUNITY GARDENS**

PROJECT: **BAYSIDE BRUNSWICK**
**LOT 13 DP 1251383, TORAKINA DR
BRUNSWICK HEADS**

REV.	ISSUE / AMENDMENTS	DATE
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B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE 1:50 @ A3 (0 5 10 15 20 25m)
REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_05**

LARGE TREATMENT SWALE

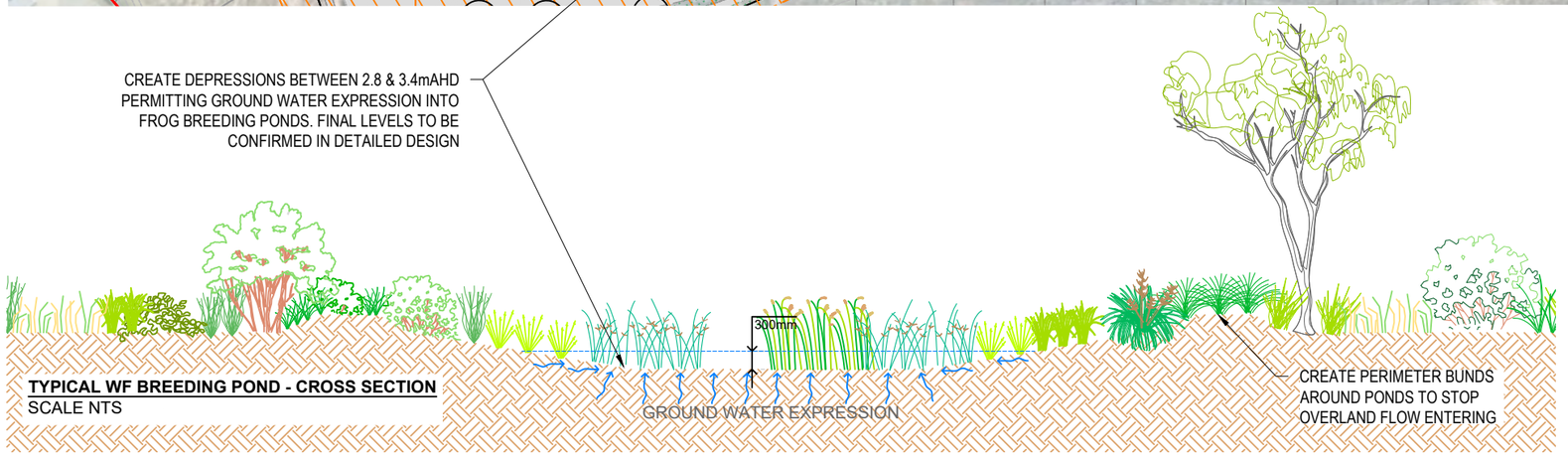
PROPOSED SECONDARY DRAIN

EXISTING DRAIN

WF CONSTRUCTED
BREEDING POND

ASSISTED NATURAL
REGENERATION TO
OCCUR

CREATE DEPRESSIONS BETWEEN 2.8 & 3.4mAHD
PERMITTING GROUND WATER EXPRESSION INTO
FROG BREEDING PONDS. FINAL LEVELS TO BE
CONFIRMED IN DETAILED DESIGN



TYPICAL WF BREEDING POND - CROSS SECTION
SCALE NTS

LEGEND

- APZ - ASSET PROTECTION ZONE
- DEVELOPMENT BOUNDARY
- 2.0m WIDE CONC. FOOTPATH
- 2.0 X 7.0m PEDESTRIAN BRIDGE
- EXISTING WF HABITAT
- OFFSET WF HABITAT AREA
- CONSTRUCTED WF BREEDING POND
- BIORETENTION SWALE - NOT MOWN
- TURF - MOWN
  MAINTAINED AS PER ROAD RESERVE
- SWALE BATTER PLANTING - NOT MOWN
- WALLUM SAND HEATH PLANTING
- FIRE RETARDANT LOW PLANTING
- EXISTING TREES TO BE RETAINED
- *ALLOCASUARINA LITTORALIS* QTY = 38
  COCKATOO FEED TREE - 5m SPACING
- LARGE STREET TREE
  PLANT AS SHOWN ON PLAN OR 10m SPACING
- SMALL STREET TREE
  PLANT AS SHOWN ON PLAN OR 10m SPACING

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DRAWING:
CENTRAL DRAIN HABITAT & REHABILITATION ZONE

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE 1:100 @ A3
0 10 20 30 40m

REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_06**

LEGEND

- APZ - ASSET PROTECTION ZONE
- DEVELOPMENT BOUNDARY
- 2.0m DECO GRANITIC SAND FOOTPATH
- EXISTING WF HABITAT
- OFFSET WF HABITAT AREA
- BIORETENTION SWALE MOWN MAINTAINED AS PER ROAD RESERVE
- BIORETENTION SWALE - NOT MOWN
- TURF - MOWN MAINTAINED AS PER ROAD RESERVE
- SWALE BATTER PLANTING - NOT MOWN
- WALLUM SAND HEATH PLANTING
- FIRE RETARDANT LOW PLANTING
- CONSTRUCTED WF BREEDING POND
- EXISTING TREES TO BE RETAINED
- *EUCALYPTUS ROBUSTA* QTY = 54 total
  KOALA FEED TREE - 10m SPACING
- *ALLOCASUARINA LITTORALIS* QTY = 38 of 76 total
  COCKATOO FEED TREE - 5m SPACING
- LARGE STREET TREE
  PLANT AS SHOWN ON PLAN OR 10m SPACING
- SMALL STREET TREE
  PLANT AS SHOWN ON PLAN OR 10m SPACING

SIMPSONS CREEK

HH 12

OFFSET WF HABITAT TO BE EMBELLISHED

MIN 5m WIDE HIGHT RESTRICTED SHOULDER PLANTING TO DISCOURAGE USERS FROM WALKING OFFTRACK

2.0m WIDE COMPACTED GRANITIC SAND PATH TO FORMALISE ACCESS TO CREEK AND MANAGE DISTURBANCE

EXISTING WF HABITAT TO BE RETAINED

EXISTING ROAD RESERVE

ROAD 2

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DRAWING: **EASTERN HABITAT & REHABILITATION ZONE**

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

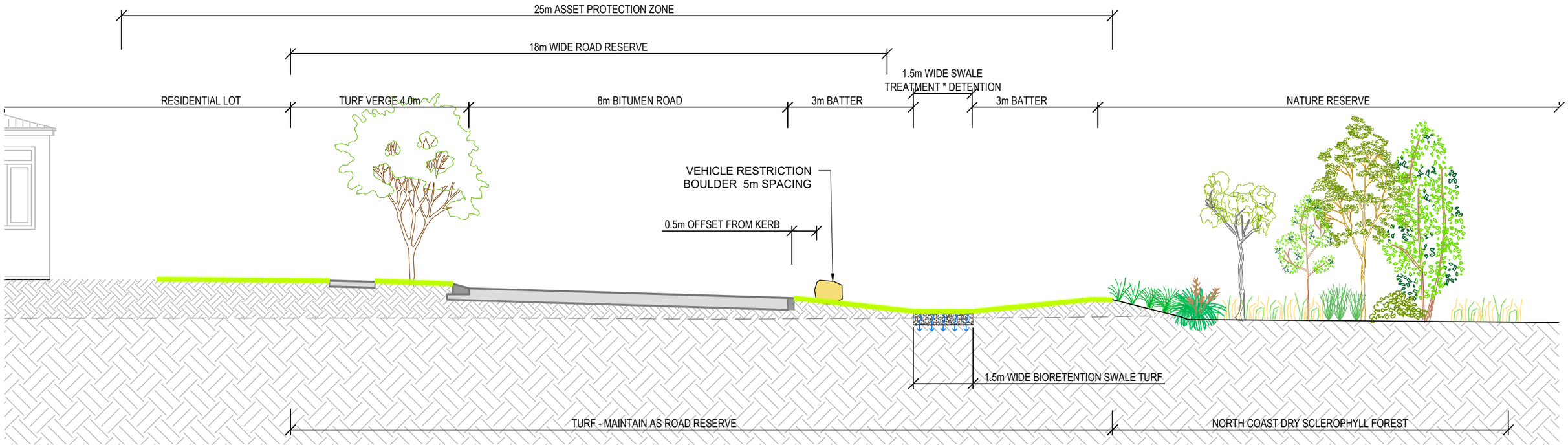
SCALE 1:100 @ A3
0 10 20 30 40m

REV. **C.2**

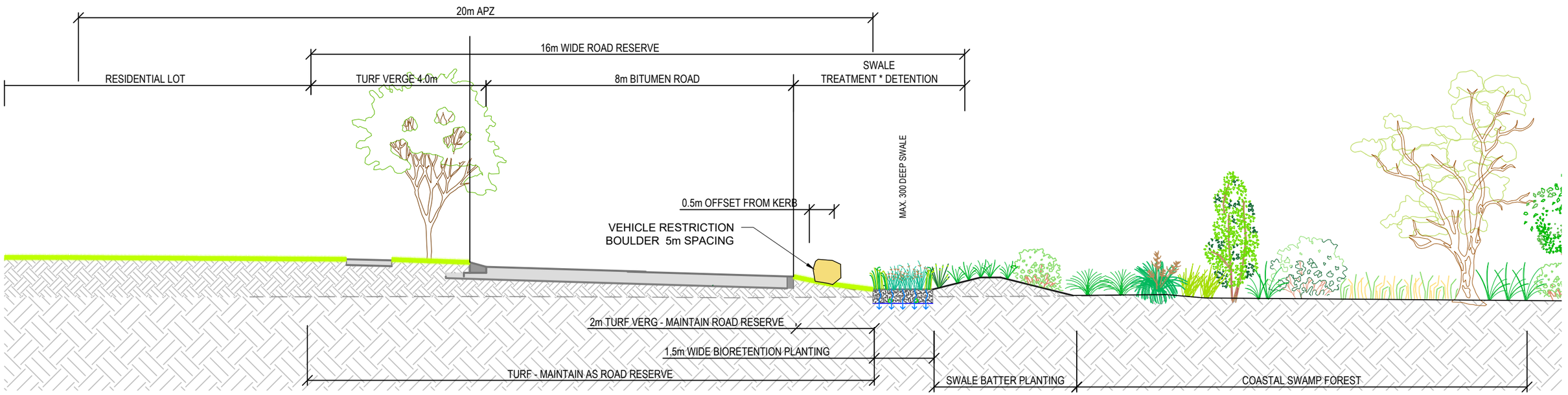
DESIGNED DM/SS
DRAWN SS
CHECKED DM

CAD FILE No. **1-211400_BAYSIDE_LD.DWG**

DWG No. **1-211400_BAYSIDE_LD_07**



AA **ROAD 6 - 25m APZ - CROSS SECTION**
SCALE 1:100



BB **ROAD 6 - 20m APZ - CROSS SECTION**
SCALE 1:50

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DRAWING: **ROAD 6 - SECTIONS AA - BB**

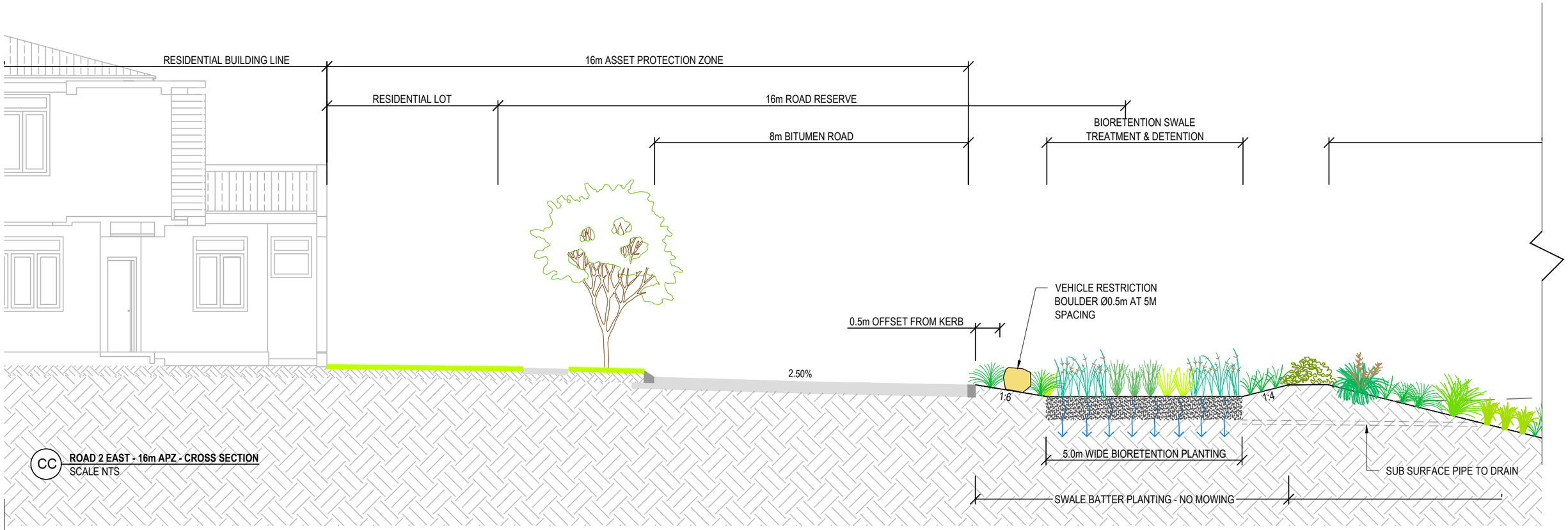
PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR
BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE

REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	DWG No. **1-211400_BAYSIDE_LD_08**
CHECKED	DM	



CC **ROAD 2 EAST - 16m APZ - CROSS SECTION**
SCALE NTS

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DRAWING: **ROAD 2 / DRAINAGE CORRIDOR - SECTION CC**

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
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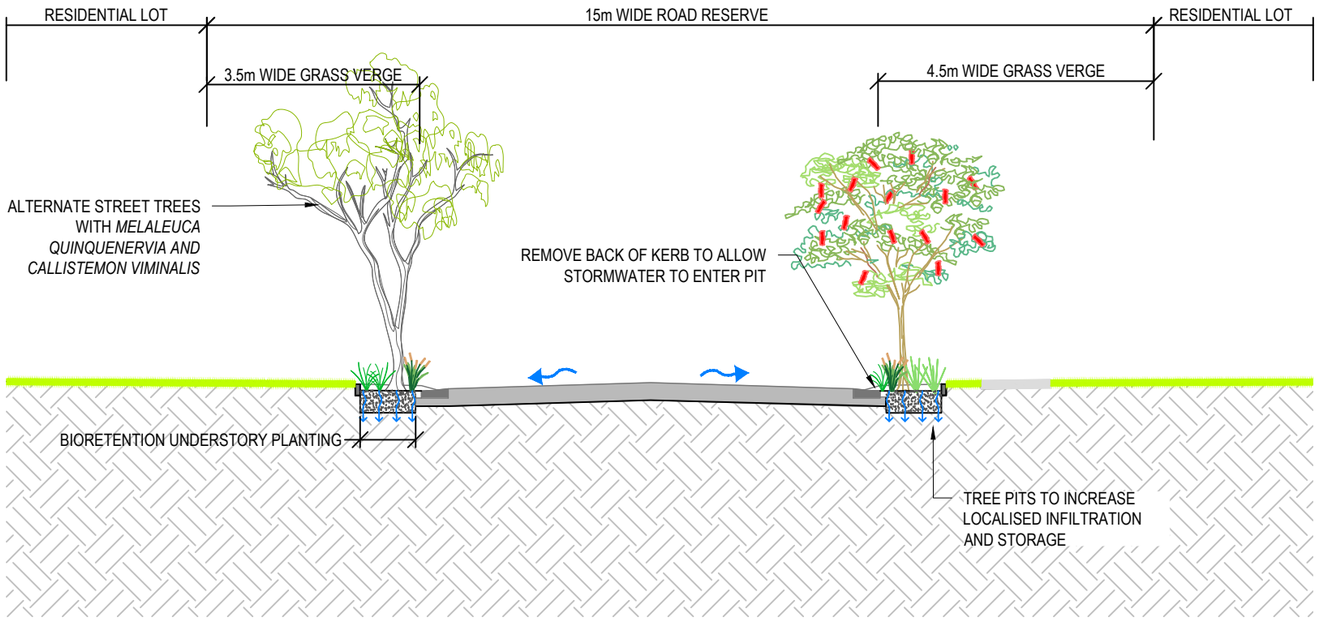
C.2	*FOR APPROVAL*	*19.08.21*

SCALE

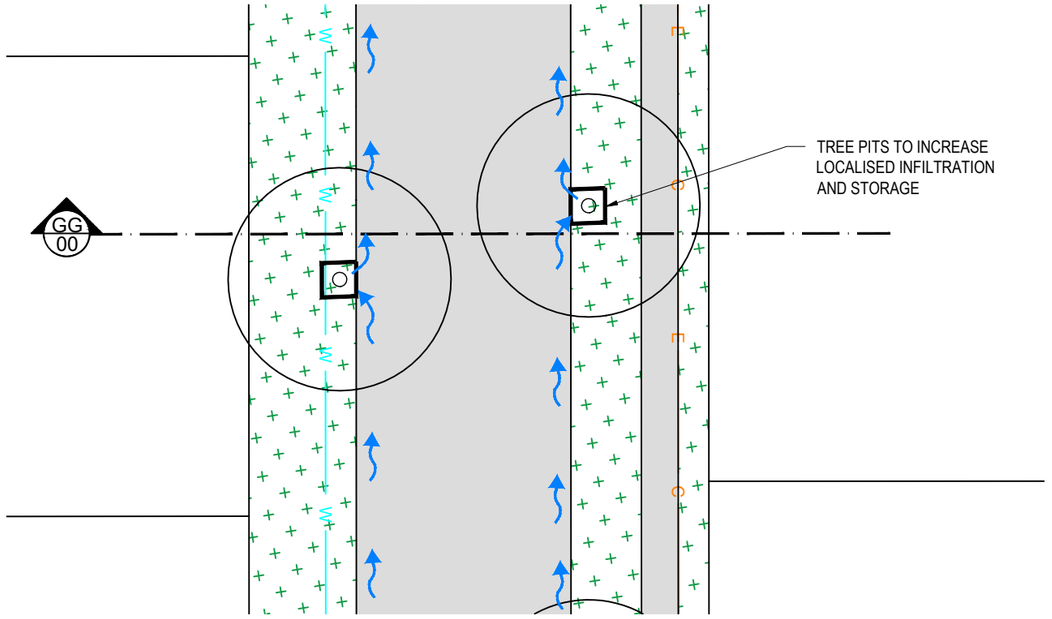
REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_09**

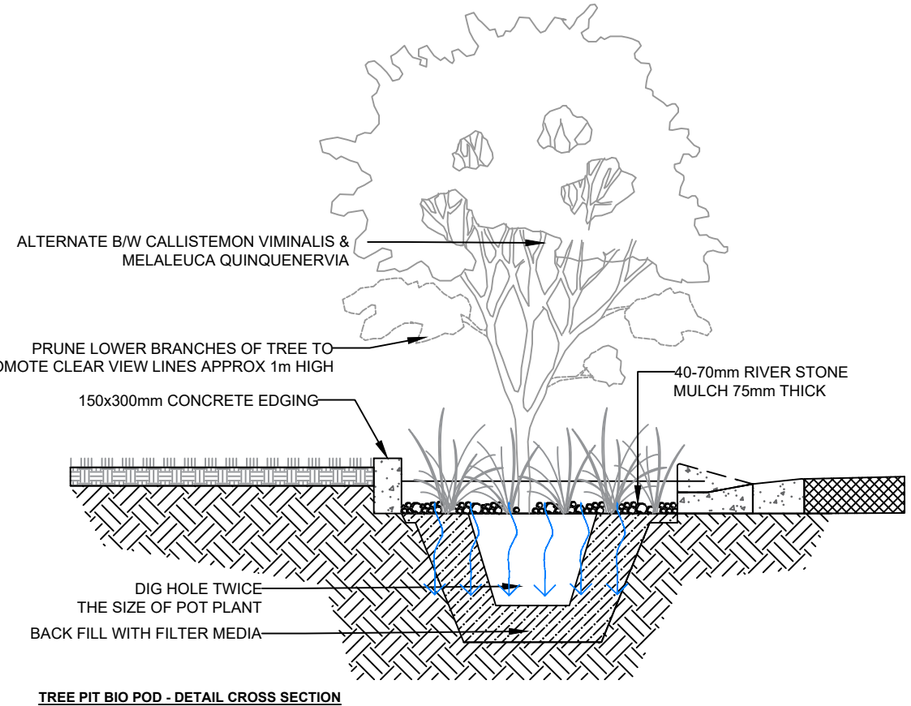


DD **ROAD 2-5 - STREET TREE - TREE PITS -CROSS SECTION**

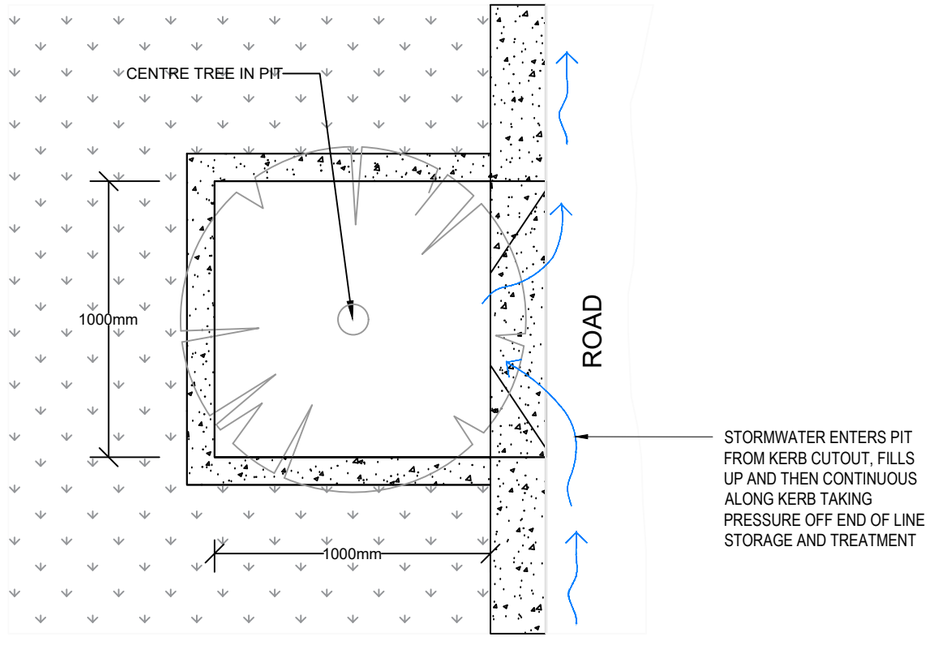
SCALE 1:100



ROAD 2-5 - STREET TREE - TREE PITS - PLAN
SCALE 1:200



TREE PIT BIO POD - DETAIL CROSS SECTION
SCALE: NTS



TREE PIT BIO POD - DETAIL PLAN
SCALE: NTS

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CLIENT: CLARENCE PROPERTY

DRAWING: **ROAD 3-5 STREET TREE PIT SECTION DD**

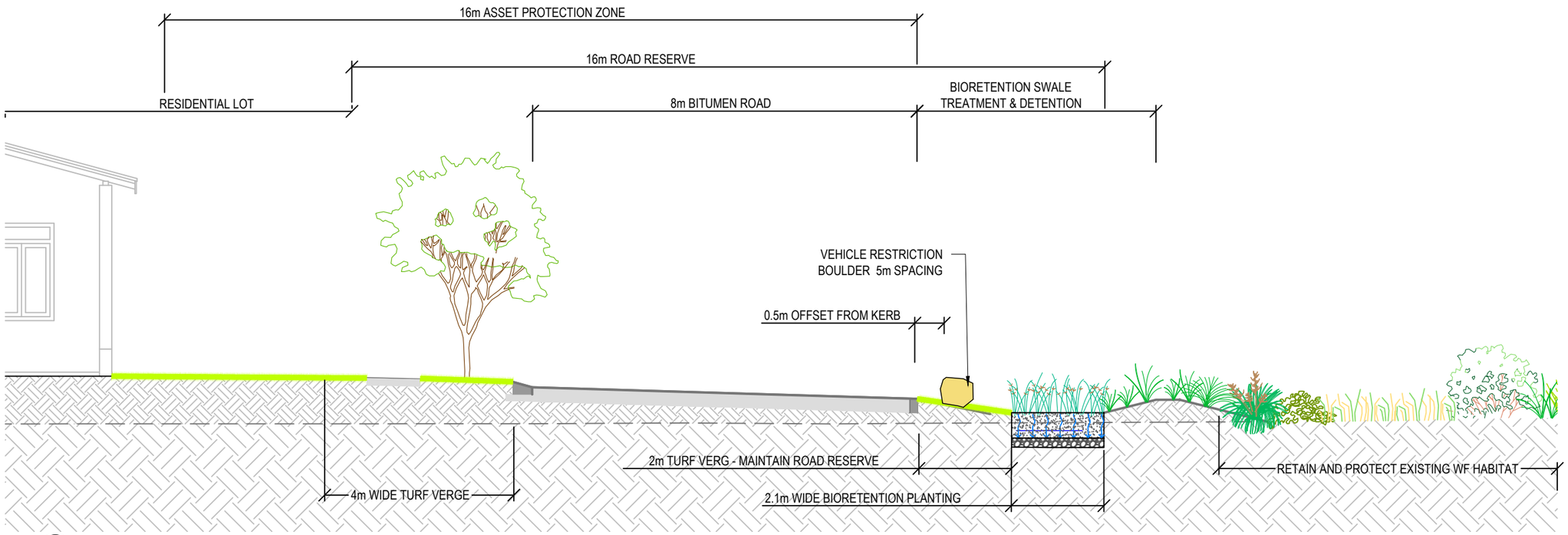
PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

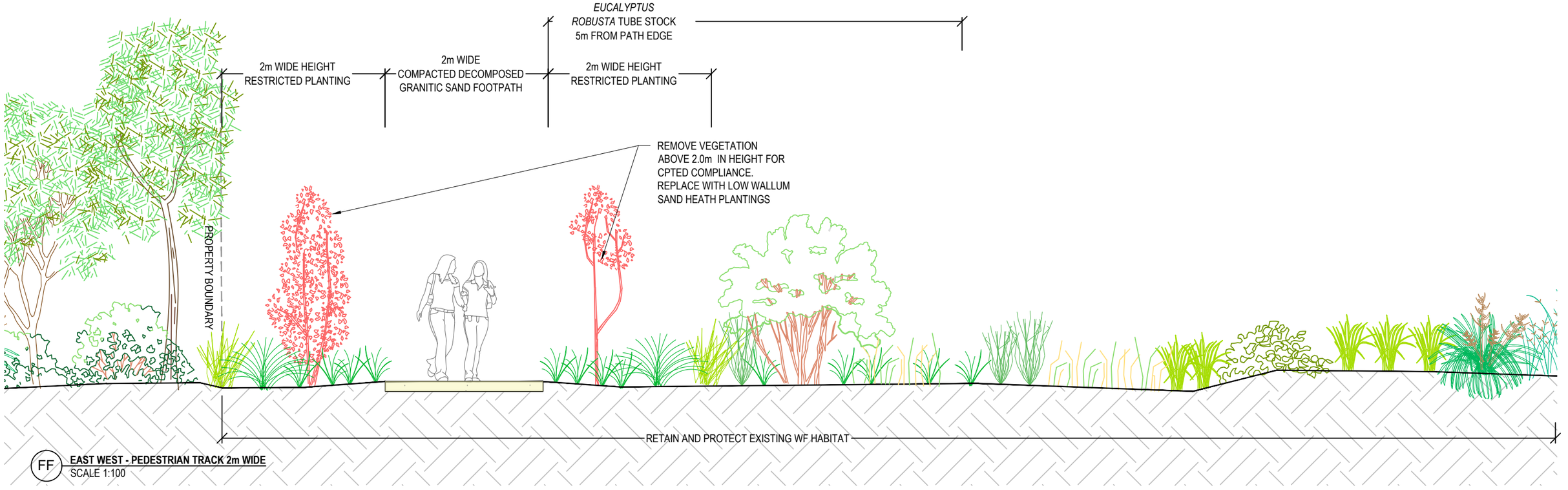
SCALE

REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_10**



EE **ROAD 7 - 16m APZ - CROSS SECTION**
SCALE 1:100



FF **EAST WEST - PEDESTRIAN TRACK 2m WIDE**
SCALE 1:100

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DRAWING:
SECTION EE & FF - ROAD 2
EAST WEST - PEDESTRIAN TRACK

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR
BRUNSWICK HEADS

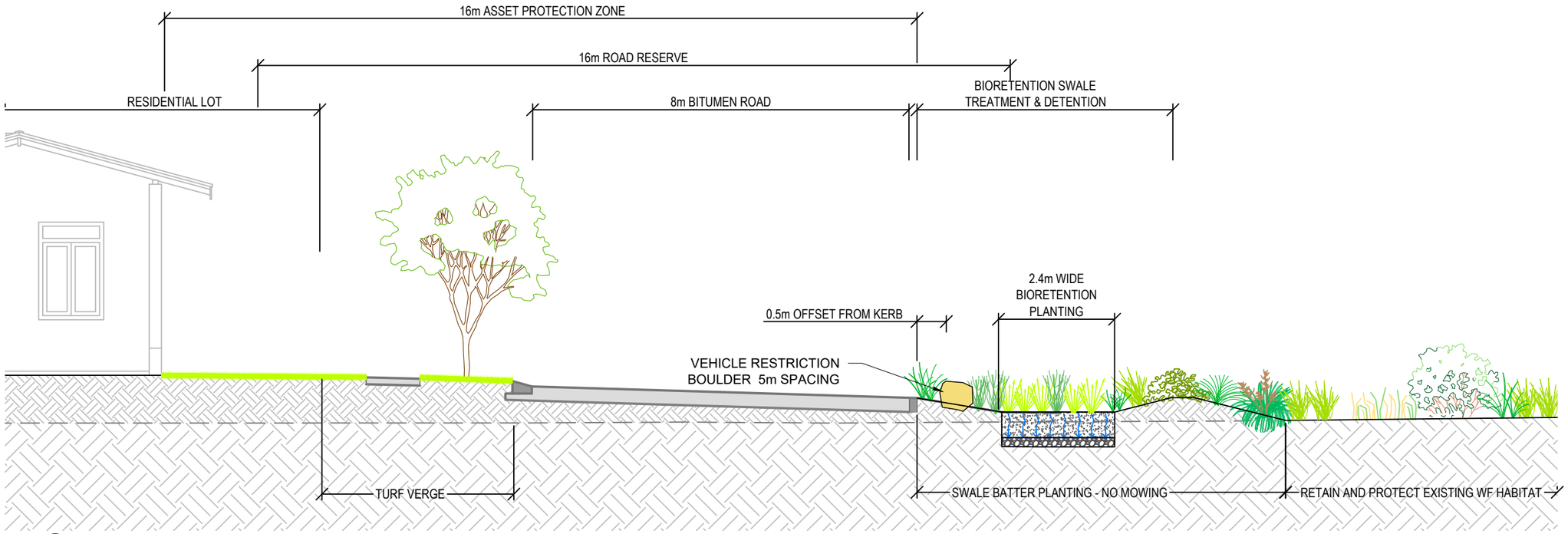
REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE

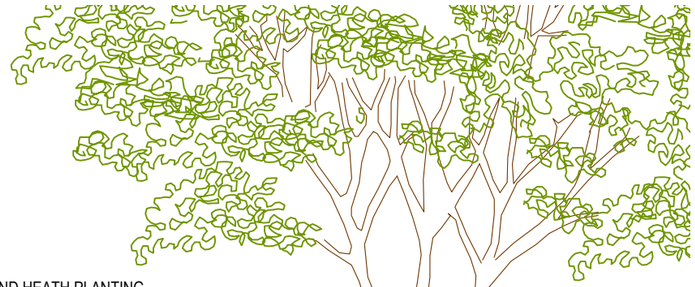
REV. **C.2**

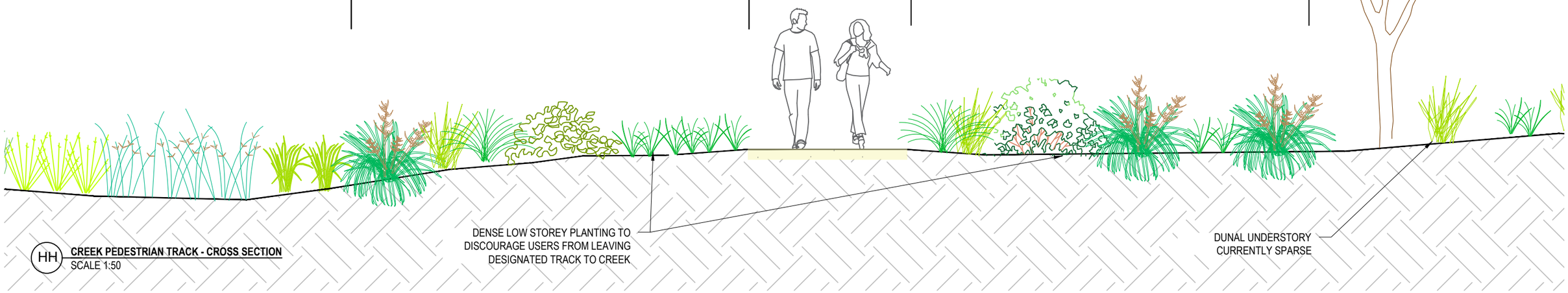
DESIGNED DM/SS
DRAWN SS
CHECKED DM

CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DWG No. **1-211400_BAYSIDE_LD_11**



GG **ROAD 2 - 16m APZ - CROSS SECTION**
SCALE 1:100





HH **CREEK PEDESTRIAN TRACK - CROSS SECTION**
SCALE 1:50

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DRAWING: **ROAD SECTION GG**
CREEK PEDESTRIAN TRACK

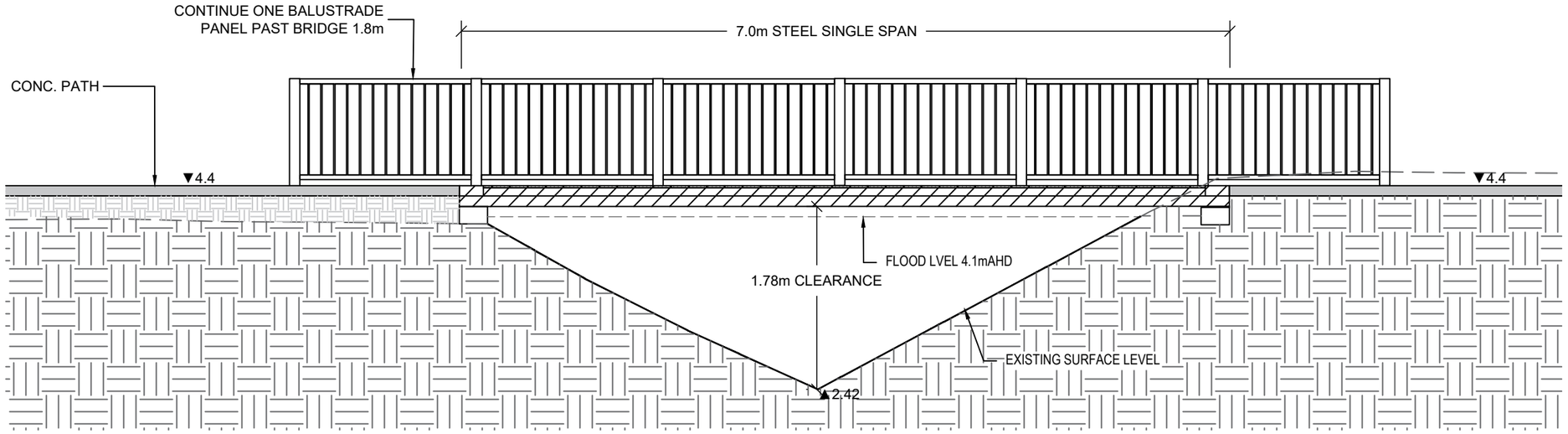
PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR
BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

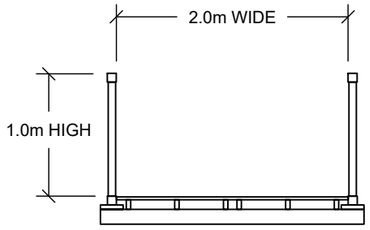
SCALE

REV. **C.2**

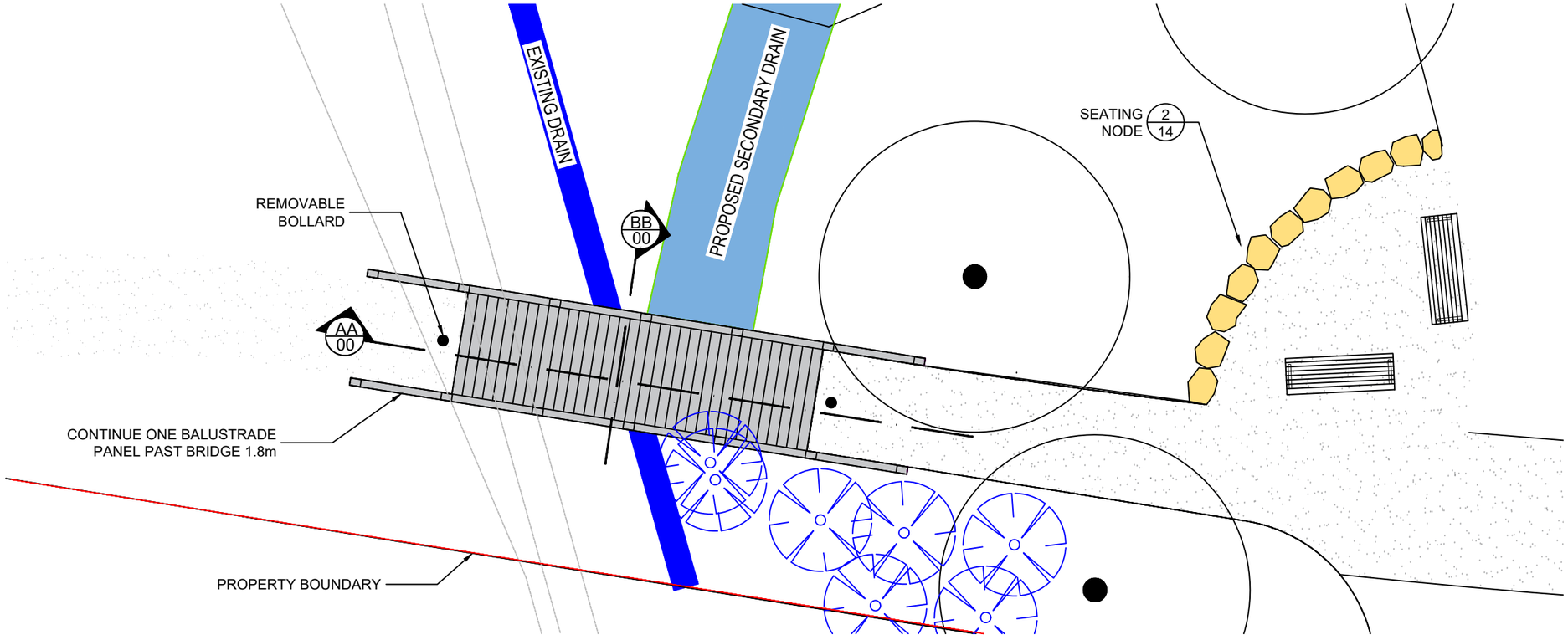
DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_12**



AA 13 **PEDESTRIAN BRIDGE - ELEVATION**
SCALE 1:50



BB 13 **PEDESTRIAN BRIDGE - CROSS SECTION**
SCALE 1:50



PEDESTRIAN BRIDGE - ELEVATION
SCALE 1:100

CONDAMINE BRIDGE - PRECEDENT IMAGE

BRIDGE SPECIFICATION
- CONDAMINE BY LANDMARK PRODUCTS PTY LTD
- 2M WIDE 7M LONG
- LOADING 3kPa (PEDESTRIAN USE ONLY)
- FLAT SINGLE SPAN
- POWDERCOATED DULUX 'SATIN BLACK'
- COMPOSITE TIMBER DECKING

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DRAWING: **PEDESTRIAN BRIDGE SOUTHERN DRAIN CROSSING**

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

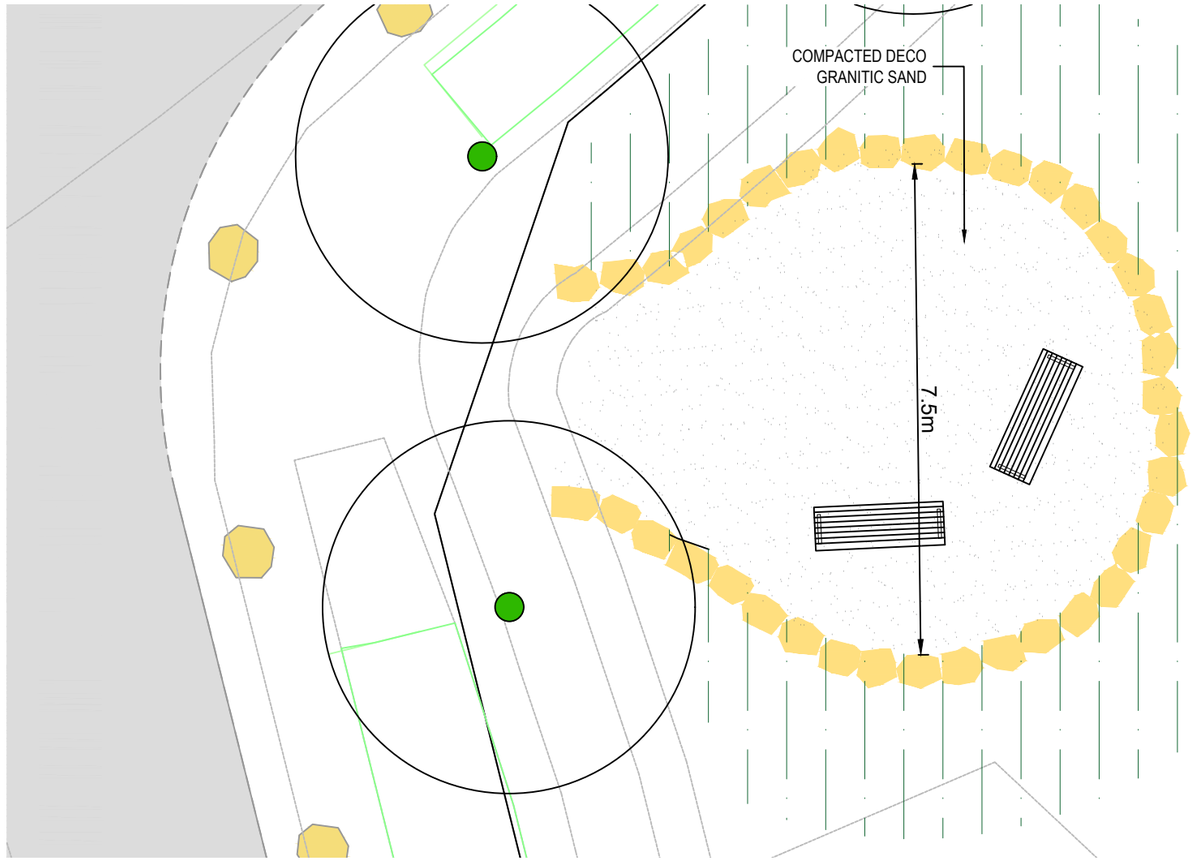
REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE

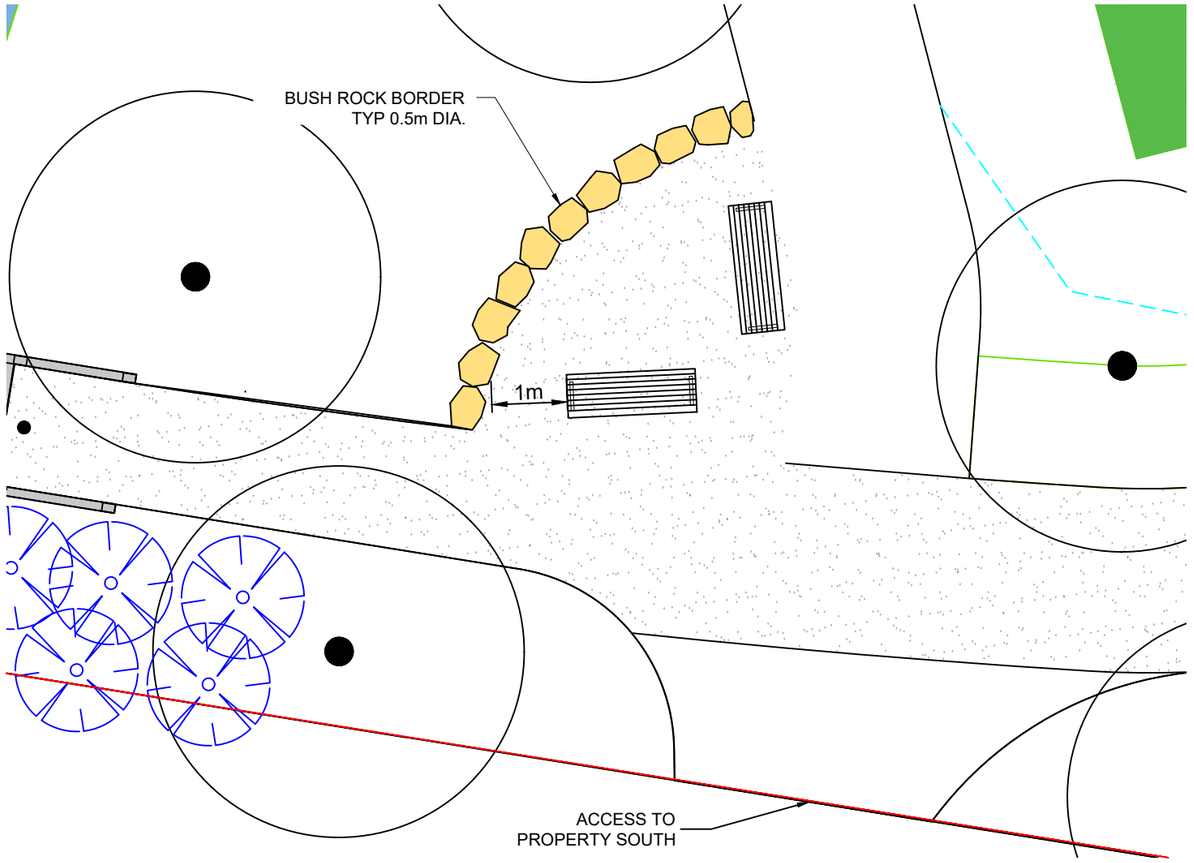
REV. **C.2**

DESIGNED DM/SS
DRAWN SS
CHECKED DM

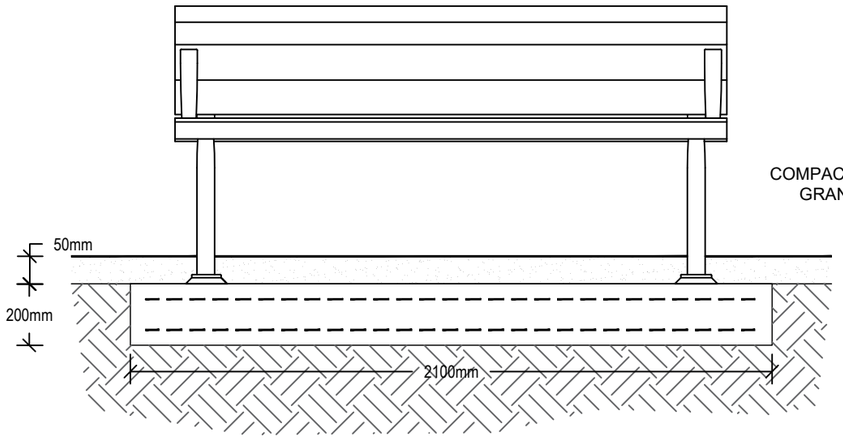
CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DWG No. **1-211400_BAYSIDE_LD_13**



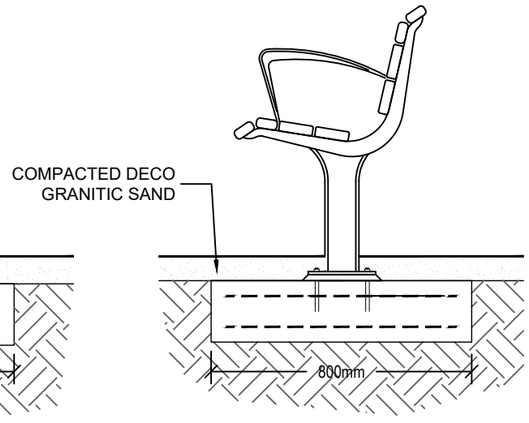
01/14 SEATING NODE #1
SCALE 1:100



02/14 SEATING NODE #2
SCALE 1:100



03/14 PARK SEAT - ELAVATION
SCALE 1:50



04/14 PARK SEAT - CROSS SECTION
SCALE 1:50

BENCH SEAT - PRECEDENT IMAGE

SEAT SPECIFICATION
TYPE: 'COURTYARD SEAT' DDA VERSION, (520 HIGH)
BATTERN TYPE: AUSTRALIAN HARDOOD TIMBER BATTERNS
BATTERN FINISH: QUILITY OUTDOOR TIMBER OIL
ARMREST: 2 X POWDERCOATED DULUX 'SATIN BLACK'
LEG TYPE: FLANGE MOUNT (SUB SURFACE MOUNTED)
FRAME FINISH: POWDERCOAT DULUX 'SATIN BLACK'

AWC
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CLIENT: CLARENCE PROPERTY

DRAWING: **SEATING NODES**

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR
BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE 0 10 20 30 40m
REV. **C.2**

DESIGNED	DM/SS	CAD FILE No. **1-211400_BAYSIDE_LD.DWG**
DRAWN	SS	
CHECKED	DM	DWG No. **1-211400_BAYSIDE_LD_14**

WALLUM FROGLET HABITAT PLANTING ZONE						
Scientific name	Common name	Type	Pot Size	Density/m²	% Prop	QTY
Baloskion pallens	Bog Rush	G	Hiko	4	10	
Baloskion tetraphyllum subsp. meiostachyum	Plume Rush	G	Hiko	4	10	
Baumea rubiginosa	Slender twig rush	G	Hiko	4	10	
Blechnum indicum	Water Fern	G	Hiko	4	10	
Callistemon pachyphyllus	Wallum Bottlebrush	S	Tube	4	10	
Gahnia clarkei	Saw-sedge	G	Hiko	4	10	
Boronia falcifolia	Wallum Boronia	S	Hiko	4	10	
Leptospermum liversidgei	Wallum Tea-tree	S	Tube	4	10	
Melastoma affine	Blue-tongue	G	Hiko	4	10	
Schoenus brevifolius	Zig-zag bog rush	G	Hiko	4	10	
				TOTAL	100	
Distribution of plants should in clumps of 5-10 plants of the same species to ensure propagation can readily occur						
Shrubs to be planted top half of batter not on basin floor. Plant in clumps of 3 or 5						

WALLUM SAND HEATH - PLANTING ZONE - UPPER BATTER						
	Common name	Type	Pot Size	Density/m²	% Prop	QTY
Baloskion tetraphyllum subsp. meiostachyum	Plume Rush	S	Tube	2	30	
Blechnum indicum	Water Fern	S	Tube	4	30	
Schoenus brevifolius	Zig-zag bog rush	S T	Tube	4	40	
				TOTAL	100	

WALLUM SAND HEATH - PLANTING ZONE - TOE OF BATTER						
	Common name	Type	Pot Size	Density/m²	% Prop	QTY
Baloskion tetraphyllum subsp. meiostachyum	Plume Rush	G	Hiko	4	25	
Baumea rubiginosa	Twig-rush	G	Hiko	4	25	
Baumea articulata	Jointed Twig-rush	G	Hiko	4	25	
Lepironia articulata	Grey Rush	G	Hiko	4	25	
				TOTAL	100	

WALLUM SAND HEATH - DRAIN PLANTING ZONE - TOP OF BATTER						
Scientific name	Common name	Type	Pot Size	Density/m²	% Prop	QTY
Acacia ulicifolia	Prickly Moses	S	Tube	4	3	
Acacia suaveolens	Sweet Wattle	S	Tube	4	3	
Acronychia imperforata	Beach Acronychia	S T	Tube	4	1	
Allocasuarina littoralis	Black She-oak	S	Tube	4	3	
Aotus ericoides	Golden Pea	S	Hiko	4	3	
Aotus lanigera	Hairy Aotus	S	Tube	4	3	
Austromyrtus dulcis	Midyim	S	Tube	4	4	
Baeckea frutescens	Weeping Baeckea	S	Tube	4	3	
Banksia aemula	Wallum Banksia	S	Tube	4	4	
Banksia ericifolia subsp. ericifolia	Heath-leaved Banksia	S	Tube	4	3	
Banksia integrifolia subsp. Integrifolia	Coast Banksia	S	Tube	4	3	
Cupaniopsis anacardioides	Tuckeroo	S T	Tube	4	1	
Dianella caerulea	Flax Lily	G	Hiko	4	20	
Elaeocarpus reticulatus	Blueberry Ash	S T	Tube	4	1	
Gahnia clarkei	Saw-sedge	G	Hiko	4	20	
Leucopogon parviflorus	Beard Heath	S	Tube	4	2	
Leptospermum trinervium	Slender Tea-tree	S T	Tube	4	1	
Lomandra longifolia	Mat-rush	G	Hiko	4	20	
Melaleuca quinquenervia	Broad-leaved Paperbark	T	Tube	4	1	
Persoonia stradbrokensis	Geebung	S T	Tube	4	1	
				TOTAL	100	
Tree species should be used sparingly and be spaced around 15m						

STREET TREE PLANTING						
Scientific name	Common name	CODE	Pot Size	Height m	Spread m	QTY
*Acmena hemilampra**	Broad Leaf Lily Pilly	AHE	45L	4 - 6m	2 - 3m	
*Acronychia imperforata**	Beach Acronychia	AIM	45L	5 - 8m	3 - 4m	
Banksia integrifolia	Coastle banksia	BIN	45L	4 -15m	1-6m	
*Cupaniopsis anacardioides**	Tuckeroo	CAN	45L	8 - 15m	3 - 5m	
Callistemon viminalis	Weeping Bottlebrush	CVI	45L	4 - 6m	3 - 4m	
Elaeocarpus obovatus	Blueberry Ash	ERE	45L	10 - 25m	4 - 10m	
Flindersia bennettiana	Bennetts Ash	FBE	45L	10 - 30m	10 - 15m	
Lophostemon confertus	Brush Box	LCO	45L	10 - 15m	5 -15m	
Melaleuca quinquenervia	Broad-leaved Paperbark	MQU	45L	8 -25 m	5 - 10m	
*Tristaniopsis laurina**	Water Gum	TLA	45L	6 - 12m	4 - 6m	
*Melicope elleryana**	Pink Euodia	MEL	45L	6 - 10m	3 - 4m	
					TOTAL	
*Fire retardant species to be planted within or near an APZ						

FIRE RETARDANT PLANTING ZONE						
Scientific name	Common name	Type	Pot Size	Density/m²	% Prop	QTY
Austromyrtus dulcis	Midyim Berry	S	Hiko	6	5	
Boronia falcifolia	Wallum Boronia	S	Hiko	6	5	
Dianella caerulea	Flaw Lily	G	Tube	6	40	
Lomandra confertifolia	Lomandra confertifolia	G	Tube	6	40	
Melastoma affine	Blue Tongue	S	Hiko	6	5	
Westringia fruticosa	Coastal Rosemary	S	Hiko	6	5	
				TOTAL	100	

BIO RETENTION PLANTING PLANTING ZONE						
Scientific name	Common name	Type	Pot Size	Density/m²	% Prop	QTY
Baloskion pallens	Bog Rush	G	Hiko	8	11	
Baloskion tetraphyllum subsp. meiostachyum	Plume Rush	G	Hiko	8	11	
Baumea rubiginosa	Slender twig rush	G	Hiko	8	11	
Blechnum indicum	Water Fern	G	Hiko	8	11	
Facinia nodosa	Knobby club-sedge	G	Hiko	8	12	
Gahnia clarkei	Saw-sedge	G	Hiko	8	11	
Imperata cylindrica	Blady grass	G	Hiko	8	11	
Lomandra longifolia	Spiny-headed mat-rush	G	Hiko	8	11	
Schoenus brevifolius	Zig-zag bog rush	G	Hiko	8	11	
				TOTAL	100	
Distribution of plants should in clumps of 5-10 plants of the same species to ensure propagation can readily occur						

TURF					
Scientific name	Common name	G/m2	% Prop	Area	Total kg
Cynodon dactylon	Green Couch	10	100		
Turf to be hydro seeded, confirm g /m2 with manufacturer specification					

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CLIENT: CLARENCE PROPERTY

DRAWING: **PLANT SCHEDULE**

PROJECT: **BAYSIDE BRUNSWICK**
LOT 13 DP 1251383, TORAKINA DR BRUNSWICK HEADS

REV.	ISSUE / AMENDMENTS	DATE
A	*FOR REVIEW*	*19.07.21*
B	*FOR APPROVAL*	*11.08.21*
C.2	*FOR APPROVAL*	*19.08.21*

SCALE

REV. **C.2**

DESIGNED DM/SS
DRAWN SS
CHECKED DM

CAD FILE No. **1-211400_BAYSIDE_LD.DWG**

DWG No. **1-211400_BAYSIDE_LD_15**

Appendix C: Management Action Summary

Table C1. Management actions and KPIs for VMZs ***(Note: this is a replication of Table 6-1)***

Phase	Actions	Location*	Timing	KPIs	Responsibility
1 (Establishment phase)	Remove environmental weeds and implement ripping within degraded areas/ informal tracks.	MZ 1-4	Prior to construction works and be completed within one year. YEAR 1	• 90% of woody weeds and exotic groundcover removed. • Ripping completed within all areas of degraded land/informal tracks. • Existing and emergent weeds controlled by initial treatment following ripping. • Rubbish removed (where relevant).	Appointed contractor
1 (Establishment phase)	Installation of 'no go' fencing prior to and during construction.	MZ 1-4	Prior to construction works. YEAR 1	• Vegetation management zones fenced off to restrict access by vehicle/plant and signage installed stating all MZs are 'no go' zones	Project manager/developer
2 (Establishment phase)	Follow up removal of environmental weeds and monitor areas where ripping has been completed	MZ 1-4	To be continued during the second year of construction. Monitoring to be completed. YEAR 2	• 95% of woody weeds and exotic groundcover removed. • Initial ripping of sandy areas produces a minimum native groundcover of 20% within monitoring plots, • 90% survival of planted trees. • Any dead plants are replaced as required. • Fencing maintained.	Appointed contractor
3 (Maintenance phase)	Follow up removal of environmental weeds and monitor areas where ripping has been conducted to assess required plant densities has been achieved.	MZ 1-4	To be continued during the third year of construction and completed prior to the end of second year of construction. YEAR 3	• Native cover of 30% achieved within ripped areas. • 90% survival of planted trees. • Emergent weeds controlled and comprise ⩽5% total cover within all MZs. • Any dead plants are replaced as required. • Fencing maintained.	Appointed contractor
4 (Maintenance phase)	Prescribed densities of plants from ripping and/or planting sandy areas are achieved as per	MZ 1-4	All actions to be completed by the end of 4th year from construction initiation date. YEAR 4	• Native cover of 40% achieved within ripped areas. • Minimum 90% native plant survivorship (plantings) achieved by end of 4th year of on ground works, • Emergent weeds continue to be controlled and comprise ⩽5% total cover within all MZs	Appointed contractor

Phase	Actions	Location*	Timing	KPIs	Responsibility
	monitoring requirements			• Any dead plants are replaced as required. • Removal of tree guards.	
5 (Completion phase)	Prescribed densities of plants from ripping and/or planting sandy areas are achieved as per monitoring requirements	MZ 1-4	All actions to be completed by the end of 4th year from construction initiation date. YEAR 5	• Native cover of 50% achieved within ripped areas. • Minimum 90% native plant survivorship (plantings) achieved by end of 5th year of on ground works, • Emergent weeds continue to be controlled and comprise ⩽5% total cover within all MZs • Any dead plants are replaced as required.	Appointed contractor
Occupation – vegetation management	Removal of all non-heath vegetation within MZ 2a and MZ 3a/3b to maintain biodiversity values.	MZ 2a, MZ 3a/3b	Annually	• MZ 2a must remain as a wetland/wet heath community (acid frog habitat). Any encroachment of Eucalypts or other sclerophyllous trees which may close out the canopy must be managed by the removal of these trees (ie. intervention management). • MZ 3a/3b must remain as heath which provides acid frog and threatened species habitat. Any encroachment of Eucalypts or other sclerophyllous trees which may close out the canopy must be managed by the removal of these trees (ie. intervention management).	MZ owner

*refer Figure 5.1 (below)