PLEASE QUOTE
Your Ref:
Our Ref: DA 2025/45

Enquiries: Planning Department

80 Wilson Street, Burnie Tasmania
PO Box 973, Burnie TAS 7320

ABN: 29 846 979 690
Phone: (03) 6430 5700
Email: burnie@burnie.tas.gov.au
Web: www.burnie.tas.gov.au

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NOTICE OF APPLICATION FOR LAND USE PERMIT

(Section 57(3) Land Use Planning and Approvals Act 1993)

Advice to Adjoining Land Owner or Occupier

Application No: -	**DA 2025/45**
Development Site: -	**15-17, 35 & 86 Circular Road East and adjoining road reserve RIDGLEY - CT: 135378/1, 135380/1 & 135379/1**
Proposal: -	**Pet dam spillway upgrade including road works vegetation clearance and causeway (excluding any development that is assessed under the *Water Management Act 1999*)**

Notice of the above application is served on you as an adjoining land owner or occupier.

The application may be viewed at -

Burnie City Council Customer Services Counter
Ground Floor, City Offices,
80 Wilson Street, Burnie

Between the hours of 8.45 am – 4.45 pm Monday to Friday inclusive (excluding public holidays) or on Council's website at www.burnie.tas.gov.au/permits

You are entitled to make representation in writing on any aspect of the proposal addressed to: -

General Manager,
Burnie City Council,
PO Box 973, Burnie 7320

or burnie@burnie.tas.gov.au by no later than 5.00 pm on **8 September 2025.** Council must have regard to any written representation received during the exhibition period when considering its decision on the application.

All persons who make representation will be notified within seven (7) days of the Council's decision. Any persons who made representation and is not satisfied with the Council decision may, under Section 61(5) of the *Land Use Planning and Approvals Act 1993*, lodge an appeal against that decision within fourteen (14) days of the date of that notice to: -

The Tasmanian Civil and Administrative Tribunal,
GPO Box 1311,
HOBART TAS 7001.

Should you have any enquiries regarding this development proposal, please do not hesitate to contact the Planning Department on (03) 6430 5700.

Troy McCarthy
PRINCIPAL PLANNER
Date of Notice**: - 23 August 2025**

BURNIE CITY COUNCIL
PO Box 973, BURNIE, TASMANIA 7320.
Ph : (03) 6430 5700
Email : burnie@burnie.tas.gov.au

Land Use Planning and Approvals Act 1993

Tasmanian Planning Scheme

PERMIT APPLICATION

Office use only

Application No _____

Date Received _____

Permit Pathway - *Permitted/Discretionary*

Use or Development Site:

Street Address: 15-17, 35 and 86 Circular Road East and Circular Road East Road Reserve, Ridgley

Certificate of Title Reference: CT 135380/1, CT 135378/1 & CT 135379/1

Applicant

First Name: MC Planners obo TasWater

Second Name:

Surname:

Postal Address: 2/129 Bathurst Street, Hobart, TAS, 7000

Phone No: 6288 7248

Mobile:

Email Address: planning@mcplanners.com.au

I/we consent for all giving of information and the serving of notices in relation to this application to be delivered electronically to the above email address? **YES** (●) **NO** ( )

Applicants Signature:

Owner (note – if more than one owner, all names must be indicated)

First Name: TasWater, The Trust Company (PTAL) Ltd, Burnie City Council and J M McDonald

Second Name:

Surname:

Postal Address:

Phone No:

Instruction for making a permit application

a) ***Use or development?***

The application must provide a full description of the proposed use and/or development and of the manner in which the use and/or development is to operate.

"Use" is the purpose or manner for which land is utilised. ‘‘Development" is any site works (including any change in natural condition or topography of land and the clearing or conversion of vegetation), and the construction, alteration, or removal of buildings, structures and signs, required in order to prepare a site for use or to change existing conditions within a site. Subdivision is development.

Clause 6.2 Tasmanian Planning Scheme provides the use classes by which all use or development must be described. Development must be categorised by reference to the use class it is to serve.

b) ***Required Information***

Adequate statements, plans and specifications must be included within the permit application to address and demonstrate compliance with all applicable requirements of the planning scheme, including any site analysis, impact report and recommendation, and advice, consent or determination required from a State agency or utility entity.

The application must clearly identify the documents relied upon for determination.

Section 51(1AC) *Land Use Planning and Approvals Act 1993* provides that a permit application is not valid unless it includes all of the information required by a planning scheme. Clause 6.1 Tasmanian Planning Scheme prescribes the minimum information that is necessary in order to complete a valid permit application.

S54 *Land Use Planning and Approvals Act 1993* provides that the planning authority may require the applicant to supply further information before it considers a permit application. If the planning authority requires further information to more particularly address one or more of the applicable requirements of the Tasmanian Planning Scheme, the statutory period for determination of a permit application does not run until that information is answered to the satisfaction of the planning authority

c) ***Applicable Provisions and Standards***

The permit application must be assessed against the applicable provisions and standards of the Tasmanian Planning Scheme. The

application is to identify by reference the clauses it relies upon to demonstrate compliance. (eg *clause 8.4.3 (A1 – A4, and P5*)

d) ***Discretionary Permits***

If a permit is discretionary the permit application must be notified for a period of 14 days to allow opportunity for any interested person to consider the proposed use and/or development and to provide comment on the discretionary matter.

If a permit application relies on performance criteria to satisfy an applicable standard or is discretionary under another provision of the interim planning scheme, the permit is discretionary only with respect to that standard.

The Council must have regard to all representations received during the notification period on a discretionary matter when determining whether to grant or refuse a permit.

e) ***If the applicant is not the landowner***

If the applicant is not the owner of the land in the use or development site, the applicant is required to notify all of the owners either prior to or within 7 days from the date of making the permit application.

The permit application must identify all of the landowners; and the applicant must sign the application form to acknowledge the obligation to advise such landowners that the permit application has been made.

If the site includes land owned or administered by the Burnie City Council or by a State government agency, the consent in writing from the Council or the Minister responsible for Crown land must be provided at the time of making the application.

f) ***Applicant declaration***

It is an offence for a person to do any act that is contrary to a compliance requirement created under the section 63 *Land Use Planning and Approvals Act 1993*. The applicant is required to complete a declaration that the information given in the permit application is true and correct.

g) ***Payment of Fees***

The Council is not required to take any action on the permit application until all the relevant fees have been paid.

Permit Information (NB If insufficient space, please attach separate document)

Proposed Use:

Use Class

Documents included with the permit application to describe the Use

Proposed Development

Use class to which the development applies

Documents included with the permit application to describe the Development

Provisions and Standards relied upon for grant of a Permit

Value of use and/or development

Notification of Landowner/s

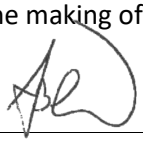
If land is not in applicant's ownership

I, Peter Coney , declare that the owner/each of the owners of the land has been notified of the intention to make this permit application.

Signature of Applicant  Date 10.07.2025

If the permit application involves land owned or administered by the BURNIE CITY COUNCIL

Burnie City Council consents to the making of this permit application.

General Manager (Signature)  Date 15/7/2025

If the permit application involves land owned or administered by the CROWN

I, the Minister responsible for the land, consent to the making of this permit application.

Minister (Signature) Date

Applicant Declaration

I, Peter Coney

declare that the information I have given in this permit application to be true and correct to the best of my knowledge.

Signature of Applicant  Date 10.07.2025

Office use only

MC Planners Ref: 25090

11 July 2025

General Manager

Burnie City Council

Via email – burnie@burnie.tas.gov.au

Attention: Planning Department

DEVELOPMENT APPLICATION – PET DAM SPILLWAY UPGRADE INCLUDING ROAD WORKS VEGETATION CLEARANCE AND CAUSEWAY – 15-17, 35, and 86 CIRCULAR ROAD EAST, AND CIRCULAR ROAD EAST ROAD RESERVE, RIDGLEY

This letter details the proposed development and provides an assessment against the provisions of the *Tasmanian Planning Scheme –Burnie* (the Planning Scheme).

In our assessment the application generates the following discretions under the planning scheme:

- 21.3.1 Discretionary uses (P1) and (P2)
- C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junction (P1)
- C7.6.1 Buildings and works within a waterway and coastal protection area or a future coastal refugia area (P1.1) and (P1.2)
- C7.6.2 Clearance within a priority vegetation area (P1.1) and (P1.2)

The following documents are enclosed in support of the application:

- Attachment 1 – Title Information
- Attachment 2 – Proposal Plans
- Attachment 3 – Natural Values Assessment
- Attachment 4 – Erosion and Sediment Control Plan
- Attachment 5 – Landowner Notification Letters

1. Site Location and Context

The development is located on land within a number of parcels as listed below in Table 1. The site is to the south and east of the Melba line, and to the north of the Pet Reservoir, and Circular Head Road (see Figure 1).

The site is an assortment of parcels which include facilities for TasWater infrastructure, the RTV training Centre, and Forico buildings which are not part of the proposal. Areas adjacent to the Pet River stream bank and the Pet Reservoir foreshore are partly vegetated.

The site is at the periphery of Ridgley, defined by its proximity to the Pet Reservoir, Pet River, TasWater facilities associated with water treatment and provision of drinking water for Burnie, as well as a collection of buildings with a legacy of forestry, now repurposed as a training centre.

An application to undertake dam works has been submitted to the Department of Natural Resources and Environment, Tasmania. The dam works permit application consists of constructing a new spillway located to the north of the dam to provide flood capacity to meet the recommendations in the ANCOLD guidelines. This also includes raising the dam embankment crest from RL 269.3 m to RL 270.8 m to provide sufficient dry freeboard under the design flood event. In addition, a localised filter buttress will be constructed around the outlet conduit, to mitigate the risk of piping along and into the conduit, and a foundation seepage interception trench will be installed along the embankment downstream toe to mitigate the risk of piping through the foundation. The scour outlet and raw water supply pipelines will be replaced as part of the upgrade works.

Table 1. land particulars related to development area

Title reference	PID	Address	Owner	Note
nil	6195291	86 Circular Road East, Ridgley	TasWater	Two separate parcels with the same PID
135380/1	9629074	15-17 Circular Road East, Ridgley	The Trust Company (PTAL) Ltd	
135378/1	2109245	35 Circular Road East Ridgley	J A and M G McDonald	RTV Training Site
135379/1	*nil*	Circular Road reserve	Burnie City Council	
nil	*nil*	Circular Road reserve	Burnie City Council	

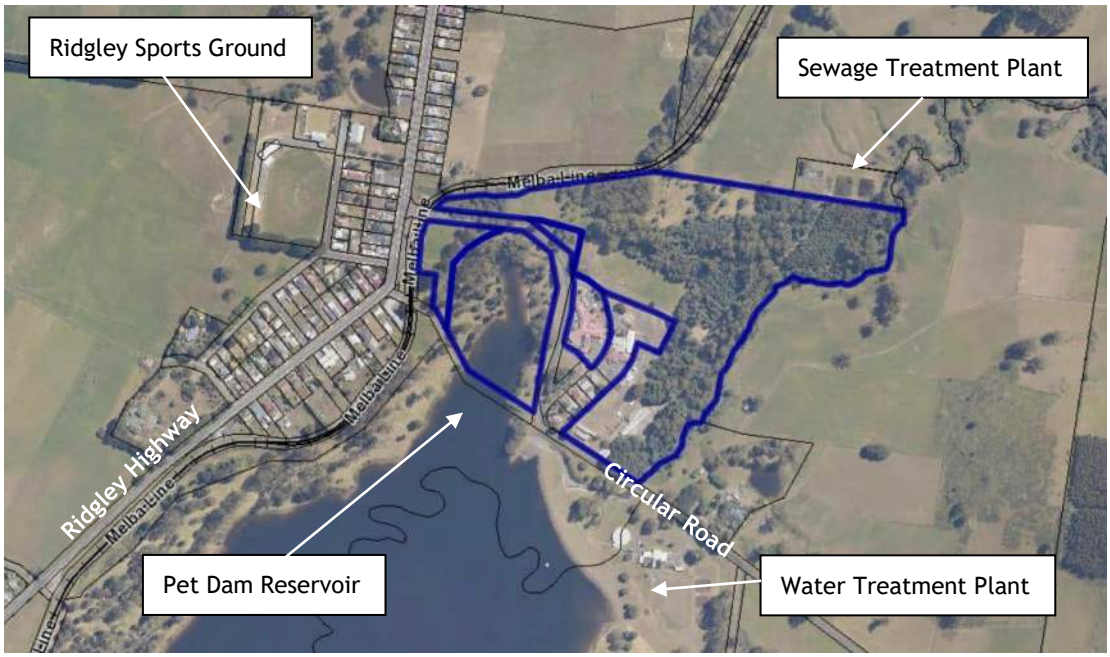


Figure 1. Subject Site (blue) and Surroundings (source: LISTmap, Accessed 04 July 2025 annotated)

2. Proposed Use and Development

The proposal seeks approval for a suite of works to facilitate significant upgrades to the Pet Reservoir Dam, which is owned and managed by TasWater. Though much of the work for the Dam upgrades may be approved under a dam works permit issued under the *Water Management Act 1999*, a number of works relating to road works, a causeway, and vegetation clearance may not be covered by that approval. This application therefore seeks to approve these works independently of the dam works permit, so they may commence before the dam works permit is finalised.

Principally, the proposal seeks to approve the relocation of the spillway from its current position at the base of the dam wall, to be instead sited to the north, directing flows around the facilities at Circular Road, and into the Pet River. This new spillway will be of a sufficient capacity to accommodate flooding events which the current spillway cannot. The spillway is designed to be channelised adjacent to a minor tributary and then fed into the Pet River. In facilitating this work, there are associated works for access upgrades for the RTV training facility, and provision of a causeway over the spillway within Circular Road.

Importantly, the development is associated with a current application for dam works permit which has been submitted to the Department of Natural Resources and Environment. Though all of the dam upgrades are not subject to this application, they do form a key part of the background to the proposal. The works subject to this application are intended to be commenced independently of the majority of the dam works upgrades, though may be completed at the same time.

3. Policy Assessment

The applicable planning instrument in the assessment of the application is the *Tasmanian Planning Scheme – Burnie* ('the Planning Scheme').

The development site is located on land zoned Utilities, Agriculture, and Village (see Figure 2) and is within the Waterway Coastal Protection Area, Priority Vegetation Area, and Bushfire Prone Area (see Figure 3).

The proposed uses are extensions of existing uses into new areas, where the Spillway forms part of the major utility (Utilities), the road works and causeway are for minor utilities (Utilities) and the access way works for the RTV Training Centre are works associated with that existing use and development (Educational and Occasional Care).

Necessary fencing of the spillway once constructed can be considered exempt as listed below:

- Fencing of the spillway within the Utilities Zone is exempt under clause 4.0.1 as listed at the table 4.6.5, where up to a height of 2.8m;
- Fencing of the spillway within Agriculture Zone is exempt under clause 4.0.1 as listed at the table 4.6.5, without qualification.

Where not exempt, the nature of the proposal and the location of the site require the proposal be considered against the following Scheme elements:

- Village Zone [12.0];
- Agriculture Zone [21.0];
- Utilities Zone [26.0];
- Natural Assets Code [C7.0];

The following section provides an assessment of the proposal against each of the above-listed Scheme elements.

Figure 2. Land use zones subject site in Blue (source: LIST map – accessed 04.07.2025 annotated).

Figure 3. Priority Vegetation Area (Green polygon), Waterway Coastal Protection Area (Blue) within subject site (blue outline) (source: LIST map - accessed 04.07.2025).

Tasmanian Planning Scheme or Interim Planning Scheme

General Provisions

There are no General Provisions that apply to the proposal

Village Zone [12.0]

The site is partially zoned Village in the *Tasmanian Planning Scheme –Burnie*. This land is included for reason of the redirection of the accessway for the RTV Training Centre, road works associated with the causeway which otherwise are not exempt, and a part of the excavation to support the spillway. As such the use and development standards of the Village Zone are relevant.

12.2 Use Table

The training centre is an existing permitted use, and the roadworks are for a minor utility which is a No Permit Required use.

The extent of the works within the Village Zone for provision of the causeway and spillway however are discretionary under the Use Table, as they are for a Utilities use which is not a minor utility.

12.3 Use Standards

Though the proposal is to establish a new Utilities use, the causeway and spillway (as associated with a dam) will not have hours of operation, lighting, or a gross floor area which exceeds 250m^2. Further, as Utilities uses 12.3.1 (A3) is not applicable in that it explicitly excludes the consideration of commercial vehicles where for such a use. There are therefore no applicable use standards for the proposal.

12.4 Development Standards for Buildings and Works

Though the proposal includes development within the Village Zone, this development is limited to a small part of the proposed causeway, relocated accessway for the RTV training centre, and excavation to support the provision of the spillway. As the proposal is not for multiple dwellings, and does not provide for a building within the Village Zone, there are no applicable development standards for these works.

Agriculture Zone [21.0]

The site is partially zoned Agriculture in the *Tasmanian Planning Scheme –Burnie*. This land is included for reason of the proposed causeway, and the majority of the spillway. As such the use and development standards of the Agriculture Zone are relevant.

21.2 Use Table

Under the Use Table 21.2, a Utilities use which is not minor utilities is categorised as discretionary.

21.3 Use Standards

21.3.1 Discretionary uses

A1 *No Acceptable Solution.*	*P1* *A use listed as Discretionary, excluding Residential or Resource Development, must be required to locate on the site, for operational or security reasons or the need to contain or minimise impacts arising from the operation such as noise, dust, hours of operation or traffic movements, having regard to:* *(a) access to a specific naturally occurring resource on the site or on land in the vicinity of the site;* *(b) access to infrastructure only available on the site or on land in the vicinity of the site;* *(c) access to a product or material related to an agricultural use;* *(d) service or support for an agricultural use on the site or on land in the vicinity of the site;* *(e) the diversification or value adding of an agricultural use on the site or in the vicinity of the site; and* *(f) provision of essential Emergency Services or Utilities.*

The proposed causeway and spillway are associated with Utilities uses which are required to be located on the site for reasons of the topography and synergies with the existing road network and facilities to the south at the Pet Dam. The upgrade of the spillway within this location is required to accommodate a design which meets the recommendations of flood capacity, per the guidelines on selection of acceptable flood capacity for dams (ANCOLD guidelines).

For the road, many of the Performance Criteria are not relevant to a causeway for an existing road network where within a road reserve, except (f) which the proposal complies with.

For the Spillway, with specific regard for criteria (a) through to (e), it is considered that the nature of the Pet River and Pet Dam is that of a water resource, which in order to be safely and effectively stored and distributed to Burnie, requires provision of a spillway in the location as shown (a).

The existing dam infrastructure, as well as water treatment plant are considered infrastructure which together with the proposal will form a broader facility within the Utilities use class across multiple parcels. The infrastructure proposed and existing all support the existing use, and colocation within the locality of these parts is a necessity (b).

Criteria (c), (d) and (e) are not relevant, as there is no existing agricultural use or other product which requires the spillway upgrade.

Having regard for the above, the proposal is considered to comply.

A2 *No Acceptable Solution.*	*P2* *A use listed as Discretionary, excluding Residential, must minimise the conversion of agricultural land to non-agricultural use, having regard to:* *(a) the area of land being converted to non-agricultural use;* *(b) whether the use precludes the land from being returned to an agricultural use;* *(c) whether the use confines or restrains existing or potential agricultural use on the site or adjoining sites.*

The causeway is a discretionary Utilities use which is limited to an existing road reserve, which has no existing or potential agricultural use. The spillway will also encompass only that land necessary for the use (a). The land is classed as class 4 under the land capability layer, and is not under an agricultural use nor contiguous with other parcels where agricultural use is undertaken.

Though the land will on installation of the causeway and spillway be unlikely to be returned to an agricultural use, on balance of the limited potential of the land to be used for agriculture presently, it is therefore considered reasonable that such a use is proposed (b).

Finally, there is no nearby agricultural use which the proposal will constrain (c).

The proposal is considered to comply with the Performance Criteria.

A3 *No Acceptable Solution.*	*P3* *A use listed as Discretionary, excluding Residential, located on prime agricultural land must:* *(a) be for Extractive Industry, Resource Development or Utilities, provided that:* *(i) the area of land converted to the use is minimised;* *(ii) adverse impacts on the surrounding agricultural use are minimised; and*

	(iii) the site is reasonably required for operational efficiency; or *(b) be for a use that demonstrates a significant benefit to the region, having regard to the social, environmental and economic costs and benefits of the proposed use.*

The land is classed as class 4 under the land capability layer, which is not considered to be prime agricultural land, therefore A3/P3 are not applicable.

A4 *No Acceptable Solution.*	*P4* *A Residential use listed as Discretionary must:* *(a) be required as part of an agricultural use, having regard to:* *(i) the scale of the agricultural use;* *(ii) the complexity of the agricultural use;* *(iii) the operational requirements of the agricultural use;* *(iv) the requirement for the occupier of the dwelling to attend to the agricultural use; and* *(v) proximity of the dwelling to the agricultural use; or* *(b) be located on a site that:* *(i) is not capable of supporting an agricultural use;* *(ii) is not capable of being included with other agricultural land (regardless of ownership) for agricultural use; and* *(iii) does not confine or restrain agricultural use on adjoining properties.*

The proposal is for a Utilities use and so A4/P4 is not applicable.

21.4 Development Standards for Building and Works

Though the causeway and spillway are development as *works,* there are no applicable standards within the Agriculture Zone.

21.5 Development Standards for Subdivision

The proposal does not include subdivision, therefore there are no applicable standards under this clause.

Utilities Zone

The site is partially zoned Utilities in the *Tasmanian Planning Scheme –Burnie*. This land is included for reason of the causeway within the road reserve, spillway and spillway approach as directed from the Pet Reservoir. As such the use and development standards of the Utilities Zone are relevant.

26.2 Use Table

A Utilities use which is not a minor utility is permitted within the Utilities Zone.

26.3 Use Standards

26.3.1 All uses

A1 *Hours of operation of a use, excluding Emergency Services, Natural and Cultural Values Management, Passive Recreation or Utilities, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone must be within the hours of:* *(a) 7.00am to 9.00pm Monday to Saturday; and* *(b) 8.00am to 9.00pm Sunday and public holidays.*	*P1* ***

The proposal is not within 50m of any of the listed zones, therefore A1/P1 is not applicable.

A2 *External lighting for a use, excluding Emergency Services, Natural and Cultural Values Management, Passive Recreation or Utilities, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must:* *(a) not operate within the hours of 11.00pm and 6.00am, excluding any security lighting; and* *(b) if for security lighting, be baffled so that direct light does not extend into the adjoining property.*	*P2* ***

The proposal is not within 50m of any of the listed zones, therefore A2/P2 is not applicable.

A3 *Commercial vehicle movements and the unloading and loading of commercial vehicles for a use, excluding Emergency Services or Utilities, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must be within the hours of:* *(a) 7.00am to 9.00pm Monday to Saturday; and* *(b) 8.00am to 9.00pm Sunday and public holidays.*	*P3* ***

The proposal is not within 50m of any of the listed zones, therefore A2/P2 is not applicable.

26.3.2 Discretionary uses

A1 *No Acceptable Solution*	*P1* *A use listed as Discretionary must not compromise or restrict the operations of an existing or proposed utility, having regard to:* *(a) the compatibility of the utility and the proposed use;* *(b) the location of the proposed use in relation to the utility, or any proposed utility;* *(c) existing land uses on the site; and*

	(d) any proposed or existing buffers or mitigation measures.

The proposal is for a permitted use, therefore A1/P1 is not applicable.

26.4 Development Standards for Buildings and Works

Though the causeway and spillway are development as *works* there are no applicable standards within the Utilities Zone.

26.4.3 Fencing

The spillway is proposed to be fenced, however the fencing is reliant on the exemptions listed within the table at 4.6.5 Fencing for Security Purposes; being fencing within the Utilities Zone where not greater than 2.8m.

26.4.4 Outdoor storage areas

A1 *Outdoor storage areas, excluding any goods for sale, must not be visible from any road or public open space adjoining the site.*	*P1* ***

No outdoor storage areas are proposed, therefore A1/P1 is not applicable.

26.5 Development Standards for Subdivision

26.5.1 Subdivision

The proposal does not involve the subdivision of any land within the Utilities Zone, therefore there are no applicable standards under this clause.

Parking and Sustainable Transport Code [C2.0]

There are no exemptions from the Parking and Sustainable Transport Code (C2.2.1), therefore provisions under C2.0 must be considered.

C2.5 Use Standards

C2.5.1 Car Parking numbers

A1 *The number of on-site car parking spaces must be no less than the number specified in Table C2.1, less the number of car parking spaces that cannot be provided due to the site including container refund scheme space, excluding if:*	*P1.1* *** *P1.2* ***

(a) the site is subject to a parking plan for the area adopted by council, in which case parking provision (spaces or cash-in-lieu) must be in accordance with that plan; *(b) the site is contained within a parking precinct plan and subject to Clause C2.7;* *(c) the site is subject to Clause C2.5.5; or* *(d) it relates to an intensification of an existing use or development or a change of use where:* *(i) the number of on-site car parking spaces for the existing use or development specified in Table C2.1 is greater than the number of car parking spaces specified in Table C2.1 for the proposed use or development, in which case no additional on-site car parking is required; or* *(ii) the number of on-site car parking spaces for the existing use or development specified in Table C2.1 is less than the number of car parking spaces specified in Table C2.1 for the proposed use or development, in which case on-site car parking must be calculated as follows: N = A + (C-B) N = Number of on-site car parking spaces required A = Number of existing on site car parking spaces B = Number of on-site car parking spaces required for the existing use or development specified in Table C2.1 C= Number of on-site car parking spaces required for the proposed use or development specified in Table C2.1.*	

The proposal does not propose any carparking. As there is no requirement for car parking for a Utilities use, the proposal complies with the Acceptable Solution.

C2.5.2 Bicycle parking numbers

A1 *Bicycle parking spaces must:* *(a) be provided on the site or within 50m of the site; and* *(b) be no less than the number specified in Table C2.1.*	*P1* ***

The proposal does not propose any bicycle parking. As there is no requirement for bicycle parking for a Utilities use, the proposal complies with the Acceptable Solution.

C2.5.3 Motorcycle parking numbers

Under clause C2.2.2, clause C2.5.3 does not apply to use or development within the Utilities Use Class.

C2.5.4 Loading bays

Under clause C2.2.3, clause C2.5.4 does not apply to use or development within the Utilities Use Class.

C2.5.5 Number of car parking spaces within the General Residential Zone and Inner Residential Zone

The proposal is not within the General Residential Zone or Inner Residential Zone, therefore clause C2.5.5 is not an applicable standard.

C2.6 Development Standards for Buildings and Works

The proposal includes the relocation of the access for the RTV training centre, for reason by of the spillway excavation and wing wall for the bridge alignment encroaching on the existing access location. As such the development standards of the Parking and Sustainable Transport Code are applicable.

C2.6.1 Construction of parking areas

A1 *All parking, access ways, manoeuvring and circulation spaces must:* *(a) be constructed with a durable all weather pavement;* *(b) be drained to the public stormwater system, or contain stormwater on the site; and* *(c) excluding all uses in the Rural Zone, Agriculture Zone, Landscape Conservation Zone, Environmental Management Zone, Recreation Zone and Open Space Zone, be surfaced by a spray seal, asphalt, concrete, pavers or equivalent material to restrict abrasion from traffic and minimise entry of water to the pavement.*	*P1* ***

The proposed access relocation will provide for a consistent access design which will be constructed of a durable sealed surface per (a) and (c), and will be drained to the public stormwater system via a relocated side entry pit at Circular Road (b).

The proposal therefore complies with the Acceptable Solution.

C2.6.2 Design and layout of parking areas

A1.1 *Parking, access ways, manoeuvring and circulation spaces must either:* *(a) comply with the following:* *(i) have a gradient in accordance with Australian Standard AS 2890 - Parking facilities, Parts 1-6;* *(ii) provide for vehicles to enter and exit the site in a forward direction where providing for more than 4 parking spaces;* *(iii) have an access width not less than the requirements in Table C2.2;* *(iv) have car parking space dimensions which satisfy the requirements in Table C2.3;* *(v) have a combined access and manoeuvring width adjacent to parking spaces not less than*	*P1* ***

the requirements in Table C2.3 where there are 3 or more car parking spaces; *(vi) have a vertical clearance of not less than 2.1m above the parking surface level; and* *(vii) excluding a single dwelling, be delineated by line marking or other clear physical means; or* *(b) comply with Australian Standard AS 2890- Parking facilities, Parts 1-6.* *A1.2* *Parking spaces provided for use by persons with a disability must satisfy the following:* *(a) be located as close as practicable to the main entry point to the building;* *(b) be incorporated into the overall car park design; and* *(c) be designed and constructed in accordance with Australian/New Zealand Standard AS/NZS 2890.6:2009 Parking facilities, Off-street parking for people with disabilities. 1*	

The accessway to the RTV training centre has been formed to the standard of a public road. The relocation of this access of a consistent design to the existing is considered sufficient to comply with (a)(i) through to (vii) noting the site is flat, the access is approximately 10m wide, and serves an existing parking area which affords onsite turning.

The proposal therefore complies with A1.1

For A1.2, the site includes accessible parking as part of the RTV site and this is not proposed to be altered. The proposal therefore complies with the Acceptable Solution.

C2.6.3 Number of accesses for vehicles

A1 *The number of accesses provided for each frontage must:* *(a) be no more than 1; or* *(b) no more than the existing number of accesses, whichever is the greater.*	*P1* *The number of accesses for each frontage must be minimised, having regard to:* *(a) any loss of on-street parking; and* *(b) pedestrian safety and amenity;* *(c) traffic safety;* *(d) residential amenity on adjoining land; and* *(e) the impact on the streetscape.*

The proposal is for a relocated access, therefore the number will not increase, and so complies with A1(b).

A2 *Within the Central Business Zone or in a pedestrian priority street no new access is provided unless an existing access is removed.*	*P2* *Within the Central Business Zone or in a pedestrian priority street, any new accesses must:* *(a) not have an adverse impact on:* *(i) pedestrian safety and amenity; or* *(ii) traffic safety; and* *(b) be compatible with the streetscape.*

The proposal is not within either the Central Business Zone, or a pedestrian priority street and so A2 is not applicable.

C2.6.4 Lighting of parking areas within the General Business Zone and Central Business Zone

The proposal does not include a carpark nor is it within the Central Business Zone or the Central Business Zone.

C2.6.5 Pedestrian access

The carpark for the RTV training centre is existing. No other carparks are provided and so C2.6.5 is not considered an applicable standard

C2.6.6 Loading bays

The proposal does not require, or propose any loading bays, therefore clause C2.6.6 is not applicable.

C2.6.7 Bicycle parking and storage facilities within the General Business Zone and Central Business Zone

No bicycle parking is required or proposed, and the proposal is neither within the General Business Zone or the Central Business Zone. Clause C2.6.7 therefore is not applicable.

C2.6.8 Siting of parking and turning areas

The proposal includes a relocated access for the RTV training centre. These works though within the Village Zone do not include any additional parking or turning areas forward of the building line. C2.6.8 is therefore not applicable.

C2.7 Parking Precinct Plan

The area is not subject to a parking precinct plan.

Road and Railway Assets Code [C3.0]

There are no exemptions from the Road and Railway Assets Code (C3.4.1), therefore provisions under C3.0 must be considered.

C3.5 Use Standards

C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junction

A1.1 *For a category 1 road or a limited access road, vehicular traffic to and from the site will not require:* *(a) a new junction;* *(b) a new vehicle crossing; or* *(c) a new level crossing.* *A1.2* *For a road, excluding a category 1 road or a limited access road, written consent for a new junction, vehicle crossing, or level crossing to*	*P1* *Vehicular traffic to and from the site must minimise any adverse effects on the safety of a junction, vehicle crossing or level crossing or safety or efficiency of the road or rail network, having regard to:* *(a) any increase in traffic caused by the use;* *(b) the nature of the traffic generated by the use;* *(c) the nature of the road;* *(d) the speed limit and traffic flow of the road;*

serve the use and development has been issued by the road authority. *A1.3* *For the rail network, written consent for a new private level crossing to serve the use and development has been issued by the rail authority.* *A1.4* *Vehicular traffic to and from the site, using an existing vehicle crossing or private level crossing, will not increase by more than:* *(a) the amounts in Table C3.1; or* *(b) allowed by a licence issued under Part IVA of the Roads and Jetties Act 1935 in respect to a limited access road.* *A1.5* *Vehicular traffic must be able to enter and leave a major road in a forward direction.*	*(e) any alternative access to a road;* *(f) the need for the use;* *(g) any traffic impact assessment; and* *(h) any advice received from the rail or road authority.*

A relocated access for the RTV training centre is proposed. This access is to be of a consistent design to the existing, albeit in an amended location to make way for the proposed causeway. The relocation will not introduce additional traffic movements for reason that it serves an existing use. The design presently can accommodate the nature of the traffic and the construction of the causeway and other minor road works will be undertaken contemporaneously to ensure adequate site lines and the like are available to users of the new access.

It is considered that the proposal complies with the Performance Criteria.

C3.6 Development Standards for Buildings and Works

C3.6.1 Habitable buildings for sensitive uses within a road or railway attenuation area

The proposal does not include a sensitive use, therefore C3.6.1 Habitable buildings for sensitive uses within a road or railway attenuation area is not an applicable standard.

C3.7 Development Standards for Subdivision

The proposal does not include subdivision, therefore clause C3.7 and all subclauses do not apply.

Natural Assets Code [C7.0]

C7.6 Development Standards for Buildings and Works

C7.6.1 Buildings and works within a waterway and coastal protection area or a future coastal refugia area

A1 *Buildings and works within a waterway and coastal protection area must:* *(a) be within a building area on a sealed plan approved under this planning scheme;* *(b) in relation to a Class 4 watercourse, be for a crossing or bridge not more than 5m in width; or* *(c) if within the spatial extent of tidal waters, be an extension to an existing boat ramp, car park,*	*P1.1* *Buildings and works within a waterway and coastal protection area must avoid or minimise adverse impacts on natural assets, having regard to:* *(a) impacts caused by erosion, siltation, sedimentation and runoff;* *(b) impacts on riparian or littoral vegetation;*

jetty, marina, marine farming shore facility or slipway that is not more than 20% of the area of the facility existing at the effective date.	*(c) maintaining natural streambank and streambed condition, where it exists;* *(d) impacts on in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation;* *(e) the need to avoid significantly impeding natural flow and drainage;* *(f) the need to maintain fish passage, where known to exist;* *(g) the need to avoid land filling of wetlands;* *(h) the need to group new facilities with existing facilities, where reasonably practical;* *(i) minimising cut and fill;* *(j) building design that responds to the particular size, shape, contours or slope of the land;* *(k) minimising impacts on coastal processes, including sand movement and wave action;* *(l) minimising the need for future works for the protection of natural assets, infrastructure and property;* *(m) the environmental best practice guidelines in the Wetlands and Waterways Works Manual; and* *(n) the guidelines in the Tasmanian Coastal Works Manual.* *P1.2* *Buildings and works within the spatial extent of tidal waters must be for a use that relies upon a coastal location to fulfil its purpose, having regard to:* *(a) the need to access a specific resource in a coastal location;* *(b) the need to operate a marine farming shore facility;* *(c) the need to access infrastructure available in a coastal location;* *(d) the need to service a marine or coastal related activity;* *(e) provision of essential utility or marine infrastructure; or* *(f) provisions of open space or for marine-related educational, research, or recreational facilities.*

The proposal includes works within two portions of land to which the waterway coastal protection area has been applied. For the western portion, this has been applied to a tributary to the Pet Reservoir which, though dammed in the location of the Ridgley Gospel Hall, forms part of the stormwater network for the area and still carries flows. This tributary is in a somewhat natural condition where south of the Ridgley Highway, though is interrupted by crossings of the Melba Line and Circular Road.

Where the tributary feeds into the Reservoir, the proposed works will modify the bank to widen the approach before the spillway crest (as shown in section A of Attachment 2) and will require removal of some riparian vegetation.

To the east of the site the waterway coastal protection area has been applied to a minor tributary to the Pet River, and its western bank. Much of the spillway is outside of the waterway coastal protection area as has been applied over this tributary, though some portions do encroach within it, as well as where the spillway feeds into the Pet River.

By reason of the works within these two areas, the proposal is reliant on the Performance Criteria.

For (a), the works are intended to be undertaken in accordance with an erosion and sediment control plan (see Attachment 4) which has been specifically formulated having regard to the

Wetlands and Waterways Works Manual. Such a plan can be included in any Construction Management Plan as required by condition of any permit issued.

For (b) Impacts on riparian are such that vegetation removal is required, though the proposal is supported by a Natural Values Assessment (see Attachment 3) which speaks to the limited conservation value of this vegetation. The vegetation removal is limited to the footprint of works as shown on the plans, as well as haulage route and stockpile areas as shown in the appendices to the Natural values Assessment. Trees outside the footprint of these areas will be monitored and only where required for reasons of safety will they be removed.

For (c), at the western portion, the stream bank condition is though established not of a natural condition in any event, owed to the damming of the Pet River to create the reservoir. For that portion to the east, the works will alter the natural stream bank condition so as to provide for the channelised spillway, and this is a necessity for the functionality of the dam.

For (d), habitat within the area is examined within the Natural Values Assessment (Attachment 3).

For (h), the siting of the spillway is entirely dictated by the operation of the dam and the effective management of overtopping water.

For (i), the extent of cut and fill is limited to that required for the design of the spillway.

For (j) the design of the spillway is entirely necessary to be sited as proposed in order to effectively function.

And for (m) the guidelines of the Wetlands and Waterways Works Manual are to be incorporated into a Construction Management Plan

(e), (f),(g),(k),(l) and (n) are not considered relevant.

A2 *Buildings and works within a future coastal refugia area must be located within a building area on a sealed plan approved under this planning scheme.*	*P2.1* *** *P2.2* ***

The proposal is not within a future coastal refugia area, therefore A2/P2.1 and P2.2 are not applicable.

A3 *Development within a waterway and coastal protection area or a future coastal refugia area must not involve a new stormwater point discharge into a watercourse, wetland or lake.*	*P3* ***

No new stormwater point is proposed, therefore A3/P3 are not applicable.

A4 *Dredging or reclamation must not occur within a waterway and coastal protection area or a future coastal refugia area.*	*P4.1* ***

No dredging or reclamation works are proposed, therefore A4/P4 are not applicable.

A5 *Coastal protection works or watercourse erosion or inundation protection works must not occur*	*P5* ***

within a waterway and coastal protection area or a future coastal refugia area.	

The proposal does not include protection works, therefore A5/P5 are not applicable.

C7.6.2 Clearance within a priority vegetation area

A1 *Clearance of native vegetation within a priority vegetation area must be within a building area on a sealed plan approved under this planning scheme.*	*P1.1* *Clearance of native vegetation within a priority vegetation area must be for:* *(a) an existing use on the site, provided any clearance is contained within the minimum area necessary to be cleared to provide adequate bushfire protection, as recommended by the Tasmania Fire Service or an accredited person;* *(b) buildings and works associated with the construction of a single dwelling or an associated outbuilding;* *(c) subdivision in the General Residential Zone or Low Density Residential Zone;* *(d) use or development that will result in significant long term social and economic benefits and there is no feasible alternative location or design;* *(e) clearance of native vegetation where it is demonstrated that on-going pre-existing management cannot ensure the survival of the priority vegetation and there is little potential for long-term persistence; or* *(f) the clearance of native vegetation that is of limited scale relative to the extent of priority vegetation on the site.* *P1.2* *Clearance of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation, having regard to:* *(a) the design and location of buildings and works and any constraints such as topography or land hazards;* *(b) any particular requirements for the buildings and works;* *(c) minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings;* *(d) any mitigation measures implemented to minimise the residual impacts on priority vegetation;* *(e) any on-site biodiversity offsets; and* *(f) any existing cleared areas on the site.*

The priority vegetation area is limited in application to the land which is within the Utilities Zone. Within this area, the Utilities use is existing and so complies with P1.1(a).

For P1.2, the proposal is supported by a Natural Values Assessment (Attachment 3) which considers the extent of works and impacts on priority vegetation, and provides specific recommendations relating to vegetation removal associated with the spillway.

For that vegetation within the Utilities Zone, the assessment finds the vegetation in this area does not meet the definition of priority vegetation, and that the project impact area has utilised existing cleared areas to the extent possible.

The proposal is considered to comply.

C7.7 Development Standards for Subdivision

The proposal does not include subdivision, therefore clause C3.7 and all subclauses do not apply.

4. Conclusion

This proposal seeks approval for upgrades to the Pet Dam spillway, and associated works for vegetation clearance and provision of a causeway. The development is on land zoned Village, Utilities and Agriculture, which is subject to the priority vegetation area and waterway coastal protection area.

The proposal has been considered against the use and development standards of the Village Zone, Utilities Zone, and Agriculture Zone, and the proposal generates the following discretions under the Scheme:

- 21.3.1 Discretionary uses (P1) and (P2)
- C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junction (P1)
- C7.6.1 Buildings and works within a waterway and coastal protection area or a future coastal refugia area (P1.1) and (P1.2)
- C7.6.2 Clearance within a priority vegetation area (P1.1) and (P1.2)

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

If Council requires any further information or clarification concerning this application, please contact us at planning@mcplanners.com.au or by phone at 6288 7248

Yours faithfully

MC PLANNERS

Peter Coney

SENIOR PLANNER

ATTACHMENT 1

Title Information

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
135380	1
EDITION	DATE OF ISSUE
4	06-Sep-2019

SEARCH DATE : 10-Jul-2025
SEARCH TIME : 02.12 PM

DESCRIPTION OF LAND

City of BURNIE
Lot 1 on Plan 135380
Derivation : Part of 50,000 Acres Granted to The Van Diemens Land Company
Prior CT 41368/1

SCHEDULE 1

D137166 TRANSFER to THE TRUST COMPANY (PTAL) LIMITED
Registered 12-Oct-2015 at 12.03 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
11/5250 LEASE - BURDENING EASEMENT: The water supplies enjoyed by the Emu Bay and Mount Bischoff Railway Company Limited during the term of the said Lease for Railway purposes
SP 135378 BENEFITING EASEMENT: Right of Carriageway over the Right of Way marked ABCGH on Plan No.135380
SP 135378 BURDENING EASEMENT: Right of Carriageway (appurtenant to Lot 2 on Sealed Plan No.135378) over the Right of Way 15.00 wide shown on Plan No.135380
SP 135378 BURDENING EASEMENT: Right of Drainage (appurtenant to Lot 2 on Sealed Plan No.135380) over the Drainage Easement 5.00 wide shown on Plan No.135380
C284166 TRANSFER of EASEMENT BURDENING EASEMENT: Pipeline Easement for the Burnie City Council over the Pipeline Easement 2.00 wide shown on Plan No.135380 Registered 07-Jun-2001 at noon
E54397 BURDENING EASEMENT: a pipeline easement (appurtenant to Lot 1 on Sealed Plan 135378) over the land marked Pipeline Easement 8.00 wide on Plan 135380 Registered 06-Sep-2019 at 12.01 PM
C892480 PRIVATE TIMBER RESERVE pursuant to Section 15(1) of the Forest Practices Act 1985 Notification of a Private Timber Reserve (affecting part of the said land within described as shown on the plan hatched on

the plan annexed therto) Registered 04-Jun-2009 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

OWNER Associated Forest Holdings Pty. Ltd.

FOLIO REFERENCE C.T. 41368-1

GRANTEE Part of Section 267 in the Emu Bay Block of 50000 Acres, Granted to the Van Diemens Land Co.

PLAN OF TITLE

LOCATION

CITY OF BURNIE

CONVERTED BY PLAN No D.39462

COMPILED BY Peacock, Darcey & Anderson Pty. Ltd.

NOT TO SCALE LENGTHS IN METRES

REGISTERED NUMBER

P135380

APPROVED 10 APR 2002

Alice Kawa
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. (4044-31,41) 103	LAST UPI No 4209305	LAST PLAN No D41368	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

SKETCH BY WAY OF ILLUSTRATION ONLY

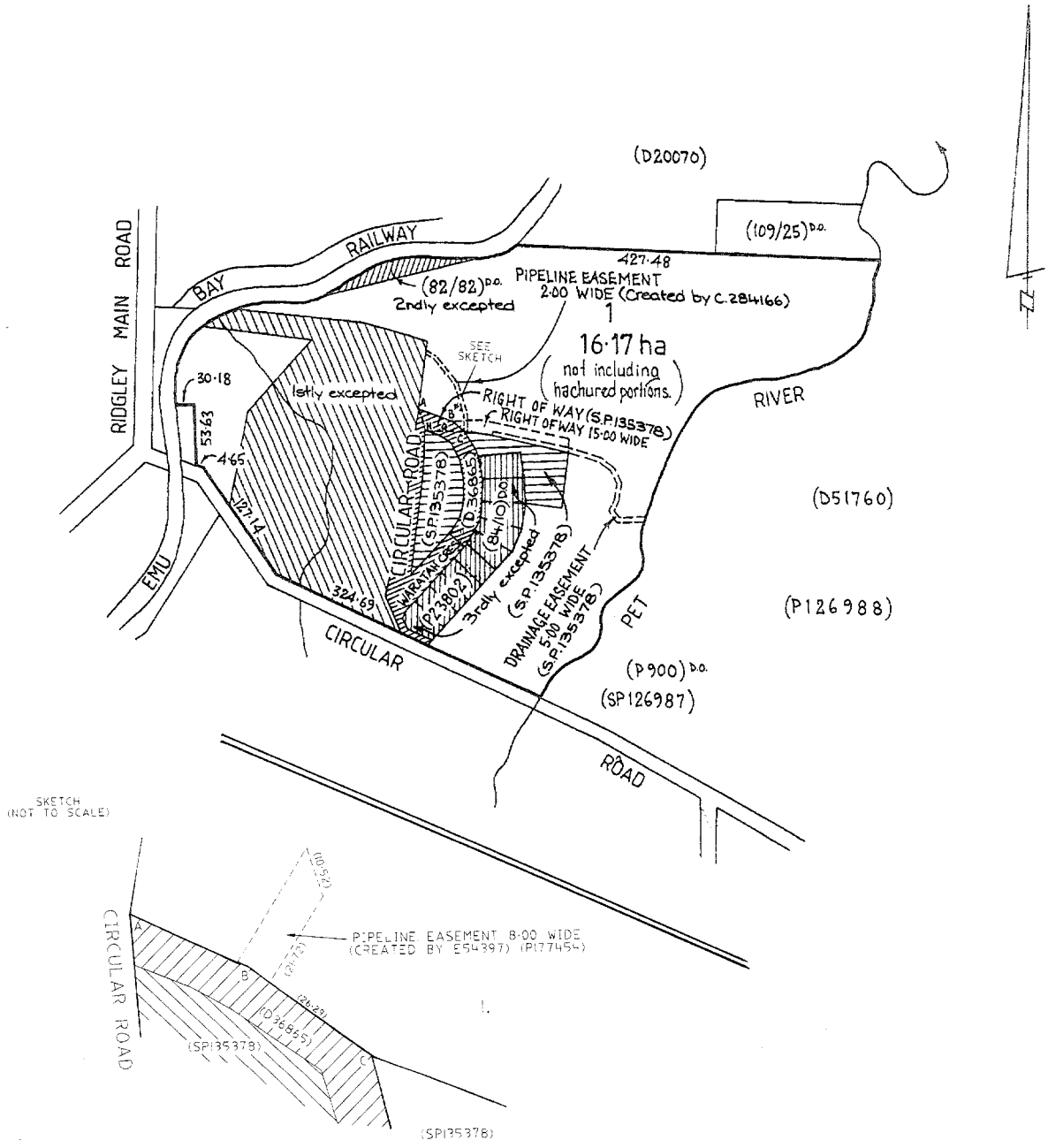
BALANCE PLAN

"EXCEPTED LANDS"

Lot 1 8386m², D 36865

Lot 3, ROAD, part Lot 1

& part Lot 2 (1·070ha) SP 135378



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
135378	1
EDITION	DATE OF ISSUE
4	06-Sep-2019

SEARCH DATE : 10-Jul-2025
SEARCH TIME : 02.13 PM

DESCRIPTION OF LAND

City of BURNIE
Lot 1 on Sealed Plan 135378
Derivation : Part of 50,000 Acres Granted to The Van Diemens Land Company
Prior CTs 41368/1 and 36865/1

SCHEDULE 1

M750179 TRANSFER to JASON ANDREW MCDONALD and MARIE GWENDOLINE MCDONALD Registered 06-Sep-2019 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP 135378 EASEMENTS in Schedule of Easements
E54396 BURDENING EASEMENT: an electricity infrastructure easement (appurtenant to Lot 2 on Sealed Plan 135378) over the land marked Wayleave Easement Variable Width on Sealed Plan 135378 Registered 06-Sep-2019 at 12.02 PM
E54396 BURDENING EASEMENT: a services easement (appurtenant to Lot 2 on Sealed Plan 135378) over the land marked Services Easement Variable Width on Sealed Plan 135378 Registered 06-Sep-2019 at 12.02 PM
E54396 BURDENING EASEMENT: a right of footway (appurtenant to Lot 2 on Sealed Plan 135378) over the land marked Footway & Services Easement Variable Width on Sealed Plan 135378 Registered 06-Sep-2019 at 12.02 PM
E54397 BENEFITING EASEMENT: a pipeline easement over the land marked Pipeline Easement 8.00 wide on Sealed Plan 135378 Registered 06-Sep-2019 at 12.01 PM
E54396 BURDENING EASEMENT: a right of carriageway and a services easement (appurtenant to Lot 2 on Sealed Plan 135378) over the land marked Right of Way & Services Easement Variable Width on Sealed Plan 135378 Registered 06-Sep-2019 at 12.02 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

OWNER North Broken Hill Ltd, Associated Forest Holdings P/L, Burnie City Council

FOLIO REFERENCE CT 23802-6, 7, 8, 9 & 10
CT41368-1 & CT36865-1

GRANTEE Part of Section 267 in the Emu Bay Block of 50000Ac, Gtd to Van Diemens Land Co.

PLAN OF SURVEY

BY SURVEYOR PAUL PLUNKETT of PEACOCK, DARCEY & ANDERSON PTY LTD AUTHORISED SURVEYORS 6 QUEEN STREET, BURNIE

LOCATION

CITY OF BURNIE

SCALE 1: 1000 LENGTHS IN METRES

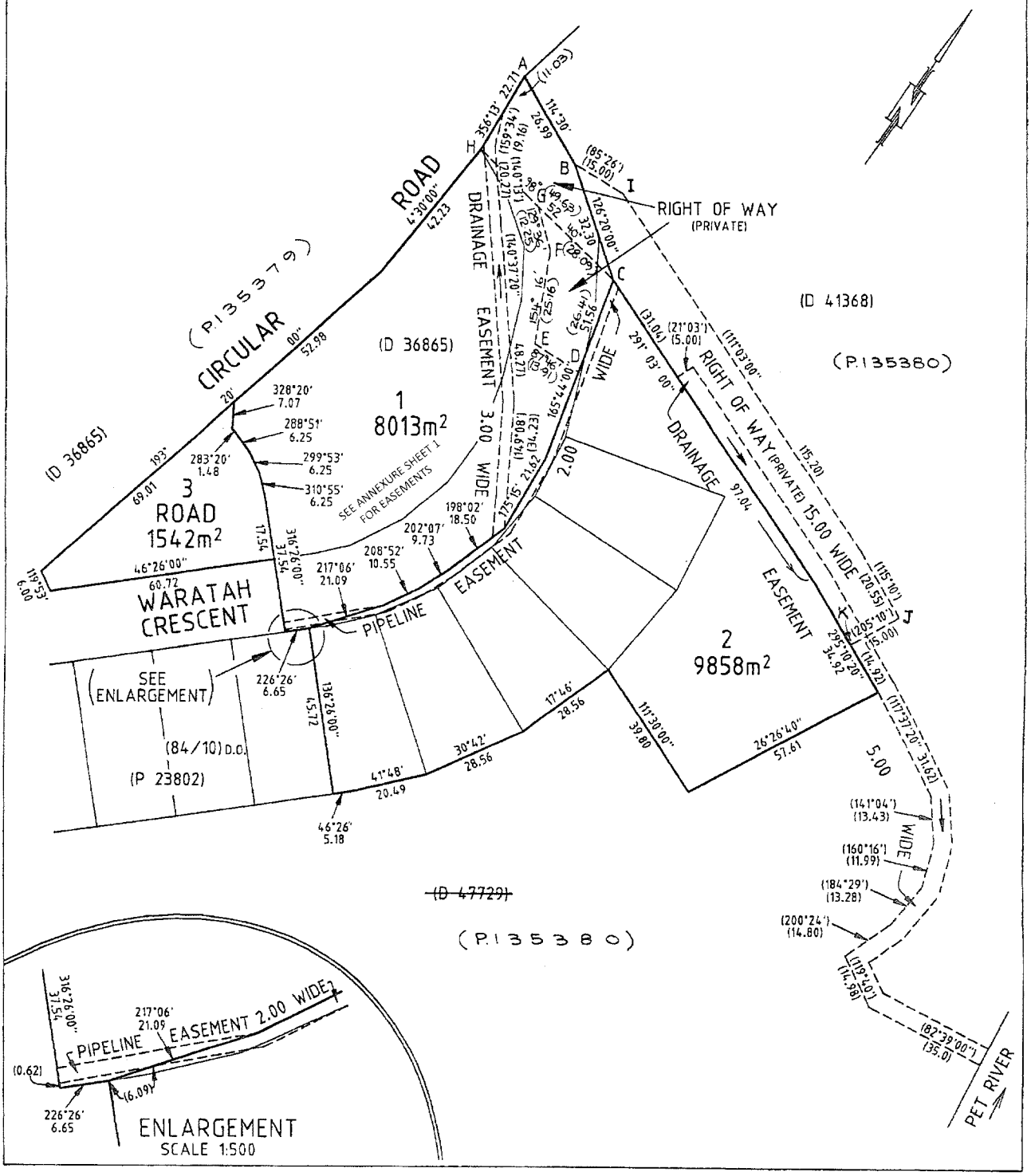
REGISTERED NUMBER

SP135378

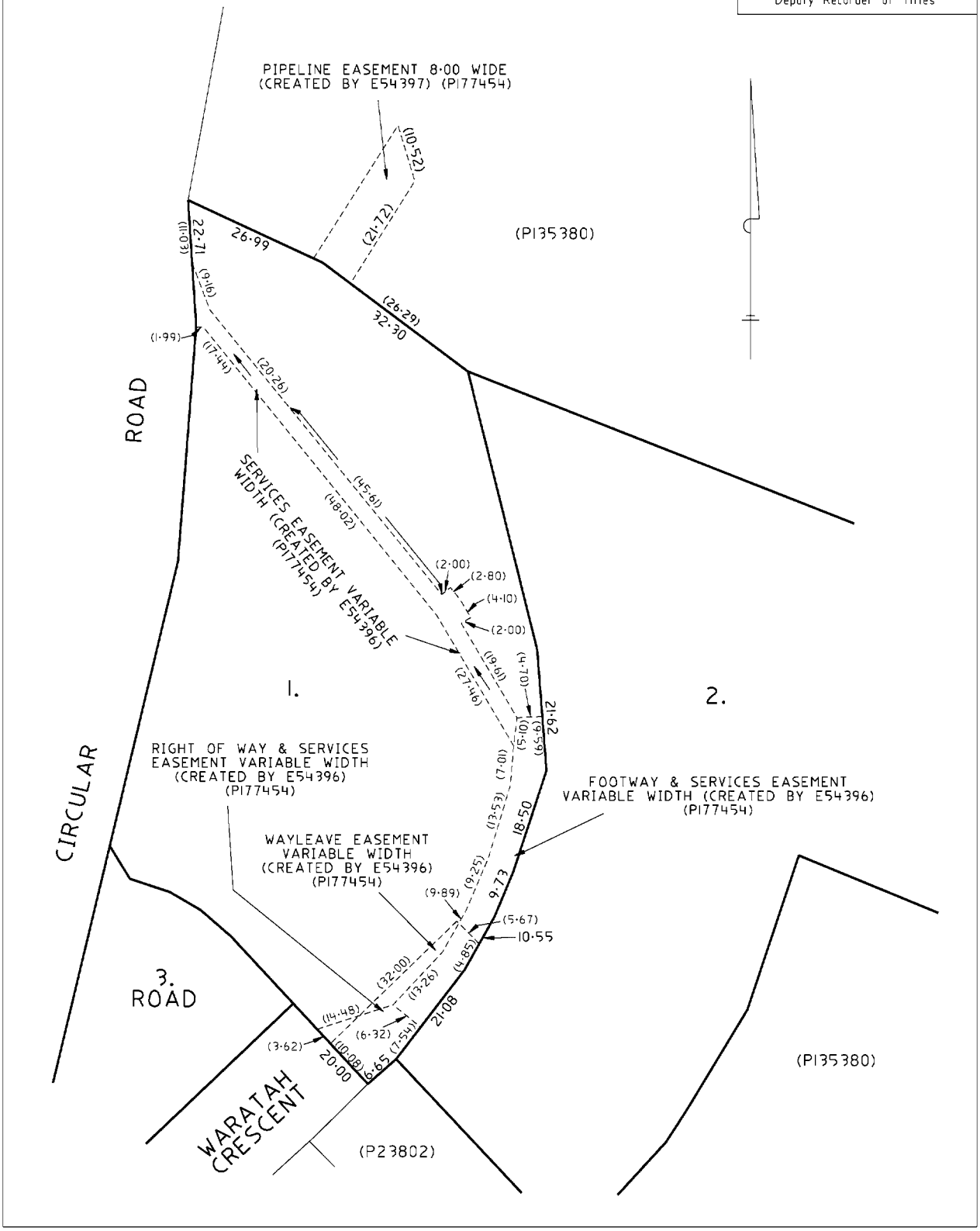
APPROVED
EFFECTIVE FROM 10 APR 2002

Alice Kawa
Recorder of Titles

MAPSHEET MUNICIPAL CODE No (4044-41)	103	LAST UPI No	4209373 - 4209377 4209305	LAST PLAN No	D36865 P23802 D41368	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN



PLAN OF TITLE ANNEXURE SHEET SHEET 1 OF 1 SHEETS	OWNER FOLIO PLAN CT: 135378/1, 135378/2, 135380/1 SCALE 1: 600 LENGTH IN METERS	Registered Number SP.135378 APPROVED 29 JULY 2019 Deputy Recorder of Titles



SCHEDULE OF EASEMENTS	Registered Number
NOTE: THE SCHEDULE MUST BE SIGNED BY THE OWNERS & MORTGAGEES OF THE LAND AFFECTED. SIGNATURES MUST BE ATTESTED.	SP135378

EASEMENTS AND PROFITS

Each lot on the plan is together with:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as may be necessary to drain the stormwater and other surplus water from such lot; and
(2) any easements or profits a prendre described hereunder.
Each lot on the plan is subject to:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as passing through such lot as may be necessary to drain the stormwater and other surplus water from any other lot on the plan; and
(2) any easements or profits a prendre described hereunder.
The direction of the flow of water through the drainage easements shown on the plan is indicated by arrows.

EASEMENTS:

Lot 1 is SUBJECT TO a right of drainage in favour of the Burnie City Council over the land marked Drainage Easement 3.00 wide passing through Lot 1.

Lot 1 is SUBJECT TO a right of carriageway (appurtenant to the balance land) marked Right of Way (Private) ABCGH passing through Lot 1.

Lot 1 is SUBJECT TO a right of carriageway (appurtenant to Lot 2) marked Right of Way (Private) ABCDEFGH passing through Lot 1.

Lot 1 AND Lot 2 are SUBJECT TO a pipeline easement in favour of the Burnie City Council over the land marked Pipeline Easement 2.00 wide passing through Lot 1 and Lot 2.

Lot 2 is TOGETHER WITH a right of carriageway marked Right of Way (Private) ABCDEFGH passing through Lot 1

Lot 2 is TOGETHER with a drainage easement over the ~~balance~~ land ~~and~~ marked Drainage Easement 5.00 wide passing through the balance land. and shown on the plan

Lot 2 is TOGETHER WITH a right of carriageway Over the land marked Right of Way (Private) 15.00 wide BIJKC over the balance land and passing through the balance land. and shown on the plan

"Pipeline Easement" means the full and free right and liberty for the Burnie City Council to enter upon the strip of land shown of the plan therein and marked "Pipeline Easement 2.00 wide" and to lay repair replace clean and maintainwater pipes and the Burnie City Council shall make good any damage to the surface occasioned thereby.

(USE ANNEXURE PAGES FOR CONTINUATION)

SUBDIVIDER: Associated Forest Holdings FOLIO REF: CT 23802 - 6, 7, 8, 9 & 10 CT 41368-1 & CT 36865-1 SOLICITOR & REFERENCE: bjc/AFH-Schedule	PLAN SEALED BY: Burnie DATE: 1ST JUNE 2000 SD 692 REF NO. Council Delegate

NOTE: The Council Delegate must sign the Certificate for the purposes of identification.

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 2 OF ..2..... PAGE/S	Registered Number SP135378
SUBDIVIDER: Associated Forest Holdings FOLIO REFERENCE: CT 23802 - 6, 7, 8, 9 & 10 CT 41368-1 & CT 36865-1	

THE COMMON SEAL of)
ASSOCIATED FOREST)
HOLDINGS PTY LTD)
was hereunto affixed)
in the presence of -)

Secretary

ASSOCIATED FOREST HOLDINGS PTY. LTD. A.C.N. 004 352 078 COMMON SEAL

Director

THE COMMON SEAL of)
THE BURNIE CITY)
COUNCIL was hereunto)
affixed in the presence of -)

BALANCE MEANS the land remaining in Folio of the Register Volume 41368 Folio 1 after excepting out those portions of Lots 1 and 2 on the Plan.

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
135379	1
EDITION	DATE OF ISSUE
1	10-Apr-2002

SEARCH DATE : 10-Jul-2025
SEARCH TIME : 02.14 PM

DESCRIPTION OF LAND

City of BURNIE
Lot 1 on Plan 135379
Derivation : Part of 50,000 Acres Gtd. to The Van Diemens Land Company
Prior CT 36865/1

SCHEDULE 1

B300575 BURNIE CITY COUNCIL

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
11/5250 BURDENING EASEMENT: The water supplies enjoyed by the Emu Bay and Mount Bischoff Railway Company Limited during the term of the said Lease for Railway purposes

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

OWNER Burnie City Council

FOLIO REFERENCE C.T. 36865-1

GRANTEE Part of Section 267 in the Emu Bay Block of 50000Ac, Gtd to The Van Diemens Land Co.

PLAN OF TITLE

LOCATION

CITY OF BURNIE

FIRST SURVEY PLAN No. D.36865

COMPILED BY Peacock, Darcey & Anderson Pty. Ltd.

SCALE 1:1250 LENGTHS IN METRES

REGISTERED NUMBER

P135379

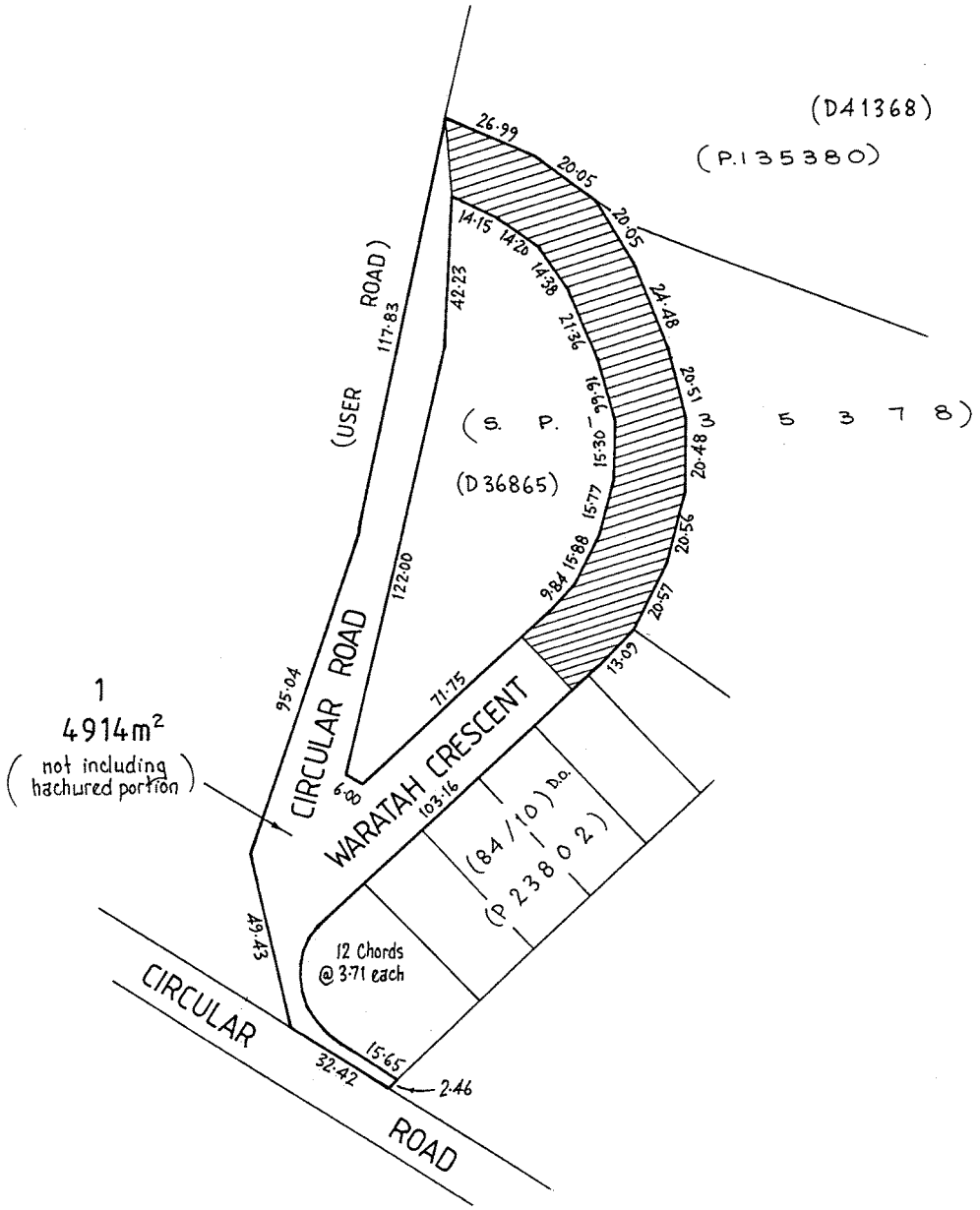
APPROVED 10 APR 2002

Alice Kawa
Recorder of Titles

MAPSHEET MUNICIPAL CODE No.(4044-41) 103	LAST UPI No —	LAST PLAN No. D36865	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

COMPILED PLAN

BALANCE PLAN



ATTACHMENT 2

Proposal Plans

IMAGE FROM GOOGLE EARTH

LOCALITY PLAN

SCALE: NTS

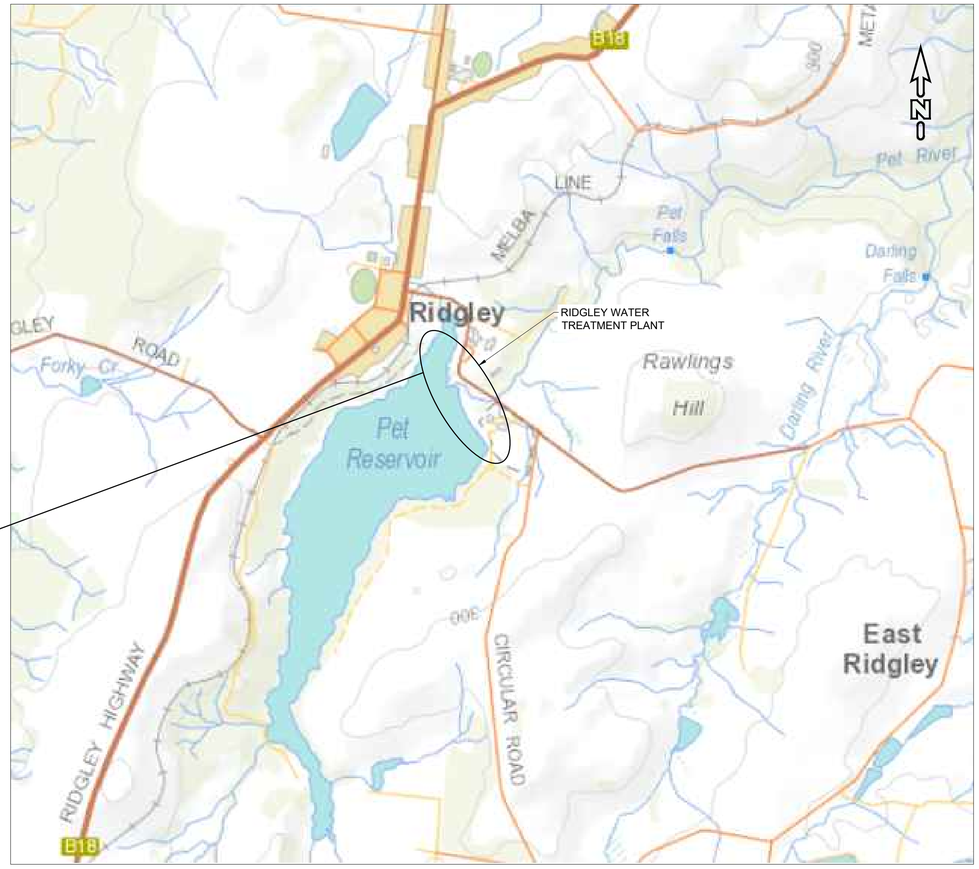


IMAGE FROM GOOGLE EARTH

SITE LOCATION

SCALE: NTS

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR

TasWater Capital Delivery Office

TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653 © 2024

Scale	NTS
Datum	NA
Sheet Size	A1

References

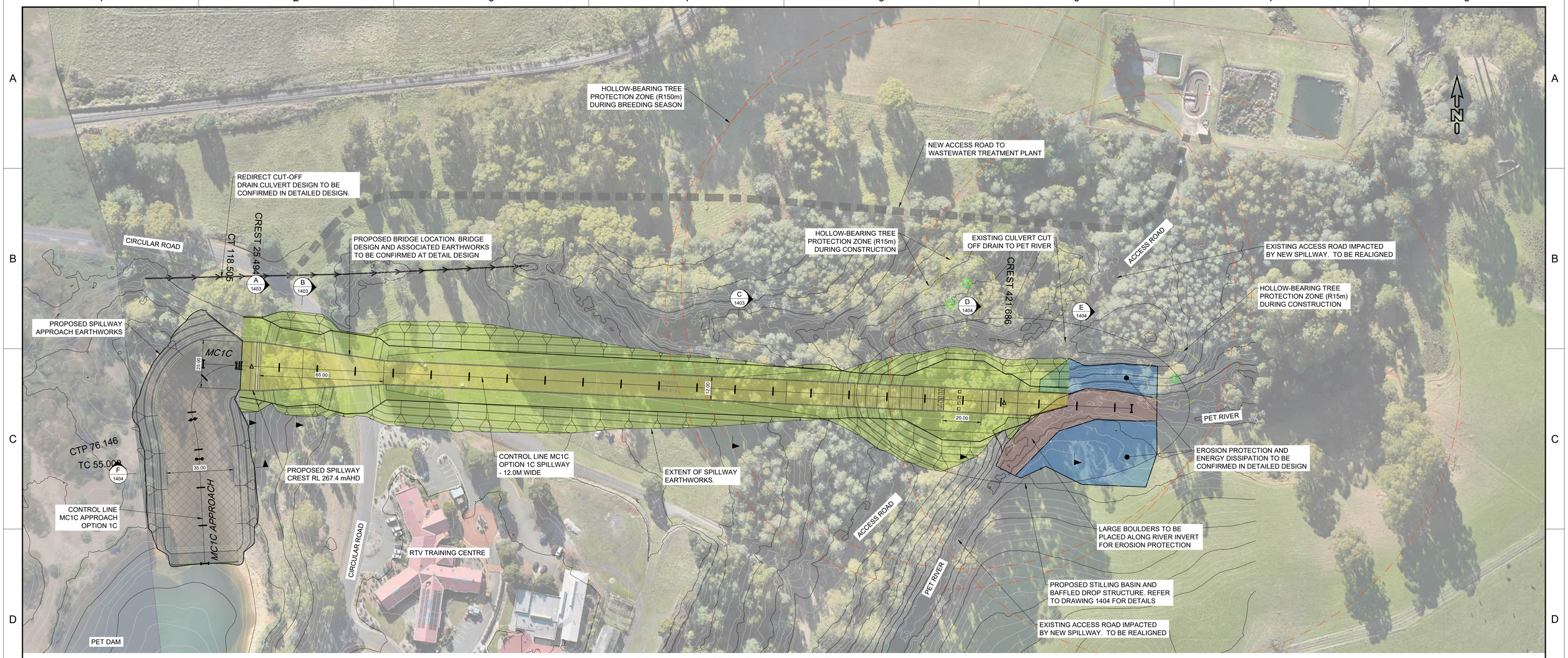
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
LOCALITY PLAN

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-0002	002	A



SPILLWAY WORKS PLAN - OPTION 1C

SCALE 1:1000

NOT FOR CONSTRUCTION

20 10 0 20 40 60 80 100m
SCALE 1:1000

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR

TasWater Capital Delivery Office

TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653 © 2024

Scale	AS SHOWN
Datum	AHD83
Sheet Size	A1
References	

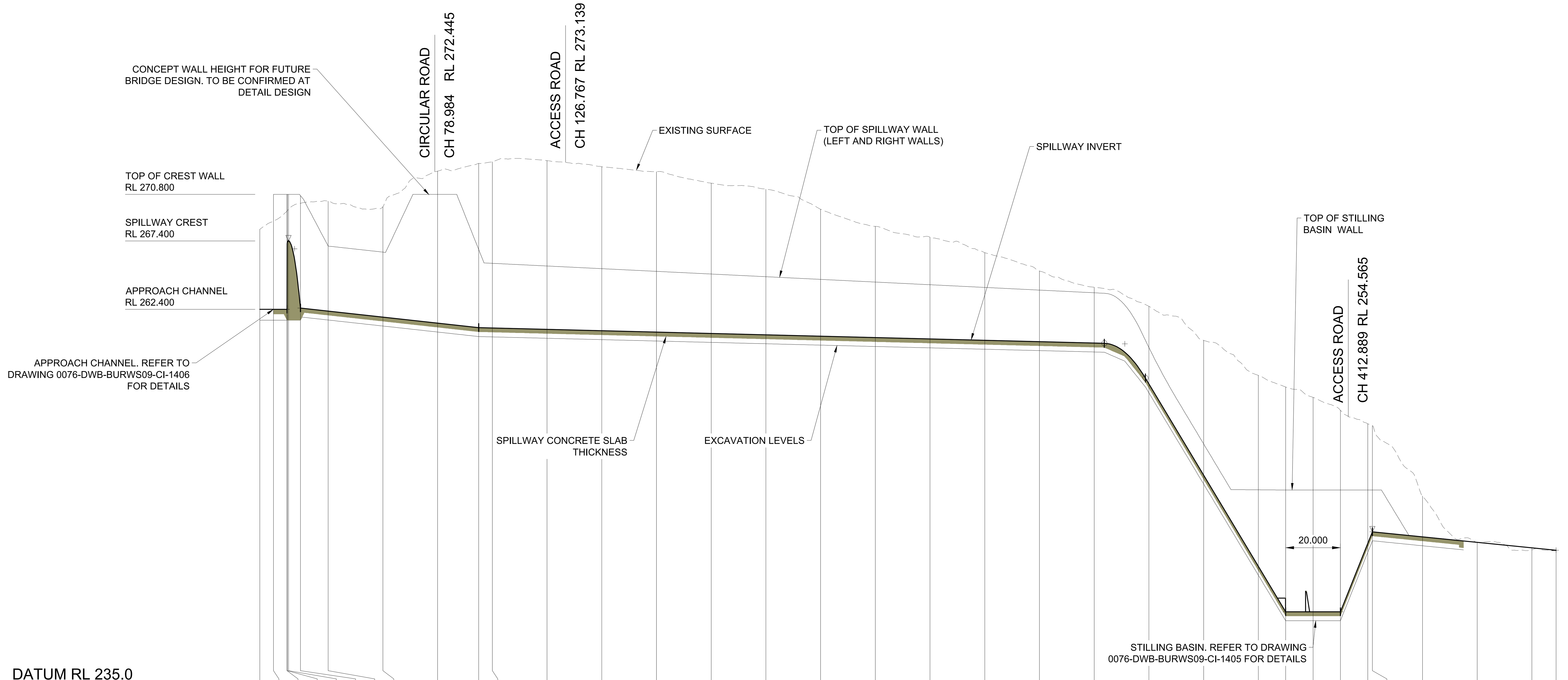
DESIGN			DATE	REVIEW			DATE
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P. Southcott	ENTURA	Mar 2025

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C PLAN

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1401	1 of 6	A



DATUM RL 235.0

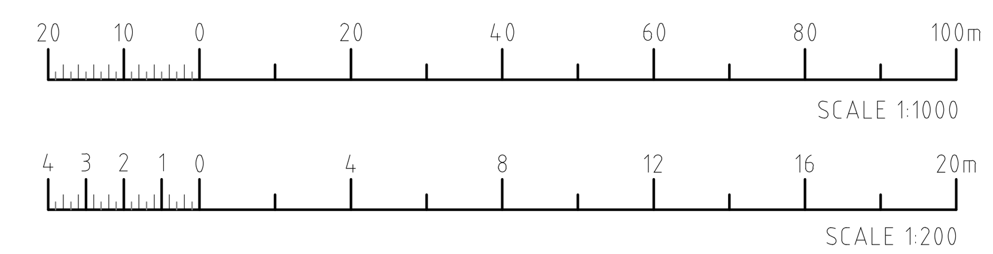
VERTICAL DATA: 0.00% | -2.20% | -0.50% | R=45.7 L=15 | -33.30% | 0.00% | 50.00% | -2.00%

CHAINAGE	TOP OF WALL	WALL HEIGHT	EXISTING SURFACE	CUT - FILL +	SPILLWAY INVERT LEVEL
15.00			268.25	-5.85	262.40
20.00	270.80	-8.40	268.85	-6.45	262.40
24.94	270.80	-8.40	269.58	-7.18	262.40
25.05	270.80	-3.54	269.60	-2.34	267.26
25.49	270.80	-3.40	269.71	-2.31	267.40
29.87	270.70	-8.21	270.15	-7.65	262.49
40.00	267.02	-4.75	270.30	-8.03	262.27
60.00	266.58	-4.75	269.90	-8.07	261.83
80.00	270.80	-9.41	272.50	-11.11	261.39
95.00	266.78	-5.72	273.06	-12.00	261.06
100.00	265.76	-4.73	273.18	-12.14	261.03
120.00	265.57	-4.63	273.26	-12.33	260.93
140.00	265.37	-4.53	272.82	-11.98	260.83
160.00	265.17	-4.44	272.46	-11.72	260.73
180.00	264.98	-4.34	271.62	-10.98	260.63
200.00	264.78	-4.25	271.17	-10.64	260.53
220.00	264.59	-4.15	269.71	-9.28	260.43
240.00	264.39	-4.06	268.46	-8.13	260.33
260.00	264.20	-3.96	267.67	-7.44	260.23
280.00	264.00	-3.87	266.54	-6.40	260.13
300.00	263.80	-3.77	265.20	-5.16	260.03
320.00	263.61	-3.67	264.02	-4.08	259.93
340.00	259.61	-2.66	262.62	-5.67	256.95
360.00	252.57	-2.28	260.13	-9.84	250.29
380.00	249.22	-5.59	257.57	-13.94	243.63
390.00	249.20	-8.90	256.73	-16.43	240.30
400.00	249.20	-8.90	255.97	-15.67	240.30
410.00	249.20	-8.90	255.03	-14.73	240.30
420.00	249.20	-3.90	254.04	-8.74	245.30
421.69	249.20	-3.06	253.90	-7.76	246.14
440.00	245.80	-0.02	248.76	-2.98	245.78
460.00			245.38	0.00	245.38
480.00			244.82	0.15	244.98
488.82			244.77	0.03	244.80

SPILLWAY OPTION 1C LONGITUDINAL SECTION

SCALE 1:1000H
1:200V

NOTES:
1. FOR INDICATIVE WATER LEVELS REFER TO PET DAM SPILLWAY OPTIMISATION PROJECT NOTE ENTURA-886904507-6935



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Rev.No.	Amendment	Date	Authorised
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Datum	AHD83
Sheet Size	A1

References

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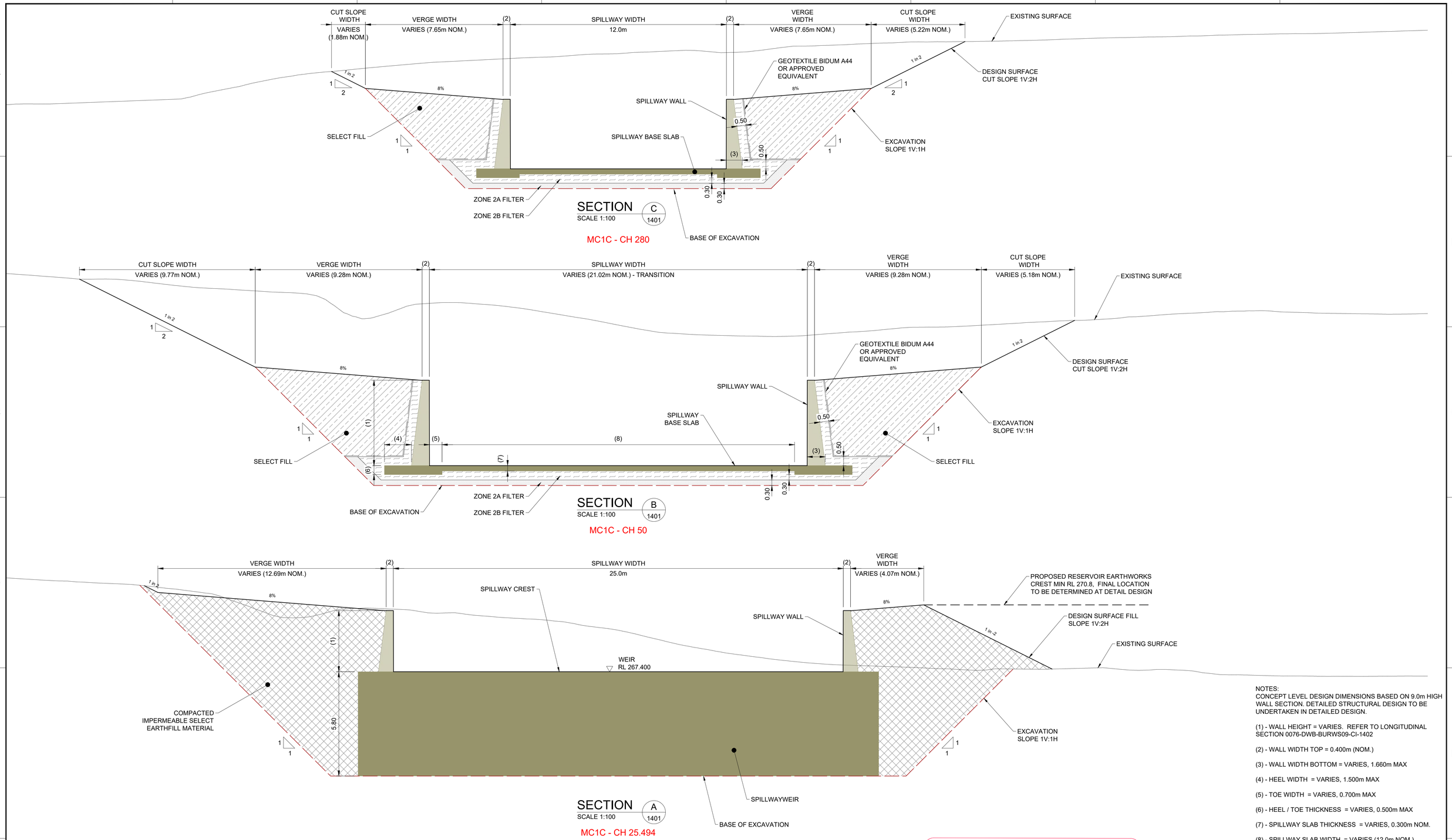
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P. Southcott	ENTURA	Mar 2025

Drawing Issue
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C LONGITUDINAL SECTION

Drawing Number: 0076-DWB-BURWS09-CI-1402 | Sheet Number: 2 of 6 | Revision: A



NOTES:
CONCEPT LEVEL DESIGN DIMENSIONS BASED ON 9.0m HIGH WALL SECTION. DETAILED STRUCTURAL DESIGN TO BE UNDERTAKEN IN DETAILED DESIGN.

(1) - WALL HEIGHT = VARIES. REFER TO LONGITUDINAL SECTION 0076-DWB-BURWS09-CI-1402

(2) - WALL WIDTH TOP = 0.400m (NOM.)

(3) - WALL WIDTH BOTTOM = VARIES, 1.660m MAX

(4) - HEEL WIDTH = VARIES, 1.500m MAX

(5) - TOE WIDTH = VARIES, 0.700m MAX

(6) - HEEL / TOE THICKNESS = VARIES, 0.500m MAX

(7) - SPILLWAY SLAB THICKNESS = VARIES, 0.300m NOM.

(8) - SPILLWAY SLAB WIDTH = VARIES (12.0m NOM.),

NOT FOR CONSTRUCTION

2 1 0 2 4 6 8 10m
SCALE 1:100

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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Sheet Size	A1
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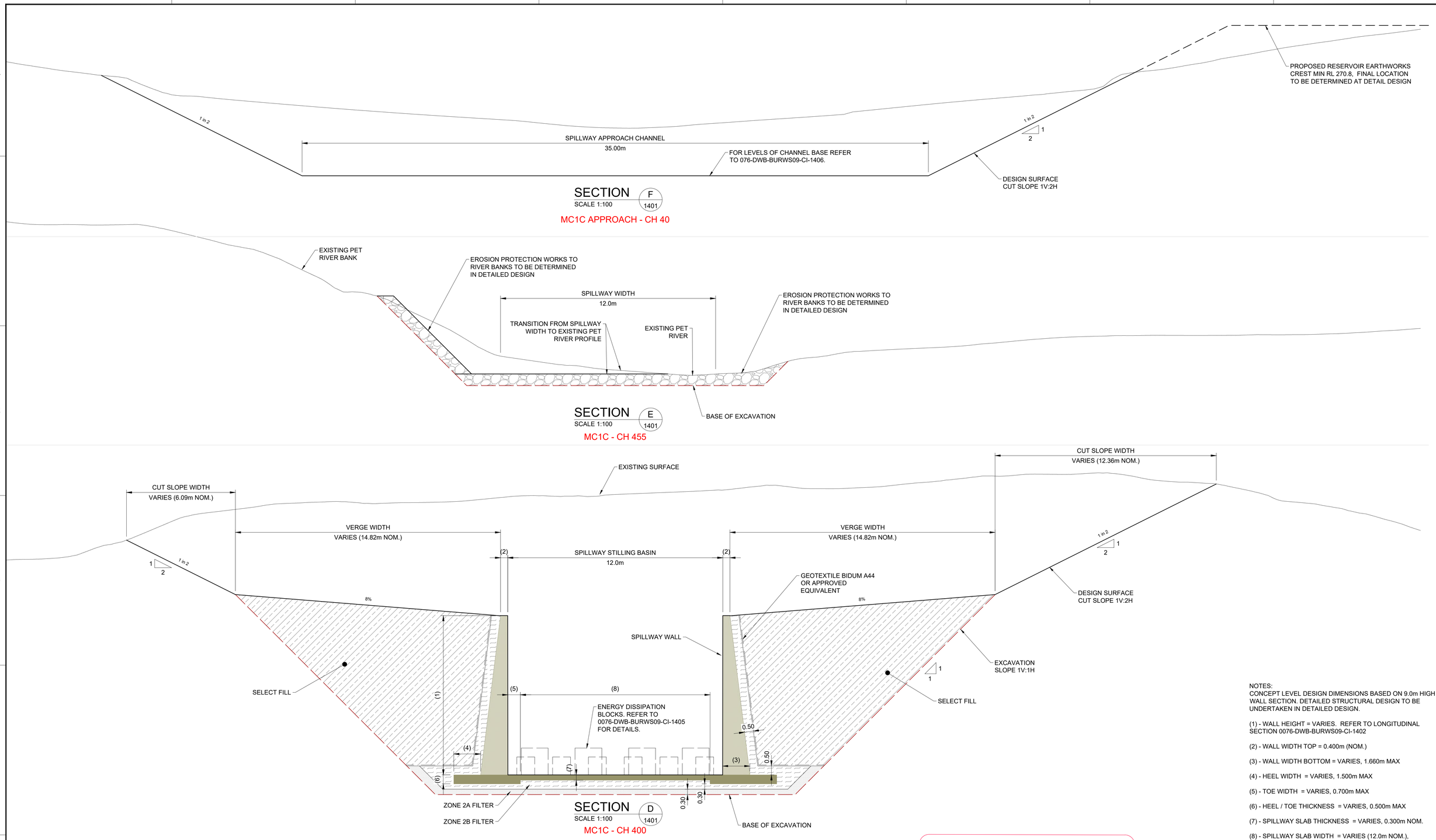
Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C SECTIONS - SHEET 1 OF 2

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1403	3 of 6	A



NOTES:
CONCEPT LEVEL DESIGN DIMENSIONS BASED ON 9.0m HIGH WALL SECTION. DETAILED STRUCTURAL DESIGN TO BE UNDERTAKEN IN DETAILED DESIGN.

(1) - WALL HEIGHT = VARIES. REFER TO LONGITUDINAL SECTION 0076-DWB-BURWS09-CI-1402

(2) - WALL WIDTH TOP = 0.400m (NOM.)

(3) - WALL WIDTH BOTTOM = VARIES, 1.660m MAX

(4) - HEEL WIDTH = VARIES, 1.500m MAX

(5) - TOE WIDTH = VARIES, 0.700m MAX

(6) - HEEL / TOE THICKNESS = VARIES, 0.500m MAX

(7) - SPILLWAY SLAB THICKNESS = VARIES, 0.300m NOM.

(8) - SPILLWAY SLAB WIDTH = VARIES (12.0m NOM.),

NOT FOR CONSTRUCTION

2 1 0 2 4 6 8 10m
SCALE 1:100

Rev.No.	Amendment	Date	Authorised
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0	-	-	-

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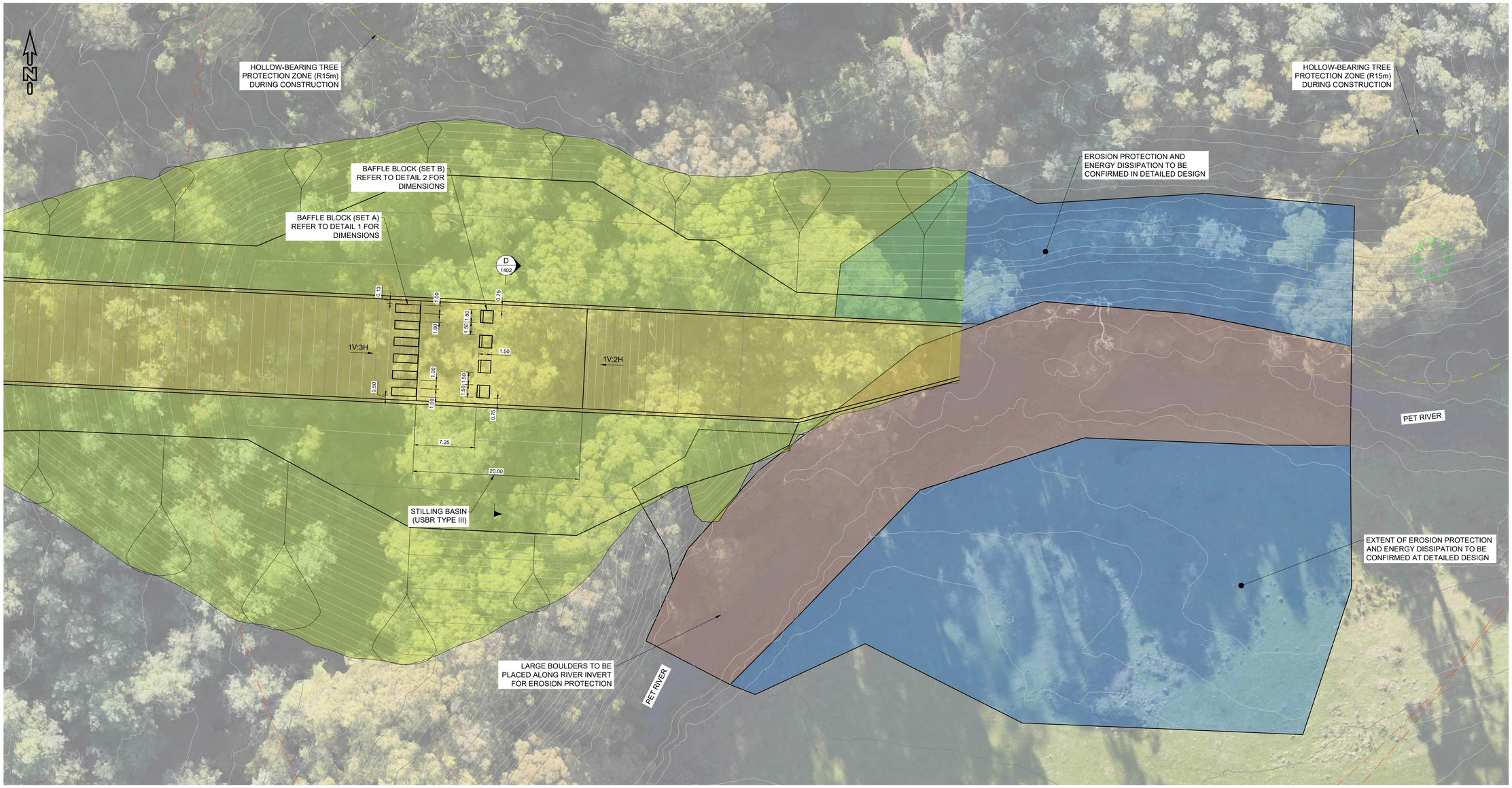
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P. Southcott	ENTURA	Mar 2025

Drawing Issue

FOR REVIEW

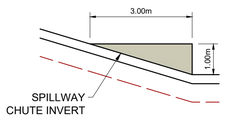
BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C SECTIONS - SHEET 2 OF 2

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1404	3 of 6	A



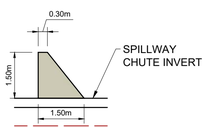
SPILLWAY BASIN PLAN

SCALE 1:250



DETAIL 1: BAFFLE BLOCK SET A

NOT TO SCALE



DETAIL 2: BAFFLE BLOCK SET B

NOT TO SCALE

NOT FOR CONSTRUCTION

5 4 3 2 1 0 5 10 15 20 25m

SCALE 1:250

Rev.No.	Amendment	Date	Authorised
-	-	-	-
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Scale	AS SHOWN
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References	

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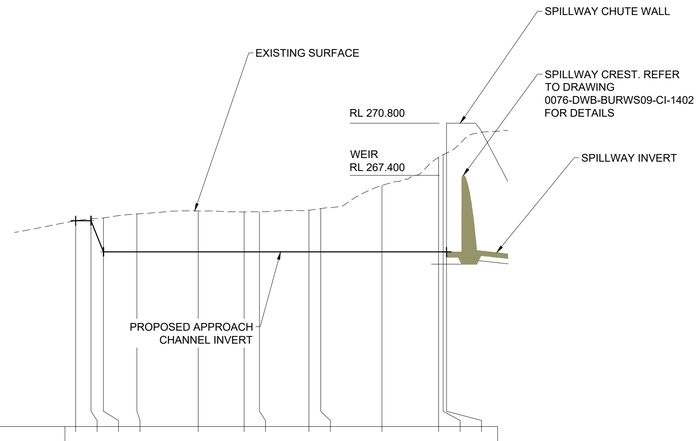
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P Southcott	ENTURA	Mar 2025

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C STILLING BASIN DETAILS

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1405	5 of 6	A



DATUM RL 251.0

VERTICAL DATA	0.00%	-50.00%	0.00%								
HORIZONTAL DATA			R-100m		R22.5m						
EXISTING SURFACE	264.43	264.56	264.62	264.88	265.07	265.01	265.02	265.12	265.23	266.74	268.58	268.75	268.85
CUT - FILL +	0.00	-0.13	-2.22	-2.48	-2.67	-2.61	-2.62	-2.72	-2.83	-4.34	-6.18	-6.35	-6.45
APPROACH CHANNEL INVERT	264.43	264.43	262.40	262.40	262.40	262.40	262.40	262.40	262.40	262.40	262.40	262.40	262.40
CHAINAGE	0.00	5.00	9.06	20.00	40.00	55.00	60.00	76.15	80.00	100.00	118.50	120.00	121.08

SPILLWAY APPROACH LONGITUDINAL SECTION

SCALE 1:1000H
1:200V

NOT FOR CONSTRUCTION

20 10 0 20 40 60 80 100m
SCALE 1:1000

4 3 2 1 0 4 8 12 16 20m
SCALE 1:200

Rev.No.	Amendment	Date	Authorised
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0	-	-	-

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Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C APPROACH CHANNEL SECTION

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1406	6 of 6	A

BURS09 - PET DAM

0076-00 - CIRCULAR ROAD, EAST RIDGELY
PET DAM UPGRADE - NEW BRIDGE

DRAWING INDEX		
SHEET	DRAWING	REV
0001	INDEX, LOCATION PLAN	A
0002	STRUCTURAL NOTES - SHEET 1	A
0003	STRUCTURAL NOTES - SHEET 2	A
0004	GENERAL ARRANGEMENT - PLAN	A
0005	SECTIONS - SHEET 1	A
0006	SECTIONS SHEET 2	A
0010	PILE ARRANGEMENT - PLAN	A
0020	ABUTMENT A - PLAN	A
0030	ABUTMENT B - PLAN	A

LOCATION PLAN
SCALE: NTS

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Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

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Scale	AS SHOWN
Datum	AHD (TAS.)
Sheet Size	A3
References	

DESIGN			DATE	REVIEW			DATE
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
COVER PAGE

Drawing Number: 0076-DWG-BURS09-ST-0001
Sheet Number: 1 of 1
Revision: A

DESIGN SPECIFICATIONS:

1. DESIGN STANDARD: AS 5100 : 2017
2. DEAD LOADS: SELF WEIGHTED BASED ON 26.0kN/m³. 1.0kPa SUPERIMPOSED DEAD LOAD EQUIVALENT TO 50mm HOTMIX OVERLAY
3. LIVE LOADS: SM1600 & HLP400. EXPOSURE CLASSIFICATION:B1 (NO GROUND CONTACT) B1 (IN CONTACT WITH GROUND)
4. DSG SPECIFICATION: WHERE APPROPRIATE, THE FOLLOWING DSG BRIDGE SPECIFICATION CLAUSES APPLY TO THIS CONTRACT. 605, 610, 611, 620, 630, 708, 713 & 812.
5. WHERE A CONFLICT OCCURS BETWEEN THESE DRAWINGS, THIS SPECIFICATION, THE DSG STANDARD SPECIFICATIONS, AUSTRALIAN STANDARDS AND THE PROJECT SPECIFICATION, REFER TO THE PROJECT SPECIFICATION.
6. DESIGN TRAFFIC SPEED: 80 kph

EARTHQUAKE LOADINGS:

1. BRIDGE CLASSIFICATION: TBC
2. ACCELERATION COEFFICIENT: TBC
3. SITE FACTOR: TBC
4. IMPORTANCE FACTOR: TBC
5. STRUCTURAL RESPONSE FACTOR: TBC
6. BRIDGE EARTHQUAKE DESIGN CATEGORY: TBC

FORCES FROM WATER FLOW:

1. ULTIMATE FLOW VELOCITY TBC
2. ULTIMATE FLOOD LEVEL TBC
3. SCOUR ALLOWANCE: TBC
4. ULTIMATE LOAD FACTOR TBC

WIND LOADS:

1. WIND REGION: TBC
2. TERRAIN CATEGORY: TBC

THERMAL EFFECTS:

1. LOCATION: TBC
2. HEIGHT ABOVE SEA LEVEL: TBC
3. REGION: TBC
4. REGIONAL CATEGORY FOR EFFECTIVE TEMPERATURE GRADIENT: TBC

DESIGN LIFE:

1. 100 YEARS FOR BRIDGE, STRUCTURE AND BEARINGS, 25 YEARS FOR REPLACEABLE BOLTS.

DIFFERENTIAL SETTLEMENT:

1. 10mm BETWEEN SUPPORTS.

DIMENSIONS / LEVELS:

1. ALL DIMENSIONS ARE IN MILLIMETRES. UNLESS NOTED OTHERWISE.
2. ALL REDUCED LEVELS ARE IN METRES TO AUSTRALIAN HEIGHT DATUM.
3. ALL COORDINATES ARE IN METRES TO MGA.
4. DIMENSIONS SHALL NOT BE SCALED FROM DRAWINGS.
5. ALL DISCREPANCIES SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE DESIGNERS.
6. ALL CHAINAGES REFER TO THE PROJECT SPECIFIC TRACK DESIGN LINE AND ARE NOTED IN METRES.

CHAMFERS AND FILLETS:

1. UNLESS NOTED OTHERWISE ON THE DRAWINGS, ALL EXPOSED CONCRETE EDGES HAVING A CONTAINED ANGLE LESS THAN 120° SHALL BE PROVIDED WITH 20mm FILLETS OR CHAMFERS AS APPROPRIATE.
2. BEARING PEDESTALS SHALL BE PROVIDED WITH 10mm CHAMFERS.

CONCRETE GRADE & COVER TO REINFORCEMENT AND TENDONS

ELEMENT	CONCRETE TYPE	CHARACTERISTIC COMPRESSIVE STRENGTH OF CONCRETE	COVER TO REINFORCEMENT & TENDONS	TYPE OF FORMWORK / COMPACTION	REMARKS
ABUTMENT CROSSHEAD	VR450	50MPa	50mm	STANDARD / STANDARD	-
PRECAST SUPER T BEAMS	VR450	50MPa	35mm	RIGID / INTENSE	HORIZONTAL
		50MPa	35mm	RIGID / INTENSE	VERTICAL OR SLOPING
INSITU DECK	VR450	50MPa	40mm	STANDARD / STANDARD	-
BORED PIERS	VR450	50MPa	50mm	STANDARD / STANDARD	-

REINFORCEMENT SYMBOLS:

1. REINFORCEMENT SYMBOLS.

   N - DEFORMED BARS TO AS/NZS 4671 :2001 GRADE D500N.
   R - PLAIN ROUND BAR TO AS/NZS 4671 :2001 GRADE R250N.

2. REINFORCEMENT NOTATION AS FOLLOWS:- 14-N16-300 EF

   NUMBER OF BARS
   GRAGE (D500N)
   BAR DIAMETER (mm)
   LOCATION
   MAX. SPACING

T	=TOP	B	=BOTTOM	ES	=EQUALLY SPACED
BF	=BACK FACE	FF	=FRONT FACE		
EF	=EACH FACE	LV	=LENGTH VARIES		

3. REINFORCEMENT SPACING NOT SHOWN SHALL BE TAKEN AS EQUAL.
4. REINFORCEMENT BARS SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC ONLY.
5. BARS SHOWN MAY REPRESENT MORE THAN ONE EQUAL LENGTH AND OR PROFILE.
6. BARS MAY NOT BE SHOWN IN TRUE POSITION FOR CLARITY.
7. ALL HOOKS BENDS AND COGS ARE STANDARD AND SHALL BE IN ACCORDANCE WITH AS 5100.5 : 2004, UNLESS NOTED OTHERWISE.

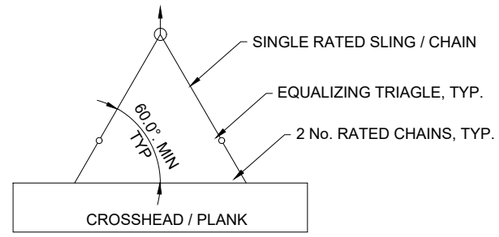
TRAFFIC BARRIER:

CLIENT SPECIFIED LOW PERFORMANCE LEVEL BARRIER

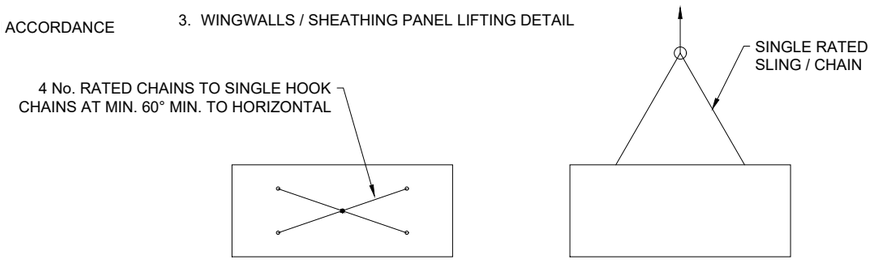
LIFTING DETAILS

1. PRECAST ELEMENTS SHALL BE LIFTED USING DEVICES ACCEPTABLE TO WORK COVER AUTHORITY.

2. PLANKS & CROSSHEAD LIFTING DETAIL



3. WINGWALLS / SHEATHING PANEL LIFTING DETAIL



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Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

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References	

DESIGN			DATE	REVIEW			DATE
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
STRUCTURAL NOTES - SHEET 1

Drawing Number	Sheet Number	Revision
0076-DWG-BURS09-ST-0002	1 of 1	A

CONCRETE:

1. ALL WORKMANSHIP & MATERIALS SHALL BE IN ACCORDANCE WITH AS 5100 & DSG SPECIFICATION.
2. IF ABBREVIATIONS OTHER THAN THOSE IN ACCORDANCE WITH AS 1100.501 ARE USED AND THEIR MEANING IS NOT EXPLICITLY SHOWN ON DRAWINGS, REFER TO ENGINEER FOR CLARIFICATION PRIOR TO PROCEEDING.
3. CONCRETE SHALL BE FROM AN APPROVED SOURCE & SHALL COMPLY WITH THE REQUIREMENTS OF THE FOLLOWING STANDARDS, UNLESS NOTED OTHERWISE
   - AS 5100.5 BRIDGE DESIGN PART 5 CONCRETE
   - AS 4671 STEEL REINFORCING MATERIALS
   - AS 3972 PORTLAND CEMENT
   - AS 1379 READY MIX CONCRETE
   - AS 2758.14 CONCRETE AGGREGATES
4. UNLESS NOTED OTHERWISE ALL CEMENT SHALL BE "GP" GENERAL PURPOSE OR "GB" GENERAL PURPOSE BLENDED CEMENT.
5. NO PENETRATIONS, RECESSES OR CHASES OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL BE MADE IN THE CONCRETE MEMBERS WITHOUT APPROVAL OF THE DESIGNER.
6. CONCRETE SHALL BE SPECIAL CLASS PERFORMANCE CONCRETE AS SPECIFIED IN DSG STANDARD B80 SPECIFICATION FOR BRIDGEWORKS.
7. CONCRETE SHALL BE INTENSELY COMPACTED TO ENSURE A DENSE HOMOGENOUS PRODUCT. NOTE THAT EXTERNAL FORMWORK MAY NEED TO BE RE-TIGHTENED. ALSO NOTE THAT THE INITIAL DISCHARGE FROM THE CONCRETE PUMP SHALL NOT BE USED UNTIL A CONSISTENT WORKABLE MIX IS DISCHARGED.
8. THE FINISHED CONCRETE SHALL BE A DENSE HOMOGENOUS MASS, COMPLETELY FILLING THE FORMWORK THOROUGHLY EMBEDDING THE REINFORCEMENT & FREE OF AIR POCKETS. ALL STRUCTURAL CONCRETE INCLUDING SLABS ON GROUND & FOOTINGS SHALL BE COMPACTED WITH MECHANICAL VIBRATORS.
9. CONSTRUCTION SUPPORT PROPPING SHALL BE LEFT IN PLACE WHERE NEEDED TO AVOID OVER STRESSING THE STRUCTURE DUE TO CONSTRUCTION LOADING.
10. FORMWORK REMOVAL SHALL BE IN ACCORDANCE WITH THE SUBMITTED METHOD OF CURING.
11. COVER IS THE CLEAR DISTANCE BETWEEN ANY REINFORCEMENT (INCLUDING FITMENTS) AND THE FACE OF THE STRUCTURAL ELEMENT. FOR ALL EXTERNAL SURFACES, PROVIDE APPROVED BAR CHAIRS. TIE WIRE SHALL NOT BE NAILED TO THE FORMS. REINFORCING BARS SHALL NOT BE USED TO KEEP FORMS APART & A THROUGH TIE STEEL SYSTEM SHALL BE USED TO TIE THE FORMS. THE COVERS SHALL BE MAINTAINED USING APPROVED BAR CHAIRS.
12. CONSTRUCTION JOINTS SHALL BE LOCATED & DETAILED AS SHOWN ON THE DRAWINGS OR SHALL BE LOCATED & FORMED TO THE APPROVAL OF THE ENGINEER. CONCRETE AGAINST WHICH NEW CONCRETE IS TO BE PLACED SHALL BE INTENTIONALLY ROUGHENED TO EXPOSE THE INBOUND COURSE AGGREGATE TO ENSURE SATISFACTORY BOND BETWEEN ADJACENT CONCRETE SURFACES U.N.O. ALL CONCRETE SURFACES SHALL BE CLEAN & FREE OF LAITANCE. THOROUGHLY MOISTEN THE ROUGHENED SURFACE IMMEDIATELY PRIOR TO PLACING CONCRETE.
13. CONDUITS & PIPES CAST IN SLABS & WALLS ARE TO BE PLACED AT MIDDLE THIRD THICKNESS OF MEMBERS & BETWEEN TWO REINFORCEMENT LAYERS. WHERE THERE IS ONLY ONE LAYER OF REINFORCEMENT, PROVIDE 50mm COVER TO CONDUIT.
14. MAXIMUM ALLOWED FREE DROP OF CONCRETE DURING PLACING IS 2000mm.
15. CONCRETE SHALL NOT BE SPREAD BY VIBRATING.
16. CURING OF CONCRETE SHALL COMMENCE NO LATER THAN 30 MINUTES AFTER FINISHING OPERATIONS HAVE BEEN COMPLETED.
17. ALL CONCRETE SURFACES SHALL HAVE NO DEFECTS WHICH STRUCTURALLY AFFECT THE CONCRETE OR REDUCE THE COVER TO STEEL REINFORCEMENT.
18. NO ADMIXTURES CONTAINING CHLORIDES SHALL BE USED.

PRECAST CONCRETE:

1. ALL PRECAST CONCRETE IS TO COMPLY WITH THE CONCRETE NOTES ON THESE DRAWINGS AND AS 5100.
2. THE CONTRACTOR SHALL REFER TO ALL RELEVANT DRAWINGS TO ENSURE THAT ALL OPENINGS, RECESSES, FIXINGS & FITTINGS SPECIFIED ON THE DRAWINGS ARE INCORPORATED INTO THE PRECAST MEMBERS.
3. ALL FERRULES USED SHALL BE GALVANISED STEEL OR OTHERWISE APPROVED, & FITTED WITH ANCHORAGE BARS OF MINIMUM 10mm DIAMETER. THE FERRULES SHALL DEVELOP THE FULL CAPACITY OF THE BOLT TO BE USED IN CONJUNCTION WITH THE FERRULE. A MINIMUM M20 DIAMETER FERRULE IS TO BE ADOPTED U.N.O.
4. FERRULES THAT WILL BE EXPOSED AFTER COMPLETION OF ERECTION ARE TO BE RECESSED 30mm BELOW THE CONCRETE SURFACE & ARE TO BE GROUTED ON COMPLETION WITH NON SHRINK GROUT. BONDING AGENT TO BE APPLIED TO SURFACE PRIOR TO GROUTING.
5. ALL HOT DIPPED GALVANISED FERRULES & FIXINGS SHALL BE IN ACCORDANCE WITH AS 4680. MINIMUM COATING THICKNESS IS 85 MICRONS.
6. GROUT TO BE USED SHALL BE NON SHRINK, & SHALL HAVE A 28 DAY CHARACTERISTIC STRENGTH OF 40MPa.

FORMWORK:

1. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, CERTIFICATION, CONSTRUCTION, INSPECTION & PERFORMANCE OF THE FORMWORK AND FALSEWORK, EXCEPT TO THE EXTENT THAT THE FORMWORK DESIGN IS SHOWN ON THE STRUCTURAL DRAWINGS.
2. DESIGN AND CONSTRUCTION AND STRIPPING TIMES TO COMPLY WITH DSG SPECIFICATION AND AS 5100.
3. DURING CONSTRUCTION, SUPPORT PROPPING IS REQUIRED WHERE LOADS FROM STACKED MATERIALS, FORMWORK & OTHER SUPPORTED SLABS INDUCE LOADS IN A SLAB OR BEAM WHICH EXCEED THE DESIGN LOAD FOR STRENGTH OR SERVICEABILITY AT THAT AGE OR WHERE THE STRUCTURE IS INCOMPLETE. ONCE THE NOMINATED 28 DAY STRENGTH HAS BEEN ATTAINED, THESE LOADS SHALL NOT EXCEED THE DESIGN SUPERIMPOSED LOADS SET OUT UNDER DESIGN SPECIFICATION NOTES .
4. THE FORMWORK SHALL NOT BE DESIGNED TO RELY ON RESTRAINT OR SUPPORT FROM THE PERMANENT STRUCTURE WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
5. ALL FORMED EXPOSED EDGES & RE-ENTRANT CORNERS SHALL BE CHAMFER OR FILLETED AS SET OUT IN THE CHAMFERS & FILLETS NOTES. DRIP GROOVES TO BE PROVIDED IN SOFFIT OF ALL BEAMS AND SLABS TO THE PERIMETER OF STRUCTURES. ALSO REFER CONCRETE NOTES FOR COVER REQUIREMENTS.
6. DIMENSIONAL TOLERANCES SHALL COMPLY WITH AS 5100.
7. BEFORE PLACING CONCRETE REMOVE ALL WATER, DUST AND DEBRIS FROM THE FORMWORK.
8. FILL ALL HOLES LEFT BY FORM TIE BOLTS WITH MORTAR MATCHING THE SURFACE COLOUR OR FINISHED SURFACE.

FOUNDATIONS:

1. FOOTINGS HAVE BEEN DESIGNED FOR THE GEOTECHNICAL PARAMETERS NOTED ON THE DRAWINGS.
2. FOOTINGS SHALL BE FOUNDED IN MATERIALS AND AT THE DEPTHS SHOWN ON THE DRAWINGS OR, WHEN NOT SHOWN ARE TO BE AS SET OUT IN THE GEOTECHNICAL REPORT. EXCAVATE FOOTINGS TO THE NOMINATED SIZE AND DEPTH, FOOTING FOUNDING LEVELS ARE PROVISIONAL SUBJECT TO ACTUAL SITE CONDITIONS AND APPROVAL BY THE GEOTECHNICAL ENGINEER.
3. FOUNDATION MATERIAL SHALL BE APPROVED FOR THIS BEARING PRESSURE BY A GEOTECHNICAL ENGINEER, BEFORE PLACING REINFORCEMENT OR CONCRETE. THE CONTRACTOR IS RESPONSIBLE TO INFORM THE ENGINEER IF CONDITIONS OTHER THAN THOSE DESCRIBED IN THE SOIL REPORT ARE ENCOUNTERED.
4. ALL FOUNDATIONS ARE TO BE FREE OF WATER AND LOOSE MATERIAL.
5. ALL FOOTINGS ARE TO BE LOCATED CENTRALLY UNDER WALLS AND COLUMNS U.N.O..
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ANY EXCAVATION IN A STABLE CONDITION WITHOUT AFFECTING SURROUNDING PROPERTY INCLUDING SERVICES. THIS INCLUDES OBTAINING ALL NECESSARY APPROVALS FOR SHORING AND ANCHORING SYSTEMS .
7. FOOTINGS SHALL BE CONSTRUCTED AND BACKFILLED AS SOON AS POSSIBLE FOLLOWING EXCAVATION TO AVOID SOFTENING OR DRYING OUT BY EXPOSURE.
8. WHERE EXCAVATED SURFACES THAT ARE REQUIRED TO SUPPORT FOUNDATIONS BECOME SOFTENED OR LOOSENED DUE TO ADVERSE WEATHER, GROUND SEEPAGE, OR OTHER CAUSES, ALL SOFT OR LOOSE MATERIAL SHALL BE REMOVED DOWN TO ACCEPTABLE BEARING AND BE REPLACED IMMEDIATELY WITH A LAYER OF CONCRETE BLINDING.
9. UNLESS OTHERWISE APPROVED BY THE ENGINEER OVER EXCAVATION SHALL BE REINSTATED.
10. ALL WORKS TO DSG DCM SPECIFICATIONS.

STRUCTURAL STEELWORK:

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS5100.6 : 2017.
2. ROLLED STEEL SECTIONS SHALL BE GRADE 300 COMPLYING WITH AS/NZS 3679.1 : 2010, U.N.O.
3. CHS, RHS AND SHS SHALL BE GRADE C350LO COMPLYING WITH AS/NZS 1163: 2009, U.N.O.
4. STEEL PLATES SHALL BE GRADE 350 COMPLYING WITH AS/NZS 3678 : 2011 U.N.O.
5. HIGH STRENGTH STRUCTURAL BOLTS, HEXAGONAL NUTS AND WASHERS SHALL BE GRADE 8.8/S COMPLYING WITH AS/NZS 1252 : 1996 U.N.O.
6. COMMERCIAL BOLTS SHALL BE GRADE 4.6/S COMPLYING WITH AS/NZS 1111.1 : 2000 U.N.O.
7. COMMERCIAL HEXAGONAL NUTS SHALL COMPLY WITH AS 1112.3 : 2000 U.N.O.
8. COMMERCIAL PLAIN WASHERS SHALL COMPLY WITH AS 1237.2 : 2000 U.N.O.
9. ALL BOLTS & NUTS SHALL BE HOT DIPPED GALVANISED TO AS 1214 : 1983 U.N.O.
10. ALL STEELWORK SHALL BE HOT DIPPED GALVANISED AFTER FABRICATION U.N.O.
11. GALVANISING SHALL COMPLY WITH AS/NZS 4680 : 2006 U.N.O.
12. WELDING ELECTRODES SHALL BE E48XX AND WELDS SHALL BE CATEGORY SP
13. COMPLYING WITH. AS/NZS 1554.1 : 2014 U.N.O.

CONSTRUCTION JOINTS:

1. CJ - DENOTES CONSTRUCTION JOINT.
2. EJ - DENOTES EXPANSION JOINT.
3. CONSTRUCTION JOINTS SHALL BE USED ONLY AS SHOWN ON DRAWINGS
4. NO CONSTRUCTION JOINT SHOWN ON THE DRAWINGS SHALL BE OMITTED WITHOUT THE WRITTEN APPROVAL OF THE DESIGNERS.

LAP LENGTHS FOR REINFORCEMENT:

1. LAPS AND OTHER SPLICES IN REINFORCEMENT SHALL ONLY BE MADE AT THE POSITION SHOWN ON THE DRAWINGS UNLESS ALTERNATIVE OR EXTRA LOCATIONS ARE APPROVED IN WRITING BY THE DESIGNERS.
2. LAP LENGTHS SHALL BE AS TABULATED BELOW UNLESS SHOWN OTHERWISE ON THE DRAWINGS:

GRADE AND BAR DIAMETER	MINIMUM LAP LENGTH
N12	350
N16	470
N20	580
N24	700
N28	900
N32	1200
N36	1400

3. MINIMUM LAP LENGTH SHOWN SHALL BE INCREASED BY 25% FOR HORIZONTAL BARS WITH MORE THAN 300mm OF CONCRETE CAST BELOW THE BAR.
4. NO MORE THAN 50% OF THE BARS SHALL BE LAPPED AT ANY LOCATION.
5. WHERE STAGGERED LAPPED SPLICES ARE NOT POSSIBLE, THE MINIMUM LAP LENGTH SHALL BE NOT LESS THAN 1.3 TIMES THE STANDARD LAP LENGTH.

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

TasWater Capital Delivery Office

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Scale	AS SHOWN
Datum	AHD (TAS.)
Sheet Size	A3
References	

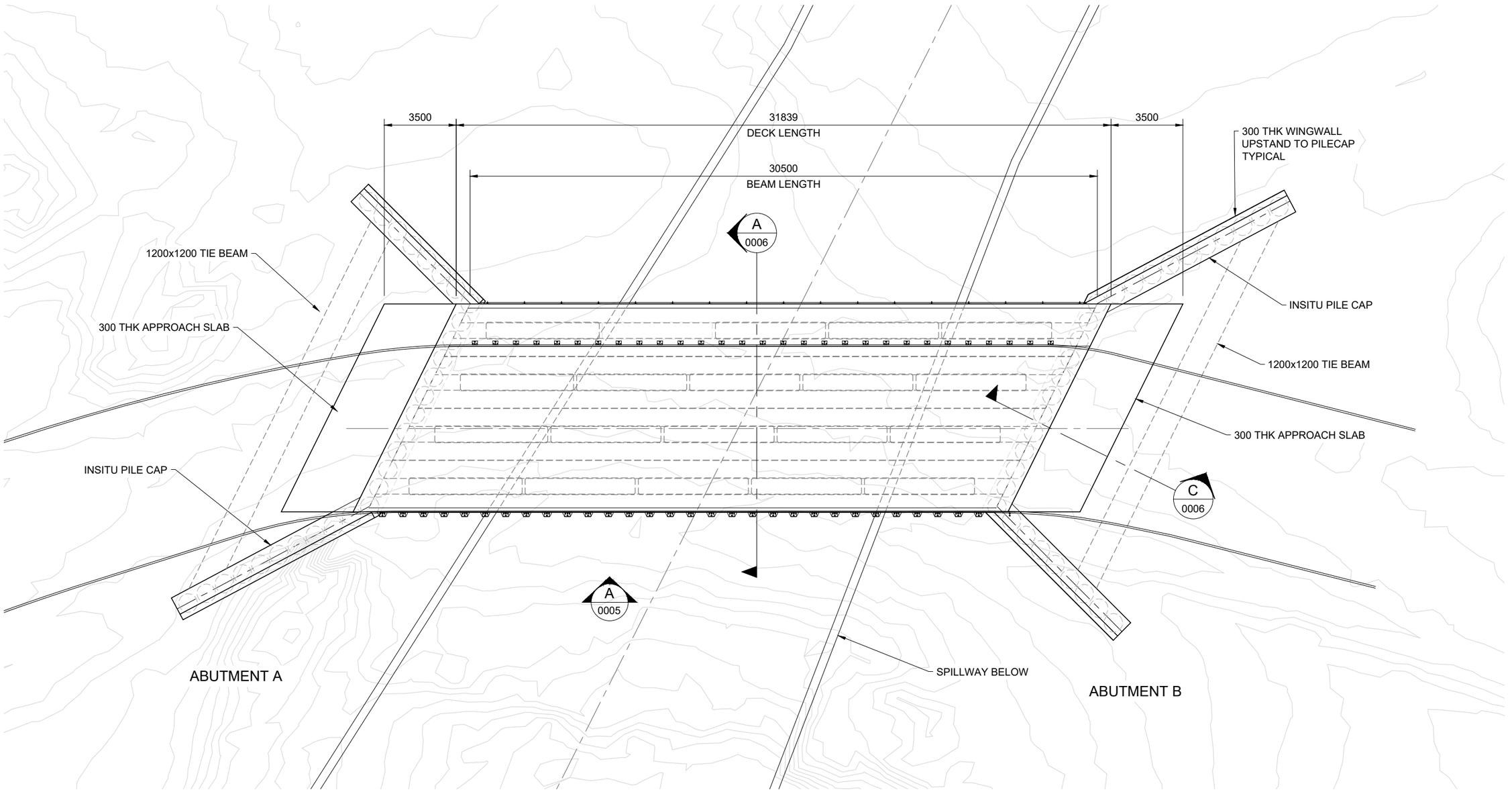
DESIGN			DATE	REVIEW			DATE
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
STRUCTURAL NOTES - SHEET 2

Drawing Number	Sheet Number	Revision
0076-DWG-BURS09-ST-0003	1 of 1	A



GENERAL ARRANGEMENT - PLAN

SCALE 1:200

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

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Sheet Size	A3
References	

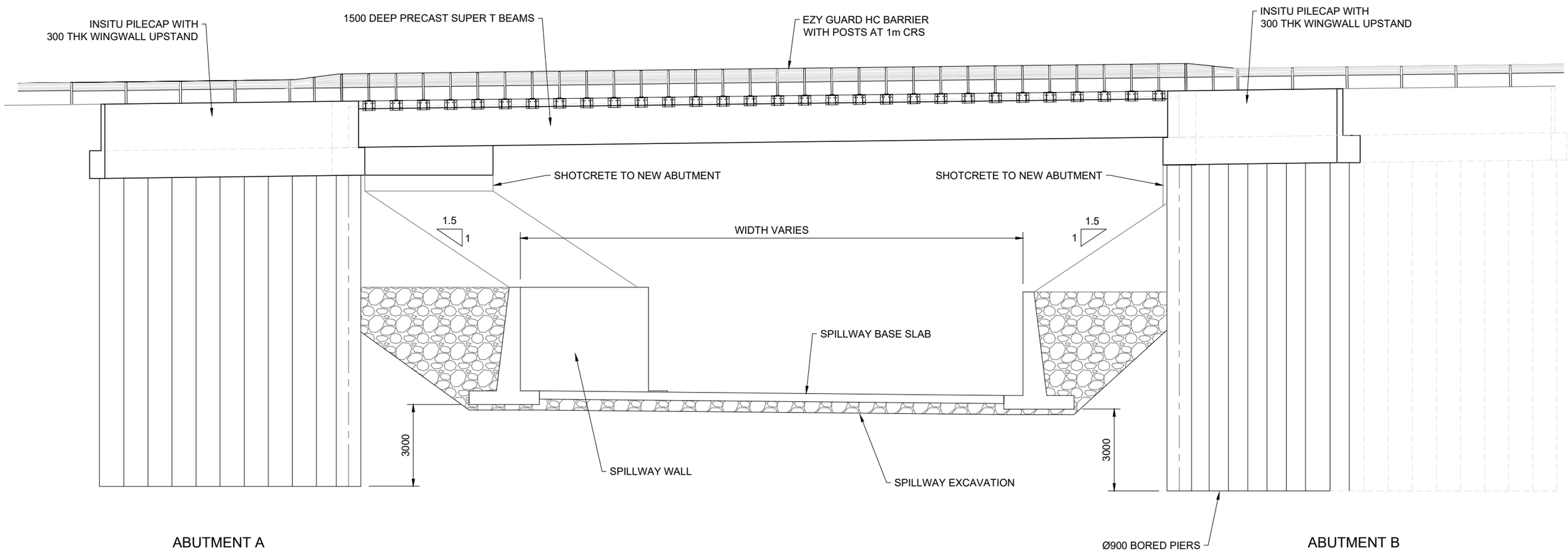
DESIGN			DATE	REVIEW			DATE
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
GENERAL ARRANGEMENT - PLAN

Drawing Number	Sheet Number	Revision
0076-DWG-BURS09-ST-0004	1 of 1	A



ELEVATION

SCALE 1:100

A
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NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

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References	

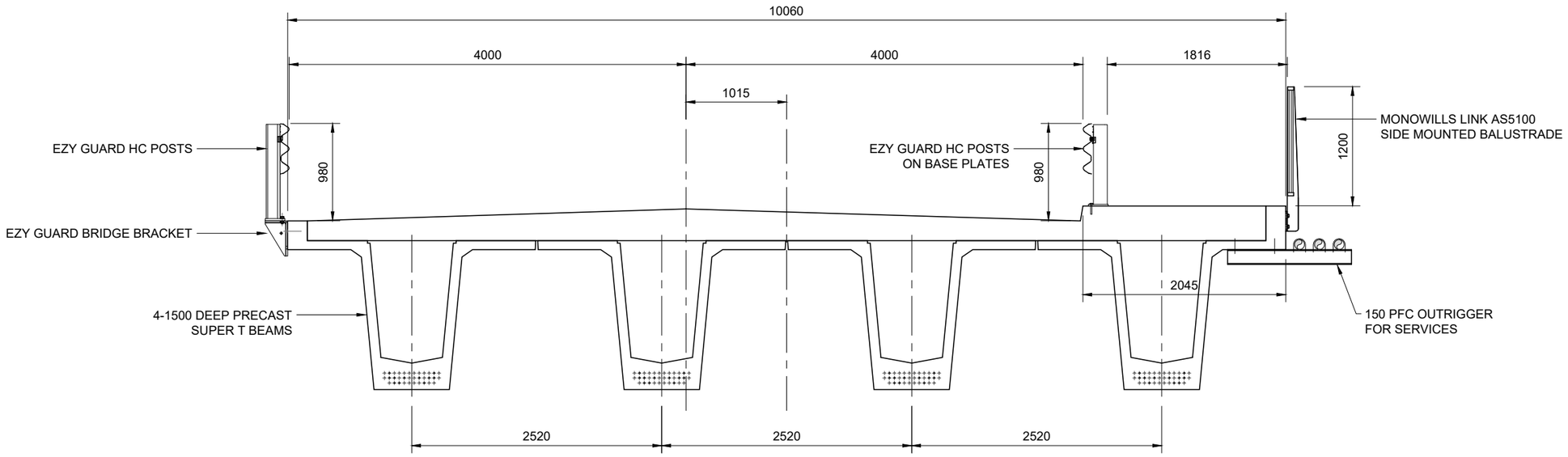
DESIGN			DATE	REVIEW			DATE
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SECTIONS - SHEET 2

Drawing Number	Sheet Number	Revision
0076-DWG-BURS09-ST-0005	1 of 1	A



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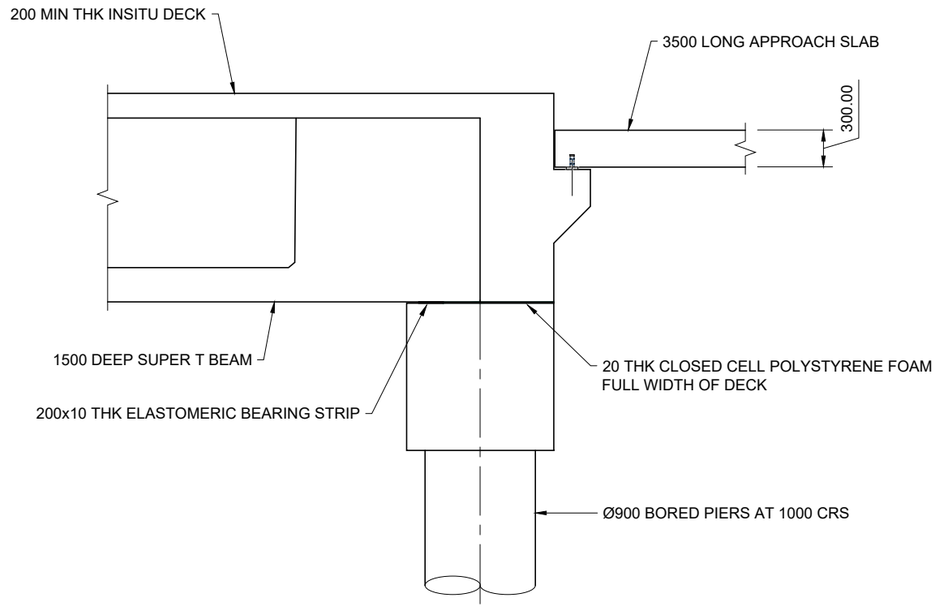

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NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

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ABN: 47 162 220 653

Scale	AS SHOWN
Datum	AHD (TAS.)
Sheet Size	A3
References	

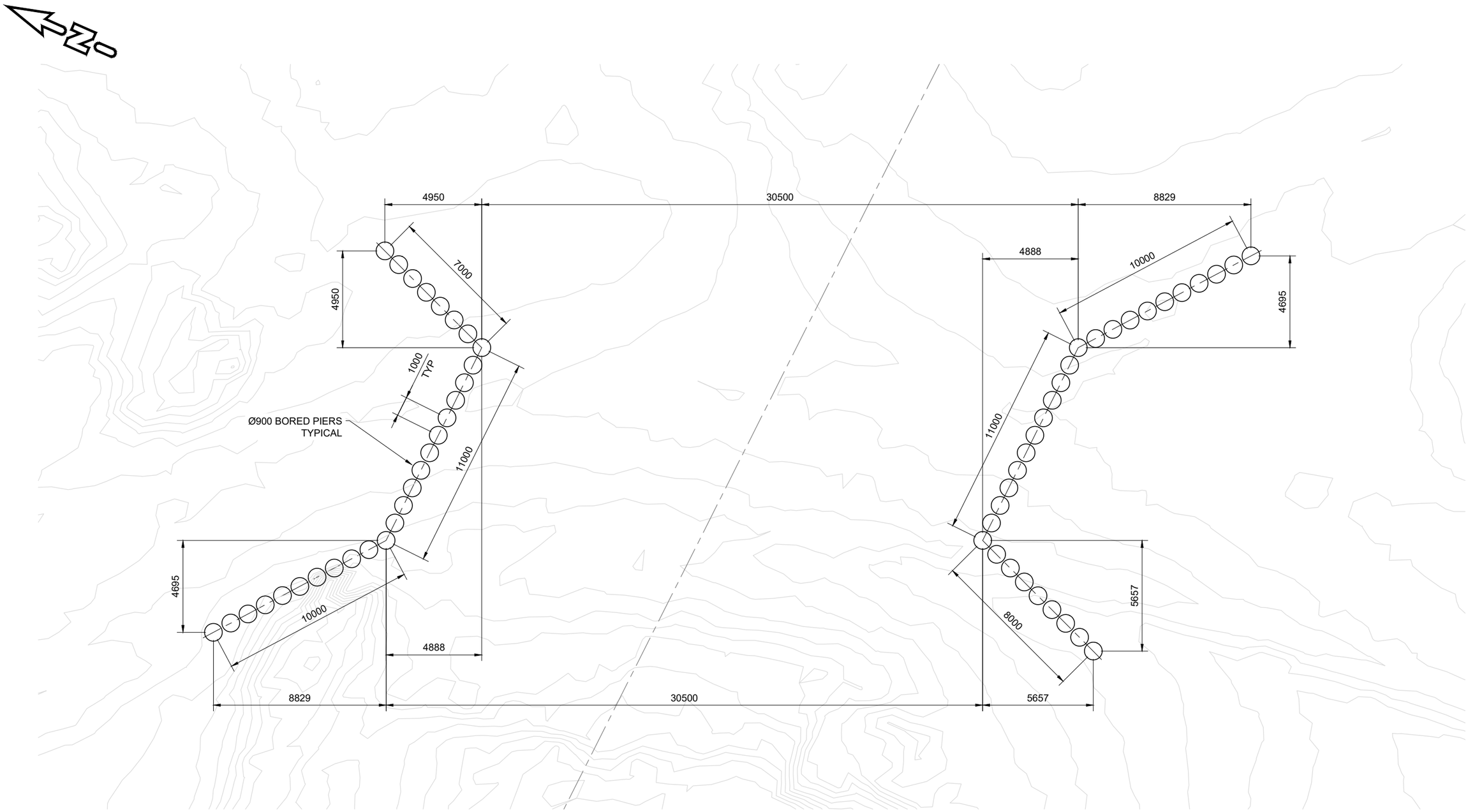
DESIGN			DATE	REVIEW			DATE
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SECTIONS - SHEET 2

Drawing Number	Sheet Number	Revision
0076-DWG-BURS09-ST-0006	1 of 1	A



PILE ARRANGEMENT - PLAN

SCALE 1:200

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

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Scale	AS SHOWN
Datum	AHD (TAS.)
Sheet Size	A3
References	

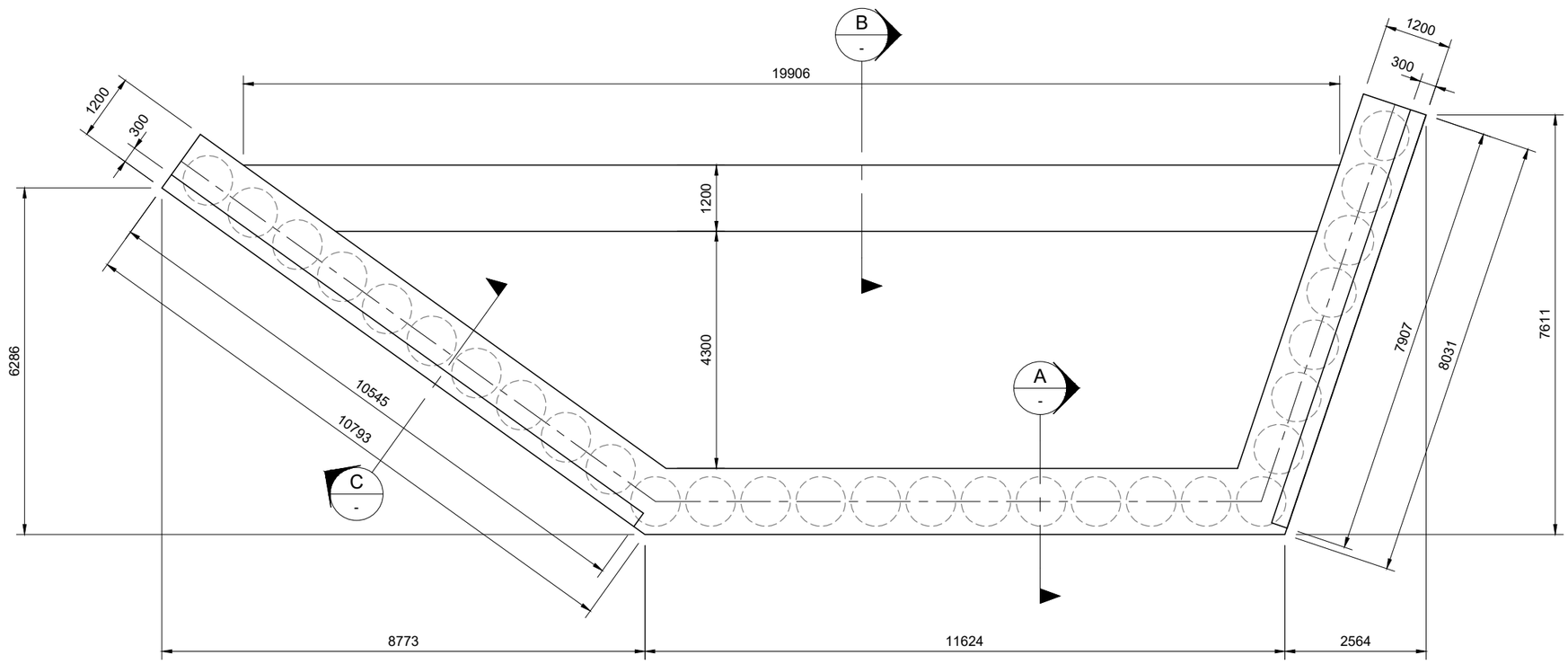
			DATE				DATE
DESIGN				REVIEW			
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
PILE ARRANGEMENT - PLAN

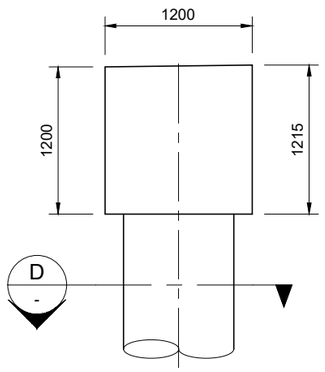
Drawing Number	Sheet Number	Revision
0076-DWG-BURS09-ST-0010	1 of 1	A



PLAN - ABUTMENT A

SCALE 1:100

APPORACH SLABS, BEAMS & DECK NOT SHOWN FOR CLARITY



SECTION A

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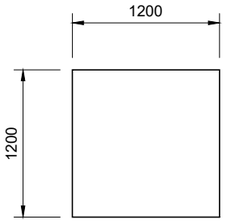
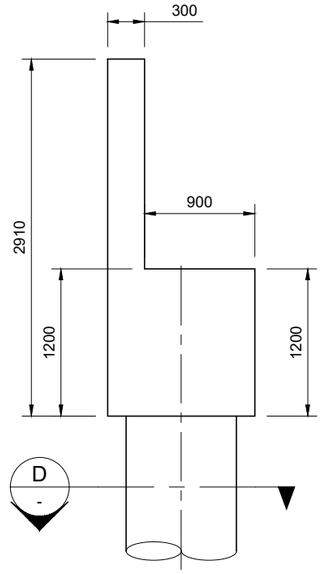


SECTION B

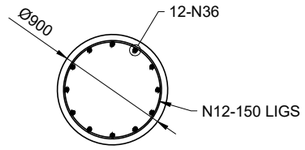
SCALE 1:100

NOT FOR CONSTRUCTION



SECTION C

SCALE 1:100



SECTION D

SCALE 1:100

Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

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Datum	AHD (TAS.)
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References	

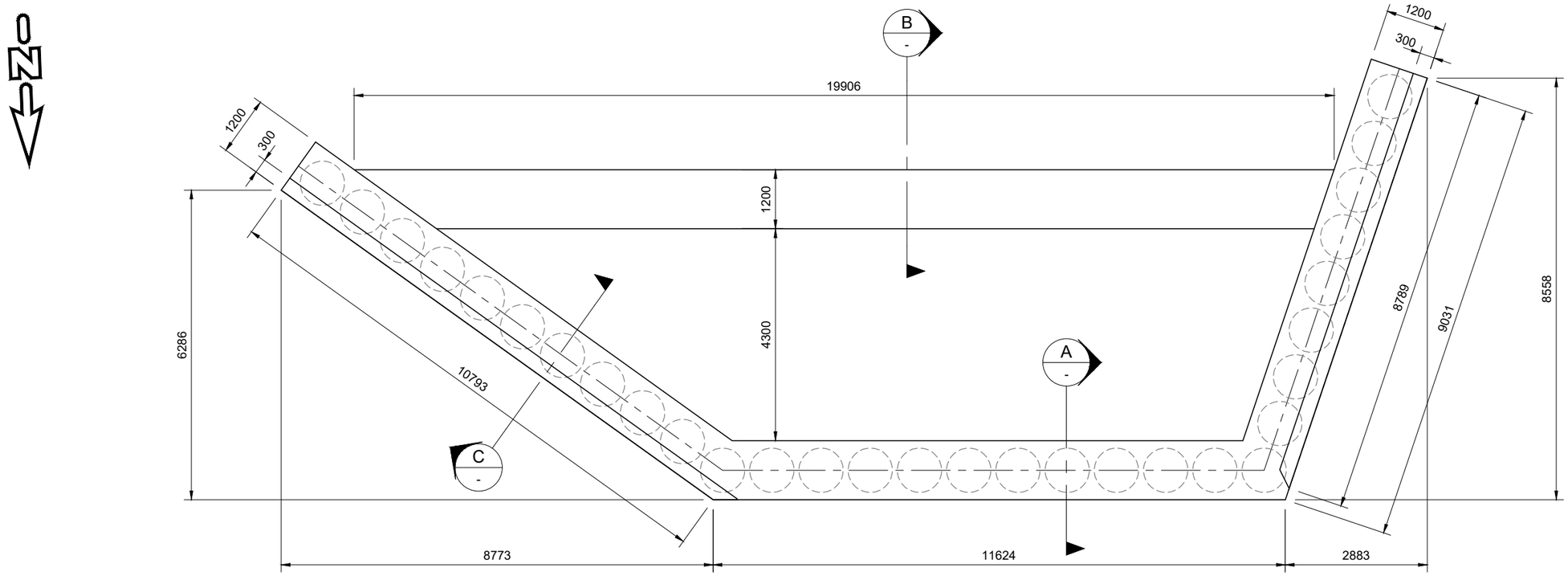
DESIGN			DATE	REVIEW			DATE
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
ABUTMENT A - PLAN

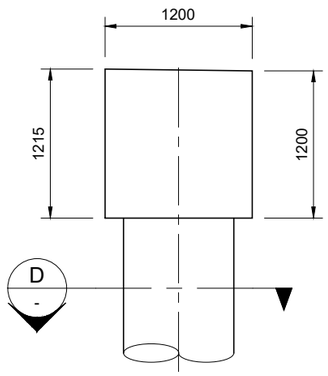
Drawing Number	Sheet Number	Revision
0076-DWG-BURS09-ST-0020	1 of 1	A



PLAN - ABUTMENT B

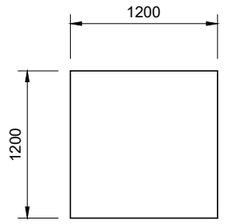
SCALE 1:100

APPORACH SLABS, BEAMS & DECK NOT SHOWN FOR CLARITY



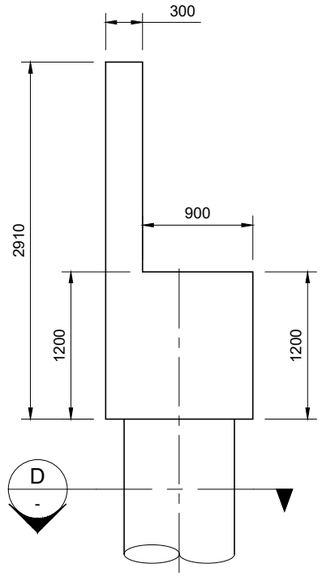
SECTION A

SCALE 1:100



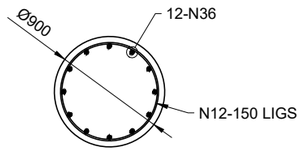
SECTION B

SCALE 1:100



SECTION C

SCALE 1:100



SECTION D

SCALE 1:100

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
A	30% PRELIMINARY / REVIEW	14/03/25	-

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References

DESIGN			DATE	REVIEW			DATE
Drawn	B.DUNSTAN	-	14/03/2025	Checked	-	-	-
Designed	A.SEATON	-	-	Approved	-	-	-

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
ABUTMENT B - PLAN

Drawing Number	Sheet Number	Revision
0076-DWG-BURS09-ST-0030	1 of 1	A

ATTACHMENT 3

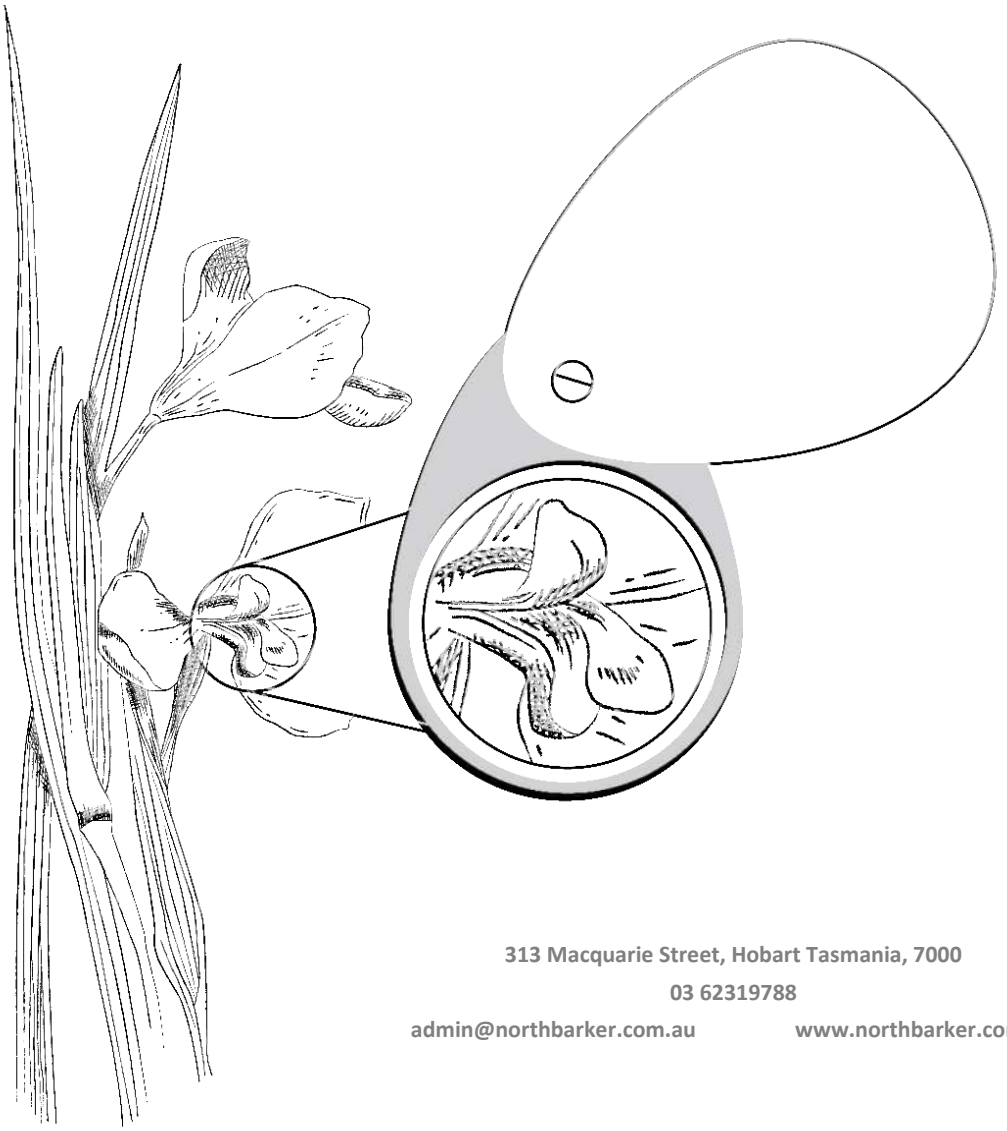
Natural Values Assessment

Pet Dam Spillway and Dam Upgrade

Natural Values Assessment

2nd June 2025

For TasWater (TSW015)



313 Macquarie Street, Hobart Tasmania, 7000
03 62319788
admin@northbarker.com.au www.northbarker.com.au

SUMMARY

TasWater have engaged North Barker Ecosystem Services (NBES) to complete ecological assessments for proposed upgrade works to the dam wall and spillway at Pet Dam, near Ridgley.

The upgrades proposed include raising of the dam wall by 300 mm to accommodate flood flows and a spillway upgrade. TasWater sought to investigate three different options for the spillway upgrade (Figure 1). The design for Option A proposes to straighten the existing spillway, and to establish a new offtake. Option B proposes the construction of a new spillway at the right-hand abutment of the dam embankment. Option C proposes the construction of a new northern spillway, completed separate from the existing dam embankment. Option C would require the development of a temporary road to allow for access on Circular Road, and emergency spillways. To facilitate these works, stockpile areas, which will be used to store spoil from the proposed works have been included in the assessment. An additional area where the dam crest may require raising is also proposed.

TasWater held an options workshop on the 12th of December 2024 where the final design via the north alignment (Option C) was confirmed. This report addresses impacts to natural values pertaining to Option C (including the spillway, approach channel, and stilling basin), proposed stockpile areas, and impacts associated with raising the dam crest.

The survey determined the main constraint to the proposal is the presence of potential masked owl nesting trees within 150 m of the footprint, which may lead to breeding disturbance. Several iterations of investigations were undertaken, with the presence of masked owls confirmed in the landscape. This requires a set of pre-clearance surveys and management measures to ensure breeding disturbance does not occur.

A summary of values and mitigation measures is as follows:

Vegetation

The spillway and stockpile area will impact a small extent of WOB and NAD vegetation. The following impact mitigation measures are recommended:

- Clearly define the extent of clearance required for the project and ensure that any additional impacts are avoided;
- Mark the works area on operation plans and on site, and confine all works, vehicles and materials to the works area;
- The utilisation of stockpile areas should be limited to modified vegetation to the extent possible.
- Large trees should be retained where possible, and to mitigate the loss of any unavoidable trees within these areas, it is recommended that the sites be rehabilitated after use. For all trees lost, a replacement ratio of 3:1 should apply to all trees. Equivalent species are recommended for planting during rehabilitation, particularly *E. obliqua* and *E. viminalis* trees which are dominant in the area and *E. globulus* trees which are fast growing and may also be utilised as a foraging source for the swift parrot; and
- Any areas of temporary disturbance should be revegetated with propagules sourced from the local area, comprised of native species (see Appendix A).

Conservation significant flora

No threatened flora species will be impacted by the proposal, as such, specific mitigation measures are not warranted.

A cluster of conservation significant conifers adjacent to the sewage treatment plant access road, although not formally protected by legislation, should be prioritised for avoidance if possible. If impacts to these trees is likely, relocation of these trees should be considered.

Threatened fauna and threatened fauna habitat

Tasmanian masked owl

Audio detection surveys conducted within the spillway survey area have recorded a number of masked owl calls. This suggests that masked owls are present in the local landscape, at least utilising the area to forage and potentially utilising one or more of the identified hollow bearing trees for nesting or roosting.

Based on advice from CAS, the following is recommended:

- Passive visual surveys will not be conducted at this stage based on the advice from CAS. As this survey method may not provide conclusive evidence of hollow utilisation, alternative methods will be adopted.
- Construction will commence outside of the breeding season if possible.
- At least 4 weeks prior to the commencement of construction, or in the final week of August (whichever comes first), physical inspection of hollows will be conducted. Inspection of hollows using cameras is not a practical solution for this site, given the size of the trees and the potential number of hollows that are not visible from ground level. Trees will be climbed by a qualified tree climber with experience in identifying fauna products.
- If a masked owl breeding is confirmed, no works are to occur until after the chicks have fledged.
- If suitable hollows are present, but no evidence of masked owl utilisation is observed, or evidence of regular use by other fauna species is observed, works can commence within the breeding season. It is recommended that works commence no longer than 6 weeks after the initial hollow inspection survey. Note that this recommendation from CAS applies to this project only and should not be relied upon to be approved for other TasWater project.
- Should no hollows be observed, no further surveys are required.

No decommissioning of hollows will occur.

Swift parrot

Some marginal foraging and nesting habitat suitable for the swift parrot is also present in the project area. The proposal will not impact on any of the foraging habitat, and one potential nest tree may require removal to raise the dam crest.

In absence of targeted surveys for swift parrots at this location, it is recommended that the clearance of any trees should be conducted outside of the breeding season (September to March).

Giant freshwater crayfish

A pre-clearance check for crayfish is recommended to be conducted daily prior to works commencing in areas containing permanent flowing water. This will require a permit to take threatened fauna under the TSP Act. It may be a requirement of CAS that a formal translocation protocol is developed and approved prior to commencement of surveys.

An erosion and sedimentation control plan is also recommended to mitigate the risk of downstream impacts to potential habitat for this species.

Platypus

Due to the confirmed presence of platypus on site, and the potential presence of burrows, a pre-clearance survey and burrow decommissioning protocol should be implemented to mitigate potential impacts to this species.

Weeds and pathogens

Seven weed species listed as declared under the Tasmanian Biosecurity Act 2019 were recorded across the project area. No evidence of pathogens such as *Phytophthora cinnamomi* or chytrid fungus were recorded.

Across the entire project area, the following biosecurity measures are recommended:

- Due to the location and nature of the works, all machinery must be clean upon entering the site and cleaned before exiting.
- In addition, the following should be followed for best practice weed and hygiene prescriptions:
    - *Keeping it clean - A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens* (Allen and Gartenstein, 2010)
    - *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania* (DPIPWE, Stewart and Askey-Doran, 2015)
    - *Wetlands and Waterways Works Manual* (DPIPWE, 2003)
- An erosion and sedimentation management plan should be considered if there is a risk that works will compromise river edges and water quality through erosion and sedimentation.

Legislative requirements

Provided the recommended mitigation and additional survey methods are adhered to, the proposal is not likely to trigger the need for referral under the EPBC Act.

A permit to take under the TSP Act for the giant freshwater crayfish may be required if individuals need to be relocated from the impact area.

The works will require a Division 3 Dam Works Permit under the *Tasmanian Water Management Act 1999*. This permit addresses the requirements of any other permits under the Tasmanian *Threatened Species Protection Act 1995*, the Tasmanian *Nature Conservation Act 2002*, and the Tasmanian *Land Use and Planning Approvals Act 1993*, however it does not exempt the works from the Tasmanian *Biosecurity Act 2019*.

Areas that are not covered by the Division 3 Dam Works Permit will require approval by means of a development application to be lodged through the Burnie City Council under the Tasmanian Planning Scheme.

ACKNOWLEDGEMENTS

Project	Pet Dam Spillway Upgrade
Location	Pet Dam, Ridgley
Proponent	TasWater CDO
Proponent contact	Cameron Amos and Quentin Ward
NBES Job Code	TSW015
NBES Project Manager	Jared Parry (jparry@northbarker.com.au)
NBES Project Summary	Natural Values Assessment
Field Surveys	Options A & B – 18/05/2020 (Jared Parry - BBus, MEM) Option C – 17/01/2024 (Sally Anthony - BSc) Stockpile Areas – 29/05/2024 (Will De Angelis - BSc) Masked Owl Investigations – ongoing from May 2024 (Ramit Singal - BE & Jared Parry) Intake channel & stilling basin – 05/03/2025 (Cameron Geeves - BSc Hons)
Reporting	Jared Parry & Sally Anthony
Mapping	Jared Parry

Version	Date	Author / Comment	Position
V1.0	22/05/2020	Jared Parry. Reviewed and delivered to client by Grant Daniels	Contract Ecologist (JP) Managing Director (GD)
V1.1	13/01/2023	Jared Parry. Updates to include spillway design	Senior Ecologist
V2.0	01/02/2024	Drafted by Sally Anthony. Reviewed and delivered to client by Jared Parry	Graduate Ecologist (SA) Senior Ecologist (JP)
V2.1	13/02/2024	Addressed Forest Practices comments and delivered to client by Jared Parry	Senior Ecologist
V2.2	26/08/2024	Report update incorporating addendum and masked owl survey results by Cameron Geeves	Senior Ecologist
V3.0	21/01/2025	Revised and delivered to client by Jared Parry	Senior Ecologist
V4.0	08/04/2025	Revised and delivered to client by Jared Parry	Lead Ecologist
V4.1	02/06/2025	Updated with new masked owl advice from CAS and updated platypus pre-clearance procedure and delivered to client by Jared Parry	Lead Ecologist

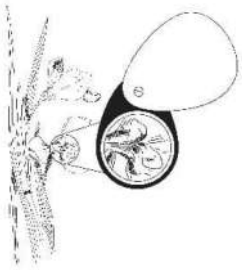


TABLE OF CONTENTS

1. PROJECT DETAILS

1.1. BACKGROUND

TasWater Capital Delivery Office (TWCDO) have engaged North Barker Ecosystem Services (NBES) to complete ecological assessments for proposed upgrade works to the dam wall and spillway at Pet Dam, near Ridgley (Figure 1).

TWCDO sought to investigate three different options for the spillway upgrade (Figure 1). The design for Option A proposes to straighten the existing spillway, and to establish a new offtake. Option B proposes the construction of a new spillway at the right-hand abutment of the dam embankment. Option C proposes the construction of a new northern spillway, completed separate from the existing dam embankment. Option C would require the development of a temporary road to allow for access on Circular Road, and emergency spillways. To facilitate these works, stockpile areas, which will be used to store spoil from the proposed works have been included in the assessment.

In December 2024, an Options Workshop was held with TWCDO and stakeholders to evaluate two final possibilities: constructing a new spillway adjacent to Circular Road, partially overlapping the existing spillway or constructing a new spillway through Forico Pty Ltd (herein referred to as Forico) owned land. The workshop concluded with the decision to adhere to Option C, which posited to construct a new spillway from the north of the dam to the Pet River, following the current creek alignment south of the Sewage Treatment Plant.

The proposed works include the following:

- Construction of a new northern bay permanent spillway, utilising the existing siphons and upgraded scour outlet to control the reservoir level, and the existing spillway for flood control;
- Construction of a bridge across the new spillway to maintain Circular Road access;
- Demolition, removal and backfill of the existing left abutment spillway structure;
- Raising of the dam wall by approximately 1 m to accommodate flood flows. The footprint for the dam wall raise will be within 50 m of the existing wall;
- Upgrades and replacement of several dam elements
- Provide temporary traffic redirection around the new spillway crest to maintain access during bridge construction;
- Construction of a cofferdam upstream of the new northern bay spillway crest. Material in the approach channel may be left in place to act as a natural cofferdam which will only be removed at the end of construction to excavate the approach channel. Remove the coffer dam upstream of the new spillway crest;
- Construction of a cofferdam in front of the existing spillway to facilitate safe dam wall construction, removal and backfilling of the old spillway; and
- Construction of new cofferdams and diversion pipeline to Pet River to maintain riverine flow and enable new spillway construction.

This report addresses impacts to natural values pertaining to Option C (including the spillway, approach channel, and stilling basin), proposed stockpile areas, and impacts associated with raising the dam crest. This report addresses impacts to natural values pertaining to Option C, proposed stockpile areas, and impacts associated with raising the dam crest.

1.2. METHODS

The assessment was undertaken in accordance with the *Guidelines for Natural Values Surveys*[1]. At the time of surveys, a precise footprint for works had not yet been defined. As TasWater wish to investigate three different spillway options, surveys constituted a broad area that included all spillway footprints. Options A & B were surveyed on May 18th, 2020, and due to the modified nature of the impact area and the limited scope for significant changes to have occurred, further surveys were not proposed with the addition of Option C. The Option C area was surveyed on the 17th of January 2024, with the upper dam approach channel and Pet River stilling basin surveyed on the 5th of March 2025. Both stockpile areas were surveyed on the 28th of May 2024. Masked owl investigations, including passive acoustic monitoring (PAM) and audio callback surveys commenced in May 2024, with final PAM surveys completed in December 2024.

Native vegetation was mapped in accordance with units defined in *From Forest to Fjaeldmark – Descriptions of Tasmania's Vegetation (Edition 2)*[2]. The site was surveyed using a meandering area search technique[3]. Additional survey effort was applied to habitats suitable for threatened species (under the Tasmanian *Threatened Species Protection Act 1995* [TSP Act] and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act]), and to 'declared' weeds listed under the Tasmanian *Biosecurity Act 2019*. All location data were recorded with a handheld GPS and/or GPS mobile applications. Botanical nomenclature follows the current census of Tasmanian plants[4].

A search was made for evidence (e.g., scats and tracks) and presence of potential threatened fauna concurrently with the botanical survey. A search for nests and tree hollows was conducted from the ground only. Diameter at breast height (DBH) of *Eucalyptus* trees was recorded using a calibrated DBH tape, and in the case of measuring large numbers of trees, estimated using DBH size classes. Trees were assessed for potential threatened fauna habitat (including searching for hollows, decaying limbs, signs of activity).

The Natural Values Atlas database was consulted for records of threatened species and vegetation types within a 5 km radius. The possibility of the project area supporting threatened values known from within this radius has been considered in the interpretation of results and discussion[5].

1.3. LIMITATIONS

Field surveys for Options A & B were undertaken in early autumn, and mid to late summer for Option C. Values that are seasonal may have been absent across sites. There may be some herb, orchid and ephemeral wetland plants that have been overlooked during the survey. However, all threatened plant species, known from the area have been considered in light of habitat suitability noted on site.

Fauna habitat, including the presence of tree hollows and nests, were assessed from ground level only. Downstream hydrological impacts to the Pet River resulting from spillway works have not been investigated in this study.

Data points were recorded on a handheld GPS with an average accuracy of <10 m.

[1] Department of Natural Resources and Environment (2019)
[2] Kitchener and Harris (2013)
[3] Goff *et al.* (1982)
[4] De Salas & Baker (2023)
[5] Department of Natural Resources and Environment (2024)

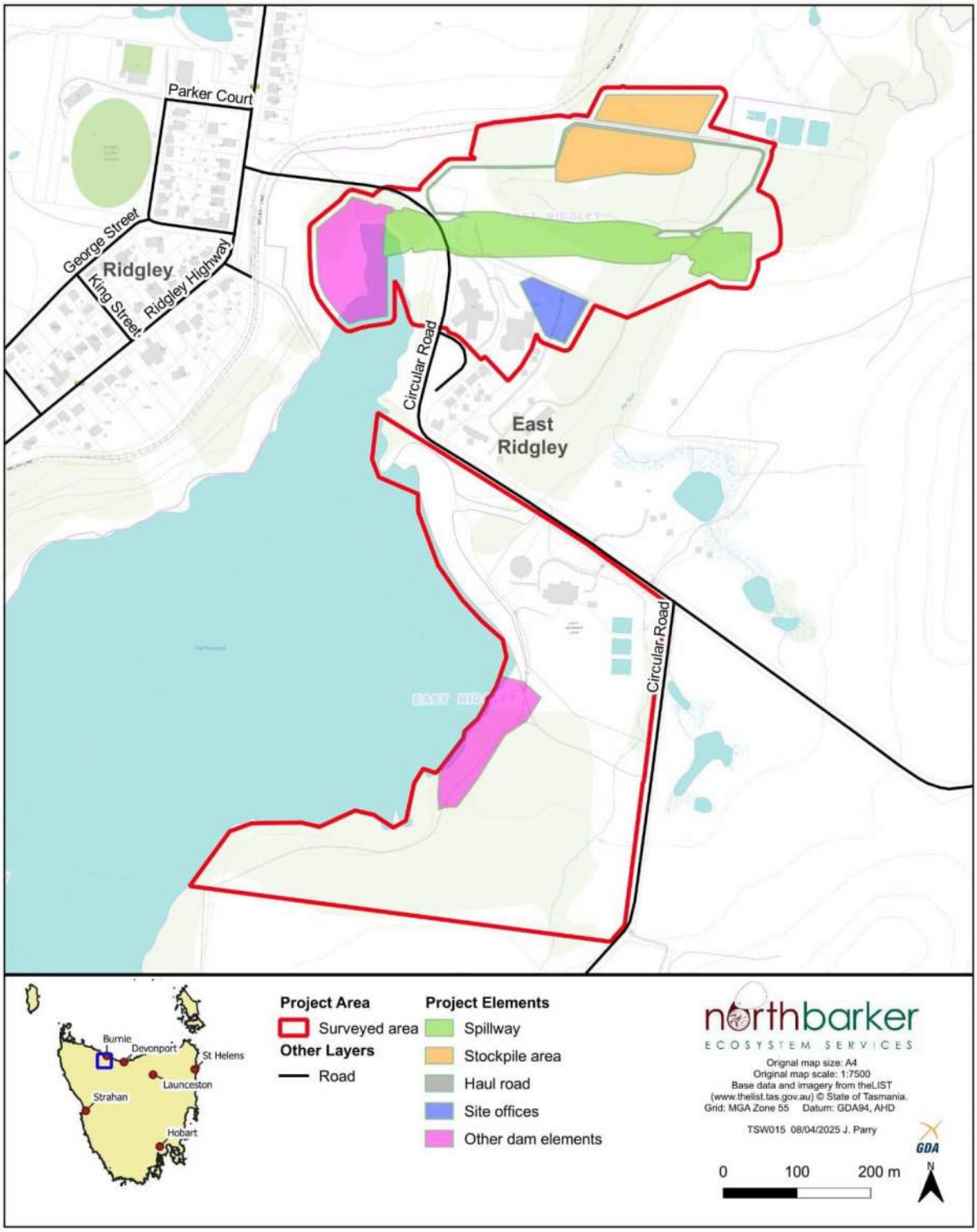


Figure 1: Location and overview of the project area

2. SITE VALUES

2.1. PROJECT ELEMENTS AND SITE CHARACTERISTICS

The spillway survey area includes areas of cleared land in the west, with areas of native canopy, an emergency helicopter pad and a portion of Circular Road providing immediate access to multiple establishments. In the east, the proposed spillway location broadly follows a small waterway which meets the Pet River (Plate 1). The waterway is bordered by native forest, with mature trees sparsely distributed across the patch.

Two small areas located directly south of the existing water treatment plant compound may require vegetation removal to facilitate the crest of the dam (Figure 1). Initially this area was identified as a potential stockpile area; however, this is not currently proposed for this location. This area currently contains numerous native trees over pasture. A large portion of this area is currently used for running livestock, with cattle grazing in the paddocks at the time of survey. In the areas outside of these fenced off paddocks, the remainder of the site is in similar condition, up to the water's edge of Pet Dam.

The proposed stockpile area is located within Forico Pty. Ltd. Property, located north of the proposed spillway. An additional stockpile overflow has been identified in the paddock immediately to the north. These areas contain few values of conservation significance.

Within the spillway and stockpile areas, a haulage road is proposed as a means to access the stockpile sites. A temporary diversion of Circular Road though modified land is also proposed while bridge works are undertaken.

Plate 1: Creek line adjacent to the proposed spillway

2.2. VEGETATION COMMUNITIES

2.2.1. Spillway area and Pet River stilling basin

The forest lining the waterway adjacent to the proposed spillway was previously mapped as wet *Eucalyptus obliqua* forest - undifferentiated (TASVEG – WOU). However, our field assessment verified this as wet *Eucalyptus obliqua* forest with a broad leaf understorey (TASVEG – WOB) (Figure 2a). The canopy is dominated by *E. obliqua* (Plate 2) and *E. regnans*, several of which were of significant size (DBH >1 m) with the potential to bear hollows. The understorey is mostly comprised of *Pomaderris apetala*, *Coprosma quadrifida* and *Dicksonia antarctica* (Plate 3), with areas of disturbance being

dominated by *Acacia dealbata* (TASVEG – NAD). This vegetation extends to the Pet River, where the proposed stilling basin is located. The WOB vegetation extends to the rail line in the north, and eastwards beyond the TasWater sewage treatment works agricultural lands.

There are several significant endemic tree specimens present at the eastern extent of the site along the access road to the sewage treatment plant, including Huon pine, pencil pine, Oyster Bay pine, and King Billy pine. These are likely to be planted specimens, nonetheless, they have been included in mapping (Figure 2a) and are discussed in Section 2.3.

Plate 2: *Eucalyptus obliqua* forest with a broad leaf understorey (TASVEG – WOB) at eastern end of the proposed spillway

Plate 3: WOB understorey vegetation

2.2.2. Stockpile area

The large majority of the stockpile area consists of agricultural land (FAG) (Plate 4), with ~0.10 ha of WOB at the southwest and southeast corners, and an area of NAD (0.27 ha) along the southern boundary (Figure 2a).

Plate 4: Agricultural land (FAG) within the proposed stockpile area

2.2.3. Haulage road, temporary detour, and intake channel

The area proposed to install a temporary detour while bridge works on Circular Road are undertaken occurs largely through modified land, with a small area of WOB to be removed.

The proposed haulage road to access stockpile areas occurs in modified land, and through WOB. Where the proposed route passes through WOB, some existing vehicle tracks will minimise the need to remove vegetation. Much of the haulage road occurs within the footprint of the spillway and stockpile area, which will be subject to ongoing vegetation impacts. Access to the eastern side of the Pet River will occur through a temporary access road through agricultural land.

The proposed spillway intake channel area to the west of the existing dam contains improved pasture with native tree canopy (FAC). Healthy *Eucalyptus viminalis* trees dominate the canopy in this area, with pasture grasses and weeds such as blackberry and Spanish heath present in the ground stratum, as well as scattered native shrubs and small trees.

2.2.4. Dam crest

An area south of the existing water treatment plant was surveyed as a potential stockpile area and for dam crest modifications. This area contains modified pasture with a canopy containing native eucalypts, predominantly *Eucalyptus obliqua* and *E. viminalis*. No native vegetation communities are present in this region (Figure 2b).

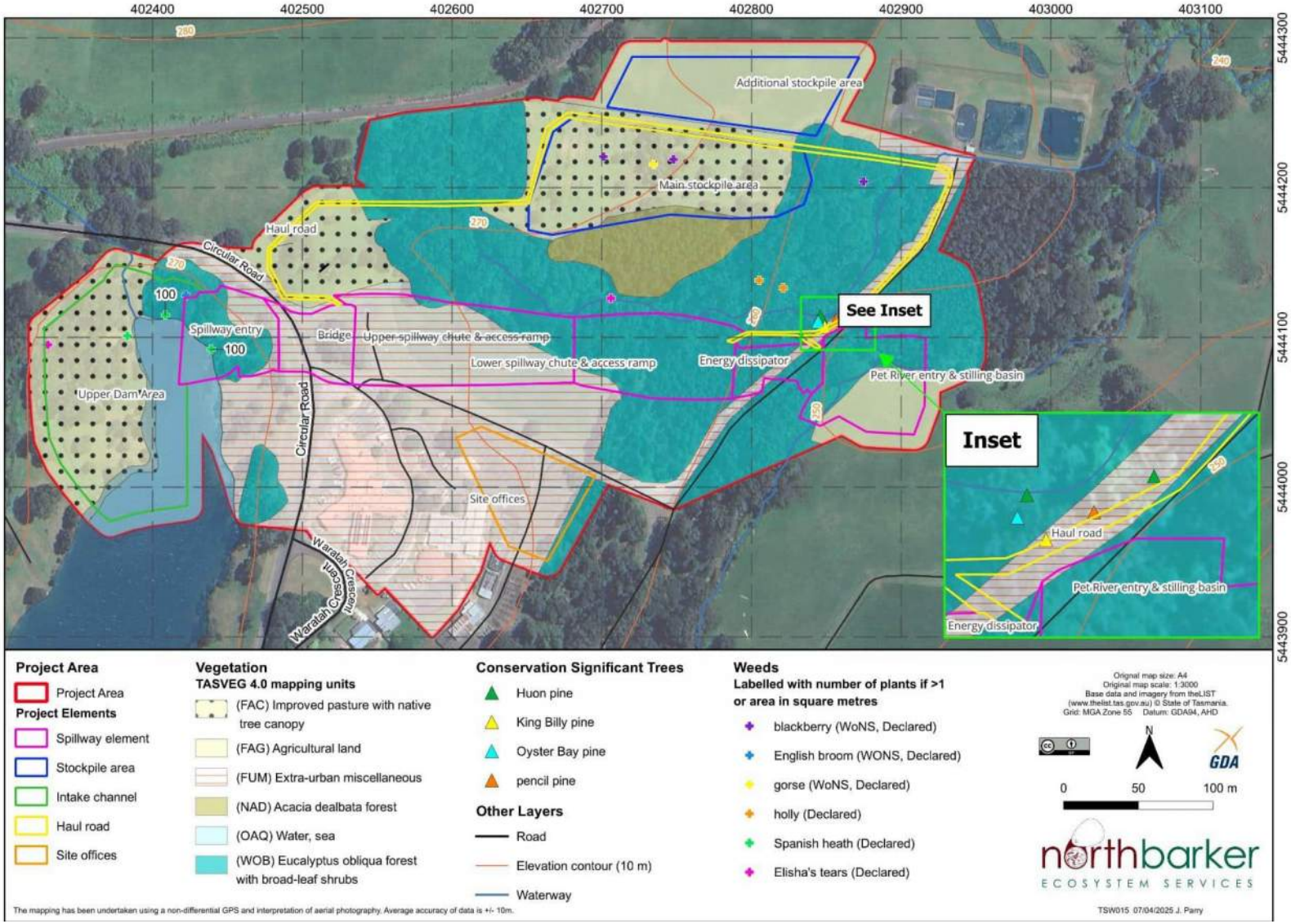


Figure 2a: Vegetation and flora values within the spillway area

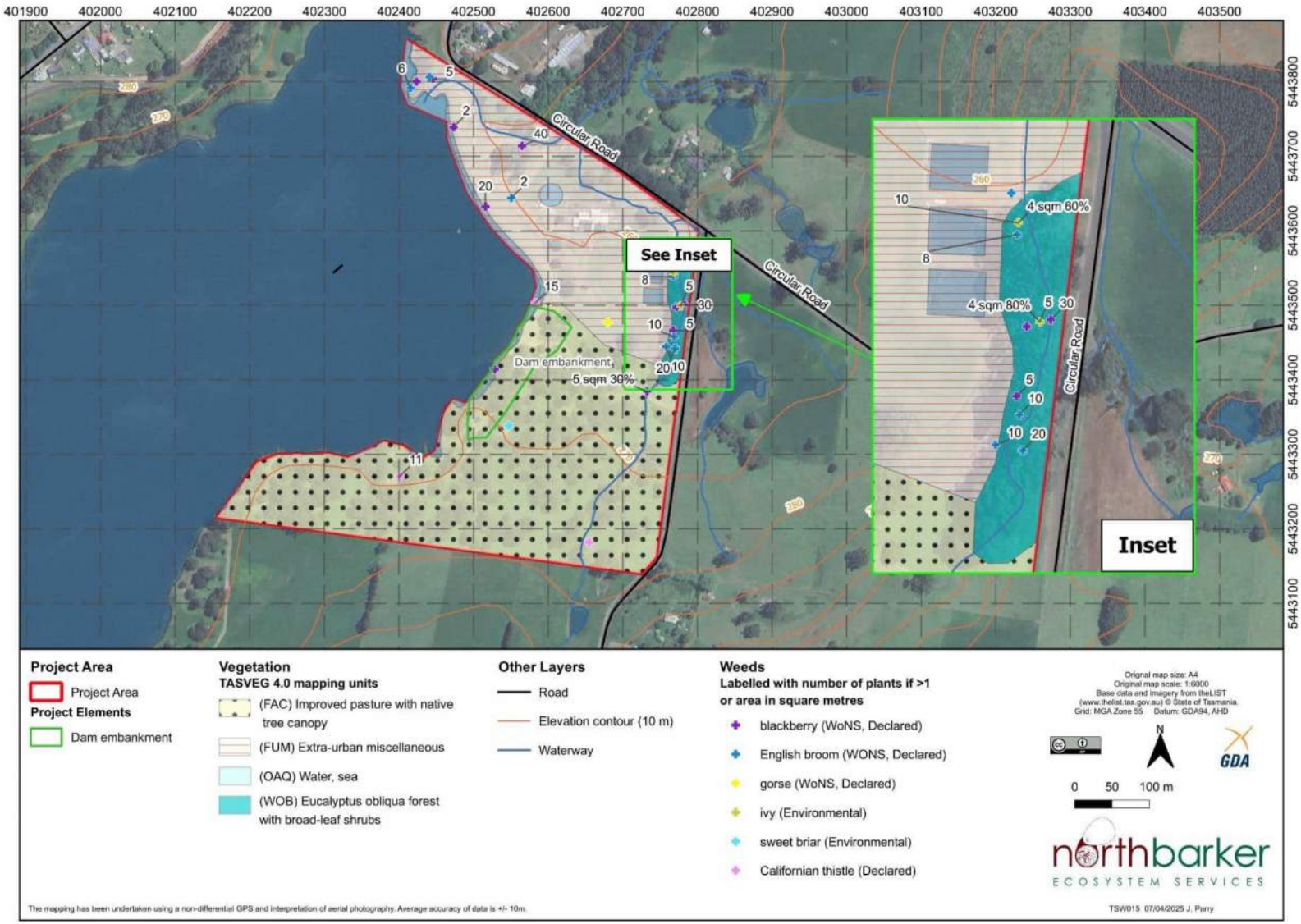


Figure 2b: Vegetation and flora values within the water treatment plant and surveyed area to the south

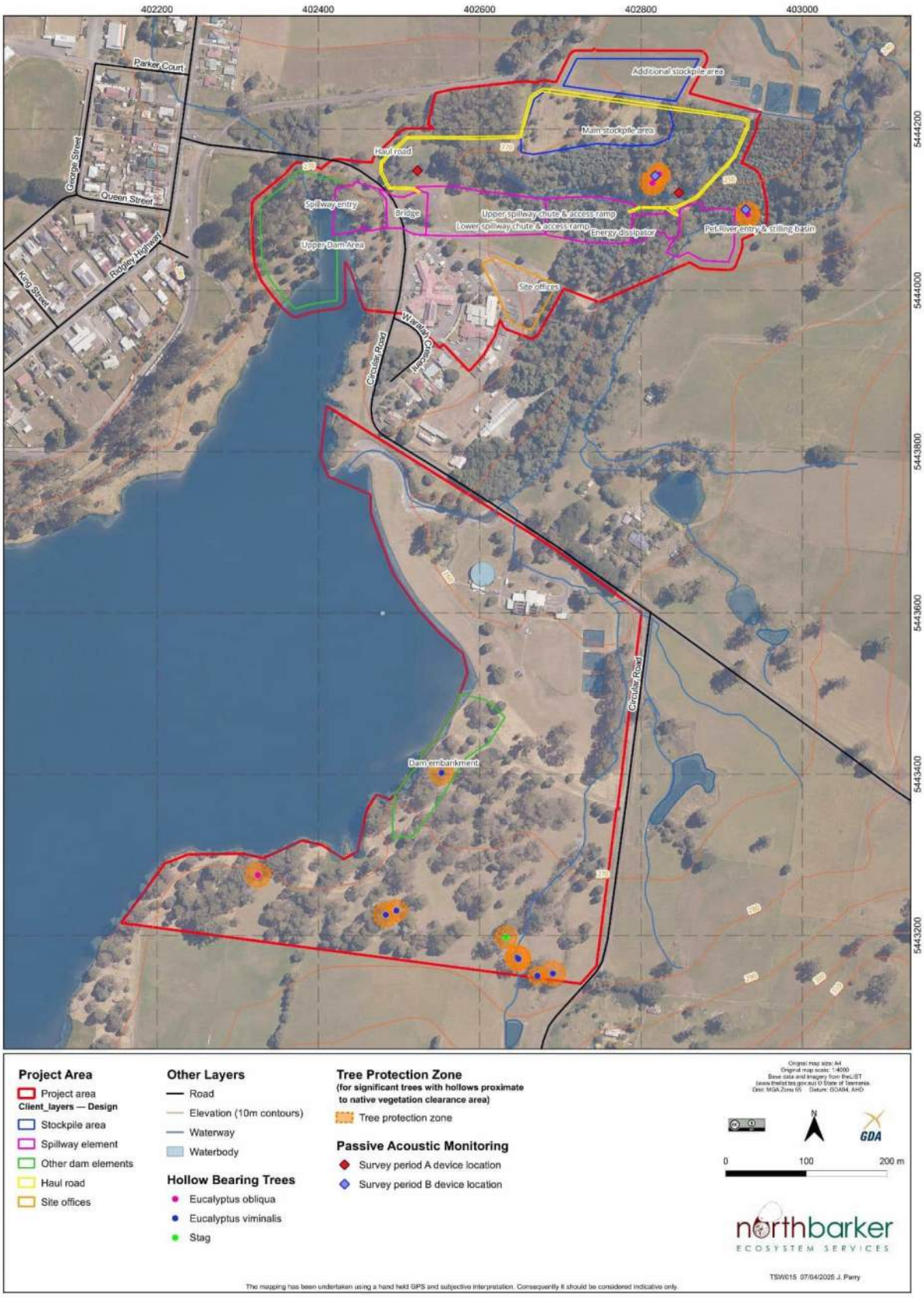


Figure 3: Hollow bearing trees mapped across the project area

2.3. CONSERVATION SIGNIFICANT FLORA

A total of 137 vascular plant taxa were recorded across the project area during surveys for all spillway options (Appendix A), with sixty of these being introduced species, seven of which are listed as 'declared' under the Tasmanian *Biosecurity Act 2019.*

No flora species listed as threatened under the TSP Act or the EPBC Act were observed in the survey.

No TSP Act or EPBC Act listed threatened species have been recorded within 500 m according to the Tasmanian *Natural Values Atlas*[6]. Within 5 km of the project area, one threatened flora species (which has no likelihood of occurring on site) has been previously recorded according to the Tasmanian *Natural Values Atlas*[7] (Table 1). *Barbarea australis* has been recorded within 5 km, on the Guide River. Although potential habitat is present along the waterway in the spillway survey area, no occurrences were recorded, and it is unlikely that this species was overlooked.

Four notable conifers, *Athrotaxis selaginoides* (King Billy pine - Plate 5), *Athrotaxis cupressoides* (pencil pine), *Lagarostrobos franklinii* (Huon pine - Plate 6), and *Callitris rhomboidea* (Oyster Bay pine) and were recorded in WOB forest in the eastern extent of the spillway area (Figure 2a). These species aren't native to the area and based on the size of the trees present, are likely to have been planted sometime in the past 50 years. These species aren't listed under the TSP Act or EPBC Act, however efforts should be made to maintain or relocate these plantings.

Table 1: Threatened flora attributed to within 5 km of the project area; SS = Tasmanian *Threatened Species Protection Act 1995*, NS = Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Barbarea australis	riverbed wintercress	e	EN	e	24	04-Mar-2020

Plate 5: King Billy pine (*Athrotaxis selaginoides*)

[6] Department of Natural Resources and Environment (2024)
[7] Department of Natural Resources and Environment (2024)

Plate 6: Huon pine (*Lagarostrobos franklinii*)

2.4. THREATENED FAUNA AND THREATENED FAUNA HABITAT

There are two recorded observations of threatened fauna within a 500 m buffer of the survey areas according to the Tasmanian Natural Values Atlas[8] (Table 2), however, there is potential for 14 species to occur within 500 m based on range boundaries (Table 3). No threatened fauna species were directly observed during field surveys.

Our fauna habitat assessment identified 21 large trees with a diameter at breast height of over 1 m throughout the spillway survey area (Figure 3). These trees are located within the WOB and FAC vegetation communities. Of these 21 trees, 12 trees have been identified to contain hollows which are considered as habitat for hollow dependant threatened fauna species; however, only 3 of these are located within 150 m of a proposed works area. Brush-tail possums were observed utilising hollows in at least one of these trees.

There are marginal foraging resources available for the swift parrot, with sporadic blue gums present across the project area, including a patch of planted blue gums on the western side of the existing spillway. It is not considered that these trees present a significant foraging resource for this species.

The waterway in the spillway survey area was deemed unsuitable for giant freshwater crayfish as it is very narrow and fast flowing through most of the survey area. In areas of low flow, high levels of silt and a lack of rock cover for sheltering renders the waterway unsuitable. Likewise, the stilling basin area on the Pet River lacks large rocks and logs suitable for crayfish to shelter under. This area does not represent breeding habitat for this species but may occasionally frequent the area.

[8] Department of Natural Resources and Environment (2024)

Table 2: Verified threatened fauna records attributed to within 500m of the project area; SS = Tasmanian *Threatened Species Protection Act 1995*, NS = Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Lathamus discolor	swift parrot	e	CR	mbe	1	11-Dec-2020
Sarcophilus harrisii	tasmanian devil	e	EN	e	4	09-Mar-2018

Table 3: Threatened fauna potential to occur based on known range boundaries within 500 m of the project area; SS = Tasmanian *Threatened Species Protection Act 1995*, NS = Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Species	Common Name	SS	NS	BO	Potential	Known	Core
Engaeus yabbimunna	Burnie burrowing crayfish	v	VU	e	1	0	0
Astacopsis gouldi	lutaralipina or giant freshwater crayfish	v	VU	e	1	0	0
Lathamus discolor	swift parrot	e	CR	mbe	1	0	0
Prototroctes maraena	australian grayling	v	VU	ae	1	0	0
Pseudemoia pagenstecheri	tussock skink	v		n	1	0	0
Oreisplanus munionga subsp. larana	marrawah skipper	e	VU	e	1	0	0
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	2	0	0
Tyto novaehollandiae subsp. castanops	masked owl (Tasmanian)	e	VU	e	1	0	1
Dasyurus maculatus subsp. maculatus	spotted-tailed quoll	r	VU	n	1	0	1
Galaxiella pusilla	eastern dwarf galaxias	v	VU	n	1	0	0
Accipiter novaehollandiae	grey goshawk	e		n	1	0	1
Sarcophilus harrisii	tasmanian devil	e	EN	e	1	0	0
Perameles gunnii	eastern barred bandicoot		VU	n	1	0	0
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	1	0	0

2.4.1. Tasmanian masked owl (*Tyto novaehollandiae castanops*)

Due to the presence of large, hollow-bearing trees, it was determined that investigations into the potential utilisation of the Tasmanian masked owl (*Tyto novaehollandiae castanops*), listed under the TSP Act as endangered and the EPBC Act as vulnerable, were warranted. This was done in accordance with survey methods and advice provided by the Conservation Assessment (CAS) branch of the Department of Natural Resources and Environment Tasmania (NRE).

Audio call-back

Four call-back surveys were conducted over the following dates 14th, 15th, 28th and 29th of May 2024. Each night four separate rounds of playback was conducted between 1800 hrs and 2000 hrs.

Surveys were conducted after sundown across and focussed on locations identified as potential habitat with the spillway survey area. The survey consisted of a twenty-minute survey broken down into five-minute blocks. For the first five minutes a selection of masked owl recorded noises (screeches and chattering) was broadcast on Bluetooth speaker. Recorded noises were played intermittently to replicate a more natural regularity of calls. The second five minutes of the survey consisted of silent listening in complete darkness for wild owl calls and watching for silhouettes (if moonlight permits). For the third five minutes of the survey, the recorded sounds were played again as per the first five minutes, with the additional use of a spotlight to observe any owls that may have been perched in nearby trees. The final five minutes of the survey was then completed in silence and dark, again listening out for wild owl sounds and looking for any owl silhouettes.

A thermal monocular was also used prior to each survey and in between the first round of callback to scan the local area and search trees for owls. This scanning method was also utilised when moving between survey locations.

No masked owls were identified during these surveys.

Passive acoustic monitoring

Two periods of passive acoustic monitoring (PAM) surveys have been undertaken within WOB forest in the spillway survey area. The first of these surveys (Survey Period A) was conducted between the 3rd of May 2024 and the 2nd of August 2024. The second round of surveys (Survey Period B) was conducted between the 18th of November 2024 and the 9th of December 2024. The secondary PAM surveys were conducted as a pre-cursor to proposed passive visual surveys (hollow observations).

The surveys have been undertaken through deploying two Songmeter SM4 Acoustic Recorders spaced ~320 m apart in order to acquire sufficient coverage of the survey area and near trees identified as potential masked owl roosting/nesting habitat (i.e. large senescing eucalypt trees which support large hollows >15 cm in diameter). Song meters were programmed to record continuously from one hour after sunset to one hour before sunrise. Figure 3 shows the location of each PAM device.

The recordings were visualised as spectrograms on Adobe Audition. Loud thuds were manually removed and where possible, sounds of wind and rain were reduced using the AI noise reduction feature on the software. Then, all recordings were normalised to -3 dB and scanned for potential screeches and chatter. When screeches were identified as possible masked owls, Raven Pro 1.5 was used to check for peak frequencies against the figure of 1764 Hz but allowing for a range of 1700-2500 Hz[9].

Positive detections of the masked owl were subsequently obtained from this analysis. Owls were recorded six times across five separate nights (four in June, one in November), with calls occurring at least 3 hours after dusk or 2 hours prior to dawn (Table 4).

Table 4: Date and time of masked owl PAM detections

Call ID	Date	Time
1	01/06/2024	4:45 AM
2	03/06/2024	10:30 PM
3	14/06/2024	7:40 PM
4	18/06/2024	7:52 PM
5	18/06/2024	8:00 PM
6	19/11/2024	3:41 AM

2.4.2. Swift parrot

The swift parrot (*Lathamus discolor*) is a migratory species which breeds in Tasmania during the summer and then migrates to mainland Australia for the winter[10]. It is a slim, medium sized parrot which is mostly green with angular wings and a slender tail[11] and is listed as critically endangered under the EPBC Act and as endangered under the TSP Act.

The breeding range of the swift parrot is concentrated along the east and southeast coast of Tasmania and is strongly associated with the distribution of blue gum (*Eucalyptus globulus*), its primary feeding resource[10]. The swift parrot nests in hollows in large eucalypt trees, normally within 10 km of foraging

[9] Todd (2012)
[10] Threatened Species Scientific Committee (2016)
[11] Higgins (1999)

habitat[12]. In Tasmania, suitable habitat includes any *Eucalyptus globulus* or *E. ovata* (black gum) that are old enough to produce significant flower or any large eucalypt trees that support suitable sized nesting hollows.

The project area falls within the species potential breeding range, however, is not within an identified swift parrot important breeding area (SPIBA). The vicinity of the project area is not known to be regularly used by swift parrots, with one record of the species documented within 500 m / 5 km from the project area[13]. While this is a relatively recent record from December 2020, this is a singular bird sighting with little additional information and an accuracy of <50 m. The swift parrot north-west breeding area 3 is located approximately 3 km northeast of the project area, with the next closest sighting south of Stowport, approximately 7 km northeast of the project area.

The project area contains no vegetation communities dominated by blue gums or black gums, nor are there any of these communities mapped within a 10 km radius. There are however numerous hardwood plantations in the broader area, which can be utilised as a foraging source for swift parrots when dominated by blue gums[14]. Numerous blue gums were also recorded within the project area, including numerous mature trees within the southern extent of the project area, recorded as potential foraging habitat for the species. Only 12 trees within the project area were directly observed to contain hollows that may provide nesting opportunities.

2.4.3. Burnie burrowing crayfish

The Burnie burrowing crayfish (*Engaeus yabbimunna*), listed as vulnerable under the EPBC Act and TSP Act, is a medium-sized burrowing crayfish, typically reaching a length of around 6 cm. The species is endemic to Tasmania, occurring over an area of approximately 130 km^2 in and around the city of Burnie. The Burnie burrowing crayfish is found in fern-dominated stream-side vegetation as well as in open and grassy sheep pasture, farm dams, roadside seeps and culverts, and sedgey marsh.

The nearest record is approximately 1.3 km north of the project area near a small dam adjacent to the Ridgley Highway. It is understood that investigations into this species have been undertaken by a specialist consultant.

There is evidence of burrowing crayfish along the creek adjacent to the spillway (Plate 7). Three small burrows were identified as photographed (Plate 7) by the water's edge. The Burnie burrowing crayfish (*Engaeus yabbimunna*) has a potential range within the site; however, there have been no confirmed sightings of threatened crayfish within 500 m.

[12] Webb (2008)
[13] Department of Natural Resources and Environment (2024)
[14] Mallick *et al.* (2004)

Plate 7: Potential burrowing crayfish burrow along the creek adjacent to the proposed spillway

2.4.4. Giant freshwater crayfish

The giant freshwater crayfish (*Astacopsis gouldi*) is listed as vulnerable under both the EPBC Act and TSP Act. The giant freshwater crayfish is endemic to rivers of northern Tasmania. The known range of this species includes rivers and streams in the Arthur River catchment and all rivers and streams flowing into Bass Strait except those of the Tamar River catchment and rivers east of Gladstone[15]. It inhabits rivers and streams at elevations of approximately 20–300 metres above sea level, with upper limits of 400 metres.

This species requires well-shaded streams that have good water quality, low sediment levels, snags, pools and undercut banks[16]. Adequate riparian vegetation, instream vegetation and woody debris and a stable thermal regime of relatively low water temperature are also important habitat features[17]. More specific habitat requirements for this species vary depending on the age-class in question. Adults often move to larger slower-flowing reaches where they dig burrows in stream banks and underneath logs and boulders in the stream bed[18]. Juveniles are typically found in shallow, fast flowing streams and creeks with cobbles and boulders, which they use for shelter.

The nearest known occurrences of this species are on the Guide River, approximately 2.8 km southwest of the proposed spillway area. A total of 8 occurrences have been recorded within 5 km of the project area.

The watercourse adjacent to the spillway area was deemed suboptimal for giant freshwater crayfish as it is very narrow and fast flowing through most of the survey area. In areas of low flow, high levels of silt and a lack of rock cover for sheltering renders the waterway unsuitable. Likewise, the stilling basin area on the Pet River lacks large rocks and logs suitable for crayfish to shelter under.

A separate study undertaken by Pinion Advisory also failed to detect the species in the Pet River but acknowledged its potential to occur.

[15] Threatened Species Scientific Committee (2017)
[16] Lynch & Bluhdorn (1997); Hamr (1990); Growns (1995)
[17] Lynch & Bluhdorn (1997); Hamr (1990)
[18] Lynch & Bluhdorn (1997)

2.5. WEEDS & PATHOGENS

Seven species listed as declared weeds under the Tasmanian *Biosecurity Regulations 2022* (in effect under the Tasmanian *Biosecurity Act 2019*) were observed across all surveys. Distribution of weeds is displayed in Figure 2a-b.

- The presence of blackberry (*Rubus fruticosus*) is frequent across all survey areas, with greatest density throughout FUM and FAC vegetation communities (Plate 8);
- English broom (*Cytisus scoparius*) is present at numerous locations in the water treatment plant area, with the highest density observed within the WOB vegetation on the eastern boundary of the water treatment plant. A further two plants were observed near the reservoir edge in the far north of the reservoir, near Circular Road (Plate 9);
- Gorse (*Ulex europaeus*) was observed in a grassy area that is subject to regular mowing in the water treatment plant area as well as at a single location within the proposed stockpile area.
- Two holly (*Ilex aquifolium*) trees were recorded in WOB vegetation on the northeastern side of spillway survey area (Plate 10);
- Spanish heath (*Erica lusitanica*) is present on the western side of the spillway survey area, occurring close to the water's edge at the northern end of reservoir (Plate 11), and along the reservoir edge in the intake channel area;
- Himalayan honeysuckle (*Leycesteria formosa*) was recorded in two locations, one on the margin of the waterway in the spillway survey area (Plate 12), and another in the intake channel area;
- Californian thistle (*Cirsium arvense*) was recorded at two separated locations within FAC in survey area south of the water treatment plant;
- No evidence of pathogens such as *Phytophthora cinnamomi* or chytrid fungus were observed during surveys.

Plate 8: Blackberry infestation in the intake channel area

Plate 9: English broom recorded north of the reservoir near Circular Road

Plate 10: Holly (*Ilex aquifolium*) tree growing in under a canopy

Plate 11: Spanish heath (*Erica lusitanica*) plants growing at water's edge of the northern end of Pet Dam reservoir

Plate 12: Himalayan honeysuckle (*Leycesteria formosa*) observed near the proposed spillway

2.6. GEOCONSERVATION SITES

No known geoconservation sites occur within the project area. The nearest known geoconservation site is located just over 2.5 km to the east. This site – Emu River incised meanders – is of State significance.

3. POTENTIAL IMPACTS AND MITIGATION

Based on assessments of the proposed spillway and stockpile areas, there are likely to be numerous minor constraints and pre-construction requirements.

3.1. VEGETATION COMMUNITIES

No threatened vegetation communities listed under either the Tasmanian *Nature Conservation Act 2002* (NCA) or the EPBC Act were observed within the project area nor are any likely to occur or have been overlooked.

Spillway area and Pet River stilling basin

The spillway upgrade will impact both modified land and native vegetation communities. The spillway is proposed to begin at the northern end of Pet Dam reservoir and travel eastward to follow the existing waterway before meeting the Pet River. The spillway will require the clearing of 1.25 ha of native WOB forest. Many *Eucalyptus regnans* and *Eucalyptus obliqua* trees will likely require removal, including several with a DBH of over 1 m, although none of these large trees within the impact area contain hollows suitable for threatened fauna. An additional 1.32 ha of modified land will be impacted.

Stockpile areas

Both stockpile areas occur in a highly modified state, with most of this area consisting of the modified land units FAC and FAG. There are only two large eucalypts (non-hollow bearing) within the main stockpile area, with the small patches of native vegetation in poor condition and containing no large trees.

It is believed that the scope of works within the proposed stockpile areas has potential to require total clearance of vegetation. This equates to approximately 0.05 ha of NAD and 0.06 ha of WOB within the main stockpile area. The potential additional stockpile area contains no native vegetation.

Haulage road, temporary detour, and intake channel

The temporary detour road to facilitate bridge works on Circular Road are likely to impact a small area of WOB vegetation, the extent of which is uncertain at this time.

The proposed haulage road will impact some WOB vegetation (0.07 ha); however, it will utilise existing formed roads and informal tracks where possible to reduce the level of vegetation removal. This calculation does not consider impacts where the haulage road overlaps with other infrastructure (ie the spillway area).

Although 94 % of the intake channel area is modified vegetation or water, numerous native trees will require removal, none of which were observed to contain hollows suitable for threatened fauna species.

Dam crest

No native vegetation communities require removal for the proposed raising of the crest of the dam, however some native tree canopy will require removal (0.92 ha of FAC).

Site offices

The site office area contains a very small sliver of WOB (0.02 ha); however in reality, no vegetation clearance will occur at this location.

3.1.1. Mitigation

The impacts of vegetation clearance are difficult to mitigate; however, the risk of unnecessary and indirect impacts on vegetation within buffer zones and outside of the designated works areas could be minimised by following these measures:

- Clearly define the extent of clearance required for the project and ensure that any additional impacts are avoided;
- Mark the works area on operation plans and on site, and confine all works, vehicles and materials to the works area;
- The utilisation of stockpile areas should be limited to modified vegetation to the extent possible.
- Large trees (>1 m DBH) should be retained where possible, and to mitigate the loss of any unavoidable trees within these areas, it is recommended that the sites be rehabilitated after use. For all trees lost, a replacement ratio of 3:1 is recommended. Equivalent species are recommended for planting during rehabilitation, particularly *E. obliqua* and *E. viminalis* trees which are dominant in the area and *E. globulus* trees which are fast growing and may also be utilised as a foraging source for the swift parrot; and
- Any areas of temporary disturbance should be revegetated with propagules sourced from the local area, comprised of native species (see Appendix A).

3.2. CONSERVATION SIGNIFICANT FLORA

No flora species listed as threatened under the TSP Act or the EPBC Act were observed in the survey areas or are considered likely to occur. No specific mitigation is required.

The cluster of conservation significant conifers adjacent to the sewage treatment plant access road, although not formally protected by legislation, should be prioritised for avoidance if possible. If impacts to these trees is likely, relocation of these trees should be considered.

3.3. THREATENED FAUNA AND THREATENED FAUNA HABITAT

3.3.1. Tasmanian masked owl

To date audio detection surveys conducted within the spillway survey area have recorded a number of masked owl calls (Table 4). This suggests that masked owls are present in the local landscape, at least utilising the area to forage and potentially utilising one or more of the identified hollow bearing trees for nesting or roosting.

In the spillway survey area, three hollow bearing *Eucalyptus obliqua* trees have been identified as well as a number of other large eucalypts. Under the current design none of these three trees tree protection zones (TPZ) will be directly impacted by works resulting from the spillway. It is generally recommended that a buffer of 150 m is applied to nest trees as a measure of minimising nest disturbance. The spillway footprint occurs within 150 m of all three potential nest trees, as such, further mitigation and investigation is warranted.

After numerous site investigations, liaison with CAS was required to determine the next steps regarding potential masked owl nesting in the project area. Below is a summary of CAS management recommendations:

Survey Recommendations

Site Survey

Noting that the proposed spillway works are well within the typically recommended 150 m buffer around potential masked owl nest trees, CAS recommends that the proposed works are undertaken outside of the species main breeding season, which is from September to January. However, it should be noted that the masked owl is known to breed outside of this period when conditions are suitable. If the proposed works will overlap with the main masked owl breeding season, CAS supports NBES' plan to undertake further investigations to determine whether the trees contain evidence of masked owl activity.

Passive Acoustic Monitoring

CAS generally supports the use of PAM as a method determining the presence or absence of masked owls in the landscape. There is currently insufficient masked owl acoustic detection research available to adequately determine whether masked owl calls may be from resident or transient birds. Without supporting evidence, CAS cannot support the conclusion that the masked owl calls detected during PAM were from transient birds. Given that the presence of masked owl has already been confirmed in the area, CAS does not consider further PAM studies to be critical for this site.

Passive Visual Surveys

While passive visual surveys are acknowledged as a valid method for detecting masked owl activity, they are only conclusive if a bird is observed entering or exiting the hollow. The accuracy of these surveys is limited due to the small snapshot of hollow use (approximately 3 hours) and because the presence of an observer may influence the behaviour of any owls present. Consequently, a lack of activity during a single night of survey would not rule out masked owl occupation, and CAS recommends that alternative survey methods are utilised if no masked owl activity is observed.

Additional Recommendations

Given that only three trees have been identified as potentially providing suitable nesting habitat for masked owl, alternative survey methods may offer a more reliable and/or efficient means of determining whether the trees contain evidence of masked owl use.

- Camera use: An action camera on a pole can be used to inspect inside the hollow to attempt determining if the hollow has been used as either a nest or roosting hollow. Alternatively, the use of cameras to monitor hollow entrances would likely provide a more precise and continuous observations of hollow use when compared to passive visual surveys. However, it is noted that the position of hollows on the trees may require tree climbing expertise to install cameras.

- Physical inspection: If tree climbing is necessary for camera installation, it may be effective to physically inspect the hollows to definitively determine whether the trees contain evidence of masked owl use. If physical hollow inspection is undertaken, please consider the dangers to the assessor and disturbance to masked owls.

Hollow Management Actions

Noting that the proposed works will occur within the typically recommended 150 m masked owl nest tree buffer but will not result in direct removal of the trees, CAS recommends the following

management actions are considered, depending on the outcome of the additional survey effort to be undertaken:

Option 1 - Confirmed Masked Owl Nesting

If surveys confirm that a tree is being used by masked owl during the breeding season, no works should commence until after the breeding season has concluded or after any chicks have fledged. Regardless of whether the nest is active or inactive, the tree is considered a masked owl nest under the NCA.

Option 2 - Suitable Nesting Hollow, No Masked Owl Activity

If surveys confirm that a hollow provides suitable nesting habitat for masked owl, but no owl activity is observed, the following applies:

a) Works commence outside the breeding season: Works may proceed. If works are continuous, the activity may extend into the following masked owl breeding season, as masked owls may assess the level of disturbance over time and choose to accept the disturbance.
b) Works not commenced before the breeding season: If works have not started before the species next breeding season, and suitable hollows for masked owl are present, works can only proceed if the physical assessment finds no evidence of masked owl utilisation, or the presence/evidence of other hollow-dependent fauna is observed. Note that this recommendation from CAS applies to this project only and should not be relied on to be valid for other TasWater projects.
c) Works not commenced before the next breeding season: The initial survey is no longer valid, as masked owl breeding may have commenced, and any novel works may disrupt a breeding attempt. A new survey should be conducted to determine whether the tree is being used for nesting prior to works commencing.

Option 3 - Unsuitable Nesting Hollow Size, Masked Owl Activity (Roost)

If the hollow is not of sufficient size to support masked owl nesting but shows signs of use by the species, the site may be considered a roost. Efforts should be made to protect roost sites, especially during the breeding season.

Option 4 - Unsuitable Hollows, No Masked Owl Activity

If the hollow is confirmed to be unsuitable for masked owl nesting and no masked owl activity is observed, no further survey effort for that tree hollow is recommended and works can proceed. A hollow may be considered unsuitable for masked owl if it is too small to fit an adult and four chicks.

Hollow Decommissioning

CAS does not support temporary closure of any potential masked owl nest hollows. Unless the survey effort can confirm that the tree hollows are not suitable for masked owl nesting, any hollows that may contain suitable nesting habitat for masked owl should not be removed or closed, even temporarily. Under the NCA, the temporary closure of a masked owl nesting hollow is considered 'take'.

With these recommendations in mind, the following approach is recommended:

- Passive visual surveys will not be conducted at this stage based on the advice from CAS. As this survey method may not provide conclusive evidence of hollow utilisation, alternative methods will be adopted.
- Construction will commence outside of the breeding season if possible.
- At least 4 weeks prior to the commencement of construction, or in the final week of August (whichever comes first), physical inspection of hollows will be conducted. Inspection of hollows using cameras is not a practical solution for this site, given the size of the trees and the potential number of hollows that are not visible from ground level. Trees will be climbed by a qualified tree climber with experience in identifying fauna products.
- If a masked owl breeding is confirmed, no works are to occur until after the chicks have fledged.
- If suitable hollows are present, but no evidence of masked owl utilisation is observed, or evidence of regular use by other fauna species is observed, works can commence within the breeding season. It is recommended that works commence no longer than 6 weeks after the initial hollow inspection survey. Note that this recommendation from CAS applies to this project only and should not be relied upon to be approved for other TasWater project.
- Should no hollows be observed, no further surveys are required.
- No decommissioning of hollows will occur.

3.3.2. Swift parrot

No trees that may provide a foraging resource for swift parrots will be removed due to construction of the spillway and associated stockpile and haulage roads.

One tree that contains hollows that may be suitable for parrots is in an area earmarked for vegetation removal for the raising of the dam crest. In absence of targeted surveys for swift parrots at this location, it is recommended that the clearance of any trees should be conducted outside of the breeding season (September to March). The loss of one potential nesting tree in the dam embankment area is not likely to have significant residual impacts on this species, nor will it lead to a reduction in the sites carrying capacity for this species.

3.3.3. Burnie burrowing crayfish

There is evidence of burrowing crayfish species along the creek adjacent to the spillway. Three small burrows were identified by the water's edge. The survey area is within the potential range of the EPBC Act vulnerable listed Burnie burrowing crayfish, with the nearest record of this species ~1.3 km north of the project area. It is understood that targeted surveys for this species have been conducted by Pinion Advisory, with the results provided to TasWater in a separate report. This report concluded that this species is not present in the project area.

3.3.4. Giant freshwater crayfish

Although habitat within the project area is largely unsuitable for breeding, individuals may utilise the site on occasion. It is likely that suitable habitat occurs downstream, although no occurrences of this species have been recorded on the Pet or Emu River.

A pre-clearance check for crayfish is recommended to be conducted daily prior to works commencing in areas containing permanent flowing water. This must be conducted by an environmental supervisor or ecologist who must be a competent wildlife handler with at least basic experience of handling crayfish. Any individuals located must be relocated well out of harms way within the same watercourse.

This will require a permit to take threatened fauna under the TSP Act. It may be a requirement of CAS that a formal translocation protocol is developed and approved prior to commencement of surveys.

An erosion and sedimentation control plan is also recommended to mitigate the risk of downstream impacts to potential habitat for this species. This plan should include revegetation measures to stabilise disturbed soils following completion of works.

3.4. OTHER FAUNA SPECIES

3.4.1. Platypus

Platypus (*Ornithorhynchus anatinus*) have been observed using the creek within the spillway and stockpile area, and there are suspected platypus burrows on the edge of Pet Dam in the south of the project area. Pre-clearance survey and burrow decommissioning protocol should be implemented to mitigate potential impacts to this species.

Timing

- Reported breeding season for platypus starts in August and ends in April. Undertaking works outside of the breading season will minimise the likelihood of disturbance; however, we understand that this may not always be a practical solution with project timeframes and milestones.

Pre-clearance surveys

- Pre-clearance works must be conducted prior to November or after April to avoid impacting breeding platypus.
- At least 30 days prior to the commencement of works[19], an ecologist will assess the works area for at least 1 hour at sunrise and sunset.
    - This is contingent on the dam levels being lowered to a level where potential burrows can be observed.
    - Surveys will be conducted at each of the 3 sites (Pet River, Spillway, and Dam Crest) for 4 hours (2 hours at sunrise, 2 hours at sunset) on a single day.
    - Burrows will be recorded with a GPS, and maps produced to inform permit applications.
- A survey summary report with survey and decommissioning methodology will be prepared to submit along with a permit application.
- For any burrows with observed use, motion sensor cameras will be set up to monitor usage prior to decommissioning[20]. One-way gates are not recommended for platypus as the gate may potentially inhibit exiting the burrow. The use of fibre-optic cameras (burrow scopes) is also not an accepted method for burrow inspection for other threatened fauna species and is not recommended for this purpose.
- Upon determining the usage of burrows, a permit to decommission burrows under the Schedule 1 of the *Nature Conservation (Wildlife) Regulations 2021* will be applied for. Note that permits can take up to 28 days to be processed.
- Burrows will be decommissioned under permit within 2 weeks of the commencement of works.
    - This will require the ecologist to inspect camera footage to determine vacancy of the burrow.

[19] Ideally this would occur 5-6 weeks prior to allow for permit processing time, and the development of a survey report to be submitted with the permit application

[20] These are required to be in place for a minimum of 7 days prior to decommissioning but can be in place longer to gain an understanding of the levels of burrow usage.

  - This will need to be conducted in the early morning and may require passive observation for up to one hour prior to checking cameras to reduce the risk of scaring an animal deeper into the burrow.
  - Burrows will be incrementally exposed to reduce the risk of individuals being injured. This must be conducted using manual methods (such as a shovel) to prevent potential collapse of burrows and impact to individuals.
  - The ecologist will have wildlife handling experience and will have equipment ready to rescue or relocate any individuals if required.
- A permit activity form will be completed and returned to the NRE Conservation Assessments Branch upon completion of works.

Construction protocols

- Contractors must not have dogs off leash on site and any onlookers with such should be asked to leash their dogs.
- Ensure that platypus can exit any works area by providing a structured ramp if necessary (i.e. if dam embankments are vertical/near vertical, or if trenching is required).
- Ensure the works area is free of any netting or material that can cause platypus to get tangled and drown.
- Ensure movement from the dam/s to a natural stream is accessible for platypus (i.e. remove any solid fencing, materials or objects that may obstruct platypus from reaching the waterway).
- Machinery should not leave stable ground at edge of the dam/waterway before vegetation is cleared to minimise risks of burrow crushing before a burrow would be exposed.
- It is recommended that mechanical removal of vegetation should be overseen by an environmental supervisor or ecologist. As burrows will be decommissioned prior to these works, this is not a requirement but may still be desirable to ensure unanticipated impacts occur. This can be timed so that vegetation removal is conducted at the same time as burrow decommissioning.
- Any unanticipated burrow discoveries should have the pre-clearance camera monitoring and decommissioning process applied. This may require an amendment to permits.
- The ecologist/supervisor must be a competent wildlife handler with at least basic experience of handling platypus (remembering males have poisonous leg spur) – however given the very low risk of actually harming an individual (which would then require rescue), the supervisor may just be an informed observer, and in the event of an individual requiring rescue, Bonorong Wildlife Rescue Service called on 0447 264 625 for further advice.
- The role of the ecologist/supervisor during vegetation removal will be to determine if any exposed platypus requires rescue/appear injured. It is considered more likely if a platypus is startled it will be quick to escape into the water beyond works. There are risks however, such as if a platypus is startled into fleeing onto other active construction areas and is subsequently at risk of injury or death from interactions with machinery or vehicles, in which case the supervisor may need to intervene. Any unharmed platypus that needs to be secured (such as being at risk) should immediately be caught by a wildlife handler, bagged in a pillowcase (or equivalent), and immediately released into the river (or dam), upstream clear of works. An injured platypus will need to be captured immediately in the same fashion and taken to Bonorong Wildlife Rescue.
- A final inspection of the bank must be undertaken after vegetation clearance. This will identify if any burrows have been dug, which will require input from an ecologist if this has occurred. This should be repeated before rocks/materials are added to make sure no new burrows have been dug.
- A diary should be kept of the environmental monitoring and rescue works, and any records of platypus logged on the Natural Values Atlas.

3.5. WEEDS

Seven declared weed species have been recorded within the project area. In addition to potentially spreading declared weeds, works are likely to provide opportunities for the invasion/spread of the non-declared spear thistle (*Cirsium vulgare*) and English ivy (*Hedera helix*). A follow-up weed inspection of the project area is recommended to establish if treatment is warranted for any proliferation of weeds due to the project disturbance. Given the project area is apparently already managed for weeds this could simply be incorporated into routine inspections by the site managers.

As a measure of reducing the potential for introducing new weeds (and spreading the ones present), all machinery must be clean upon entering the site and cleaned before exiting. In addition, the following should be followed for best practice prescriptions:

- *Keeping it clean - A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens* (Allen and Gartenstein, 2010)
- *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania* (DPIPWE, Stewart and Askey-Doran, 2015)
- *Wetlands and Waterways Works Manual* (DPIPWE, 2003)

In addition to the above, it is our recommendation that if there is a risk of soil erosion and sedimentation due to the proposed works, an erosion and sedimentation management plan should be considered.

3.6. GEOCONSERVATION SITES

No known geoconservation sites occur within the project area, nor are any likely to be at risk from the proposed spillway upgrade.

4. LEGISLATIVE IMPLICATIONS

4.1. COMMONWEALTH *ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999*

The EPBC Act is structured for self-assessment; the proponent must determine whether the project has the potential for significant impacts to Matters of National Environmental Significance (MNES) and the potential to be a 'controlled action', which if confirmed, would require assessment and approval from the Commonwealth Minister.

Referral under the EPBC Act will be necessary if there is potential for significant impacts to MNES.

Based on the current understanding of potential MNES within the survey areas, the most likely triggers for referral can be expected to be potential impacts to the swift parrot and Tasmanian masked owl. Significant impact assessments addressing these species have been supplied as a separate document[21].

Based on the current design, proposed mitigation measures, and impact assessment, the project is unlikely to trigger the need for referral.

4.2. TASMANIAN *WATER MANAGEMENT ACT 1999*

All dam constructions and/or upgrades require a permit under the provisions of the Tasmanian *Water Management Act 1999*. Due to numerous conditions listed in the dam approvals guidelines[22], the proposal will require a Division 3 Dam Works Permit.

[21] North Barker Ecosystem Services (2024)
[22] Department of Primary Industries, Parks, Water, and Environment (2016) - https://nre.tas.gov.au/water/dams/dam-works-permit-guidelines

Under Subdivision 2 (Section 155) of the Tasmanian *Water Management Act 1999* the Minister must take into consideration any matters relating to the potential impact of the dam works, with matters pertaining to natural values being:

> 1) *In considering a permit application, the Minister is to take into consideration –*
>
> *f) any matters relating to the potential impact of the dam works, including but not limited to:*
>
> *(ii) the potential impact of the dam works on, or matters that are relevant to, conservation and protection of natural values; and*
>
> *(iii) the mitigation or offsetting of any adverse impact that may result from the dam works.*

Under the Division 3 Dam Works Permit, permits that would be typically required under the Tasmanian *Threatened Species Protection Act 1995*, for species listed under Schedule 1, 5 or 8 of the Tasmanian *Nature Conservation (Wildlife) Regulations 2021*, under Section 60A of the Tasmanian *Land Use and Approvals Act 1993*, and under the Tasmanian *Forest Practices Regulations 2017* are exempt as they are administered alternatively via this Act. A dam works permit does not exempt the permit holder from approvals required under the EPBCA or the Tasmanian *Biosecurity Act 2019*.

Areas that are not covered by the Division 3 Dam Works Permit will require approval by means of a development application to be lodged through the Burnie City Council under the Tasmanian Planning Scheme.

4.3. TASMANIAN *THREATENED SPECIES PROTECTION ACT 1995*

Any potential impacts under this Act are addressed through the Division 3 Dam Works Permit under the Tasmanian *Water Management Act 1999*. Areas that are not covered by the Division 3 Dam Works Permit will require a permit under this Act.

The only species likely to require a permit to take is the giant freshwater crayfish (if required to be relocated from the impact area).

4.4. TASMANIAN *NATURE CONSERVATION ACT 2002*

Any potential impacts under this Act, including the Tasmanian *Nature Conservation (Wildlife) Regulations 2021*, are addressed through the Division 3 Dam Works Permit under the Tasmanian *Water Management Act 1999*.

Areas that are not covered by the Division 3 Dam Works Permit will require a permit under this Act.

The only likely permit requirement would be for the potential destruction of platypus burrows (and relocation of individuals); however, as these habitat features are only likely to occur on the reservoir edge, it is likely that this will be covered by the Division 3 Dam Works Permit.

4.5. TASMANIAN *FOREST PRACTICES ACT 1985*

Any potential impacts under this Act are addressed through the Division 3 Dam Works Permit under the Tasmanian *Water Management Act 1999*. Harvesting of tree ferns is also exempt under this clause, however if any commercial opportunities are desired through the harvesting of ferns, the Forest Practices Authority should be consulted prior to clearance.

Any tree removal that occurs outside of the area covered by the Division 3 Dam Works Permit will require a Forest Practices Plan under this Act. This will require an assessment from a certified Forest Practices Officer (FPO). A list of qualified FPO's can be found on the Forest Practices Authority website[23].

The spillway area is located within a private timber reserve. An application to revoke this reserve must be made prior to any clearance if this option is preferred. This application must be submitted to Private Forests Tasmania.

4.6. TASMANIAN *BIOSECURITY ACT 2019*

The Tasmanian *Biosecurity Act 2019* and associated *Biosecurity Regulations 2022* include a list of declared weeds (listed as declared pests). Statutory weed management plans exist for the majority of listed species. These include a classification of each weed at the municipal level and provide direction as to their management intent.

Class A municipalities for a particular weed are those that are yet to be detected or are limited to localised infestations that are deemed to be eradicable. Therefore, the objective is the eradication of infestations.

Class B municipalities are those which host moderate or large and widespread infestations of the declared weed that are not deemed eradicable because the feasibility of effective management is low at this time. Therefore, the objective is containment of infestations. This includes preventing spread of the declared weed from the municipality or into properties currently free of the weed or which have developed or are implementing a locally integrated weed management plan for that species. As well there is a requirement to prevent spread of the weeds to properties containing sites for significant flora, fauna, and vegetation communities.

The relevant statutory weed management plans define the Burnie City Council area as a Zone B municipality for infestations of blackberry, Californian thistle, English broom, gorse, Himalayan honeysuckle, and Spanish heath.

Zone A localities are areas in which eradication is deemed feasible (generally due to the existence of a targeted management plan) and is the responsibility of the landowner or land manager or, in the case of disturbance, the development proponent.

The relevant statutory weed management plans define the Burnie City Council area as a Zone A municipality for infestations of holly (conservatively assigned to Zone A as a statutory management plan does not yet exist for this species).

4.7. TASMANIAN PLANNING SCHEME

The project area is within the Burnie City Council area, which is subject to the planning provisions detailed in the Tasmanian Planning Scheme. The survey areas are within Utilities, Village and Agriculture Zones, and areas are subject to the Priority Vegetation and Waterway and Coastal Protection Area overlays.

As the works will require a permit under the Tasmanian *Water Management Act 1999*, the project is likely to be exempt from assessment under the Tasmanian Planning Scheme under Section 4.2.1:

[23] https://fpa.tas.gov.au/landowners/contact_a_forest_practices_officer

	Use or Development	Requirements
4.2.1	Dam construction works	Works that are directly associated with construction of a dam approved under the *Water Management Act 1999*, including the construction of vehicular access, vegetation removal and bulk soil excavations, are exempt if contained on the same site as the dam.

4.7.1. Natural Assets Code

Although the project is likely to largely be exempt from the provisions of the Tasmanian Planning Scheme, some of the project area may fall outside of the remit of the Division 3 Dam Works Permit and thus must meet the relevant requirements of the Tasmanian Planning Scheme. The only zone or code overlay with provisions for natural values is the Priority Vegetation and Waterway and Coastal Protection Area overlays (Figure 4), both of which are addressed under the Natural Assets Code. The following Table 5 and Table 6 provide commentary regarding how the project can meet the provisions of this code.

Waterway and coastal protection area

The waterway and coastal protection area overlay apples to a buffer on all natural waterways in the project area (Figure 4), ranging from a 10 m buffer on minor streams to a 30 m buffer on the Pet River.

Table 5: C7.6.1 Buildings and works within a waterway and coastal protection area or a future coastal refugia area

Objective		
That buildings and works within a waterway and coastal protection area or future coastal refugia area will not have an unnecessary or unacceptable impact on natural assets.		
Acceptable Solutions		
A1 Buildings and works within a waterway and coastal protection area must:		
(a)	Be within a building area on a sealed plan approved under this planning scheme.	The proposed works are not within a building area on a sealed plan approved under the scheme and therefore does meet the acceptable solution.
(b)	In relation to a Class 4 watercourse, be for a crossing or bridge not more than 5 m in width.	Not applicable to this proposal.
(c)	If within the spatial extent of tidal waters, be an extension to an existing boat ramp, car park, jetty, marina, marine farming shore facility or slipway that is not more than 20% of the area of the facility existing at the effective date.	Not applicable to this proposal.
Performance Criteria		
P1.1 Buildings and works within a waterway and coastal protection area must avoid or minimise adverse impacts on natural assets, having regard to:		
(a)	Impacts caused by erosion, siltation, sedimentation, and runoff.	An erosion and sedimentation control plan has been recommended to mitigate this risk.

(b)	Impacts on riparian or littoral vegetation.	Impacts to riparian vegetation will be limited to the minimum extent required to complete works. Revegetation is recommended to stabilise disturbed soils post construction.
(c)	maintaining natural streambank and streambed condition, where it exists.	The natural streambed condition will be maintained outside of the permanent footprint area. An erosion and sedimentation control plan has been recommended to mitigate risk of impacts to downstream values.
(d)	Impacts on in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation.	The natural in-stream habitat will be maintained outside of the permanent footprint area.
(e)	The need to avoid significantly impeding natural flow and drainage.	Diversion pipelines are proposed to maintain riverine flow within the Pet River.
(f)	The need to maintain fish passage, where known to exist.	Fish passage will be maintained where it exists. Installation of cofferdams will be carefully managed to ensure impacts to fish are minimised.
(g)	The need to avoid land filling of wetlands.	No land filling of wetlands will occur.
(h)	The need to group new facilities with existing facilities, where reasonably practical.	The spillway design area has been chosen based on an iterative design and consultation process. The final location has been deemed the most appropriate site and new facilities will be grouped together and are within proximity to existing facilities.
(i)	Minimising cut and fill.	Cut and fill will be limited to the area required to complete works.
(j)	Building design that responds to the particular size, shape, contours, or slope of the land.	Designs will be developed with topography in mind.
(k)	Minimising impacts on coastal processes, including sand movement and wave action.	Not applicable to this proposal.
(l)	Minimising the need for future works for the protection of natural assets, infrastructure and property.	The proposal is to replace aging infrastructure to minimise the need for future works and to increase safety to natural assets, infrastructure and property.
(m)	The environmental best practice guidelines in the *Wetlands and Waterways Works Manual*.	All works will be conducted in accordance with these guidelines.
(n)	The guidelines in the *Tasmanian Coastal Works Manual*.	Not applicable to this proposal.
P1.2 Buildings and works within the spatial extent of tidal waters must be for a use that relies upon a coastal location to fulfil its purpose, having regard to:		
Not applicable to this proposal.		

P2.1 Buildings and works within a future coastal refugia area must allow for natural coastal processes to continue to occur and avoid or minimise adverse impacts on natural assets, having regard to:
Not applicable to this proposal.
P2.2 Buildings and works within a future coastal refugia area must be for a use that relies upon a coastal location to fulfil its purpose, having regard to:
Not applicable to this proposal.

Priority vegetation

Priority vegetation is defined as any native vegetation where the following apply:

a) it forms an integral part of a threatened native vegetation community as prescribed under Schedule 3A of the Tasmanian *Nature Conservation Act 2002*;
b) is a threatened flora species;
c) it forms a significant habitat for a threatened fauna species; or
d) it has been identified as native vegetation of local importance.

Priority vegetation mapped in the project area is confined to the margins of Pet Dam (Figure 4), which contains some WOB vegetation, but is predominantly modified land. The WOB in this area does not constitute significant habitat for a threatened fauna species, nor does it meet any of the other criteria of priority vegetation; thus, the mapped areas of priority vegetation in the project area do not qualify under this definition. Nonetheless, the performance criteria are addressed in Table 6.

Table 6: C7.6.2 Clearance within a priority vegetation area

Objective		
That clearance of native vegetation within a priority vegetation area: (a) Does not result in unreasonable loss of priority vegetation; (b) Is appropriately managed to adequately protect identified priority vegetation; and (c) Minimises and appropriately manages impacts from construction and development activities.		
Acceptable Solutions		
A1	Clearance of native vegetation within a priority vegetation area must be within a building area on a sealed plan approved under this planning scheme.	The proposed works are not within a building area on a sealed plan approved under the scheme and therefore does meet the acceptable solution.
Performance Criteria		
P1.1 Clearance of native vegetation within a priority vegetation area must be for [one of the following]:		
(a)	An existing use on the site, provided any clearance is contained within the minimum area necessary to be cleared to provide adequate bushfire protection, as recommended by the Tasmanian Fire Service or an accredited person.	Not applicable to this proposal.
(b)	Buildings and works associated with the construction of a single dwelling or an associated outbuilding.	Not applicable to this proposal.

(c)	Subdivision in the General Residential Zone or Low-Density Residential Zone.	Not applicable to this proposal.
(d)	Use or development that will result in significant long term social and economic benefits and there is no feasible alternative location or design.	This criterion is outside the remit of an ecologist and cannot be addressed in the context of a natural values assessment.
(e)	Clearance of native vegetation where it is demonstrated that on-going pre-existing management cannot ensure the survival of the priority vegetation and there is little potential for long-term persistence; or	As dam safety review results found that spillway related failure models were reaching intolerable levels, pre-existing management cannot ensure the survival of priority vegetation on site, nor downstream of the project area.
(f)	The clearance of native vegetation that is of limited scale relative to the extent of priority vegetation on the site.	As the vegetation in the project area does not meet the definition of priority vegetation, this criterion can be satisfied. Extensive areas of similar vegetation to those that will be impacted will remain on site outside of the project impact footprint.
P1.2 Clearance of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation, having regard to [all of the following]:		
(a)	The design and location of buildings and works and any constraints such as topography or land hazards.	The spillway design area has been chosen based on an iterative design and consultation process. The final location has been deemed the most appropriate site and considers topography and land hazards.
(b)	Any particular requirements for the buildings and works.	Vegetation removal at the spillway entrance is required to construct the spillway and intake channel.
(c)	Minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings.	Not applicable to this proposal.
(d)	Any mitigation measures implemented to minimise the residual impacts on priority vegetation.	As the vegetation in the project area does not meet the definition of priority vegetation, this criterion is not applicable.
(e)	Any on-site biodiversity offsets; and	No on-site biodiversity offsets are required; however, replacement of impacted trees and revegetation of temporary disturbance areas has been recommended.
(f)	Any existing cleared areas on the site.	The proposed impact area utilised cleared land to the extent possible.

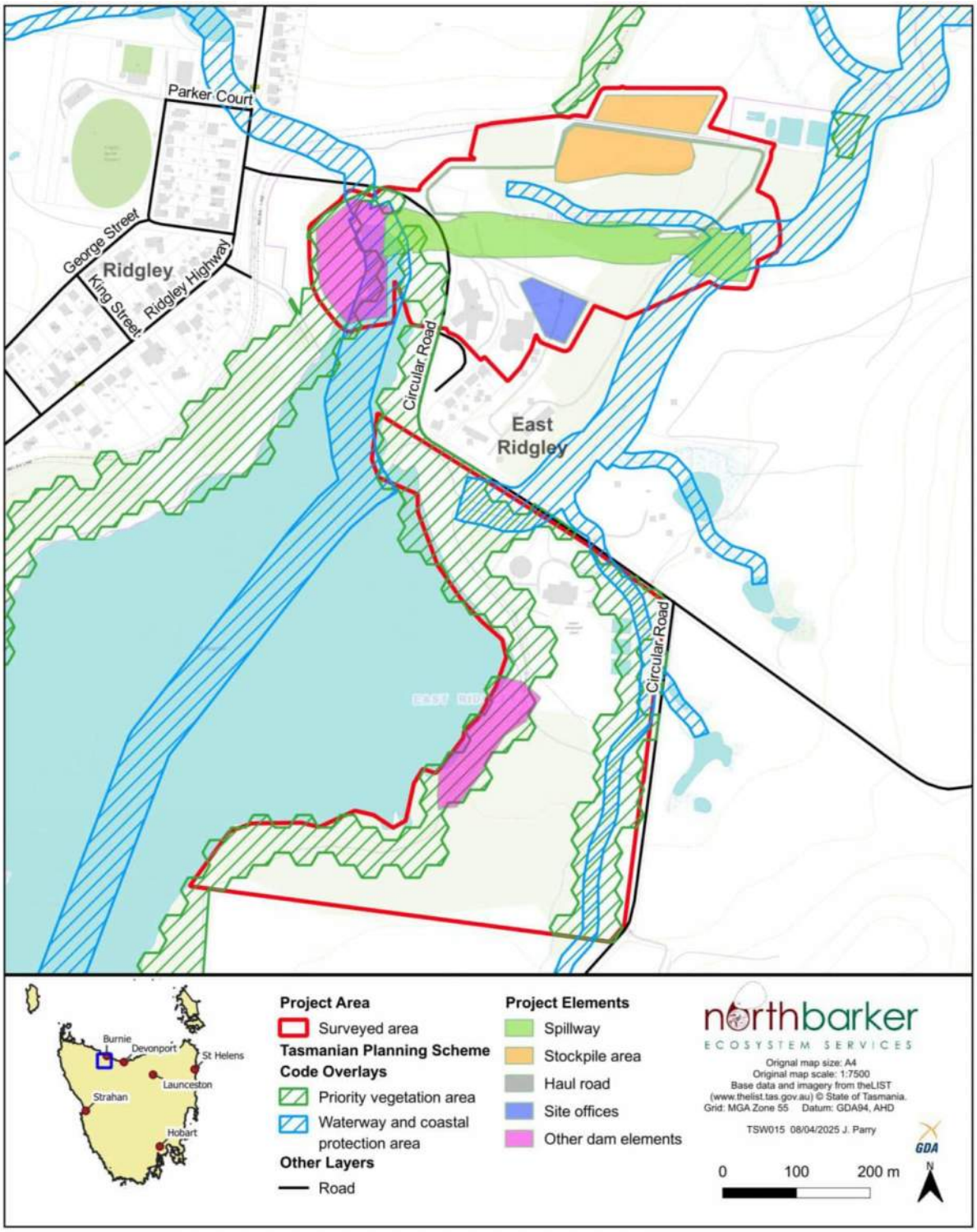


Figure 4: Planning scheme overlays in relation to project elements

5. CONCLUSION AND RECOMMENDATIONS

North Barker Ecosystem Services have completed a natural values survey of the Pet Dam water treatment plant site near Ridgley. TasWater have settled on a construction area, which includes the spillway footprint, stockpile area, spillway intake channel, and dam embankment area. This area contains some potential threatened fauna habitat and will require additional pre-construction survey work in order to determine impacts to the TSP Act endangered / EPBC Act vulnerable Tasmanian masked owl. A summary of other natural values is provided below.

Vegetation

The spillway and stockpile area will impact a small extent of WOB and NAD vegetation. The following impact mitigation measures are recommended:

- Clearly define the extent of clearance required for the project and ensure that any additional impacts are avoided;
- Mark the works area on operation plans and on site, and confine all works, vehicles and materials to the works area;
- The utilisation of stockpile areas should be limited to modified vegetation to the extent possible.
- Large trees should be retained where possible, and to mitigate the loss of any unavoidable trees within these areas, it is recommended that the sites be rehabilitated after use. For all trees lost, a replacement ratio of 3:1 should apply to all trees. Equivalent species are recommended for planting during rehabilitation, particularly *E. obliqua* and *E. viminalis* trees which are dominant in the area and *E. globulus* trees which are fast growing and may also be utilised as a foraging source for the swift parrot; and
- Any areas of temporary disturbance should be revegetated with propagules sourced from the local area, comprised of native species (see Appendix A).

Conservation significant flora

No threatened flora species will be impacted by the proposal, as such, specific mitigation measures are not warranted.

A cluster of conservation significant conifers adjacent to the sewage treatment plant access road, although not formally protected by legislation, should be prioritised for avoidance if possible. If impacts to these trees is likely, relocation of these trees should be considered.

Threatened fauna and threatened fauna habitat

Audio detection surveys conducted within the spillway survey area have recorded a number of masked owl calls. This suggests that masked owls are present in the local landscape, at least utilising the area to forage and potentially utilising one or more of the identified hollow bearing trees for nesting or roosting. Based on advice from CAS, the following is recommended:

- Visual surveys will not be conducted at this stage based on the advice from CAS. As this survey method may not provide conclusive evidence of hollow utilisation, alternative methods will be adopted.
- Construction will commence outside of the breeding season if possible.
- At least 4 weeks prior to the commencement of construction, or in the final week of August (whichever comes first), physical inspection of hollows will be conducted. Inspection of hollows using cameras is not a practical solution for this site, given the size of the trees and the potential number of hollows that are not visible from ground level. Trees will be climbed by a qualified tree climber with experience in identifying fauna products.
- If a masked owl breeding is confirmed, no works are to occur until after the chicks have fledged.

- If suitable hollows are present, but no evidence of masked owl utilisation is observed, or evidence of regular use by other fauna species is observed, works can commence within the breeding season. It is recommended that works commence no longer than 6 weeks after the initial hollow inspection survey. Note that this recommendation from CAS applies to this project only and should not be relied upon to be approved for other TasWater project.
- Should no hollows be observed, no further surveys are required.
- No decommissioning of hollows will occur.

Some marginal foraging and nesting habitat suitable for the swift parrot is also present in the project area. The proposal will not impact on any of the foraging habitat, and one potential nest tree may require removal to raise the dam crest.

In absence of targeted surveys for swift parrots at this location, it is recommended that the clearance of any trees should be conducted outside of the breeding season (September to March).

A pre-clearance check for crayfish is recommended to be conducted daily prior to works commencing in areas containing permanent flowing water. This will require a permit to take threatened fauna under the TSP Act. It may be a requirement of CAS that a formal translocation protocol is developed and approved prior to commencement of surveys. An erosion and sedimentation control plan is also recommended to mitigate the risk of downstream impacts to potential habitat for this species.

Due to the presence of platypus on site, and the potential presence of burrows, a pre-clearance survey and burrow decommissioning protocol should be implemented to mitigate potential impacts to this species.

Weeds and pathogens

Across the entire project area, the following biosecurity measures are recommended:

- Due to the location and nature of the works, all machinery must be clean upon entering the site and cleaned before exiting.
- In addition, the following should be followed for best practice weed and hygiene prescriptions:
    - *Keeping it clean - A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens* (Allen and Gartenstein, 2010)
    - *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania* (DPIPWE, Stewart and Askey-Doran, 2015)
    - *Wetlands and Waterways Works Manual* (DPIPWE, 2003)
- An erosion and sedimentation management plan should be considered if there is a risk that works will compromise river edges and water quality through erosion and sedimentation.

Legislative requirements

Provided the recommended mitigation and additional survey methods are adhered to, the proposal is not likely to trigger the need for referral under the EPBC Act.

A permit to take under the TSP Act for the giant freshwater crayfish may be required if individuals need to be relocated from the impact area.

The works will require a Division 3 Dam Works Permit under the *Tasmanian Water Management Act 1999*. This permit addresses the requirements of any other permits under the Tasmanian *Threatened Species Protection Act 1995*, the Tasmanian *Nature Conservation Act 2002*, and the Tasmanian *Land Use and Planning Approvals Act 1993*, however it does not exempt the works from the Tasmanian *Biosecurity Act 2019*.

Areas that are not covered by the Division 3 Dam Works Permit will require approval by means of a development application to be lodged through the Burnie City Council under the Tasmanian Planning Scheme.

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APPENDIX A: VASCULAR PLANT SPECIES LIST

Status codes:

ORIGIN	NATIONAL SCHEDULE	STATE SCHEDULE
	EPBC Act 1999	TSP Act 1995
i - introduced	CR - critically endangered	e - endangered
d - declared weed WM Act	EN - endangered	v - vulnerable
en - endemic to Tasmania	VU - vulnerable	r - rare
t - within Australia, occurs only in Tas.		

Sites:

1	FAC - Improved pasture with native tree canopy - E402564, N5443714	18/05/2020 Jared Parry
2	FUM - Extra urban miscellaneous - Dam wall area - E402500, N5443734	18/05/2020 Jared Parry
3	FUM - Extra urban miscellaneous - Drainage line - E402550,	18/05/2020 Jared Parry
4	WOB - Eucalyptus obliqua forest with with broad-leaf shrubs - E402767, N5443527	18/05/2020 Jared Parry
5	Additional species - E402685, N5443510	18/05/2020 Jared Parry
6	WOB - Eucalyptus obliqua forest with with broad-leaf shrubs - E402849, N5444124	17/02/2024 Sally Anthony
7	FUM - Extra urban miscellaneous - E402509, N5444148	17/01/2024 Sally Anthony
8	FAG- Agricultural land - E402824, N5444234	28/05/2024 Will DeAngelis
9	NAD- Acacia dealbata forest - E402739, N5444180	28/05/2024 Will DeAngelis
10	FAC - Improved pasture with native tree canopy - E402730, N5443385	28/05/2024 Will DeAngelis
11	FAC - Improved pasture with native tree canopy - E402343, N5444075	5/03/2025 Cameron Geeves
12	FAG – Agricultural land - E402954, N5444075	5/03/2025 Cameron Geeves

Site	Name	Common name	Status
	DICOTYLEDONAE		
	APIACEAE		
7	*Aegopodium podagraria*	goutweed	i
6	*Hydrocotyle hirta*	hairy pennywort	
7 10	*Hydrocotyle muscosa*	mossy pennywort	
	APOCYNACEAE		
11	*Vinca major*	blue periwinkle	i
	AQUIFOLIACEAE		
6	*Ilex aquifolium*	holly	d
	ARALIACEAE		
4 10	*Hedera helix*	ivy	i
	ASTERACEAE		
6	*Bedfordia salicina*	tasmanian blanketleaf	en
2	*Bellis perennis*	english daisy	i
2 10	*Cassinia aculeata subsp. aculeata*	dollybush	
7 10	*Centipeda elatinoides*	spreading sneezeweed	
10	*Cirsium arvense var. arvense*	Californian thistle	d
1 4 8 9 10 11 12	*Cirsium vulgare*	spear thistle	i
5	*Euchiton japonicus*	common cottonleaf	
1 2 3 4 7 10 11 12	*Hypochaeris radicata*	rough catsear	i
9 10	*Olearia lirata*	forest daisybush	
6	*Ozothamnus ferrugineus*	tree everlastingbush	
2 4 6 7 8	*Senecio linearifolius var. linearifolius*	common fireweed groundsel	

9 10 11 12			
6 11 12	*Senecio minimus*	shrubby fireweed	
2	*Senecio quadridentatus*	cotton fireweed	
7 10	*Taraxacum officinale*	common dandelion	i
	BORAGINACEAE		
10 12	*Myosotis laxa subsp. caespitosa*	lesser forgetmenot	i
	BRASSICACEAE		
11 12	*Cardamine hirsuta*	hairy bittercress	i
1 2 4	*Hirschfeldia incana*	hoary mustard	i
6 12	*Nasturtium officinale*	two-row watercress	i
10	*Raphanus raphanistrum*	wild radish	i
	CALLITRICHACEAE		
11 12	*Callitriche stagnalis*	mud waterstarwort	i
	CAPRIFOLIACEAE		
4	*Leycesteria formosa*	himalayan honeysuckle	d
	CARYOPHYLLACEAE		
12	*Cerastium glomeratum*	sticky mouse-ear	i
2	*Scleranthus biflorus*	twinflower knawel	
	CASUARINACEAE		
7	*Allocasuarina verticillata*	drooping sheoak	
	CHENOPODIACEAE		
11	*Chenopodium album*	fat hen	i
	ELAEOCARPACEAE		
6	*Aristotelia peduncularis*	heartberry	en
	ERICACEAE		
7 11	*Erica lusitanica*	spanish heath	d
	ESCALLONIACEAE		
6	*Anopterus glandulosus*	tasmanian laurel	en
	EUCRYPHIACEAE		
6	*Eucryphia lucida*	leatherwood	en
	EUPHORBIACEAE		
12	*Euphorbia peplus*	petty spurge	i
	FABACEAE		
1 2 4 6 7 8 9 11	*Acacia dealbata subsp. dealbata*	silver wattle	
1 2 4 6 7 10 11 12	*Acacia melanoxylon*	blackwood	
6 9	*Acacia verticillata*	prickly moses	
2 4	*Cytisus scoparius*	english broom	d
10	*Lotus corniculatus*	bird's-foot trefoil	i
7 11 12	*Lotus uliginosus*	greater birdsfoot-trefoil	i

1 2	*Medicago sp.*	medick	
4 10 11	*Pultenaea juniperina*	prickly beauty	
7	*Trifolium dubium*	suckling clover	i
7 10 12	*Trifolium repens*	white clover	i
5 8	*Ulex europaeus*	gorse	d
10	*Vicia sativa subsp. nigra*	narrowleaf vetch	i
2 7	*Vicia sativa subsp. sativa*	common vetch	i
	FAGACEAE		
12	*Nothofagus cunninghamii*	myrtle beech	
7	*Quercus robur*	english oak	i
	GERANIACEAE		
1 3 4 7 10	*Geranium potentilloides var.*	mountain cranesbill	
	HALORAGACEAE		
12	*Myriophyllum crispatum*	upright watermilfoil	i
7	*Myriophyllum sp.*	water milfoil	
	LAMIACEAE		
3 7 12	*Prunella vulgaris*	selfheal	i
	MYRTACEAE		
10	*Eucalyptus cordata subsp. cordata*	tasmanian silver gum	en
2 6 8 9 10	*Eucalyptus globulus subsp. globulus*	tasmanian blue gum	
4 6 7 9 10	*Eucalyptus obliqua*	stringybark	
6 8 10	*Eucalyptus regnans*	giant ash	
8	*Eucalyptus sp.*	gum	
1 4 8 10 11	*Eucalyptus viminalis subsp. viminalis*	white gum	
7 11	*Leptospermum lanigerum*	woolly teatree	
7	*Melaleuca armillaris*	giant honeymyrtle	
	ONAGRACEAE		
11 12	*Epilobium billardierianum*	common willowherb	
7	*Epilobium hirtigerum*	hairy willowherb	
6	*Fuchsia magellanica*	fuchsia	i
	OROBANCHACEAE		
4 10	*Parentucellia viscosa*	yellow glandweed	i
	OXALIDACEAE		
6 9	*Oxalis perennans*	grassland woodsorrel	
	PHRYMACEAE		
6 12	*Erythranthe moschata*	musk monkeyflower	i
	PITTOSPORACEAE		
4 6 7 9 10 11	*Pittosporum bicolor*	cheesewood	
	PLANTAGINACEAE		
10	*Limosella australis*	southern mudwort	
1 3 4 7 10	*Plantago lanceolata*	ribwort plantain	i

10	*Plantago major*	great plantain	i
	POLYGONACEAE		
7 10 12	*Acetosella vulgaris*	sheep sorrel	i
12	*Persicaria hydropiper*	green waterpepper	
7 10	*Persicaria prostrata*	creeping waterpepper	
2 7 12	*Rumex crispus*	curled dock	i
	PRIMULACEAE		
2 3 7 8 11	*Lysimachia arvensis*	scarlet pimpernel	i
	RANUNCULACEAE		
11 12	*Ranunculus amphitrichus*	river buttercup	
12	*Ranunculus lappaceus*	woodland buttercup	
10	*Ranunculus repens*	creeping buttercup	i
	RHAMNACEAE		
6 9 10 11 12	*Pomaderris apetala*	common dogwood	
	ROSACEAE		
2 4 6 7 8 10 11 12	*Acaena novae-zelandiae*	common buzzy	
11	*Cotoneaster glaucophyllus var. serotinus*	largeleaf cotoneaster	i
6	*Cotoneaster simmonsii*	himalayan cotoneaster	i
1 2 4 6 7 8 10 11 12	*Rubus fruticosus*	blackberry	d
	RUBIACEAE		
7	*Asperula sp.*	woodruff	
6 9 12	*Coprosma quadrifida*	native currant	
7 10	*Galium aparine*	cleavers	i
	RUTACEAE		
6	*Zieria arborescens*	stinkwood	
	THYMELAEACEAE		
9	*Pimelea drupacea*	cherry riceflower	
	URTICACEAE		
9	*Urtica urens*	stinging nettle	i
	GYMNOSPERMAE		
	CUPRESSACEAE		
6	*Athrotaxis cupressoides*	pencil pine	en
6	*Athrotaxis selaginoides*	king billy pine	en
6	*Callitris rhomboidea*	oyster bay pine	
	PINACEAE		
6 9	*Pinus radiata*	radiata pine	i
	PODOCARPACEAE		
6	*Lagarostrobos franklinii*	huon pine	en

MONOCOTYLEDONAE

	CYPERACEAE		
2 3 4 6 7 8 9 11 12	*Carex appressa*	tall sedge	
11 12	*Carex fascicularis*	tassel sedge	
10 12	*Cyperus eragrostis*	drain flatsedge	i
10	*Cyperus lucidus*	leafy flatsedge	
10 11 12	*Eleocharis acuta*	common spikesedge	
10	*Eleocharis sphacelata*	tall spikesedge	
12	*Gahnia grandis*	cutting grass	
11 12	*Schoenus apogon*	common bogsedge	
	IRIDACEAE		
12	*Crocosmia Xcrocosmiiflora*	montbretia	i
	JUNCACEAE		
12	*Juncus articulatus*	jointed rush	i
3	*Juncus holoschoenus*	jointleaf rush	
11 12	*Juncus pallidus*	pale rush	
3 4	*Juncus pauciflorus*	looseflower rush	
2 3 4 6 7 9 10	*Juncus procerus*	tall rush	
11 12	*Juncus sarophorus*	broom rush	
7	*Luzula sp.*	luzula	
	POACEAE		
2	*Agrostis capillaris*	brown top bent grass	i
11 12	*Aira caryophyllea*	silvery hairgrass	i
7 8 10 11 12	*Anthoxanthum odoratum*	sweet vernalgrass	i
7 11	*Arrhenatherum elatius var. bulbosum*	bulbous oatgrass	i
1 2 3 4 7 8 10 11 12	*Dactylis glomerata*	cocksfoot	i
7	*Digitaria ciliaris*	crabgrass	i
8 10	*Ehrharta sp.*	ricegrass	
10	*Glyceria maxima*	reed sweetgrass	i
7 8 10 11	*Holcus lanatus*	yorkshire fog	i
9	*Microlaena stipoides*	weeping grass	
10	*Paspalum dilatatum*	paspalum	i
10	*Poa annua*	winter grass	i
10 11	*Poa labillardierei*	silver tussockgrass	
7	*Poa sp.*	poa	
	POTAMOGETONACEAE		
12	*Potamogeton sp.*	pondweed	

	TYPHACEAE		
4 7 11	*Typha latifolia*	great reedmace	i
	PTERIDOPHYTA		
	ASPIDIACEAE		
6 7 9 11 12	*Polystichum proliferum*	mother shieldfern	
	BLECHNACEAE		
3 4 9 10	*Blechnum minus*	soft waterfern	
6 9 10 11 12	*Blechnum nudum*	fishbone waterfern	
	DENNSTAEDTIACEAE		
8 9 11	*Hypolepis rugosula*	ruddy groundfern	
4 6 7 8 9 10 11	*Pteridium esculentum subsp. esculentum*	bracken	
	DICKSONIACEAE		
6 7 9 10 11 12	*Dicksonia antarctica*	soft treefern	
	POLYPODIACEAE		
6	*Microsorum pustulatum subsp.*	kangaroo fern	
	PTERIDACEAE		
9	*Pteris epaleata*	netted brake	

ATTACHMENT 4

Erosion and Sediment Control Plan

pitt&sherry

Specialist Knowledge.
Practical Solutions.

Conceptual Sediment and Erosion Control Plan (SECP)

PET Dam Upgrade

A. Purpose and Introduction

This document provides a Conceptual Sediment and Erosion Control Plan (SECP) for the proposed Pet Dam upgrade. It describes the proposed works, relevant environmental features and risks, and an outline of sediment and erosion control measures that may be implemented to manage the risks of construction works. This SECP will be used in a submission to Department of Natural Resources and Environment (NRE) Tasmania to obtain a Permit to Undertake Dam Works under the Water Management Act and Regulations.

The purpose of the SECP is to demonstrate how soil and water resources will be managed during construction of the works to minimise offsite pollution caused by erosion and transport of sediment-laden water offsite. This Conceptual SECP has been prepared with reference to *Guidelines for Developing a Sediment Control Plan for Dam Work Sites* (NRE, undated) and uses information from other recognised Australian erosion and sediment control guidelines and resources, including:

- *Managing Urban Stormwater: Soils and Construction* (Volume 1, 4th edition) (NSW Landcom, 2004)); and
- *Best Practice Erosion and Sediment Control* (International Erosion Control Association, 2008).

This Conceptual SECP serves as a framework document and outlines the fundamental principles to be followed in the planning and implementation of erosion and sediment control measures for the project. It:

- Provides a description of the project
- Outlines the site constraints including identification of sensitive areas and drainage patterns
- Assesses the erosion hazard at the site
- Identifies a suite of erosion and sediment control management practices to minimise associated risks to the environment, and provides an indicative layout for these controls
- Provides directions for installing, monitoring and maintaining erosion and sediment controls;
- Describes the procedure for preparing progressive erosion and sediment control plans throughout the course of construction, to address the changing needs of the construction program; and
- Outlines the roles and responsibilities of those involved in the implementation of erosion, sediment and water quality management controls.

This SECP provides a set of baseline plans showing the indicative layout of key erosion and sediment control measures; however, it does not describe the precise layout of all control measures through all stages of construction nor does it contain detailed engineering design of structures. Progressive SECPs shall be prepared for this purpose by the construction team in consultation with the Project Engineers and Soil Conservationist, as required, once detailed design plans and details of the construction methodology and staging are available.

B. Document Format and Structure

This document and the accompanying plans and Figures are intended to be printed at A3 size, for ease of posting to notice boards within the construction compound, and to assist with visibility and dissemination of the plan.

The contents include written sections outlining aspects including a description of the works, environmental factors, and general details on the suite of erosion and sediment controls that will be applicable to the works. Appendixes contain Figures, Design Drawings, Sediment and Erosion Control Plans and Standard Drawings (SDs) that describe design and installation requirements for key SECP techniques.

The contents include:

C. Works Overview

TasWater is proposing to undertake a significant capital works program to upgrade the Pet Dam. Key work elements that are the focus of the SECP include:

- New Spillway – a new northern spillway (Option C), concrete lined, between the existing dam crest and Pet River
- Dam Crest Raise – raise the earthen dam wall by approximately 0.5m to provide additional freeboard
- Filter Buttress – toe of dam wall seepage control area comprised of graded fill
- Foundation Seepage Trenches; and
- Ancillary works including access tracks, material stockpile/laydown areas, and site compound.

Figures showing the extent of the main works and potential ancillary facility sites are provide in Appendix 1. Concept Design Drawings are provided in Appendix 2.

A summary of the works, key issues and approach to ERSED for each of the work elements is provided below:

<u>New Spillway</u>

The proposed new northern spillway is on a new alignment to the northeast of the existing dam wall. It takes the form of a trapezoidal section, concrete lined waterway (refer Appendix 2). From chainage 0 to about CH340m the spillway has a gentle grade of about 0.5-2%; thereafter, it steepens considerably to about 33% terminating at a stilling basin adjacent the Pet River. The works include reshaping the inlet in Pet reservoir, and construction of a stabilised, rock lined discharge area at the outlet within Pet River.

The works involve substantial excavation with cut depth in parts up to 12m. Key risks include:

- Disturbance to native vegetation and fauna habitat. Significant vegetation clearing is required
- Works within pet river and in close proximity to a small gully, with potential for damage to the watercourses and discharge of sediment-laden runoff impacting water quality
- Erosion and sedimentation within the linear spillway alignment. The erosion hazard is high, due to the long slopes, steep batters, and substantial volume of spoil to be removed; and
- Rehabilitation risks where vegetation is to be used to stabilise the upper batters.

A conceptual SECP for the spillway works is included at Appendix 2. Key controls include minimising the disturbance footprint; undertaking excavation and construction works in manageable stages to reduce the area exposed to erosion at any one time; protecting steep exposed batters and long slopes from erosion through use of temporary stabilisation (eg RECPs); collecting dirty stormwater within sumps or basins and treating water prior to discharge; and ensuring that a detailed Works Within Waterways plan is prepared for all works within 40m of Pet River.

<u>Dam Crest Raise</u>

The dam crest is being raised by about 1m along its 300m length using imported fill. The works will involve excavation of existing crest material to expose the embankment fill, placement of new fill to raise the dam crest, and formation of a 4m road along the centreline of the crest. The upstream face is to be stabilised with

rock pitching; the downstream face with topsoil and hydromulch with suitable grass species.

Key risks include:

- Earthworks will expose soils to erosion on the relatively steep upstream and downstream faces of the dam
- Increases in water level within the reservoir could expose the works to inundation and damage; and
- Rehabilitation risks where vegetation is to be used to stabilise the upper batters.

A conceptual SECP for the dam crest works is included at Appendix 2. Key controls include minimising the disturbance footprint; undertaking excavation and construction works in manageable stages and undertaking progressive rehabilitation of completed works; protecting exposed batters particularly on the upstream side using temporary stabilisation (eg RECPs); and having in place appropriate sediment controls (eg sediment fence, coir logs) to trap sediment at source.

Filter Buttress

The filter buttress works are in the toe area of the dam wall, downslope of the crest raising works. Its purpose is to intercept and manage dam seepage. The filter buttress involves excavating the embankment material and backfilling with select sand and granular rock fill.

Key risks include:

- earthworks will expose soils to erosion on the relatively steep downstream face of the dam; and
- potential for dirty stormwater and seepage accumulation within the works excavation, requiring treatment and disposal.

A conceptual SECP for the filter buttress works is included at Appendix 2. Key controls include diverting of upslope (clean) stormwater run-on; undertaking excavation and construction works in manageable stages; and having in place appropriate sediment controls (eg sediment fence, coir logs) to trap sediment at source. Collected stormwater will need to be tested and treated to achieve approved discharge limits.

Foundation Seepage Trenches

The foundation seepage trenches tie in with the filter buttress and are designed to intercept seepage along the length of the dam wall toe. They comprise a series of roughly 1m wide, 2m deep trenches containing select backfill and slotted drainage pipe. Seepage water is collected and discharged by the trenches into new outfall pipes to the existing spillway stilling basin.

Key risks include:

- Potential for erosion by stormwater flowing along the trench
- Potential for dirty stormwater and seepage accumulation within the works excavation, requiring treatment and disposal; and
- Risk of ongoing drainage issues if trenches are not appropriately backfilled and stabilised to match surrounding ground levels.

Sediment and erosion control considerations are outlined in Section L of this plan.

Ancillary works

Ancillary works associated with the main construction program include the formation of access tracks, temporary drainage works, establishment of construction compound, laydown areas and material stockpiles. The details of these works are not yet available and would be the responsibility of the selected Construction Contractor. TasWater has given consideration to potential locations for these ancillary works as indicated in the Figures in Appendix 1.

The Contractor should prepared Progressive Sediment and Erosion Control Plans that describe the layout of appropriate controls prior to works commencing. Key matters for consideration include:

- Minimising the disturbance footprint and identifying works areas using barrier fencing or similar
- Diverting upslope clean stormwater run-on;
- Stabilised access to works compounds and stockpile locations;
- Sediment controls downslope of disturbed areas; and
- Rehabilitating all disturbed areas post construction.

D. Environmental Risk Factors

This section provides a summary of important environmental factors. These factors are important in informing overall construction environmental management, including the selection and implementation of good erosion and sediment control.

Biodiversity

- The proposed works have the potential to impact biodiversity through direct impacts associated with construction. The proposed works will require clearing of native vegetation and impacts to terrestrial and aquatic fauna habitat
- Outcomes of a recent biodiversity assessment of the Site are described in Pet Dam Spillway and Dam Upgrade Options: Natural Values Assessment (North Barker, 2024). The Site contains significant biodiversity values
- Northern spillway area contains cleared land and remnant native vegetation described as wet Eucalyptus obliqua forest with a broad leaf understorey (TASVEG – WOB). Canopy is dominated by E. obliqua and E. regnans, several of which were of significant size (DBH > 1 m) with the potential to bear hollows
- Stockpile Areas A and B comprise a mixture of cleared land with exotic pasture groundcover, with a native tree canopy. The areas contain many large native trees dominated by Eucalyptus viminalis, with Eucalyptus obliqua and Eucalyptus globulus. These should be prioritised for avoidance where possible
- No flora species listed as threatened under the TSPA or the Commonwealth EPBCA were observed in the survey areas or are considered likely to occur. King Billy and Huon pine trees should be prioritised for avoidance if possible; and
- Fauna surveys and habitat assessment identified potential for numerous native fauna including threatened species to utilise the Site. 3 trees within the northern spillway area contains hollows and should be prioritised for avoidance. There is evidence of burrowing crayfish and habitat for platypus along watercourses associated with the northern spillway. There is potential habitat for Swift Parrot and Masked Owl.

For detail around mitigating biodiversity impacts refer to details in the North Barker NVA (2024). Mitigation options include:

- Clearly define the extent of disturbance required for core construction areas and minimise unnecessary disturbance beyond this
- Minimise disturbance and material stockpiling around large trees that are to be retained
- Promptly rehabilitate disturbed areas after use
- Replace lost trees by planting with similar species, at a ratio of 3 replacement trees for each tree lost
- Protect hollow bearing trees and other important fauna habitat as outlined further in the NorthBarker NVA (2024) and crayfish survey by Pinion Advisory (2024); and
- Undertake pre-clearance inspections before removing potential habitat trees.

Weeds

- Seven species listed as declared weeds under the Tasmanian Biosecurity Regulations 2022 were observed (North Barker, 2024); including blackberry (Rubus fruticosus), English broom (Cytisus scoparius), Gorse (Ulex europaeus), holly (Ilex aquifolium), Spanish heath (Erica lusitanica), Himalayan honeysuckle (Leycesteria formosa) and Californian thistle (Cirsium arvense); and
- Weed management measures should be implemented to prevent spread of existing weeds and introduction of new weeds. Ensure machinery is clean upon entering site. A follow-up weed inspection should be undertaken at completion of the works.

Soils

- The proposed works will involve significant soil disturbance. Activities such as groundcover and vegetation removal, access by construction equipment, and substantial civil works involving excavation and filling, will all result in soil disturbance. This disturbance will increase potential for erosion and soil structural decline
- The Reconnaissance Soil Map Series of Tasmania, Burnie-Table Cape Soil Report (DPIWE, 2000) indicates the Site is part of the Yolla Association. This soil association occurs on landforms comprising rolling to steep hills, at elevations above about 270m AHD, on Tertiary basalt parent material. Soil type is a Krasnozem (Great Soil Group), or Brown Ferrosol under the Australian Soil Classification. Dominant soil type is the Yolla Clay Loam and slump complex. Topsoils tend to be Dark brown loam to heavy clay loam. Subsoils are dark to strong brown light to medium clay. Texture grade tends to be moderate to strong. Available soils laboratory data indicates soils are acidic, have high effective Cation Exchange Capacity and low exchangeable sodium percentage
- Generally, Krasnozem soils are high in iron, are not significantly dispersible, and have relatively low erodibility
- Geotechnical investigations have been undertaken by pitt&sherry (2024, 2025). Information gathered during these investigations mainly aligns with the regional mapping confirming basalt derived residual soils with colluvium/alluvium on slopes and in drainage lines; and
- Potential acid sulphate soils (PASS) have been identified in some areas and are subject to further investigation. A site specific acid sulfate soil management plan will be prepared. Sediment and erosion controls should be provided for any proposed PASS treatment areas

Watercourses and Water Quality

- The Pet reservoir and the associated earthen dam wall, spillway, and downstream section of Pet River are the dominant landscape drainage features. Proposed upgrade works will occur close to and within both Pet River and its tributaries, and also on the upstream side of the main dam wall within the reservoir
- Soil disturbance during earthworks will increase the likelihood of erosion and sedimentation leading to water quality decline in receiving waters
- Civil works, specifically formation of the new northern spillway and its outlet structure at Pet River, will involve significant disturbance to the bed and banks of Pet River

- The techniques outlined in this SECP are intended to reduce the risk of erosion, sedimentation and water quality impacts
- A detailed Works Within Waterways Plan should be prepared by the construction contractor to address specific risks associated with instream works affecting the bed and banks of Pet River
- Works within and near watercourses should be scheduled for the dry season when base flows are low; and
- Water levels in Pet Reservoir shall be lowered during critical works to reduce the likelihood of overflow events and damage/erosion to downstream works.

Erosion Hazard

The revised universal soil loss equation (RUSLE) is a method for assessing erosion hazard at construction sites. It is designed to predict the long term, average, annual soil loss from sheet and rill erosion at nominated sites under specified management conditions. It is used to assess erosion hazard at construction sites and estimate sediment flux.

The RUSLE equation is represented by:

A = R K LS P C where,

A = computed soil loss (tonnes/ha/yr)

R = rainfall erosivity factor

K = soil erodibility factor

LS = slope length/gradient factor

P = erosion control practice factor

C = ground cover and management factor.

A good explanation of RUSLE is provided in Landcom (2004). The adopted RUSLE factors are summarised below.

Three scenarios are adopted to assess the relative erosion hazard across different work areas. Assuming other factors remain constant, the key variables affecting erosion hazard under sheet flow conditions are slope length and gradient. Estimated annual soil loss is calculated as:

- 8 tonnes/ha/year (rated Very Low) for Scenario A (80m slope length, 0.5% grade)
- 970 tonnes/ha/year (rated Very High) for Scenario B (80m slope length, 33% grade); and
- 320 tonnes/ha/year (rated Low-Moderate) for Scenario C (20m slope length, 33% grade).

This data highlights the impact of slope factors on the overall erosion hazard and the importance of reducing slope length to reduce erosion hazard. This can be done by breaking works into stages, and by using earth banks and drains to shorten long slopes.

RUSLE Factors

Factor	Value	Description
R-factor	1390	Rainfall erosivity: related to average rainfall energy and intensity. Calculation based on rainfall intensity in the 2-year, 6 hour storm (approximately 7.5 mm/hr)
K-factor	0.042	Soil erodibility: conservative value (refer Rosewell, 1993)
LS-factor	A – 0.1 B – 12.8 C – 4.2	Slope length/gradient factor: describes combined effect of slope length and gradient on soil loss. Three typical scenarios are considered: A – Spillway flat section; 80m slope length, 0.5% grade B – Spillway ramp section; 70m slope length, 33% grade C – Dam wall; 20m slope length, 33% grade
P-factor	1.3	Practice-factor: related to site management practices and surface condition, and their relationship to runoff generation. A factor of 1.3 is standard on construction sites.
C-factor	1.0	Cover factor: describes the effect of surface cover in reducing exposure of soils to erosion. A nominal value of 1.0 is adopted for construction sites where soils are bare and compacted.

E. Sediment and Erosion Control Principles

The primary objective of this SECP is to minimise erosion, manage sediment and reduce impacts on receiving waters. This will be achieved by adherence to the following principles:

- Minimise ground disturbance during construction activities, and stage works where practicable to reduce the time of disturbance in individual work areas;
- Strip, stockpile and conserve topsoil for later use in rehabilitation;
- Divert “clean” run-on stormwater away from construction areas and separate “clean” from “dirty” stormwater, where practicable;
- Convey dirty waters to sediment traps to capture sediment and minimise water pollution;
- Install, monitor and maintain erosion and sediment controls in accordance with relevant guidelines and industry best practice; and
- Rehabilitate the site progressively to reduce the erosion hazard and achieve a stable landscape upon completion.

F. Progressive Sediment and Erosion Control Plans

This Conceptual SECP will be supplemented by the production of Progressive Sediment and Erosion Control Plans (PSECPs) as required, detailing any changes in response to finalisation of the detailed design and construction methodology, and to reflect alternative management measures or changes to the plan as the project progresses through different stages. These PSECPs will be prepared once the detailed design documentation is available and once construction methodology and staging details are known, and always before works begin in individual areas.

The PSECPs will:

- Be prepared by or in consultation with a suitably qualified professional (preferably a soil conservationist) and in association with construction personnel
- Formulate practical documents for field reference. This process will allow consideration of specific construction methods and will provide a sense of ownership and buy-in for all parties;
- Be prepared for:
  - Different stages of construction, as required (e.g. Vegetation clearing and topsoil stripping; bulk earthworks; drainage installation and rehabilitation)
  - Areas of high erosion hazard, such as on steep batters and works in waterways
  - Key project/construction areas such as temporary access tracks; watercourse crossings; construction compound, laydown areas and material stockpiles
- Be prepared on base plans that show contours and drainage paths, the constructed drainage network (if any), limits of disturbance and extent of earthworks, location of sensitive areas and location of control measures
- Explain the ordering and scheduling of works, particularly the order in which the erosion and sediment controls will be installed
- Describe specific construction details, notes and operating procedures
- Contain detailed design information including sizing and location, for key drainage controls such as any sediment basins, temporary waterways and energy dissipaters
- Be given a sequential number and recorded in a register for progressive SECPs; and
- Be controlled and distributed in accordance with the contractor’s quality system procedure for document control.

The Contractor will ensure that the Progressive SECPs are regularly reviewed and changes implemented to manage the erosion hazard and prevent pollution at the site. Additional erosion and sediment control works will be installed as might become necessary, for example due to unforeseen events or site conditions, or to initiate repairs after severe rain events.

G. General Sequence of Sediment and Erosion Control Implementation

Erosion and sediment controls shall be in place before earthworks and land disturbance is undertaken, and shall remain in place until the disturbed areas they serve have been stabilised and rehabilitated.

A typical sequence to planning and implementation of erosion and sediment controls is as follows:

1. Plan ahead. Collectively review the construction methodology and seek to implement methods that minimise disturbance and reduce environmental risk, eg. By staging the works and planning sensitive works during the dry season when intense rainfall is less likely
2. Ensure PSECPs are developed and circulated to all responsible people prior to works commencing in any area
3. Install a stabilised site access/exit at all entry points to the surrounding road network
4. Install perimeter controls (e.g. barrier fencing or mulch bunds to delineate “no go” areas) to manage the disturbance footprint and avoid unnecessary vegetation and soil disturbance
5. Install sediment basins and traps (e.g. silt fence) in suitable locations downslope of proposed work areas as indicated on the PSECPs
6. Install drainage controls including clean and dirty water diversion drains. Ensure clean water is diverted safely through (or around) the site. Divert dirty water runoff to sediment traps. Avoid mixing of clean and dirty waters
7. Clear and grub the site, then strip and stockpile topsoil from work areas, ensuring weed infested topsoil is separated and designated not for reuse.

Weed-free topsoil is to be saved for use later in rehabilitation. It may be stored in designated stockpiles or perimeter bunds, as appropriate

8. Undertake construction works in accordance with the approved plans. Review and upgrade sediment and erosion controls as works proceed
9. Inspect all erosion and sediment controls at least weekly, and immediately after significant rain events that generate runoff over disturbed areas. Undertake repairs and install new/modified erosion and sediment controls as necessary to mitigate erosion and pollution risks
10. Maintain erosion and sediment control measures in a fully functioning condition until all earthwork activities are completed and the site is rehabilitated; and
11. Remove temporary soil conservation structures as the last activity in the final rehabilitation/revegetation program.

H. Erosion Control Measures

Erosion prevention is a preferred over sediment control where this is practicable. The control of raindrop and sheet erosion minimises the amount of sediment that is mobilised during a rainfall event. This follows the age-old principle of "prevention is better than the cure," meaning that if erosion is minimised, water quality impacts will be largely prevented so reducing the reliance on downstream sediment trapping and other water quality control devices to protect the offsite receiving environment.

The Project will adopt management and mitigation measures to minimise soil erosion impacts during construction. Relevant controls include:

- Prepare, review and implement PSECPs before works commence in individual areas, so that opportunities for erosion control are maximised;
- Stage the construction program so that the amount of disturbed soil exposed at one time is minimised. This would include undertaking earthworks progressively in phases. Undertake vegetation clearing and topsoil stripping as near as possible to main earthworks commencement;
- Plan to undertake higher risk works (such as works within waterways, and on long steep slopes) during the dry season (November to March) when intense rainfall and storms are less likely
- Plan construction works to limit the amount of disturbed area at any one time;
- Delay any clearing along watercourses as long as possible in the construction program and preferably only clear immediately prior to major works in the area;
- Limit disturbance to two metres beyond the edge of any essential construction activity;
- Construct a stabilised access point to the construction site (refer SD6-14) to prevent tracking of sediment to adjoining roadways and improve trafficability in these high traffic areas. Incorporate a wheel wash or submerged cattle grid where needed to provide control of sediment tracking to sealed roads;
- Stabilise haul roads and light vehicle access tracks to minimise dust and sediment generation. Haul roads will be provided with a durable, non-erodible pavement surface to minimise dust and sediment generation while improving operational life;
- During windy weather unsealed roads will be kept moist (not wet) by sprinkling with water to reduce wind erosion;
- Limit vehicular access to the site to that essential for construction work, ensure vehicles remain on formed roadways only, and ensure all vehicles park in designated areas that have been suitably stabilised (e.g. With road base);
- Erect clearly visible and sturdy barrier fencing as shown in the PSECPs and elsewhere at the discretion of the Site Superintendent to define essential construction areas and help minimise unnecessary disturbance beyond core work zones. Barrier fence will be installed upfront and before construction works commence in any given area. Employ fencing and signage to identify construction areas and "No-Go" zones;
- Divert clean stormwater from upslope of disturbed areas using earth banks or catch drains, and using energy dissipaters or level spreaders at their outlets as appropriate. Discharge stormwater in safe areas, avoiding erosion and flooding hazards;
- Before construction, strip topsoil and stockpile this for later use in rehabilitation;
- To prevent the spread of weeds, ensure weed-infested topsoil is kept separate from clean (weed-free) topsoil, is marked accordingly, and not used in rehabilitation;
- Stockpiles of topsoil, subsoil and other erodible materials will be located at least 5 m from areas of likely concentrated or high velocity flows, particularly earth banks and roads. An additional buffer of 40 m should be provided between stockpiles and natural waterways. Refer to SD 4-1 for erosion and sediment controls related to material stockpiles;
- Use rolled erosion control blankets (RECPs) (refer SD5-2) to provide temporary cover and erosion control. These techniques are especially relevant in high erosion hazard areas such as steep batters and works within waterways where erosion control must be prioritised.
- All areas of concentrated flow (diversion banks and waterways) will be designed by a suitably qualified person to convey and remain stable during the design storm event. All construction waterways other than temporary diversion banks will be designed as trapezoidal channels in accordance with SD 5-6 (earth bank high flow). Stabilisation may be required (eg using jute matting, rock lining or vegetation) and stabilisation methods would be outlined in the PSECPs;
- On completion of major works and before revegetation, reinstated subsoils should be left with a loose surface to encourage water infiltration and help with keying topsoil later. This will be very important on steeper slopes;
- Rehabilitate the site progressively upon conclusion of works in individual areas, and use temporary stabilisation when works areas are expected to remain idle for more than 20 days;
- Annual cover crops will be used to provide temporary cover and undersown with the desired mix of perennial species for final revegetation. For plant establishment supplementary watering may be required, particularly during spring and summer. Revegetation details will be provided in the PSECPs and/or landscape plans.

I. Temporary stabilisation

Temporary stabilisation should be provided to disturbed construction areas where there is likely to be a delay of longer than 20 days in achieving final stabilisation. Temporary stabilisation shall also be provided in areas of relatively high erosion hazard, and within sensitive environments like areas of concentrated flow (ie drains) and "waterfront lands" within 40 m of waterways. Use of temporary stabilisation can significantly reduce the erosion and pollution hazard in high risk areas.

Temporary stabilisation may be achieved by a number of means including:

- Spray-on synthetic soil stabilisers, such as Petrotac and Gluon;
- Spray-on anionic bitumen emulsion;
- Hydromulch;
- Hand seeding;
- Geofabrics, such as bidim and jute matting;
- Tarpaulins, particularly for small stockpiles; and
- Mulch cover (though not suited to areas of concentrated flow).

The choice of stabilisation method will be determined onsite through discussions between the construction and environment team, and will be detailed in PSECPs. A temporary stabilisation guide is provided in the following table which specifies maximum acceptable C-factors at nominated times during works. The C-factor is the "cover" factor described in RUSLE. Cover can be achieved using a range of materials including vegetation, mulch, hard armouring and rolled erosion control products (RECPs). The choice of appropriate stabilisation will be dependent on site factors and importantly, the nature of stormwater flow the stabilised area may receive.

Lands	Maximum C-factor	Remarks
Waterways and other areas subject to concentrated flow, post construction	0.05	Applies after ten working days from completion of formation and before they are allowed to carry any concentrated flows. Stabilisation of waterways would be undertaken to keep bed and banks stable in flows up to the 20-yr ARI, time of concentration storm event. Maximum C-factor of 0.05 equals 70% groundcover
Stockpiles, post construction	0.1	Applies after ten working days from completion of formation. Maximum C-factor of 0.10 equals 60% ground cover
All lands, including waterways and stockpiles during construction	0.15	Applies after 20 working days of inactivity, even though works might continue later. Maximum *C*-factor of 0.15 equals 50% ground cover

J. Stormwater Management

The following stormwater management controls will be implemented as part of the erosion and sediment control program:

- Divert clean stormwater away from areas to be disturbed by construction activities using earth banks or catch drains. For temporary banks construction is to follow SD 5-5 for earth banks (low flow). For permanent banks, construction is to follow SD 5-6 for earth banks (high flow). Clean water diversion banks shall be installed upfront and before any earthworks commence in the areas they protect. Permanent diversion banks will be sized by a suitably qualified person. Note that wherever possible drains should have trapezoidal or parabolic cross-sections. Avoid v-drains which are much more prone to erosion.
- Collect dirty water in earth banks or catch drains for diversion to sediment control structures as shown in the PSECPs. For temporary banks, construction is to follow SD 5-5 for earth banks (low flow). For permanent banks, construction is to follow SD5-6 for earth banks (high flow);
- Consideration should be given to the use of RECPs such as bidim, jute mesh and other biodegradable blankets to line temporary waterways. These can provide temporary protection to earth-based drains intended to be removed or upgraded within six months. Install the fabric following SD 5-7 ensuring continuous contact with the soil, overlapping of fabric in the right direction and secure pinning of all edges.
- Install temporary earth diversion banks (refer SD 5-5) at the direction of the site manager to mitigate against unforeseen erosion hazards, particularly when rain is forecast. These shall be used to shorten slope lengths, or to

divert localised run-on away from high hazard areas such as unstable batters, stockpiles or clean water drainage lines;

- Temporary diversion of small catchments can be achieved using sand bags, gravel-filled geotextile sausages, coir logs or similar
- Suitable energy dissipaters shall be placed at the outlets from all diversion banks, culverts and waterways (refer SD 5-8);
- Install temporary waterway crossings beneath access tracks where required to retain the passage of clean and dirty water flow lines (refer SD5-1).
- Check dams (SD 5-4) using rock aggregate, sandbags or geotextile "sausages" may be installed within drains and diversion channels to help reduce erosion, especially on steep sections. Care must be taken to ensure there is adequate provision for a spillway that allows flows to be retained within the diversion channel and not escape which may lead to scouring and/or flooding of adjacent lands;
- Maintain slope lengths no greater than 80 metres in disturbed areas, where possible. To reduce slope lengths in construction areas either stage the works, or install temporary earth diversion banks following SD 5- 5. On roads consider the use of cross banks and mitre drains to shed water from the surface, improve drainage and reduce erosion;
- Ensure roof water from site infrastructure is discharged in suitably stabilised locations to prevent erosion. Where buildings are without gutters, the ground surface beneath the roof drip-line should be stabilised with gravel or suitable non-erodible material.

K. Sediment Control

- While erosion control will be prioritised in all areas of work, these measures will not always be 100% effective and some erosion can be expected to occur. Sediment controls will be employed downslope of all disturbed areas to treat and retain sediment laden runoff. Sediment traps must be installed prior to disturbance within the areas they protect.
- Sediment traps shall be installed to treat dirty water runoff from disturbed areas and retain sediment as close as possible to its source. Sediment traps work most effectively by damming water and allowing sediment to settle under gravity, with time, in relatively quiescent conditions. As such, they will generally be installed in areas of sheet flow. Construction of sediment traps in areas of concentrated flow (eg drains, waterways) is not favoured, as they have limited effectiveness in these areas and can lead to scouring and unwanted damage.
- Sediment trap types include sediment fence, mulch bunds, rock weirs, check dams, informal shallow sumps and sediment basins. A range of materials may be used such as woven geotextiles, earth, rock, mulch or crushed concrete. Certified weed-free straw bales may also be used, but hay bales will be avoided as they provide a potential source of weed seeds. When installing sediment traps, materials will be firmly anchored to the ground to prevent water passing under them.
- Adequate provision must be allowed for water to bypass sediment traps during larger storms without causing flooding or erosion of adjoining areas.
- Because the site soils are relatively fine textured erosion may mobilise fine particles such as silt and clay. Extended detention times or assistance with flocculation will be required to achieve efficient sediment capture. Appropriately sized, designed and operated sediment basins are the most effective form of sediment trap.
- Sediment fence (SD6-8) or alternative linear sediment trap (eg mulch bunds) would be installed downslope of disturbed areas subject to sheet flow that do not drain to a sediment basin. Situations where linear sediment traps will be considered for use include:
  - around stockpiles, construction compound and laydown areas;
  - as boundary control downslope of disturbed areas that do not drain to a sediment basin;
  - adjacent to unsealed roads;
  - between works areas and clean water drains.
- Sediment controls shall be installed downslope of disturbed areas as shown on the PSECPs and elsewhere at the discretion of the Site Superintendent.
- Sediment fence will have a return of 1 metre upslope at intervals not exceeding 20 metres and cut-through weirs will be installed where required as a means of controlling discharge. Returns are installed to subdivide the catchment area of the sediment fence, to improve its effectiveness and help prevent structural damage during peak flows.
- Mulch bunds can be used as effective sediment traps in areas that are subject to sheet flow. Consider installing returns at regular intervals to break up the catchments. Monitor for any areas of stormwater breakthrough and repair these promptly.
- Informal shallow excavated sediment traps may be used to capture sediment laden runoff especially from relatively small catchments. This form of control is typically not subject to any detailed design; however, as with any sediment trap their size should be assessed according to the catchment they serve and suitable inlet and outlet controls employed to minimize erosion from concentrated flows. Shallow excavations may be used in isolation or along with other controls such as sediment fence and rock filter dams to increase the water and sediment storage capacity.
- Inlet filters (refer SD6-12, SD6-12) shall be used to protect existing stormwater inlets that may receive dirty stormwater runoff from the works

L. Trenching

Sediment and erosion controls for trenching works include:

- Avoid trenching in areas where water flow is likely to concentrate. Alternatively, schedule work during periods when rainfall is not forecast.
- Ensure trench widths and depths are the minimum necessary.
- Divert surface water away from trench openings.
- Use sandbags as plugs or bulkheads across trench inverts to shorten the length of sediment-laden water flow in the trench.
- Leave excavations open for the minimum practical time (try to limit the time trenches are left open to fewer than three days). Avoid opening trenches whenever the risks of storms are high. Organise service installations to enable progressive backfilling
- Ensure plugs, collars or trench stops are employed to control tunnel erosion after backfilling is completed. Proper seepage collars or clay/bentonite plugs may be necessary in highly erodible soils
- Provide an appropriate allowance for settling of uncompacted backfill material (e.g. 10%)
- After backfilling, remove excess or unsuitable spoil from the site. Then, replace topsoil and vegetate to match surrounding ground levels and vegetation species as soon as possible

M. Dewatering

Dewatering may be required where dirty water has accumulated in excavations, trenches or even sediment basins if used. If water is to be pumped and discharge to the stormwater system or natural waterway, treatment will be required to protect water quality and ecological values of the receiving environment. By law you are responsible not to discharge pollutants (including sediment) into the stormwater system or receiving environment where it has the potential to damage infrastructure, cause an environmental nuisance or environmental harm.

Following are important controls and matters for consideration during dewatering:

- Dewatering is a high-risk activity that must be carefully managed to avoid water quality impacts. If done poorly, dewatering can result in discharge of turbid water to the environment. The Contractor should develop a Dewatering Procedure outlining specific procedures, techniques and responsibilities for management of dewatering activities.
- Adopt site specific water quality targets if imposed by any planning approval or regulatory authorities. Otherwise, in the absence of site specific criteria the following water quality targets may be adopted for discharge water:
  - pH 6-5 – 8.5
  - Suspended solids < 50 mg/L
  - No visible oil and grease
- Minimise the time and cost associated with treatment of dirty water. This can be achieved by:
  - implementing good clean and dirty water separation, to reduce the volume of dirty water requiring treatment
  - minimising the time and size of disturbed areas draining to open excavations
  - undertaking progressive rehabilitation to reduce erosion and sediment load
  - prioritise source controls that trap sediment at source, rather than adopting an end of catchment approach that can result in large volumes of dirty water and sediment requiring treatment before dewatering
- Make a plan for dewatering on the assumption that excavations may fill with dirty water. Have in place suitable dewatering, treatment and discharge methods. This could include:
  - Vacuum trucks to dewater small excavations and take water off site for discharge to a licensed facility
  - Pump and dewater to filter bags that trap sediment and discharge water to grassy areas that can absorb the water
  - Pump to a dedicated water treatment facility
  - Pump to a sediment basin for subsequent treatment and discharge
  - Treat water in-situ and discharge to a stable location upon achieving desired water quality target
- Always supervise dewatering activities. Ensure that pump inlets draw from the clean water zone and minimise remobilising of any settled sediment
- Test water to ensure water quality targets are met prior to any managed discharge. Onsite water testing methods are preferred to avoid delays due to laboratory turnaround times. Suitable handheld meters for measuring pH and TSS can be obtained for this purpose. Water testing is the responsibility of the site superintendent or SEO who will then determine whether water is suitable for discharge or requires further treatment
- Treatment for highly turbid water containing dispersed fine sediment is likely to require assisted flocculation. Gypsum is a common and safe to use flocculant

that may be effective, Trials may be required to assess the efficacy of gypsum and to determine suitable dosing rates. Some flocculants like alum are far more effective but pose environmental risks that must be carefully managed and will likely require specialist advice.

- Specific guidance on dewater and water treatment practices can be found in the IECA (2008) *Best Practice Erosion and Sediment Control Guidelines*

N. Rehabilitation

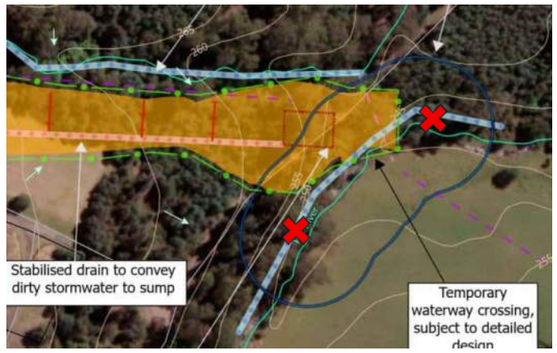
- Temporary stabilisation of disturbed areas should be undertaken after conclusion of earthworks if permanent rehabilitation is delayed, or if there is likely to be a significant delay in the construction program. Rehabilitation should also be undertaken of any areas disturbed by early works that are not likely to be further disturbed at a later stage
- The preferred site stabilisation method will be identified on a site by site basis and included within the PSECPs. Advice from a soil conservationist and/or rehabilitation specialist should be sought during this process
- Final site stabilisation can be achieved using vegetation, mulch, rock armouring, paving, concrete, synthetic or natural fibre geofabrics, spray on synthetic soil binders or any other cover that protects the ground surface against erosion
- When selecting stabilisation methods a key factor for consideration is the expected nature of stormwater drainage over the stabilised area. Areas subject to concentrated flow (ie watercourses and drains) will require different stabilisation techniques to those subject to sheet flow. In areas of sheet flow vegetation will generally be acceptable. Concentrated flow areas may require rock armouring or similar to account for scouring velocities
- Successful revegetation requires:
  - Availability of acceptable soil materials and correct site preparation (refer SD4-2, SD7-1)
  - Selection of an appropriate establishment technique
  - Selection and application of appropriate plant species, fertilisers and soil ameliorants
  - Application of sufficient water for germination and establishment if rainfall is inadequate
  - Maintenance, and replanting if revegetation is not successful
- When replacing topsoil on batters lightly scarify the subsoil materials first along the contour to assist in keying the topsoil in. Replace topsoil to the depths indicated in SD4-2, noting that it can be very difficult to achieve successful topsoil replacement and revegetation on slopes greater than 2(H):1(V). Specialised measures may be required in such areas such as hydromulching and ecoblanket
- It is common practice to use annual species as a fast growing and highly effective temporary cover crop. However, these plants will die within one season, providing almost no surface protection thereafter. For longer term protection a mixture of perennial and annual species is best. While the perennial species are usually slower to establish, they will grow under the annual species and succeed them to provide a permanent surface protection; and
- Hydromulch should be considered for rapid stabilisation of high risk areas where erosion could pose an unacceptable risk to water quality or structural integrity of the completed works. Focus areas would include the dam wall, internal batters to the new northern spillway, and works adjacent to watercourses.

O. Waste Management and Pollution Control

- Trade waste receptacles will be provided for the safe and efficient storage of all construction and miscellaneous wastes. Recyclable materials shall be separated and recycled where possible. Otherwise, disposable wastes will be removed from site regularly and disposed by approved means
- Potentially contaminating materials used or stored on the site (e.g. fuel, oils) shall be prevented from entering the groundwater or surface water systems. This will be achieved through storage in designated secondary containment areas (e.g. internally bunded shipping containers or purpose-built structures). Bulk storage areas for fuels, oils and chemicals used during construction will be contained within an impervious bund to retain any spills of more than 110% of the volume of the largest container in the bunded area
- Any spillage will be immediately contained and absorbed with a suitable absorbent material. Storage will comply with AS 1940- 2004 *The Storage and Handling of Flammable and Combustible Liquids*. Emergency spill clean up kits will be maintained on-site in agreed locations that are accessible and known to all site workers. Spill kits will be used in the event of inadvertent spills of fuels, oils, hydraulic fluids and other hazardous wastes, to contain the spill and avoid contamination of waters. Workers will be trained in the use of spill kits. Contaminated soils shall be excavated and disposed by means to be authorised by the Site Superintendent
- Material Safety Data Sheets (MSDS) for all chemicals stored on-site will be maintained by the Site Safety and Environment Officer and made available to site personnel. Site personnel will be informed of their location as a part of the site induction; and
- Refuelling of equipment on-site or any other activity which could result in a spillage of a chemical, fuel or lubricant will be undertaken away from drainage/stormwater lines. A designated refuelling area should be established with drip trays installed and spill kits on stand-by.

P. Inspection, Monitoring and Maintenance

- An inspection and maintenance program is essential to successful implementation of the erosion and sediment control plan. Inspections, particularly during storms, will show whether devices are operating effectively. Where a device proves inadequate, it should be quickly redesigned and/or repaired to make it effective
- The site superintendent or delegate (eg site environment officer) will inspect the site at least weekly paying particular attention to:
  - ensuring PSECPs are prepared and approved before commencing works in individual areas and are maintained up to date as the site and nature of work change
  - ensuring barrier fencing is maintained and exclusion zones are being observed by all site workers and contractors
  - waste receptacles are emptied regularly in a manner approved by the site superintendent
  - ensuring progressive and prompt rehabilitation of lands, that rehabilitation has effectively reduced the erosion hazard and that repairs or upgrades are initiated as appropriate
  - constructing additional erosion and/or sediment controls to ensure the desired erosion and sediment control is achieved, i.e. make ongoing changes to the Plan
  - maintaining erosion and sediment control measures in a functioning condition until all earthworks are completed and the site is rehabilitated
  - removing trapped sediment and disposing this in safe areas
  - maintaining stability of creek crossings and protection of clean water flow lines
  - removing temporary soil conservation structures as the last activity in the rehabilitation program
- Implement a routine water quality monitoring program. A suggested monitoring program includes:
  - Once daily visual monitoring immediately upstream and downstream of works in Pet River. Monitor for visual evidence of turbid water or other impacts
  - Weekly pH and TSS (or turbidity) testing using hand held monitoring equipment
  - Record all observations in a register
  - Suggested upstream and downstream monitoring locations are adjacent the new spillway discharge works as shown below (marked by red “X”)



- Where water quality impacts are observed, immediately review work practices, review control measures for effectiveness and implement additional measures as required;
- Upon completion of construction the site should be inspected at least monthly and until such time as a stable landscape is returned, vegetation is growing well and there is minimal evidence of active erosion.

Q. Roles and Responsibilities

Prior to the start of construction works, the Contractor will nominate someone to be responsible for implementation and maintenance of the erosion and sediment controls. This is commonly the site environment officer (SEO). Responsibilities of the SEO include:

- Identify and delineate site access points, parking area and ‘no go’ zones, and their maintenance
- Maintain supplies of erosion and sediment control materials on site and ensure they are readily available, such as sediment fence, wire, stakes, and clean gravels/aggregate, and sufficient RECP to be employed for high hazard areas
- Review and maintain control measures, fences, barriers and signs on the site
- Complete daily and weekly checks and post rain event checks on all erosion and sediment control infrastructure or devices utilised on site
- Ensure that PSECPs are prepared for all work areas prior to construction commencing, and contribute advice for PSECP preparation including on risk assessment, and selection of controls
- Check that works are compliant with this SECP and the PSECPs and are completed in a timely manner

- Ensure that essential construction areas and also “no go” zones are in place, are being observed, and that the controls and signage that delineate these areas is being maintained
- Instructing and overseeing the maintenance of erosion and sediment controls and implementation of new controls as risk profiles change
- Ensure that when any erosion and sediment control device reaches 75% of capacity, that it is emptied as soon as practical, and that any material removed is disposed of in a manner such that further erosion is prevented from occurring (e.g. spreading soil amongst existing vegetation on higher ground, not below drain outlets or sediment structures, or taking off site); and
- Ensuring that topsoil and subsoil resources are being clearly segregated and preserved for later use in rehabilitation.

R. Training and Awareness

- All Project personnel, subcontractors and consultants will receive training on environmental obligations during the Project induction, toolbox talks and specific training.
- Project inductions will include:
  - Site specific erosion and sediment control procedures;
  - ‘Clean’ and ‘dirty’ water on the Project site;
  - Delineation of essential work areas and “no go” zones; and
  - Spill response.
- Site inductions and toolbox talks will highlight the specific environmental requirements and activities being undertaken, which will include relevant soil and water management matters.

S. Reference Documents

Department of natural resources and Environment. *Guidelines for Developing a Sediment and Erosion Control Plan for Dam Works Sites*

Environmental Protection Authority (EPA) Tasmania’s Soil & Water Management Plans Fact Sheets (EPA Fact Sheets)

Hazelton, P.A. & Murphy, B.W (2007). *Interpreting soil test results: What do all the numbers mean? (2nd ed.).* CSIRO, Melbourne.

IECA (2008). *Best Practice Erosion and Sediment Control*. International Erosion Control Association.

Landcom (2004). *Managing Urban Stormwater: Soils and Construction (Volume 1, 4th edition)*

ACRONYMS

PSECP	Progressive Sediment and Erosion Control Plan
RECP	Rolled Erosion Control Products
RUSLE	Revised Universal Soil Loss Equation
SECP	Sediment and Erosion Control Plan
SD	Standard Drawing
SEO	Site Environment officer

Document Signoff and contact

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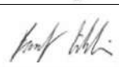
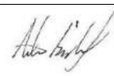
Bradley Gibbins	Project Manager	0498207500	bgibbons@pittsh.com.au

Prepared by — Adam Bishop		**Date —**26 May 2025
Reviewed by — Bradley Gibbons		**Date —** 26 May 2025
Authorised by — Adam Bishop		**Date —** 26 May 2025

Figures

Appendix A

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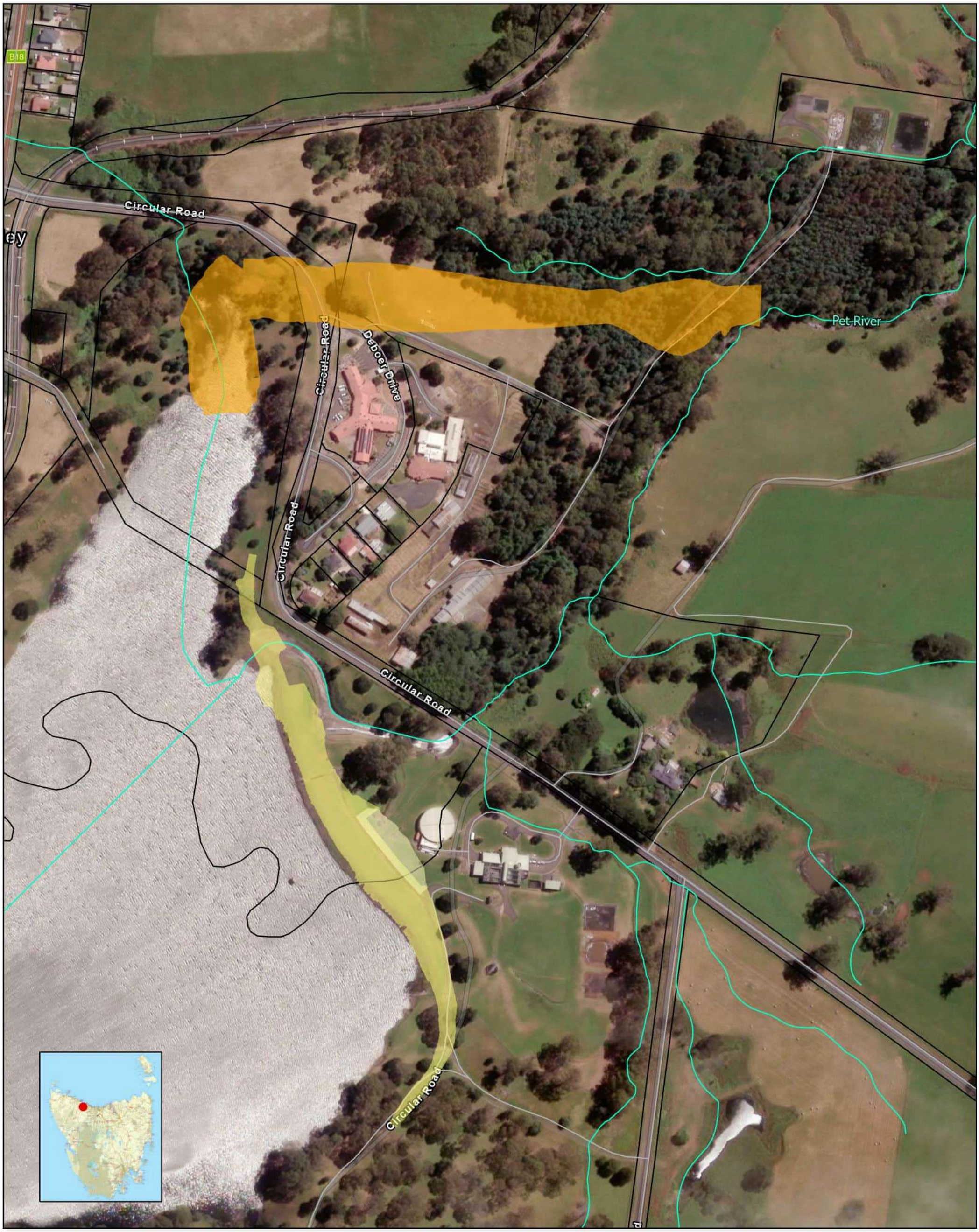

TasWater

Main Works Overview

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N

0 35 70 140 Metres

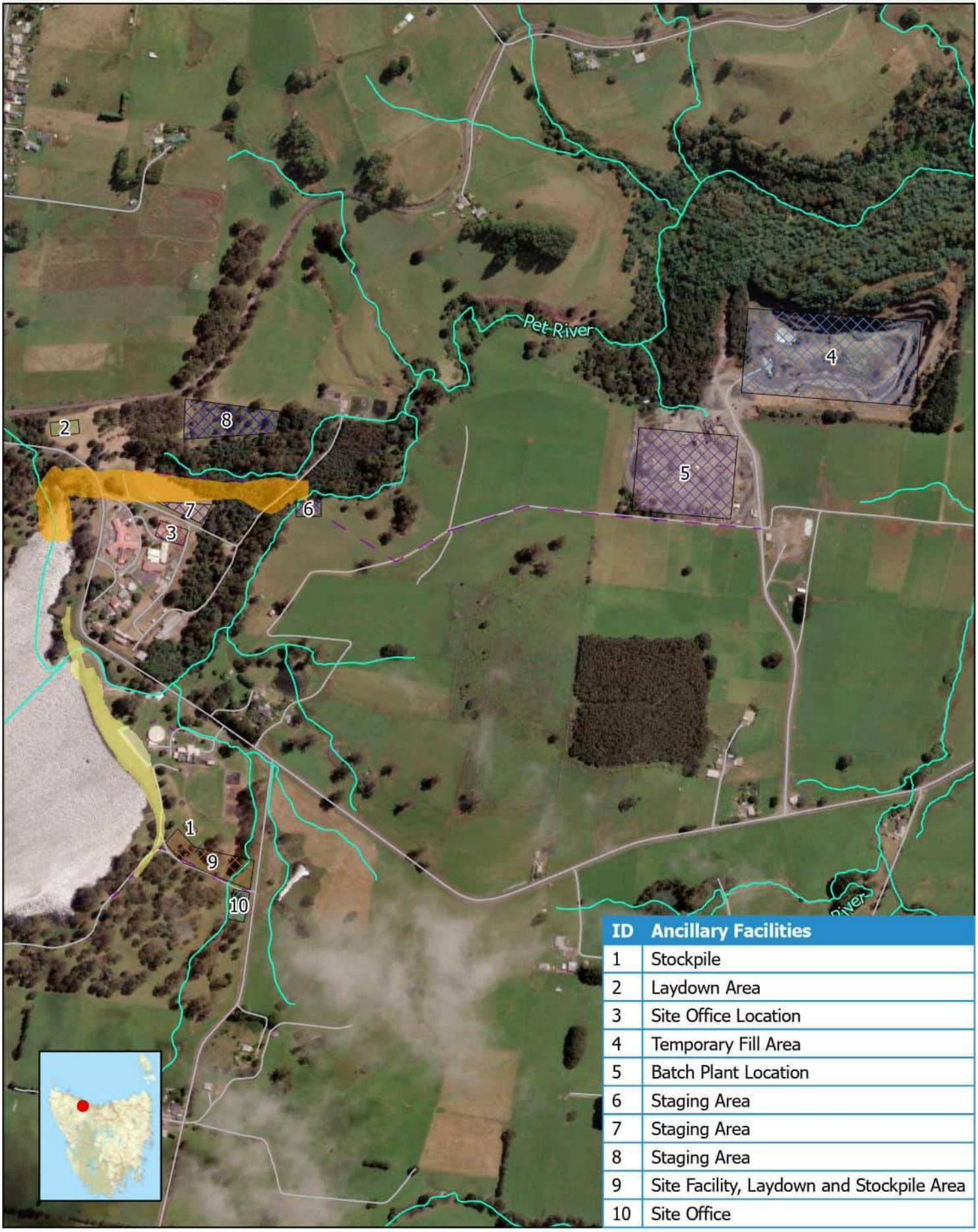
Coordinate System: GDA2020 MGA Zone 55
1:3,000 When Printed at A4

MAP REF	P.25.0344
AUTHOR	JB
REVISION	RevB
DATE	14/05/2025

DATA SOURCES Base data and map from The LIST Tasmanian Government
Project specific data

Legend

- Spillway
- Filter Buttress
- Crest Raising
- Road
- Hydrographic Lines
- Cadastral Parcels



ID	Ancillary Facilities
1	Stockpile
2	Laydown Area
3	Site Office Location
4	Temporary Fill Area
5	Batch Plant Location
6	Staging Area
7	Staging Area
8	Staging Area
9	Site Facility, Laydown and Stockpile Area
10	Site Office

TasWater

Works Overview

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N

0 75 150 300 Metres

Coordinate System: GDA 1994 MGA Zone 55
1:9,000 When Printed at A4

MAP REF	P.25.0344
AUTHOR	JB
REVISION	RevB
DATE	14/05/2025

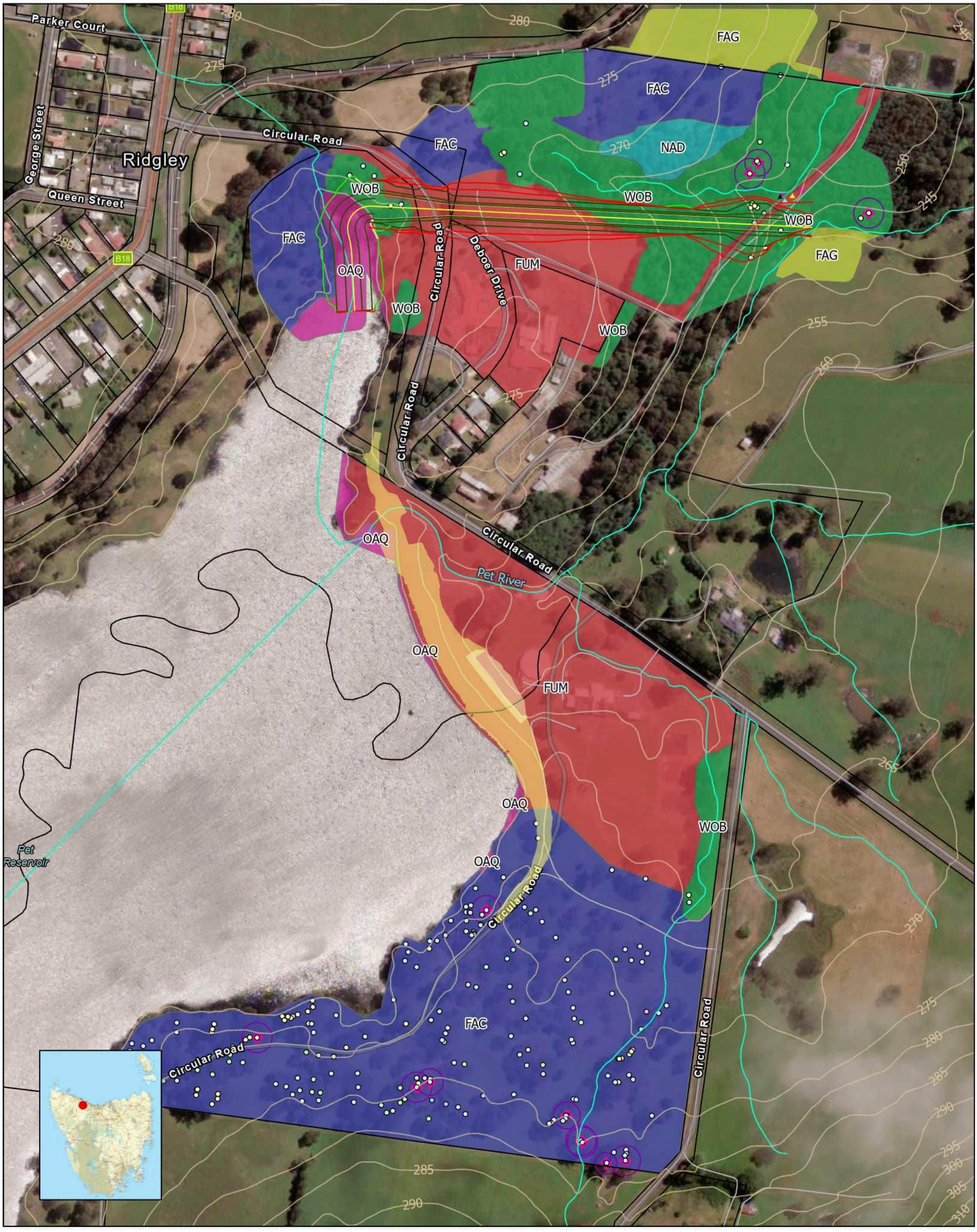
DATA SOURCES Base data and map from The LIST Tasmanian Government
Project specific data

Legend

- Spillway
- Filter Buttress
- Crest Raising
- Hydrographic Lines
- Road

Ancillary Facilities

- Potential Access Option
- Potential River Crossing
- Batch Plant Location
- Laydown Area
- Site Facility, Laydown and Stockpile Area
- Site Office
- Site Office Location
- Staging Area
- Stockpile
- Temporary Fill Area



TasWater

Constraints - Pet Dam

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N

0 40 80 160 Metres

Coordinate System: GDA 1994 MGA Zone 55
1:3,500 When Printed at A4

MAP REF	P.25.0344
AUTHOR	JB
REVISION	RevA
DATE	12/05/2025

DATA SOURCES Base data and map from The LIST Tasmanian Government
Project specific data

Legend

- Crest Raising
- Filter Buttress

Vegetation - North Barker 2024

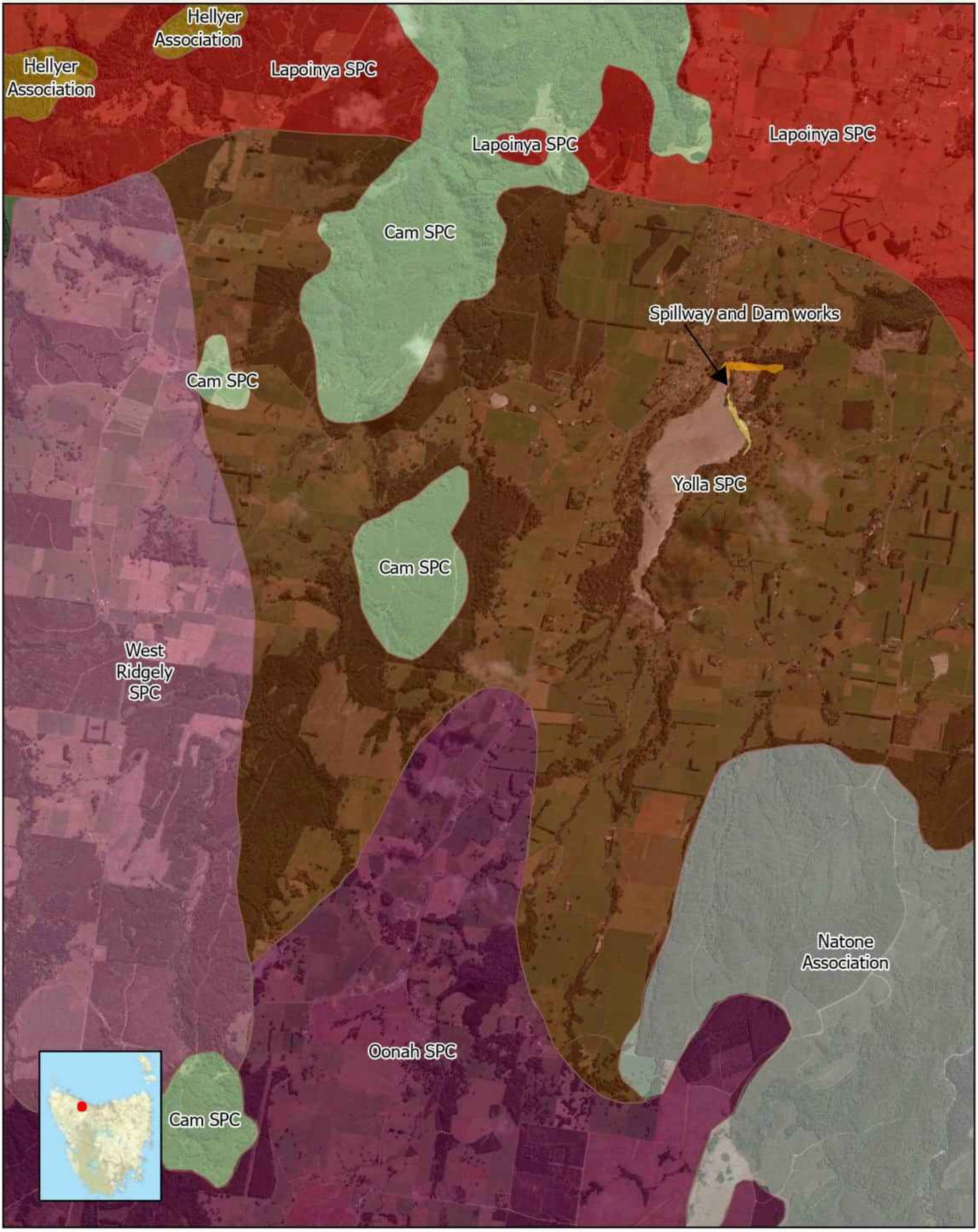
Vegcode
- FAC
- FAG
- FUM
- NAD
- OAQ
- WOB

- Hollow Bearing Tree TPZ - North Barker 2024
- Hollow Bearing Tree - North Barker 2024

Notable Trees - North Barker 2024
- Huon pine
- King Billy pine
- Oyster bay pine
- pencil pine

Significant Trees - North Barker 2024
- Eucalyptus sp.
- alpine white gum
- blue gum
- mountain ash
- stag
- stringy bark
- white gum

- Cadastral Parcels
- Road
- Hydrographic Lines
- Contours 5 metres



TasWater

Soils

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MAP REF	P.25.0344
AUTHOR	JB
REVISION	RevA
DATE	12/05/2025

DATA SOURCES: Base data and map from The LIST Tasmanian Government
Project specific data

Legend

- Spillway
- Filter Buttress
- Crest Raising

Soil Types

- Cam SPC
- Hellyer Association
- Lapoinya SPC
- Natone Association
- Oonah SPC
- West Ridgely SPC
- Yolla SPC

Design Drawings

Appendix B

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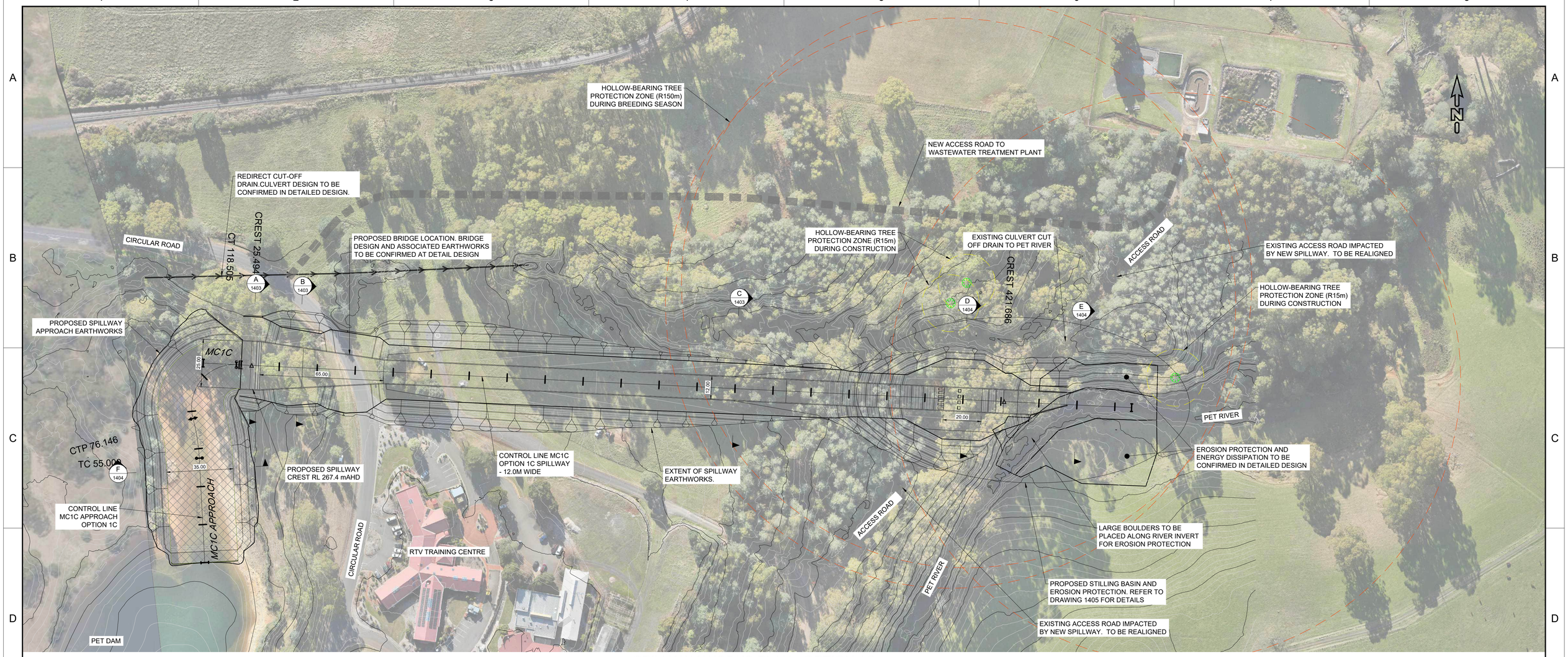

SPILLWAY WORKS PLAN - OPTION 1C

SCALE 1:1000

NOT FOR CONSTRUCTION

20 10 0 20 40 60 80 100m

SCALE 1:1000

Rev.No.	Amendment	Date	Authorised
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0	-	-	-

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ABN: 47 162 220 653 © 2024

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Datum	AHD83
Sheet Size	A1
References	

DESIGN			DATE	REVIEW			DATE
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P. Southcott	ENTURA	Mar 2025

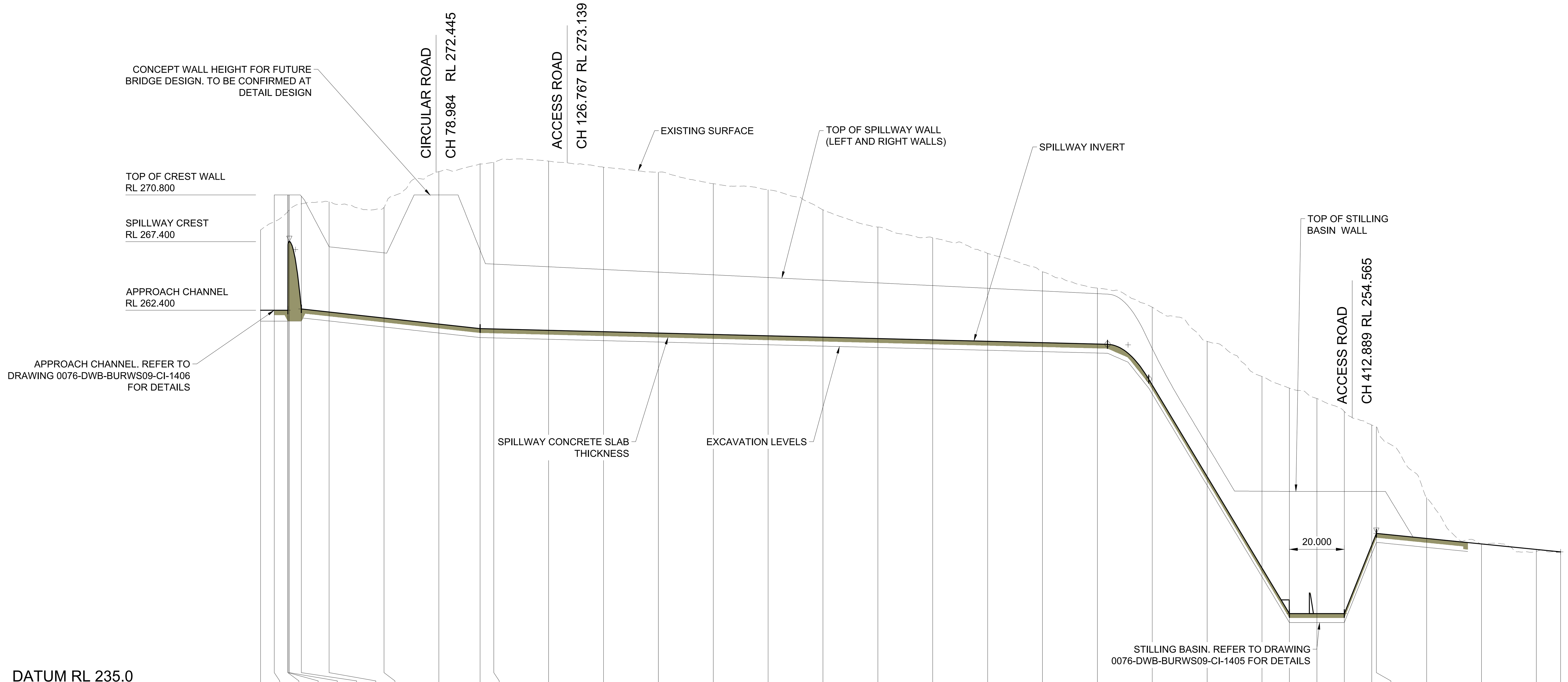
Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE

CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C PLAN

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1401	1 of 6	A



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CHAINAGE	TOP OF WALL	WALL HEIGHT	EXISTING SURFACE	CUT - FILL +	SPILLWAY INVERT LEVEL
15.00			268.25	-5.85	262.40
20.00	270.80	-8.40	268.85	-6.45	262.40
24.94	270.80	-8.40	269.58	-7.18	262.40
25.05	270.80	-3.54	269.60	-2.34	267.26
25.49	270.80	-3.40	269.71	-2.31	267.40
29.87	270.70	-8.21	270.15	-7.65	262.49
40.00	267.02	-4.75	270.30	-8.03	262.27
60.00	266.58	-4.75	269.90	-8.07	261.83
80.00	270.80	-9.41	272.50	-11.11	261.39
95.00	266.78	-5.72	273.06	-12.00	261.06
100.00	265.76	-4.73	273.18	-12.14	261.03
120.00	265.57	-4.63	273.26	-12.33	260.93
140.00	265.37	-4.53	272.82	-11.98	260.83
160.00	265.17	-4.44	272.46	-11.72	260.73
180.00	264.98	-4.34	271.62	-10.98	260.63
200.00	264.78	-4.25	271.17	-10.64	260.53
220.00	264.59	-4.15	269.71	-9.28	260.43
240.00	264.39	-4.06	268.46	-8.13	260.33
260.00	264.20	-3.96	267.67	-7.44	260.23
280.00	264.00	-3.87	266.54	-6.40	260.13
300.00	263.80	-3.77	265.20	-5.16	260.03
320.00	263.61	-3.67	264.02	-4.08	259.93
340.00	259.61	-2.66	262.62	-5.67	256.95
360.00	252.57	-2.28	260.13	-9.84	250.29
380.00	249.22	-5.59	257.57	-13.94	243.63
390.00	249.20	-8.90	256.73	-16.43	240.30
400.00	249.20	-8.90	255.97	-15.67	240.30
410.00	249.20	-8.90	255.03	-14.73	240.30
420.00	249.20	-3.90	254.04	-8.74	245.30
421.69	249.20	-3.06	253.90	-7.76	246.14
440.00	245.80	-0.02	248.76	-2.98	245.78
460.00			245.38	0.00	245.38
480.00			244.82	0.15	244.98
488.82			244.77	0.03	244.80

SPILLWAY OPTION 1C LONGITUDINAL SECTION

SCALE 1:1000H
1:200V

NOTES:
1. FOR INDICATIVE WATER LEVELS REFER TO PET DAM SPILLWAY OPTIMISATION PROJECT NOTE ENTURA-886904507-6935

SCALE 1:1000 (20 10 0 20 40 60 80 100m)
SCALE 1:200 (4 3 2 1 0 4 8 12 16 20m)

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
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0	-	-	-

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ABN: 47 162 220 653 © 2024

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Datum	AHD83
Sheet Size	A1

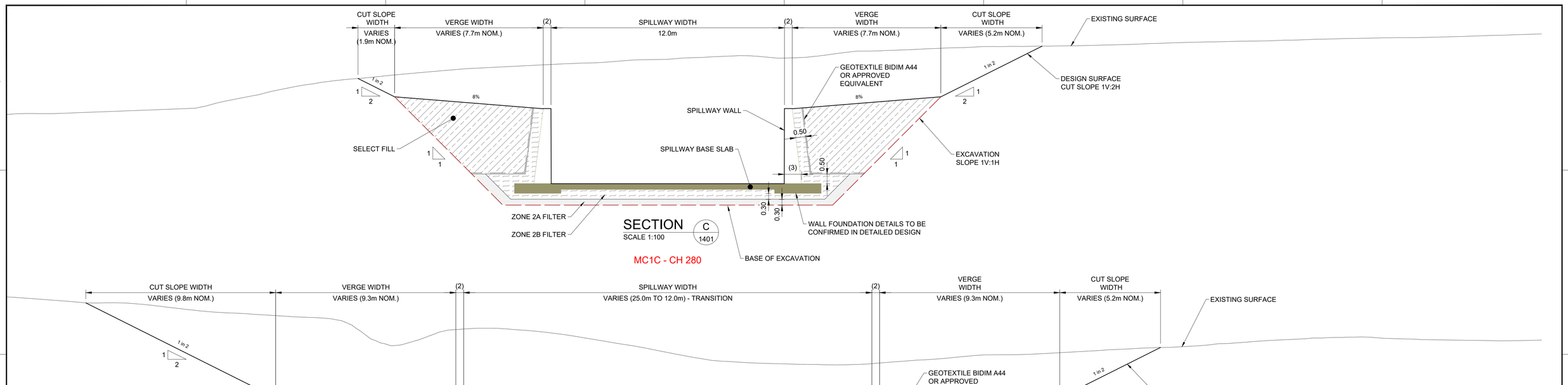
References

	DESIGN		DATE		REVIEW		DATE
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P. Southcott	ENTURA	Mar 2025

Drawing Issue
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C LONGITUDINAL SECTION

Drawing Number: 0076-DWB-BURWS09-CI-1402
Sheet Number: 2 of 6
Revision: A



NOTES:
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(1) - WALL HEIGHT = VARIES. REFER TO LONGITUDINAL SECTION 0076-DWB-BURWS09-CI-1402

(2) - WALL WIDTH TOP = 0.400m (NOM.)

(3) - WALL WIDTH BOTTOM = VARIES, 1.660m MAX

(4) - HEEL WIDTH = VARIES, 1.500m MAX

(5) - TOE WIDTH = VARIES, 0.700m MAX

(6) - HEEL / TOE THICKNESS = VARIES, 0.500m MAX

(7) - SPILLWAY SLAB THICKNESS = VARIES, 0.300m NOM.

(8) - SPILLWAY SLAB WIDTH = VARIES (12.0m NOM.),

NOT FOR CONSTRUCTION

2 1 0 2 4 6 8 10m
SCALE 1:100

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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Scale	AS SHOWN
Datum	AHD83
Sheet Size	A1
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DESIGN			DATE	REVIEW			DATE
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P. Southcott	ENTURA	Mar 2025

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C SECTIONS - SHEET 1 OF 2

Drawing Number	Sheet Number	Revision
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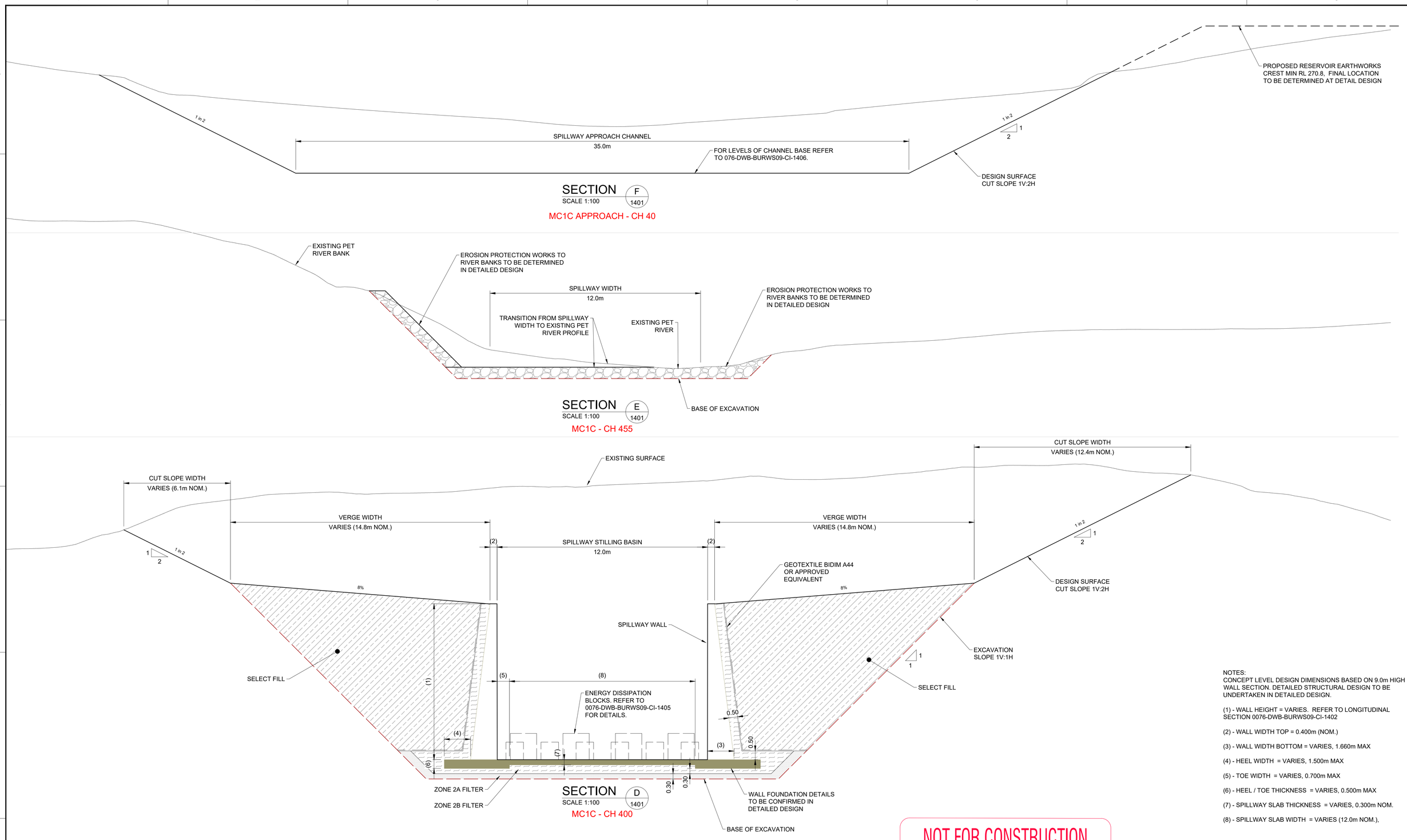

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(2) - WALL WIDTH TOP = 0.400m (NOM.)

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(4) - HEEL WIDTH = VARIES, 1.500m MAX

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(6) - HEEL / TOE THICKNESS = VARIES, 0.500m MAX

(7) - SPILLWAY SLAB THICKNESS = VARIES, 0.300m NOM.

(8) - SPILLWAY SLAB WIDTH = VARIES (12.0m NOM.),

NOT FOR CONSTRUCTION

2 1 0 2 4 6 8 10m
SCALE 1:100

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR

TasWater Capital Delivery Office

TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653

Scale	AS SHOWN
Datum	AHD83
Sheet Size	A1
References	

DESIGN			DATE	REVIEW			DATE
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P. Southcott	ENTURA	Mar 2025

Drawing Issue

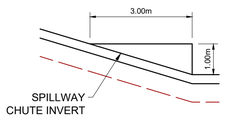
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C SECTIONS - SHEET 2 OF 2

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1404	3 of 6	A

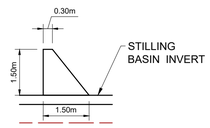
SPILLWAY BASIN PLAN

SCALE 1:250



DETAIL 1: BAFFLE BLOCK SET A

NOT TO SCALE



DETAIL 2: BAFFLE BLOCK SET B

NOT TO SCALE

NOT FOR CONSTRUCTION

5 4 3 2 1 0 5 10 15 20 25m

SCALE 1:250

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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TasWater Capital Delivery Office

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Scale	AS SHOWN
Datum	AHD83
Sheet Size	A1
References	

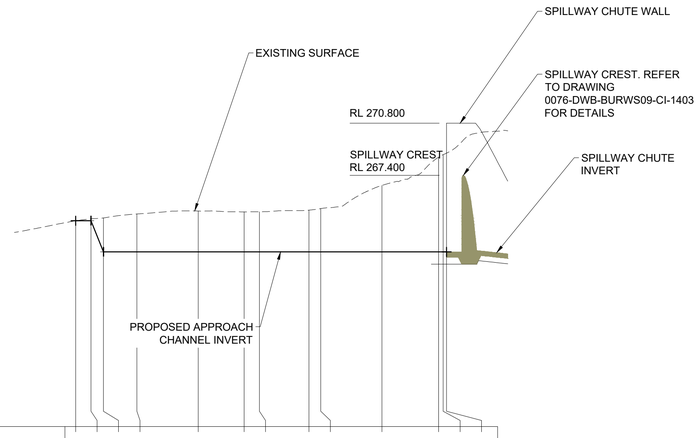
DESIGN			DATE	REVIEW			DATE
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P Southcott	ENTURA	Mar 2025

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C STILLING BASIN DETAILS

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1405	5 of 6	A



DATUM RL 251.0

VERTICAL DATA	0.00%	-50.00%	0.00%								
HORIZONTAL DATA			R-100m		R22.5m						
EXISTING SURFACE	264.43	264.56	264.62	264.88	265.07	265.01	265.02	265.12	265.23	266.74	268.58	268.75	268.85
CUT - FILL +	0.00	-0.13	-2.22	-2.48	-2.67	-2.61	-2.62	-2.72	-2.83	-4.34	-6.18	-6.35	-6.45
APPROACH CHANNEL INVERT	264.43	264.43	262.40	262.40	262.40	262.40	262.40	262.40	262.40	262.40	262.40	262.40	262.40
CHAINAGE	0.00	5.00	9.06	20.00	40.00	55.00	60.00	76.15	80.00	100.00	118.50	120.00	121.08

SPILLWAY APPROACH LONGITUDINAL SECTION

SCALE 1:1000H
1:200V

NOT FOR CONSTRUCTION

20 10 0 20 40 60 80 100m
SCALE 1:1000

4 3 2 1 0 4 8 12 16 20m
SCALE 1:200

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR

TasWater Capital Delivery Office

TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653 © 2024

Scale	AS SHOWN
Datum	AHD83
Sheet Size	A1
References	

	DESIGN		DATE	REVIEW			DATE
Drawn	S. Dickinson	ENTURA	Mar 2025	Checked	S. Ng	ENTURA	Mar 2025
Designed	C. Flack	ENTURA	Mar 2025	Approved	P. Southcott	ENTURA	Mar 2025

Drawing Issue

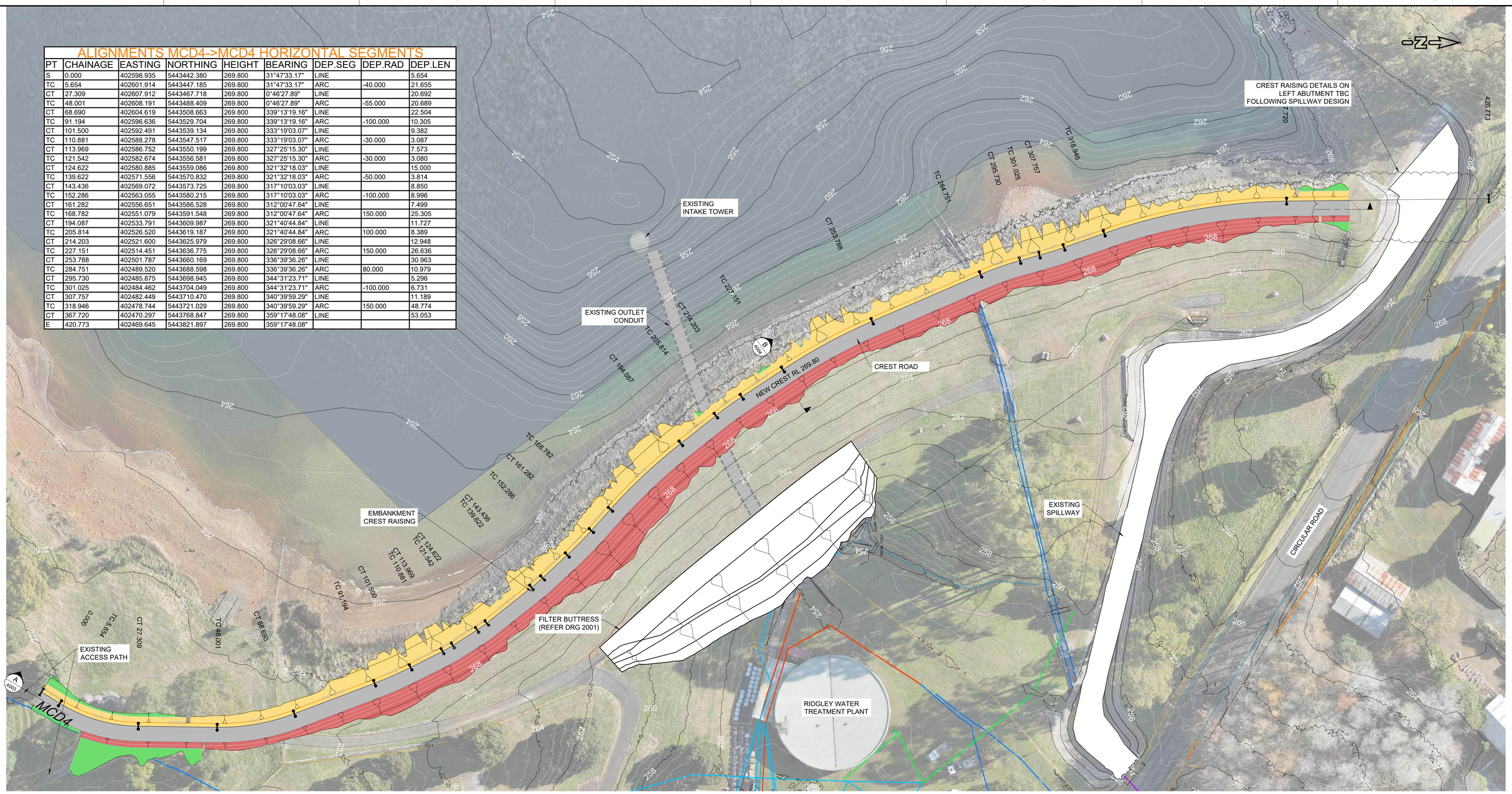
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
SPILLWAY OPTION 1C APPROACH CHANNEL SECTION

Drawing Number	Sheet Number	Revision
0076-DWB-BURWS09-CI-1406	6 of 6	A

ALIGNMENTS MCD4->MCD4 HORIZONTAL SEGMENTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	DEP.SEG	DEP.RAD	DEP.LEN
S	0.000	402598.935	5443442.380	269.800	31°47'33.17"	LINE		5.654
TC	5.654	402601.914	5443447.185	269.800	31°47'33.17"	ARC	-40.000	21.655
CT	27.309	402607.912	5443467.718	269.800	0°46'27.89"	LINE		20.692
TC	48.001	402608.191	5443488.409	269.800	0°46'27.89"	ARC	-55.000	20.689
CT	68.690	402604.619	5443508.663	269.800	339°13'19.16"	LINE		22.504
TC	91.194	402596.636	5443529.704	269.800	339°13'19.16"	ARC	-100.000	10.305
CT	101.500	402592.491	5443539.134	269.800	333°19'03.07"	LINE		9.382
TC	110.881	402588.278	5443547.517	269.800	333°19'03.07"	ARC	-30.000	3.087
CT	113.969	402586.752	5443550.199	269.800	327°25'15.30"	LINE		7.573
TC	121.542	402582.674	5443556.581	269.800	327°25'15.30"	ARC	-30.000	3.080
CT	124.622	402580.885	5443559.086	269.800	321°32'18.03"	LINE		15.000
TC	139.622	402571.556	5443570.832	269.800	321°32'18.03"	ARC	-50.000	3.814
CT	143.436	402569.072	5443573.725	269.800	317°10'03.03"	LINE		8.850
TC	152.286	402563.055	5443580.215	269.800	317°10'03.03"	ARC	-100.000	8.996
CT	161.282	402556.651	5443586.528	269.800	312°00'47.64"	LINE		7.499
TC	168.782	402551.079	5443591.548	269.800	312°00'47.64"	ARC	150.000	25.305
CT	194.087	402533.791	5443609.987	269.800	321°40'44.84"	LINE		11.727
TC	205.814	402526.520	5443619.187	269.800	321°40'44.84"	ARC	100.000	8.389
CT	214.203	402521.600	5443625.979	269.800	326°29'08.66"	LINE		12.948
TC	227.151	402514.451	5443636.775	269.800	326°29'08.66"	ARC	150.000	26.636
CT	253.788	402501.787	5443660.169	269.800	336°39'36.26"	LINE		30.963
TC	284.751	402489.520	5443688.598	269.800	336°39'36.26"	ARC	80.000	10.979
CT	295.730	402485.875	5443698.945	269.800	344°31'23.71"	LINE		5.296
TC	301.025	402484.462	5443704.049	269.800	344°31'23.71"	ARC	-100.000	6.731
CT	307.757	402482.449	5443710.470	269.800	340°39'59.29"	LINE		11.189
TC	318.946	402478.744	5443721.029	269.800	340°39'59.29"	ARC	150.000	48.774
CT	367.720	402470.297	5443768.847	269.800	359°17'48.08"	LINE		53.053
E	420.773	402469.645	5443821.897	269.800	359°17'48.08"			



EMBANKMENT CREST RAISING PLAN

SCALE 1:500

LEGEND

- PROPOSED EMBANKMENT CREST RAISING
- 4m WIDE DAM CREST ROAD
- PROPOSED UPSTREAM RIPRAP PROTECTION
- PROPOSED CUTTING

NOT FOR CONSTRUCTION

NOTES

1. ALL DIMENSTIONS, CHAINAGES AND LEVELS ARE IN METERS.

10 8 6 4 2 0 10 20 30 40 50m
SCALE 1:500

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR

TasWater Capital Delivery Office

TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653 © 2024

Scale	1:500
Datum	AHD83
Sheet Size	A1
References	

DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
EMBANKMENT CREST RAISING PLAN

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-4001	# of #	A

NOT FOR CONSTRUCTION

10 8 6 4 2 0 10 20 30 40 50m
SCALE 1:500

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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Scale	1:500
Datum	AHD83
Sheet Size	A1
References	

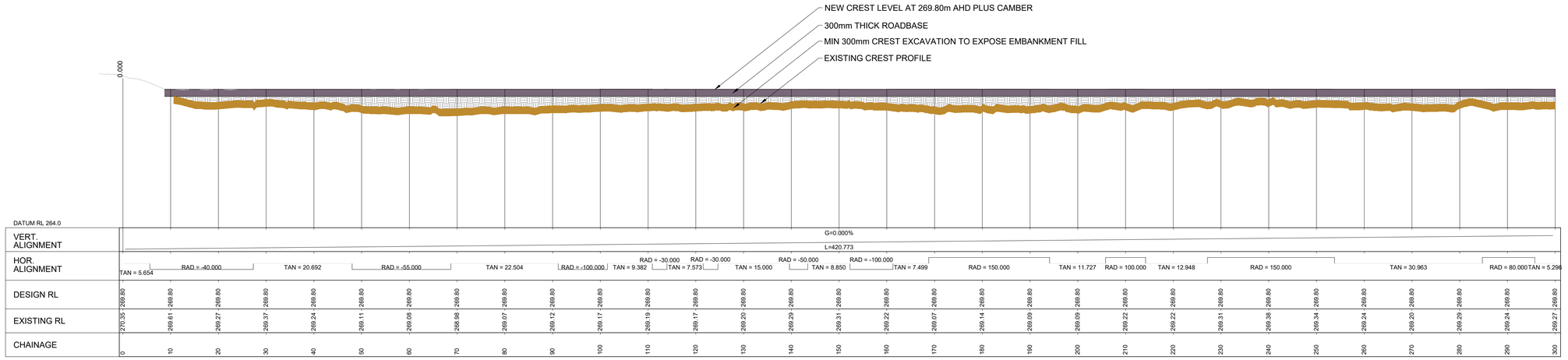
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

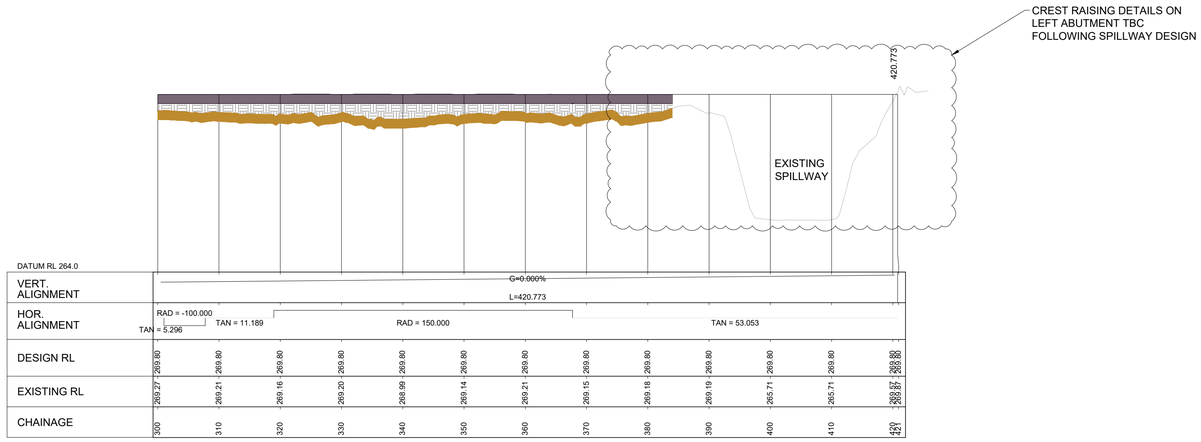
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
EMBANKMENT CREST RAISING EXCAVATION PLAN

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-4002	# of #	A



SECTION A
SCALE 1:500(H)
SCALE 1:100(V)
4001



SECTION A
SCALE 1:500(H)
SCALE 1:100(V)
4001

LEGEND

- 300mm THICK ROADBASE
- ZONE 1A CREST RAISING
- CREST EXCAVATION

NOTES

1. ALL DIMENSTIONS, CHAINAGES AND LEVELS ARE IN METERS.
2. FOR GENERAL NOTES REFER TO DRAWING 0076-DWG-BURWS09-CI-0001.

10 8 6 4 2 0 10 20 30 40 50m
SCALE 1:500

2 1 0 2 4 6 8 10m
SCALE 1:100

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653 © 2024

Scale	1:500/1:100
Datum	AHD83
Sheet Size	A1
References	

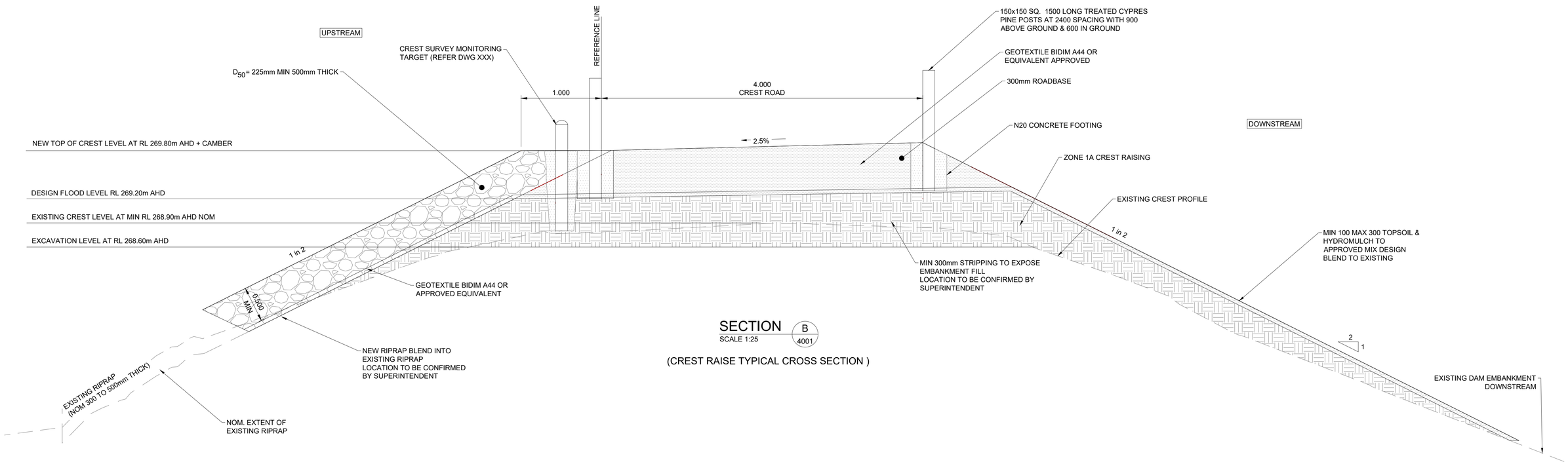
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
EMBANKMENT CREST RAISING LONGITUDINAL SECTIONS

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-4003	# of #	A



SECTION B / 4001
SCALE 1:25

(CREST RAISE TYPICAL CROSS SECTION)

NOTES

1. ALL DIMENSTIONS, CHAINAGES AND LEVELS ARE IN METRES.
2. FOR GENERAL NOTES REFER TO DRAWING 0076-DWG-BURWS09-CI-0001.

NOT FOR CONSTRUCTION

0.5 0 0.5 1.0 1.5 2.0 2.5m
SCALE 1:25

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR

TasWater Capital Delivery Office

TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653 © 2024

Scale	1:500/1:100
Datum	AHD83
Sheet Size	A1
References	

DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

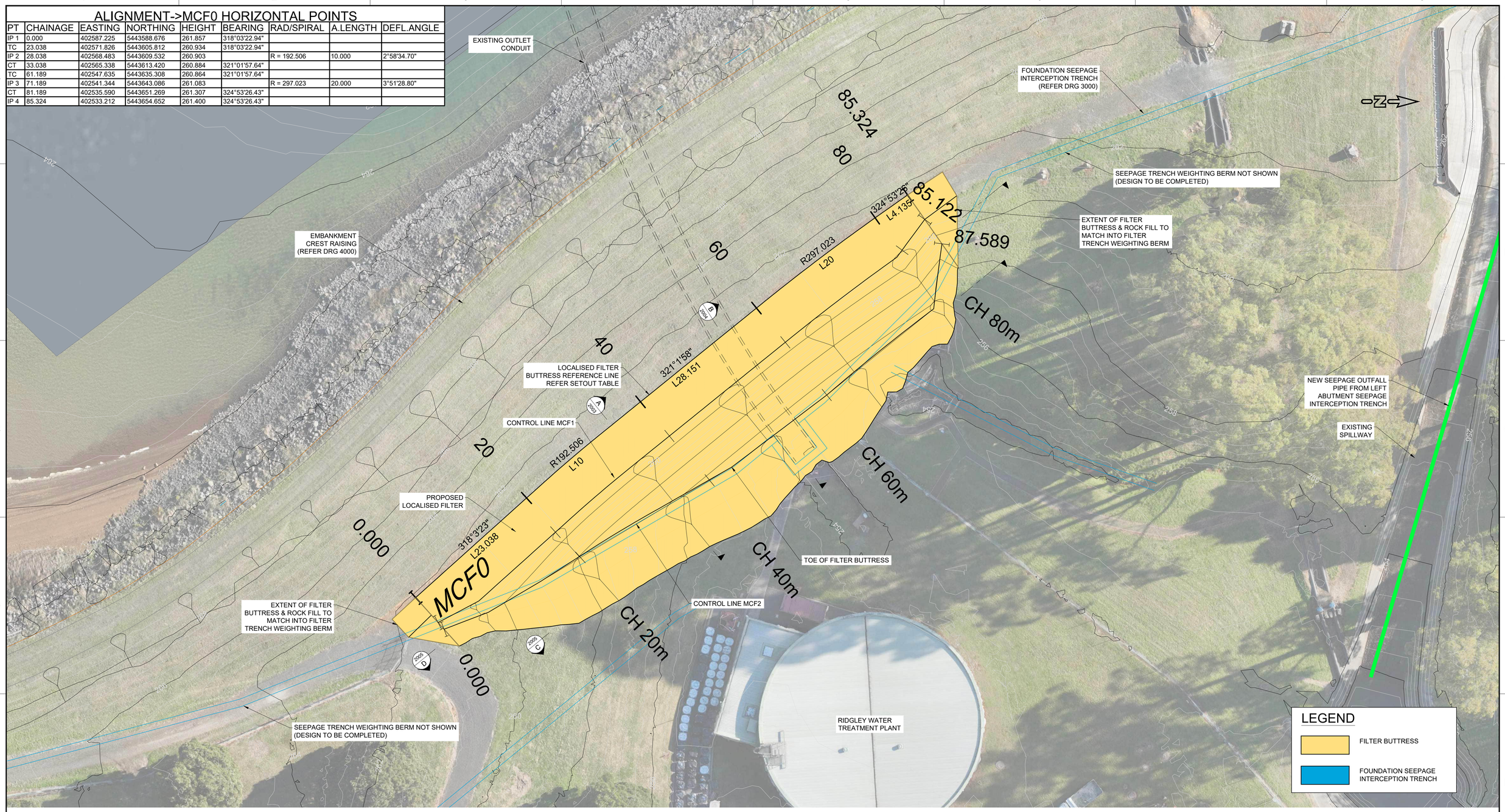
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
EMBANKMENT CREST RAISING TYPICAL CROSS SECTION

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-4004	# of #	A

ALIGNMENT->MCF0 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	402587.225	5443588.676	261.857	318°03'22.94"			
TC	23.038	402571.826	5443605.812	260.934	318°03'22.94"			
IP 2	28.038	402568.483	5443609.532	260.903		R = 192.506	10.000	2°58'34.70"
CT	33.038	402565.338	5443613.420	260.884	321°01'57.64"			
TC	61.189	402547.635	5443635.308	260.864	321°01'57.64"			
IP 3	71.189	402541.344	5443643.086	261.083		R = 297.023	20.000	3°51'28.80"
CT	81.189	402535.590	5443651.269	261.307	324°53'26.43"			
IP 4	85.324	402533.212	5443654.652	261.400	324°53'26.43"			



OUTLET TUNNEL LOCALISED FILTER PLAN

SCALE 1:250

NOTE

1. REFER DWG 6001 FOR LOCATIONS OF NEW SEEPAGE MONITORING WEIRS.

NOT FOR CONSTRUCTION

5 4 3 2 1 0 5 10 15 20 25m

SCALE 1:250

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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Scale	1:250
Datum	AHD83
Sheet Size	A1
References	

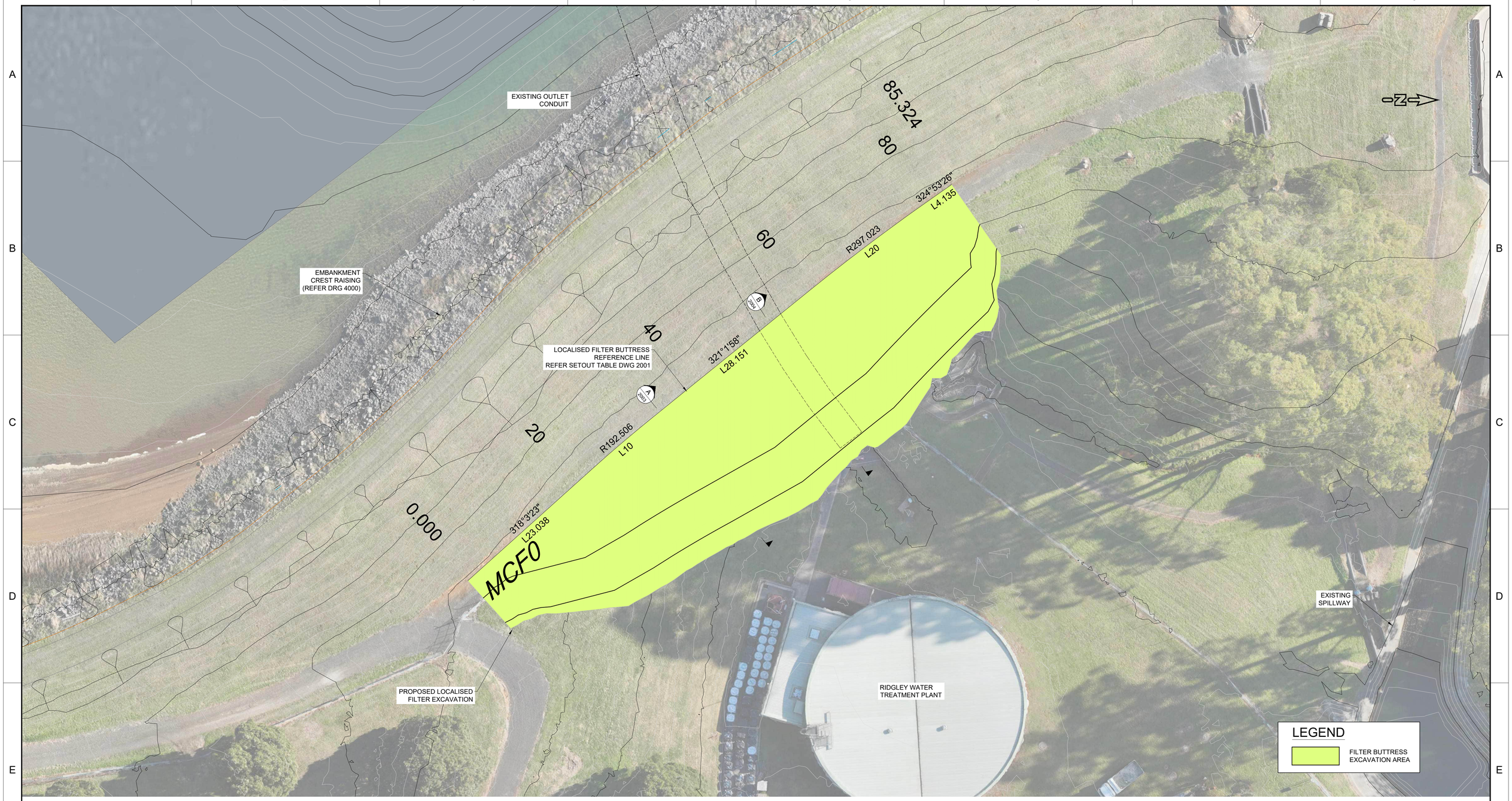
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
OUTLET CONDUIT LOCALISED FILTER PLAN

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-2001	# of #	A



OUTLET TUNNEL LOCALISED FILTER EXCAVATION PLAN

SCALE 1:250

NOTE

1. SET OUT TABLES WILL BE PROVIDED FOR EXCAVATION OF LOCALISED FILTER BUTTRESS.

5 4 3 2 1 0 5 10 15 20 25m

SCALE 1:250

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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Scale	1:250
Datum	AHD83
Sheet Size	A1
References	

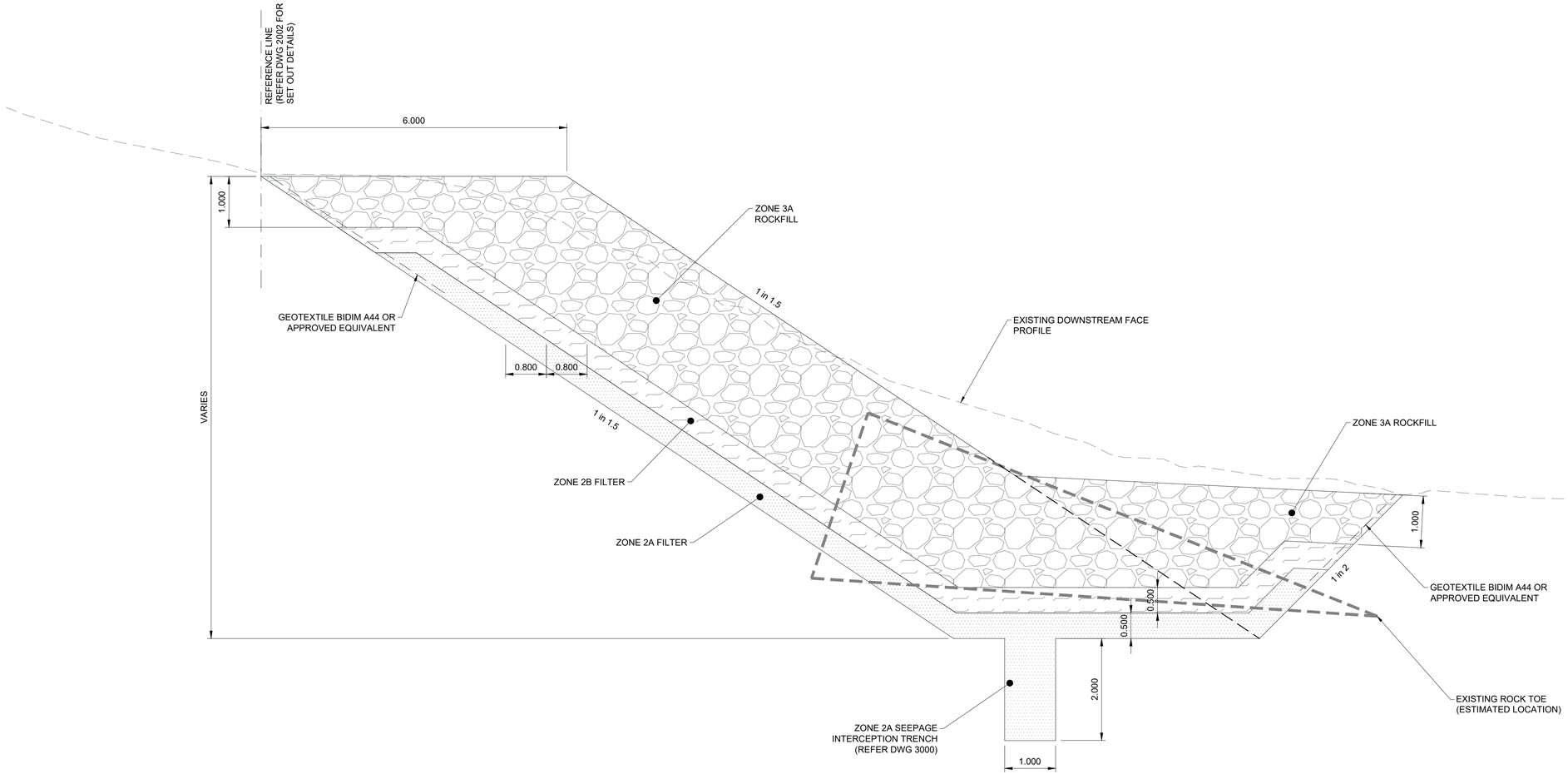
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
OUTLET CONDUIT LOCALISED FILTER EXCAVATION PLAN

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-2002	# of #	A



SECTION A
SCALE 1:50
2001

(FILTER BUTTRESS TYPICAL CROSS SECTION)

NOTES

1. ALL DIMENSTIONS AND LEVELS ARE IN METERS.
2. FOR GENERAL NOTES REFER TO DRAWING 0076-DWG-BURWS09-CI-0001.

1 0.5 0 1 2 3 4 5m
SCALE 1:50

NOT FOR CONSTRUCTION

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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Scale	1:250
Datum	AHD83
Sheet Size	A1

References

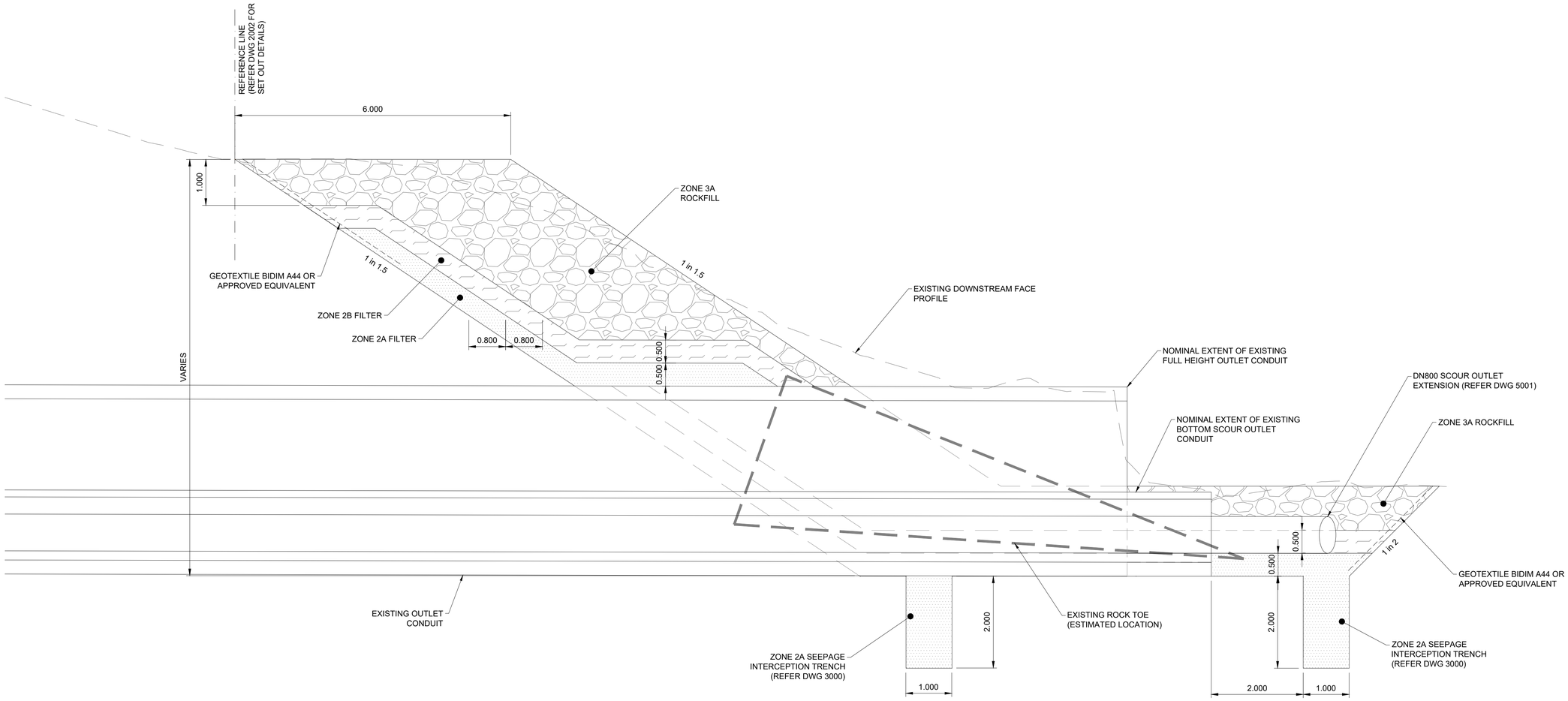
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
OUTLET CONDUIT LOCALISED FILTER SECTIONS 1 OF 3

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-2003	1 of 3	A



SECTION B 2001

SCALE 1:50

(FILTER BUTTRESS AT OUTLET CONDUIT)

NOTES

1. ALL DIMENSTIONS, CHAINAGES AND LEVELS ARE IN m.
2. FOR GENERAL NOTES REFER TO DRAWING 0076-DWG-BURWS09-CI-0001.

NOT FOR CONSTRUCTION

2 1 0 2 4 6 8 10m

SCALE 1:100

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653 © 2024

Scale	1:200
Datum	AHD83
Sheet Size	A1
References	

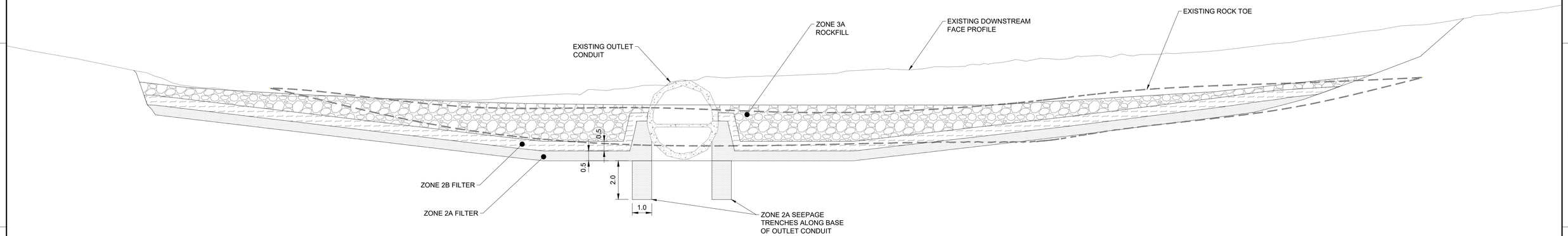
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

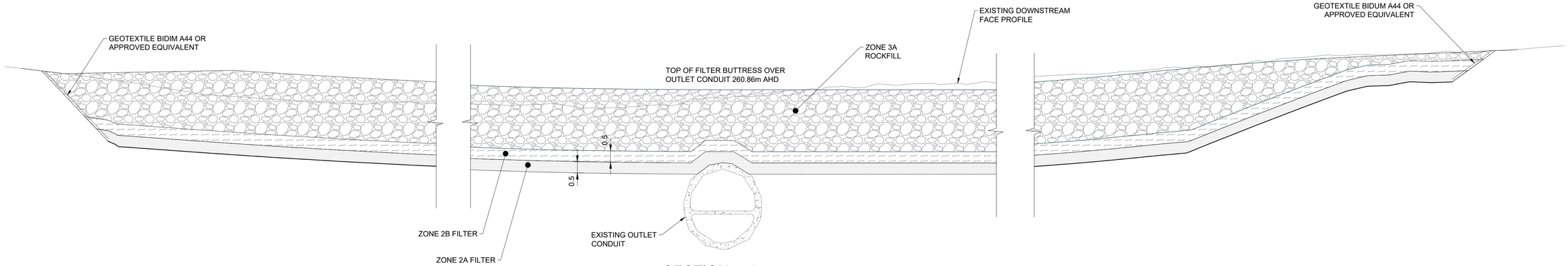
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
OUTLET CONDUIT LOCALISED FILTER SECTIONS

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-2004	# of #	A



SECTION C
SCALE 1:100
2001



SECTION D
SCALE 1:100
2001

NOTES

1. ALL DIMENSTIONS, CHAINAGES AND LEVELS ARE IN m.
2. FOR GENERAL NOTES REFER TO DRAWING 0076-DWG-BURWS09-CI-0001.

NOT FOR CONSTRUCTION

2 1 0 2 4 6 8 10m
SCALE 1:100

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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TasWater Capital Delivery Office

TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
ABN: 47 162 220 653 © 2024

Scale	1:200
Datum	AHD83
Sheet Size	A1
References	

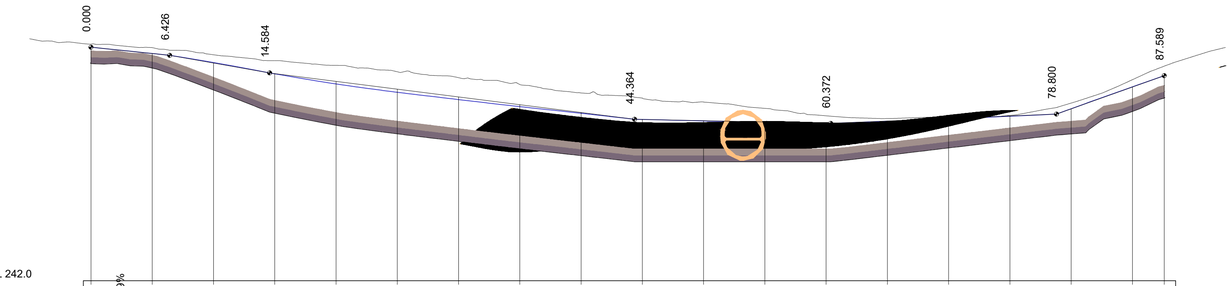
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
OUTLET CONDUIT LOCALISED FILTER SECTIONS 3 OF 3

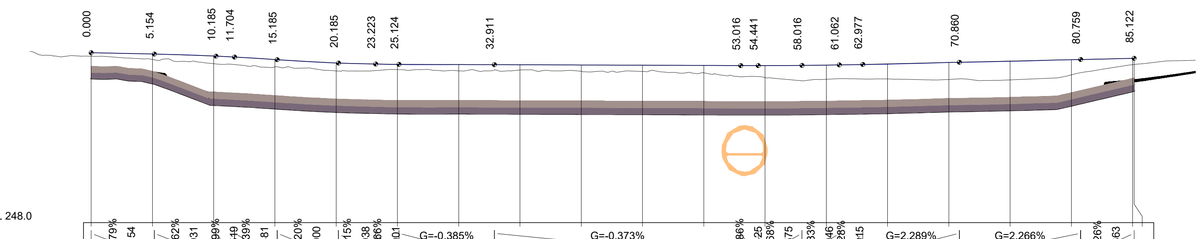
Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-2005	3 of 3	A



DATUM RL 242.0																							
VERT. ALIGNMENT	G=-7.339% L=6.426		G=-17.607% L=8.158		G=-12.692% L=29.780						G=-2.071% L=16.008		G=4.091% L=18.428				G=35.666% L=8.789						
HOR. ALIGNMENT	TANGENT = 6.426		TANGENT = 8.158		TANGENT = 29.780						TANGENT = 16.008		TANGENT = 18.428				TANGENT = 8.789						
DESIGN RL SURFACE	261.06	260.54	259.76	258.90	258.27	257.63	257.00	256.37	255.73	255.16	255.06	254.96	254.85	255.03	255.24	255.44	256.03	257.81	258.73				
DESIGN RL EXCAVATION	259.75	259.39	257.61	255.71	254.73	254.02	253.41	252.82	252.24	251.75	251.75	251.75	251.75	252.28	252.87	253.47	254.02	255.85	256.94				
EXISTING RL	261.31	261.02	260.44	259.96	259.57	259.05	258.57	258.01	257.32	256.91	256.58	256.06	255.46	255.23	255.38	255.49	256.50	258.40	259.50				
CHAINAGE	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	88				

LONGSECTION - CONTROL LINE - MCF2

SCALE 1:250(H)
1:250(V)



DATUM RL 248.0																							
VERT. ALIGNMENT	G=-2.079% L=5.154		G=-3.362% L=5.031	G=-4.999% L=1.519	G=-6.239% L=3.481	G=-5.420% L=5.000	G=-2.715% L=1.038	G=-1.086% L=1.901	G=-0.385% L=7.788		G=-0.373% L=20.105			G=-0.186% L=1.425	G=-0.468% L=3.575	G=1.333% L=3.046	G=2.028% L=1.915	G=2.289% L=7.883		G=2.266% L=9.899		G=2.126% L=4.383		
HOR. ALIGNMENT	TANGENT = 6.185		TANGENT = 17.038		RADIUS = 186.506				TANGENT = 28.151					RADIUS = 291.023				TANGENT = 6.291					
DESIGN RL SURFACE	261.86	261.75	261.59	261.30	261.03	260.92	260.90	260.88	260.86	260.84	260.82	260.81	260.85	260.95	261.06	261.18	261.29	261.40	261.40				
DESIGN RL EXCAVATION	259.75	259.35	257.59	257.30	257.02	256.92	256.90	256.88	256.86	256.84	256.82	256.81	256.85	256.95	257.06	257.18	257.54	258.71	258.73				
EXISTING RL	261.57	261.31	260.96	260.70	260.37	260.49	260.38	260.45	260.34	260.33	260.22	259.83	259.69	259.74	259.68	259.66	260.05	260.88	260.89				
CHAINAGE	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	85				

LONGSECTION - CONTROL LINE - MCF1

SCALE 1:250(H)
1:250(V)

NOTES

1. ALL DIMENSTIONS, CHAINAGES AND LEVELS ARE IN m.
2. FOR GENERAL NOTES REFER TO DRAWING 0076-DWG-BURWS09-CI-0001.

NOT FOR CONSTRUCTION

2 1 0 2 4 6 8 10m
SCALE 1:100

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR

TasWater Capital Delivery Office

TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
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Scale	1:200
Datum	AHD83
Sheet Size	A1
References	

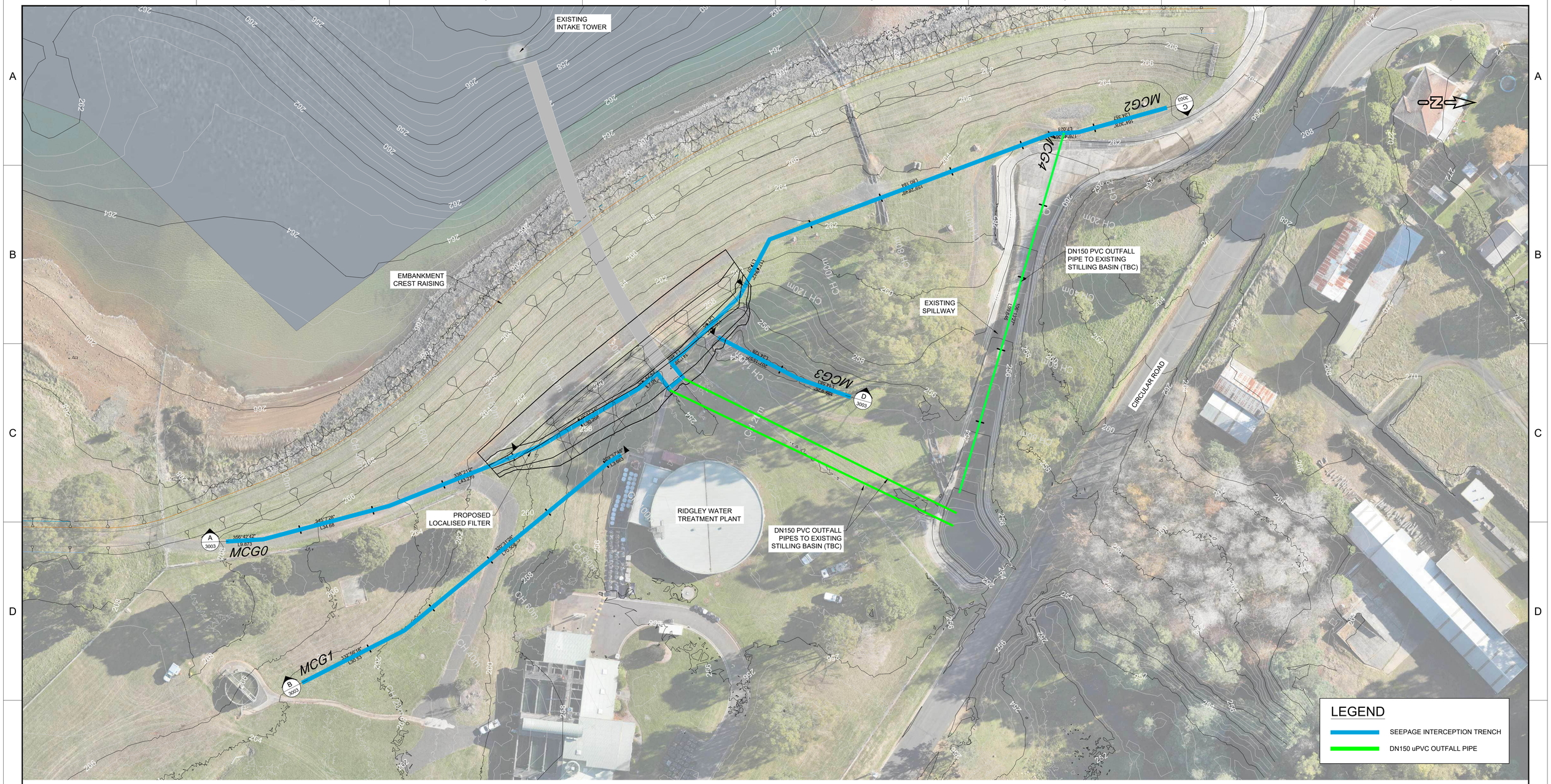
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Sep 2024	Checked	B. McGrath	ENTURA	Sep 2024
Designed	C. Flack	ENTURA	Sep 2024	Approved	P. Southcott	ENTURA	Sep 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
OUTLET CONDUIT LOCALISED FILTER LONGSECTIONS

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-2006	3 of 3	A



FOUNDATION SEEPAGE INTERCEPTION PLAN

SCALE 1:500

NOTES

1. ALL DIMENSTIONS, CHAINAGES AND LEVELS ARE IN METRES.
2. FOR GENERAL NOTES REFER TO DRAWING 0076-DWG-BURWS09-CI-0001.
3. REFER DWG 6001 FOR LOCATIONS OF NEW SEEPAGE MONITORING WEIRS.
4. SET OUT POINTS FOR SEEPAGE INTERCEPTION TRENCH TO BE PROVIDED.

NOT FOR CONSTRUCTION

10 8 6 4 2 0 10 20 30 40 50m
SCALE 1:500

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR

TasWater Capital Delivery Office

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Scale	1:250
Datum	AHD83
Sheet Size	A1
References	

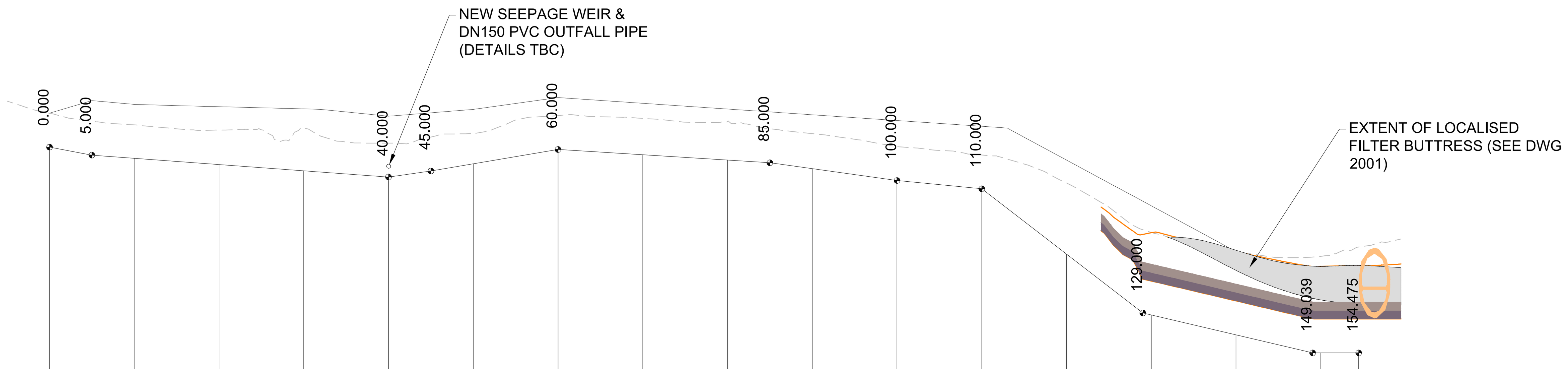
DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Aug 2024	Checked	B. McGrath	ENTURA	Aug 2024
Designed	C. Flack	ENTURA	Aug 2024	Approved	P. Southcott	ENTURA	Aug 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
FOUNDATION SEEPAGE INTERCEPTION PLAN

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-3001	# of #	A



DATUM RL 243.0

VERT. ALIGNMENT: G=-9.416% L=5.000; G=-3.687% L=35.000; G=7.091% L=5.000; G=8.451% L=15.000; G=-3.127% L=25.000; G=-6.982% L=15.000; G=-4.897% L=10.000; G=-38.518% L=19.000; G=-11.740% L=20.039; G=0.000% L=5.436

HOR. ALIGNMENT: TANGENT = 24.357 TANGENT = 7.028; TANGENT = 80.184; TANGENT = 17.070; TANGENT = 21.350; TANGENT = 4.485

CHAINAGE	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	154
DESIGN INVERT RL	261.87	261.22	260.85	260.48	260.11	260.89	261.73	261.42	261.11	260.60	259.91	259.42	255.56	251.98	250.81	249.74	249.74
DESIGN SURFACE RL	263.87	264.39	264.26	264.13	263.70	264.10	264.80	264.46	264.12	263.78	263.44	263.10	261.11	258.42	255.72		
EXISTING RL	263.87	263.19	262.88	262.97	262.11	262.69	263.73	263.57	263.39	262.67	261.91	261.42	259.76	256.85	255.69	255.43	255.99

SECTION C 3001
SCALE 1:500(H)
SCALE 1:250(V)

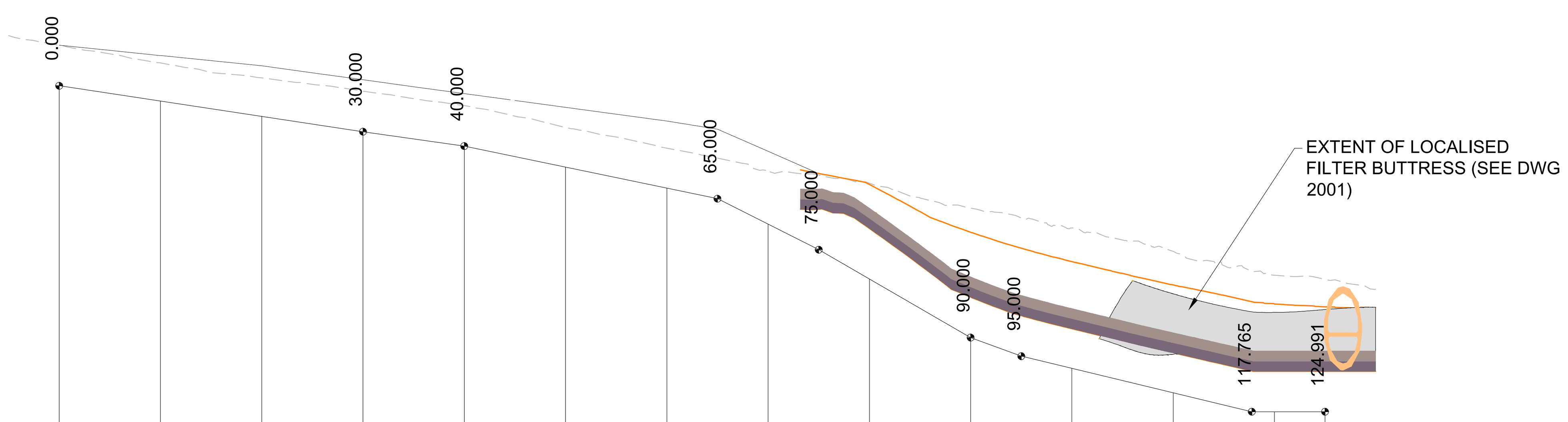
DATUM RL 246.0

VERT. ALIGNMENT: G=-3.068% L=5.000; G=-5.133% L=33.610; G=-5.151% L=0.100

HOR. ALIGNMENT: TANGENT = 14.583; TANGENT = 24.128

CHAINAGE	0	10	20	30	39
DESIGN INVERT RL	252.70	252.29	251.78	251.27	250.82
EXISTING GROUND RL	254.70	253.86	253.71	253.45	254.26

SECTION D 3001
SCALE 1:500(H)
SCALE 1:250(V)



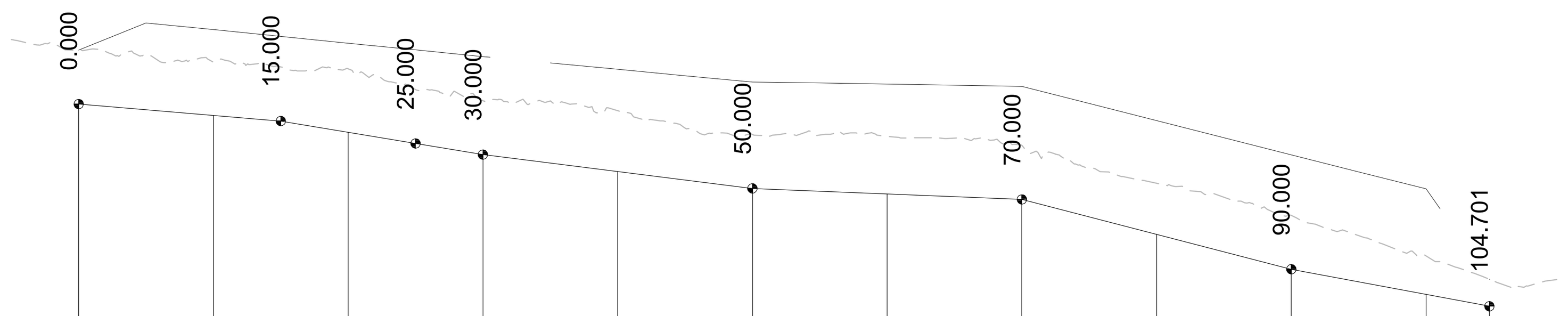
DATUM RL 243.0

VERT. ALIGNMENT: G=-7.561% L=30.000; G=-7.114% L=10.000; G=-10.391% L=25.000; G=-25.187% L=10.000; G=-28.944% L=15.000; G=-18.337% L=5.000; G=-12.060% L=22.765; G=0.000% L=7.227

HOR. ALIGNMENT: TANGENT = 9.873; TANGENT = 34.680; TANGENT = 43.219; TANGENT = 30.208; TANGENT = 7.010

CHAINAGE	0	10	20	30	40	50	60	70	80	90	100	110	120	125
DESIGN INVERT RL	265.84	265.09	264.33	263.58	262.87	261.83	260.79	259.01	256.30	253.41	251.89	250.68	249.75	249.75
DESIGN SURFACE RL	267.84	267.34	266.83	266.14	265.46	264.78	264.10	262.61						
EXISTING RL	267.84	266.97	266.23	265.58	264.87	263.78	262.76	261.55	261.03	259.80	258.82	257.66	256.49	256.28

SECTION A 3001
SCALE 1:500(H)
SCALE 1:250(V)



DATUM RL 248.0

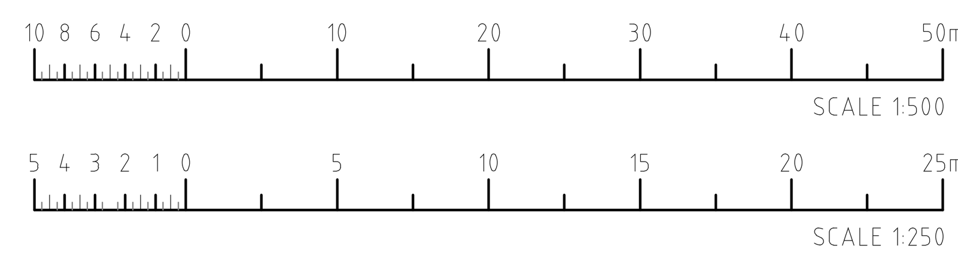
VERT. ALIGNMENT: G=-4.196% L=15.000; G=-8.321% L=10.000; G=-8.247% L=5.000; G=-6.269% L=20.000; G=-2.037% L=20.000; G=-12.944% L=20.000; G=-9.335% L=14.701

HOR. ALIGNMENT: TANGENT = 30.530; TANGENT = 70.508; TANGENT = 3.663

CHAINAGE	0	10	20	30	40	50	60	70	80	90	100	105
DESIGN INVERT RL	261.64	261.22	260.60	259.77	259.14	258.51	258.31	258.11	256.81	255.52	254.58	254.15
DESIGN SURFACE RL	263.64	264.40	263.90	263.40	262.93	262.46	262.38	262.30	261.03	259.75	258.50	
EXISTING RL	263.64	263.20	262.95	261.77	261.40	260.51	260.44	260.11	258.70	257.52	256.01	255.15

SECTION B 3001
SCALE 1:500(H)
SCALE 1:250(V)

NOT FOR CONSTRUCTION



Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

XR
TasWater Capital Delivery Office

Scale	1:500, 1:100
Datum	AHD83
Sheet Size	A1

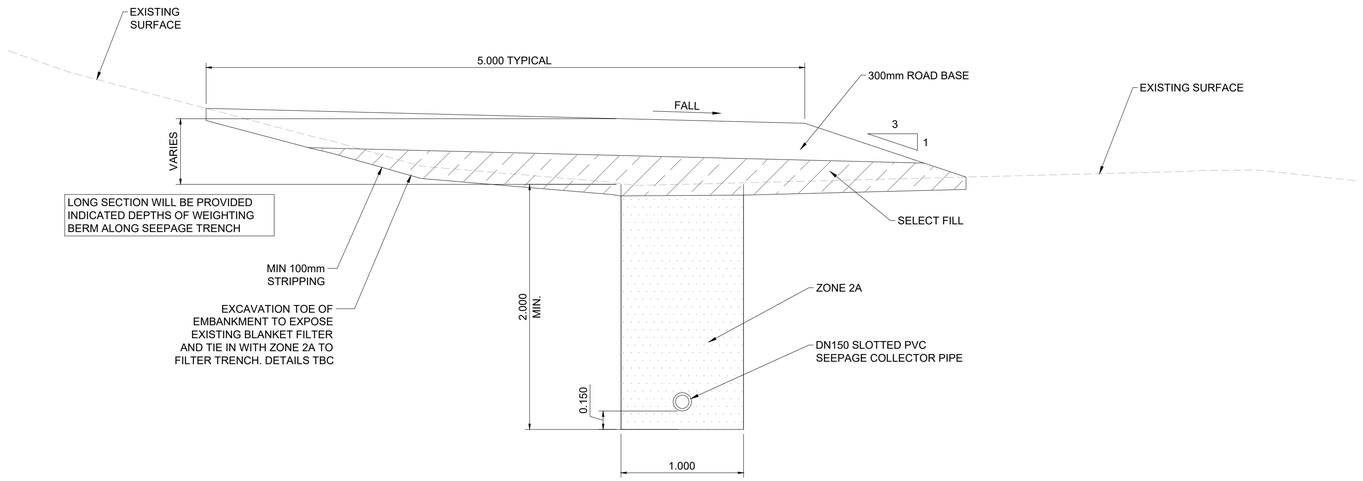
References

DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Aug 2024	Checked	B. McGrath	ENTURA	Aug 2024
Designed	C. Flack	ENTURA	Aug 2024	Approved	P. Southcott	ENTURA	Aug 2024

Drawing Issue
FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
FOUNDATION SEEPAGE INTERCEPTION TRENCH LONGITUDINAL SECTIONS

Drawing Number: 0076-DWG-BURWS09-CI-3002
Sheet Number: # of #
Revision: A



SEEPAGE TRENCH TYPICAL SECTION (CH 30 - MCG0)

SCALE 1:25

NOTES

1. REFER TO SETOUT POINTS FOR LOCATION OF TRENCH.

NOT FOR CONSTRUCTION

0.5 0 0.5 1.0 1.5 2.0 2.5m

SCALE 1:25

Rev.No.	Amendment	Date	Authorised
-	-	-	-
0	-	-	-

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TASMANIAN WATER & SEWERAGE CORPORATION PTY LTD
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Scale	1:25
Datum	AHD83
Sheet Size	A1
References	

DESIGN			DATE	REVIEW			DATE
Drawn	S. Banerjee	ENTURA	Aug 2024	Checked	B. McGrath	ENTURA	Aug 2024
Designed	C. Flack	ENTURA	Aug 2024	Approved	P. Southcott	ENTURA	Aug 2024

Drawing Issue

FOR REVIEW

BURSW09 - PET DAM SITE
CIRCULAR ROAD, EAST RIDGLEY
PET DAM UPGRADE
FOUNDATION SEEPAGE INTERCEPTION TRENCH TYPICAL SECTION

Drawing Number	Sheet Number	Revision
0076-DWG-BURWS09-CI-3003	# of #	A

Sediment and Erosion Control Plan Drawings

Appendix C

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Divert stormwater upslope of work area

Temporary sediment traps along spillway alignment, relocate as construction permits

Protect watercourse and riparian buffer (20m minimum) from unnecessary disturbance

Boundary control to be strictly observed and minimise disturbance to native vegetation

Prepare detailed works within waterway procedure for all work within 40m of Pet River

Circular Road

Stabilised drain to convey dirty stormwater to sump

Pet River

Temporary waterway crossing, subject to detailed design

Spillway excavated in stages, generally working from the bottom upwards towards the dam. Erosion and sediment controls updated progressively to suit.

Excavation for spillway inlet will result in a closed catchment. Stormwater within excavation to be diverted to a sump and pumped to treatment area or treated in-situ

Major sump/dirty water dam in stilling basin. Divert all dirty water within spillway excavation to sump. Treat in-situ and discharge or pump to treatment location.

Waratah Crescent

Taswater

Spillway Sediment and Erosion Control Plan

pitt&sherry

N

0 20 40 80 Metres

Coordinate System: GDA2020 MGA Zone 55
1:1,750 When Printed at A4

MAP REF	P.25.0344
AUTHOR	JB
REVISION	RevA
DATE	14/05/2025

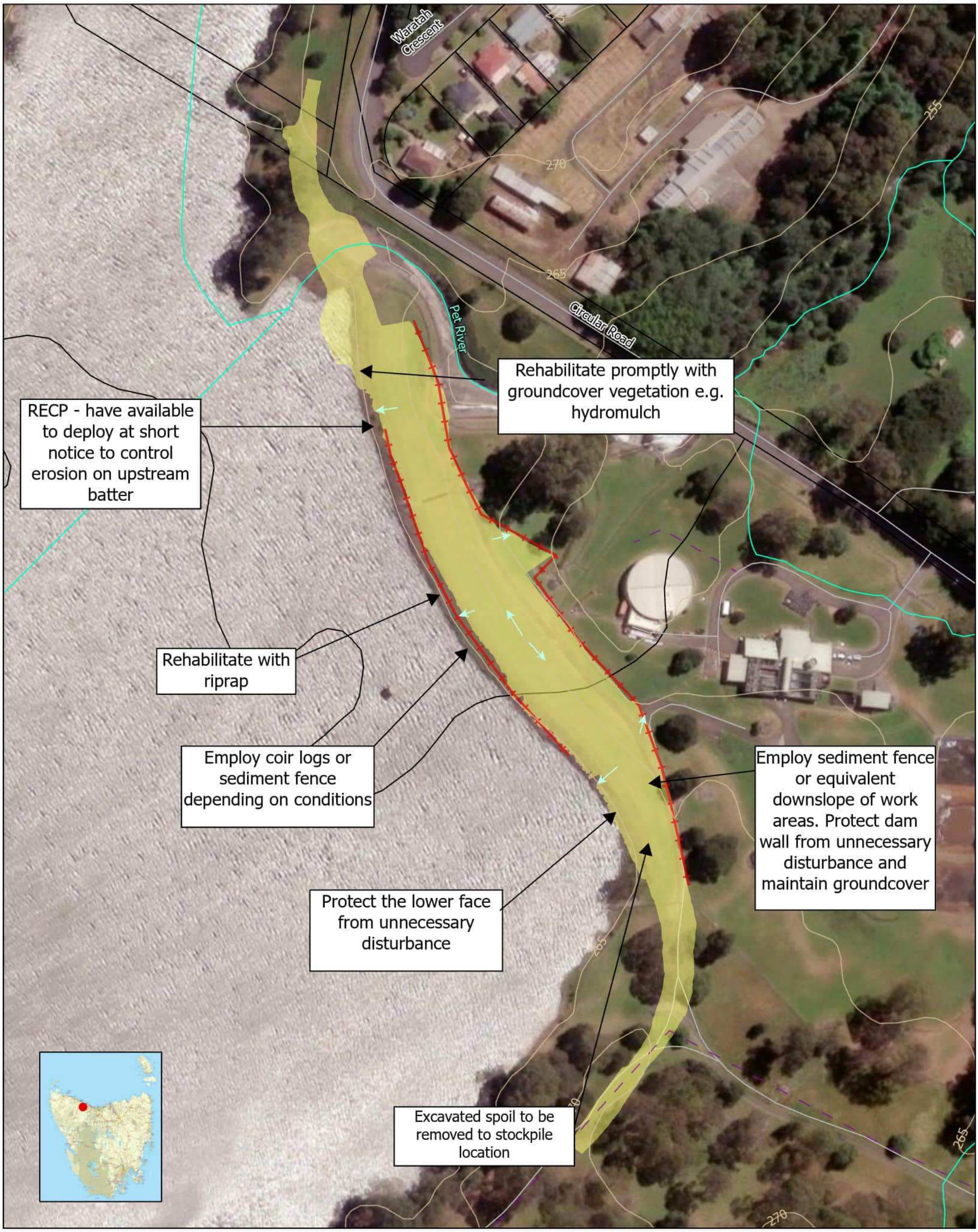
DATA SOURCES	Base map from ESRI Base data from The LIST Tasmanian Government Project specific data

Legend

- Spillway
- Potential Access Option
- Potential River Crossing
- Hydrographic Lines
- Road Centrelines
- Contours 5 metres
- Water Flow Direction

Sediment and Erosion Controls

- Barrier fence / flagging
- Catch drain - clean water (refer SD5-5
- Catch drain - dirty water (refer SD5-5)
- Indicative dirty water sump
- Sediment fence (Refer SD6-8)
- Blocking dam / coffer dam
- 40m Waterway Buffer



TasWater

Crest Raising Sediment and Erosion Controls

pitt&sherry

N

0 15 30 60 Metres

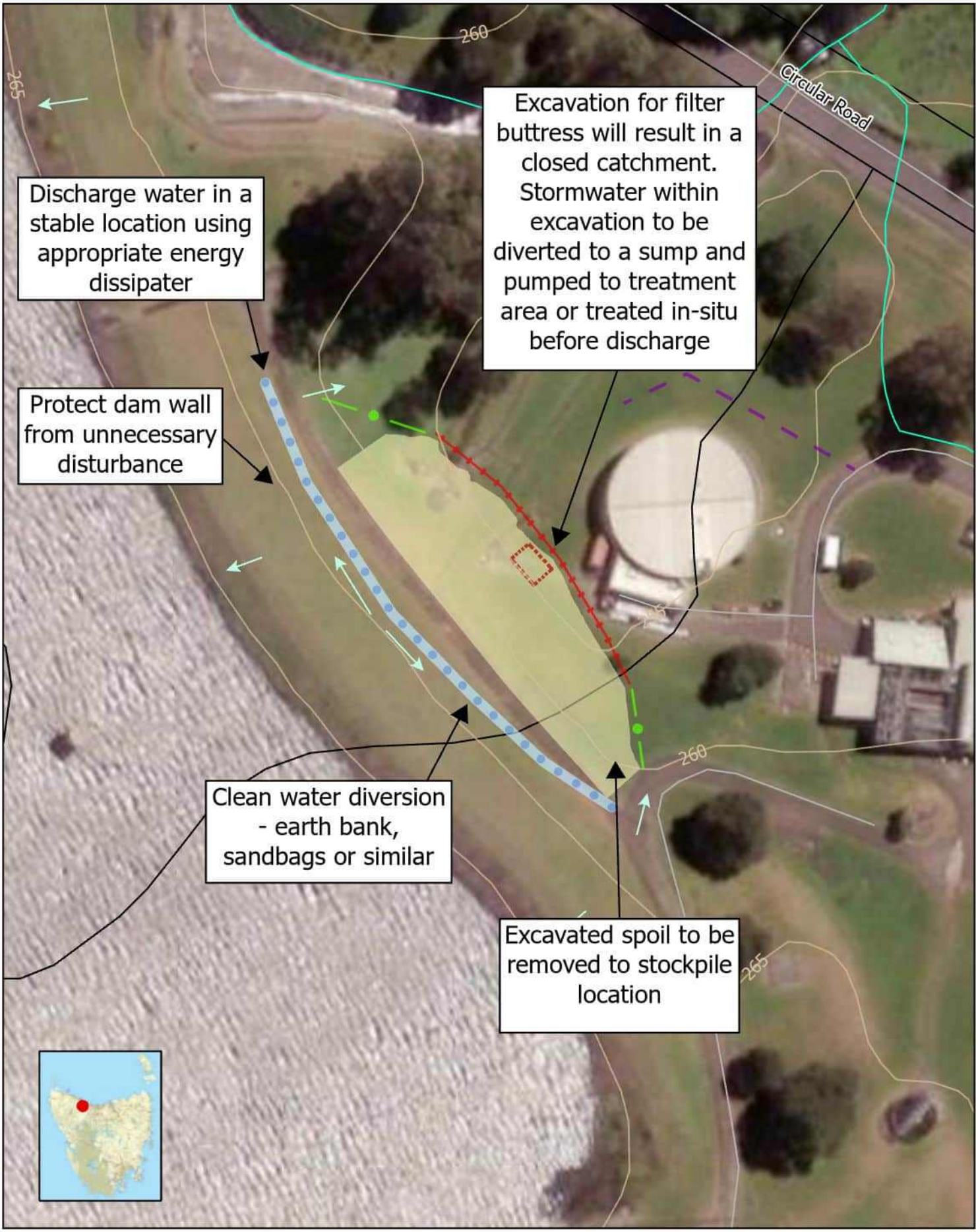
Coordinate System: GDA 1994 MGA Zone 55
1:1,600 When Printed at A4

MAP REF	P.25.0344
AUTHOR	JB
REVISION	RevB
DATE	14/05/2025

DATA SOURCES Base data and map from The LIST Tasmanian Government
Project specific data

Legend

- Crest Raising
- Sediment fence (Refer SD6-8)
- Water Flow Direction
- Contours 5 metres
- Potential Access Option
- Hydrographic Line
- Road
- Cadastral Parcels



TasWater

Filter Buttress Sediment and Erosion Controls

pitt&sherry

N

0 5 10 20 Metre

Coordinate System: GDA2020 MGA Zone 55
1:1,000 When Printed at A4

MAP REF	P.25.0344
AUTHOR	JB
REVISION	RevB
DATE	14/05/2025

DATA SOURCES: Base data and map from The LIST Tasmanian Government; Project specific data

Legend

- Filter Buttress
- Sediment and Erosion Controls
- Barrier fence / flagging
- Catch drain - clean water (refer SD5-5
- Sediment fence (Refer SD6-8)
- Indicative dirty water sump
- Water Flow Direction
- Potential Access Option
- Contours 5 metres
- Hydrographic Lines
- Road
- Cadastral Parcels

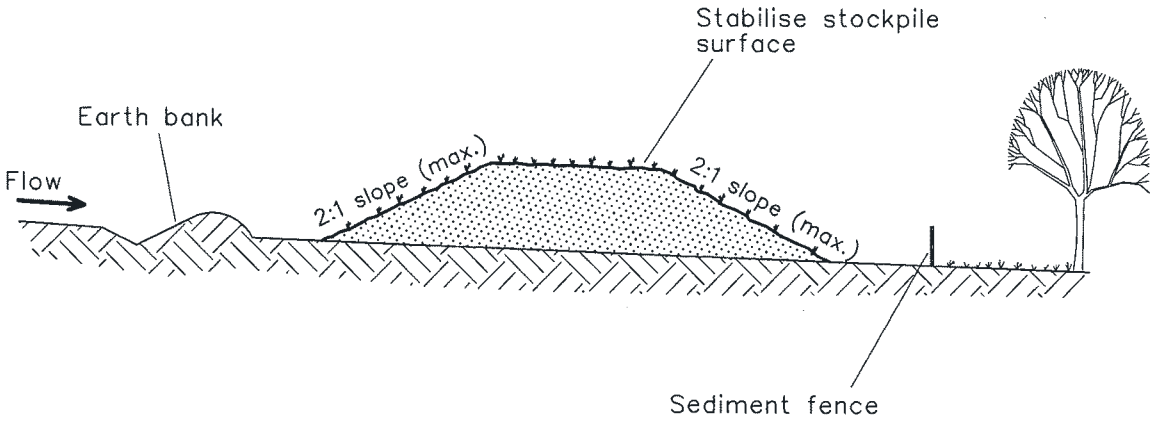
Standard Drawings

Appendix D

pitt&sherry

Erosion and Sediment Control Standard Drawings

taken from the Blue Book - *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004)

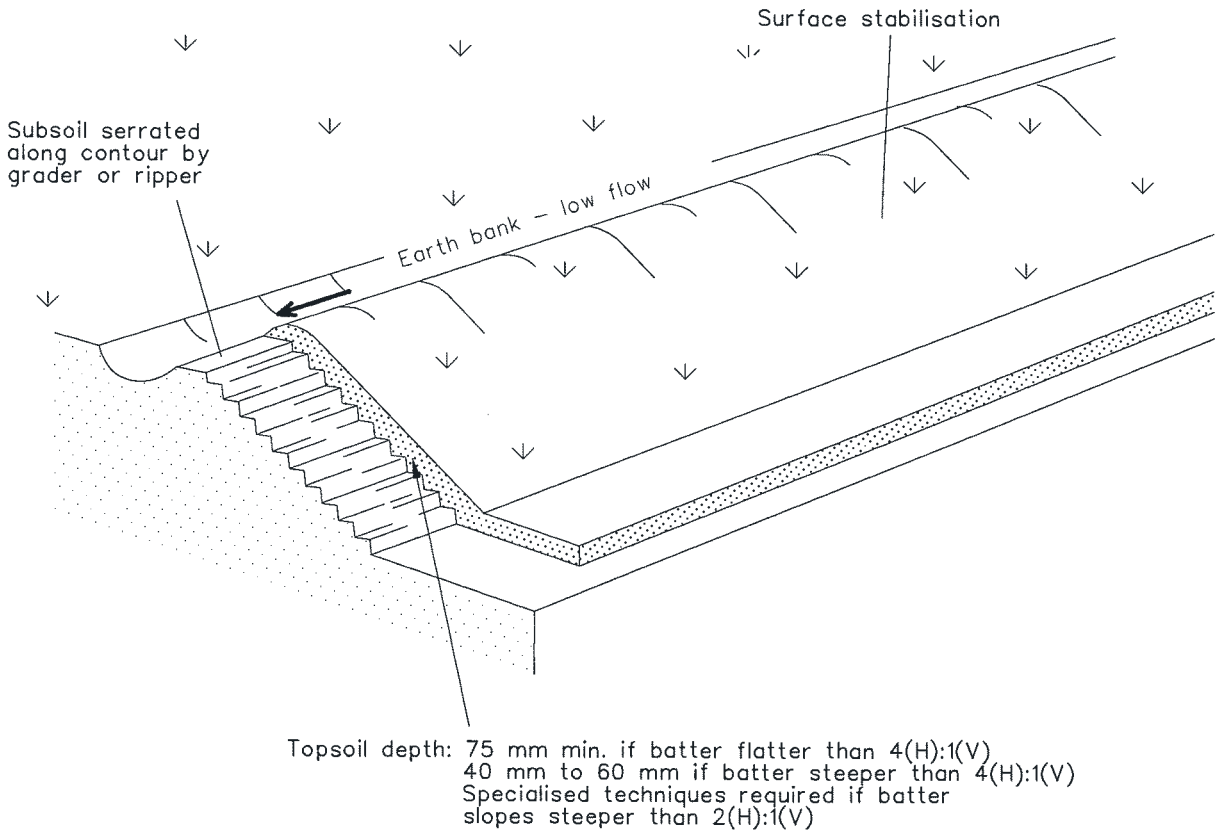


Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES

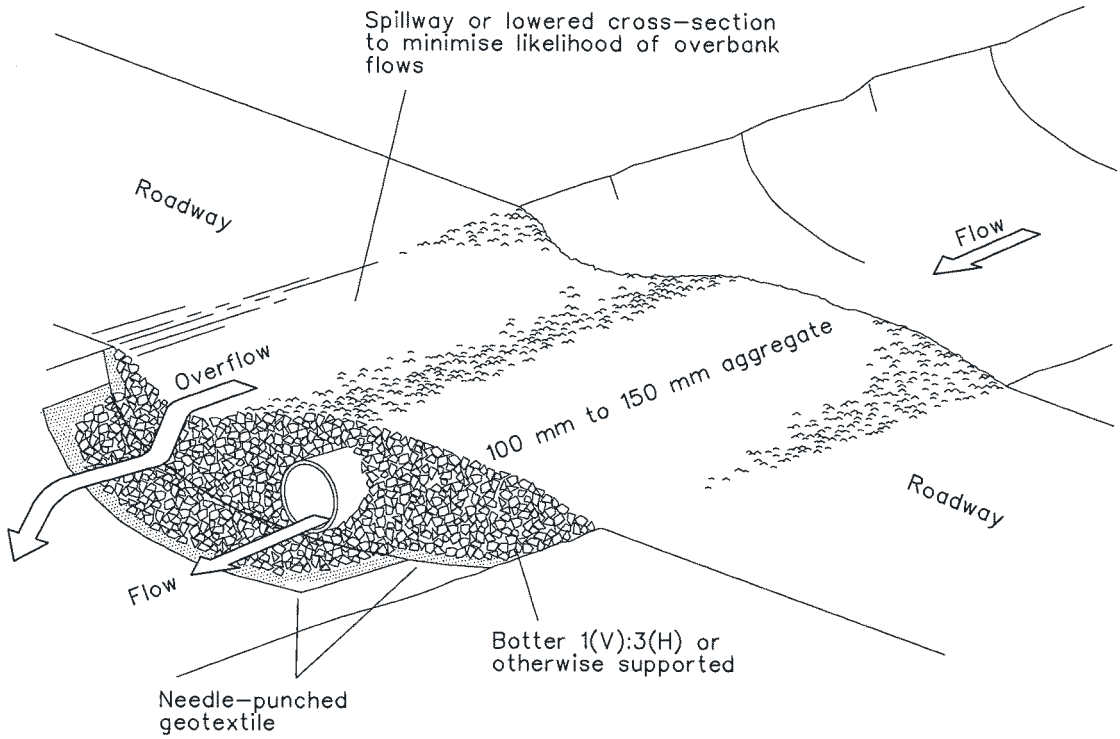
SD 4-1



Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

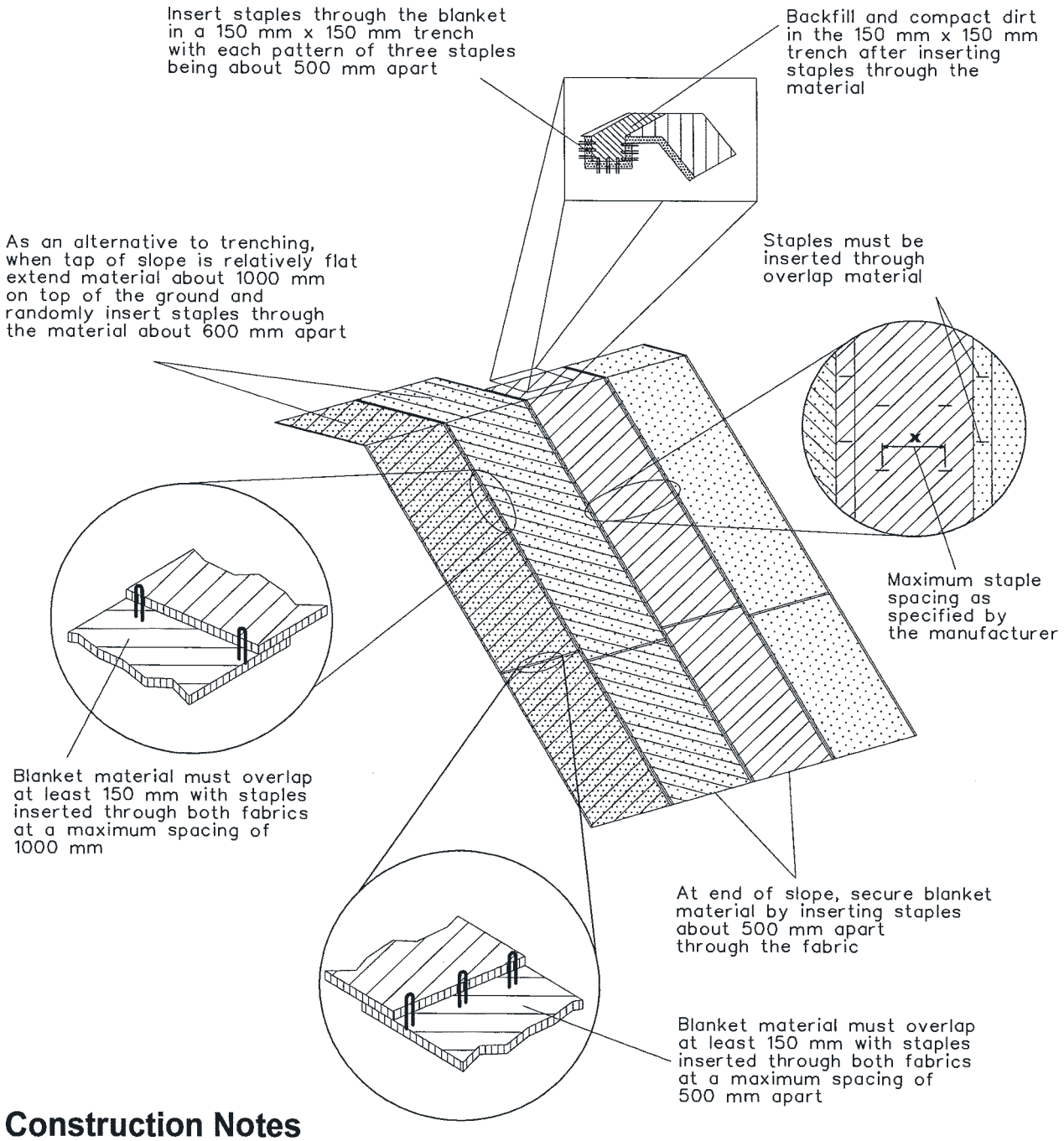
REPLACING TOPSOIL SD 4-2



Construction Notes

1. Prohibit all traffic until the access way is constructed.
2. Strip any topsoil and place a needle-punched textile over the base of the crossing.
3. Place clean, rigid, non polluting aggregate or gravel in the 100 mm to 150 mm size class over the fabric to a minimum depth of 200 mm.
4. Provide a 3-metre wide carriageway with sufficient length of culvert pipe to allow less than a 3(H): 1 (V) slope on side batters.
5. Install a lower section to act as an emergency spillway in greater than design storm events.
6. Ensure that culvert outlets extend beyond the toe of fill embankments.

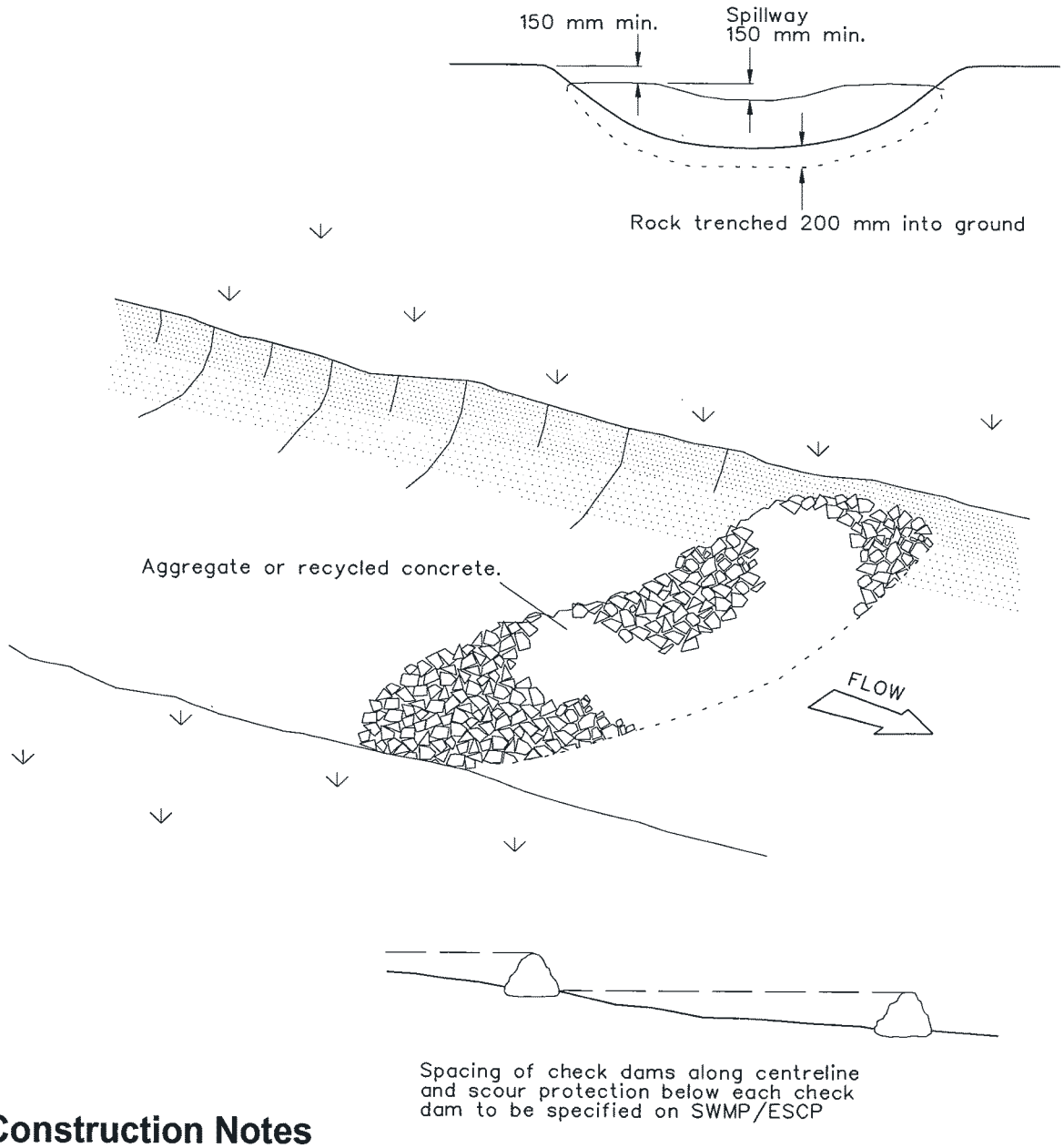
TEMPORARY WATERWAY CROSSING SD 5-1



Construction Notes

1. Remove any rocks, clods, sticks or grass from the ground surface before laying the matting.
2. Spread topsoil to at least 75 mm depth.
3. Where appropriate, complete fertilising and seeding on a properly prepared seedbed (Standard Drawing 7-1) before laying the matting.
4. Ensure the fabric can be continuously in contact with the soil by grading the surface carefully first.
5. Lay the matting in "shingle-fashion" with the ends of each upstream roll overlapping the next roll downslope.
6. Ensure sufficient staples are used to maintain a good contact between the soil and the matting.

RECP : SHEET FLOW SD 5-2



Spacing of check dams along centreline and scour protection below each check dam to be specified on SWMP/ESCP

Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.

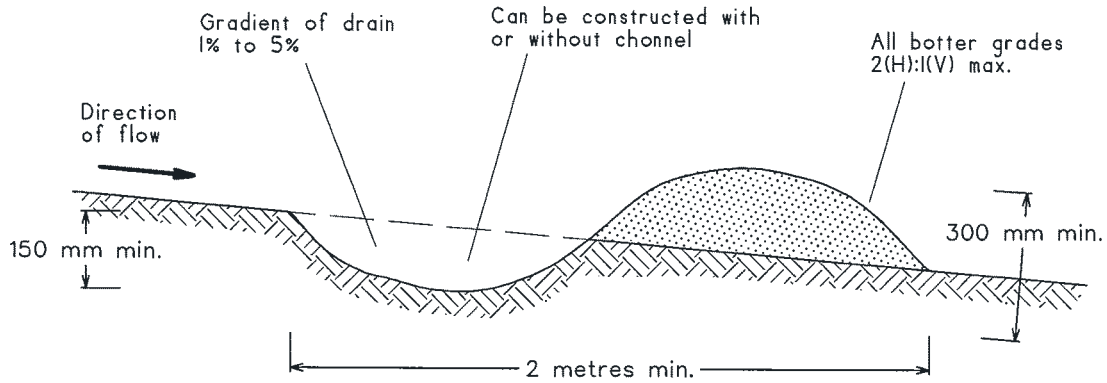
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.

3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.

4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

ROCK CHECK DAM

SD 5-4

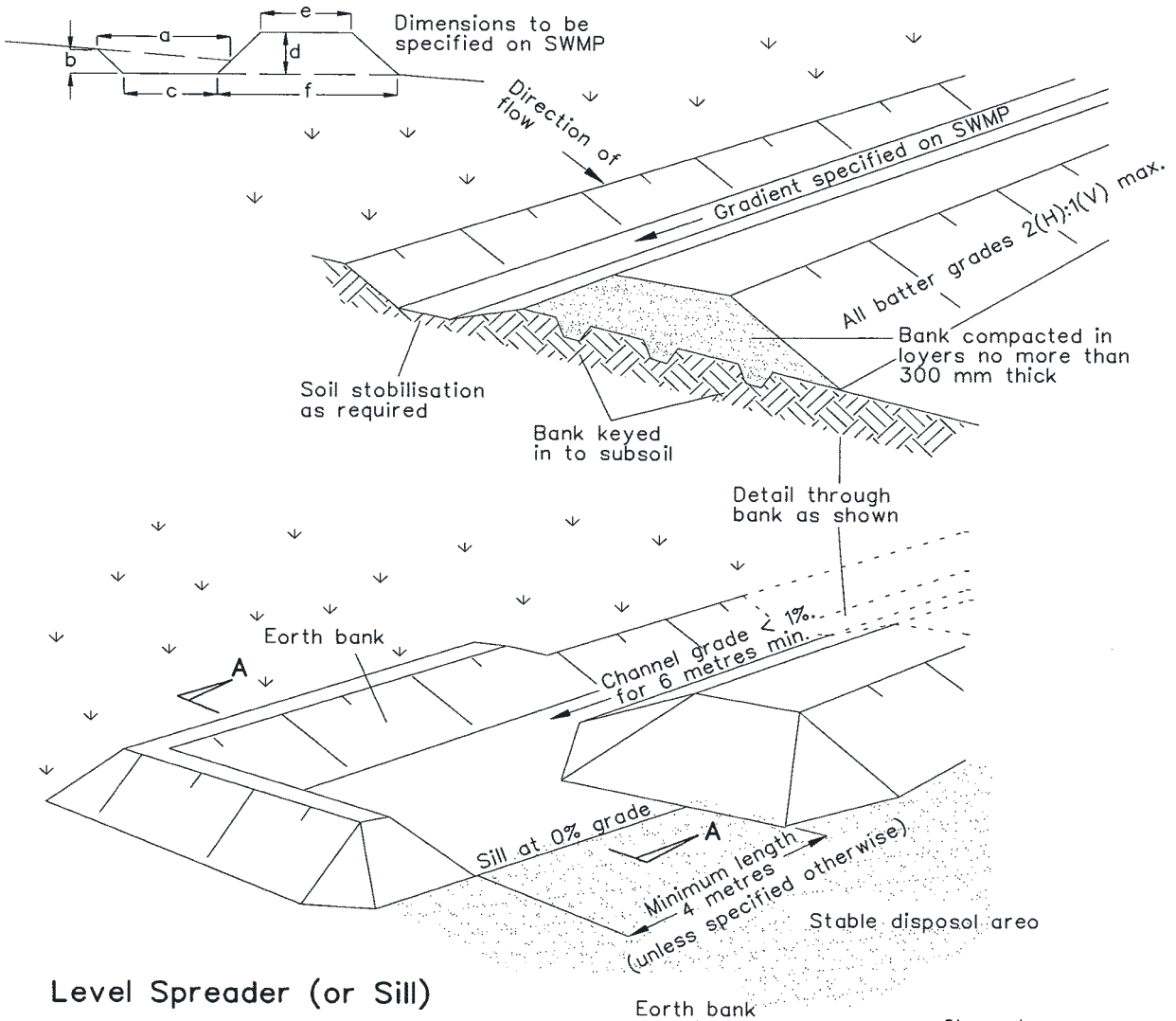


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

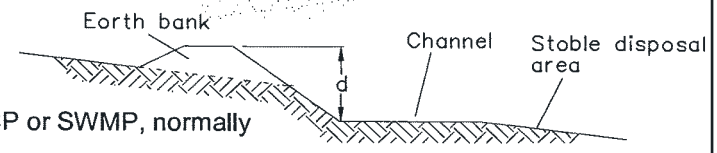
Construction Notes

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

EARTH BANK (LOW FLOW) SD 5-5



Level Spreader (or Sill)

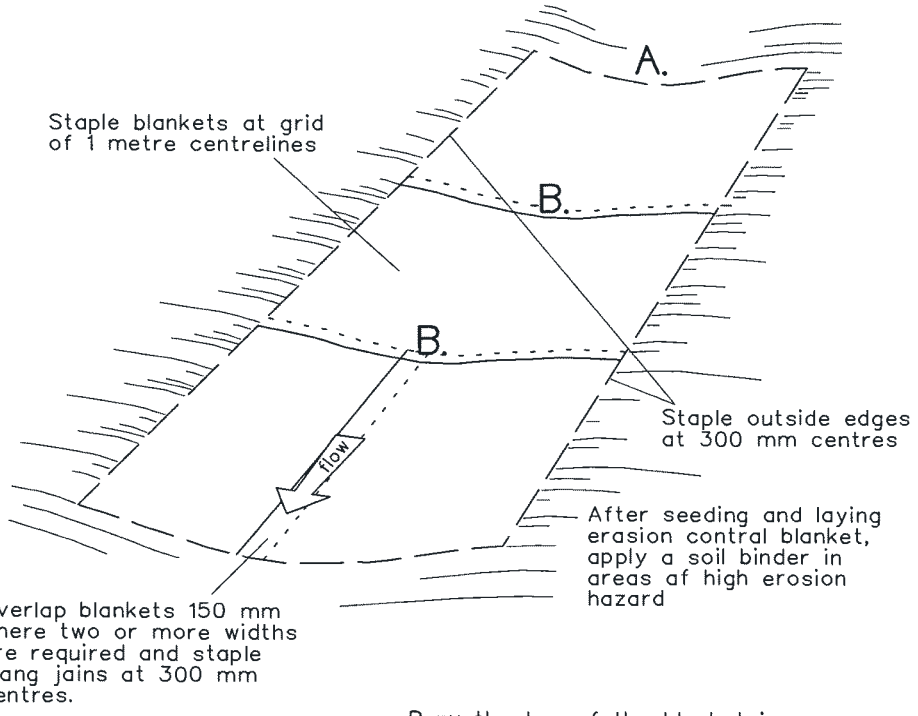


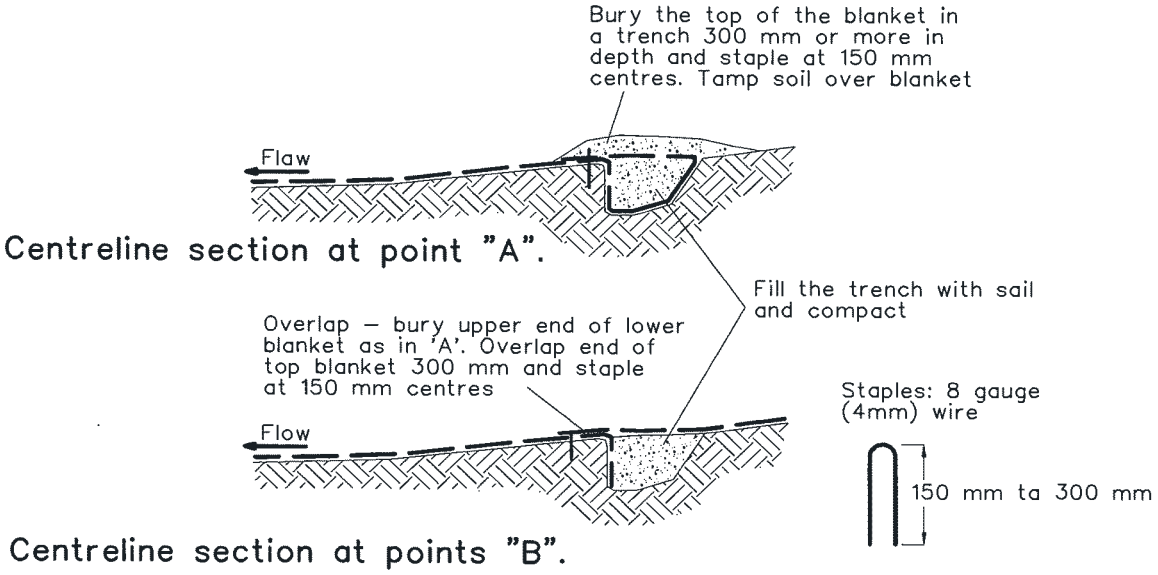
Section AA

Construction Notes

1. Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.

EARTH BANK (HIGH FLOWS) SD 5-6

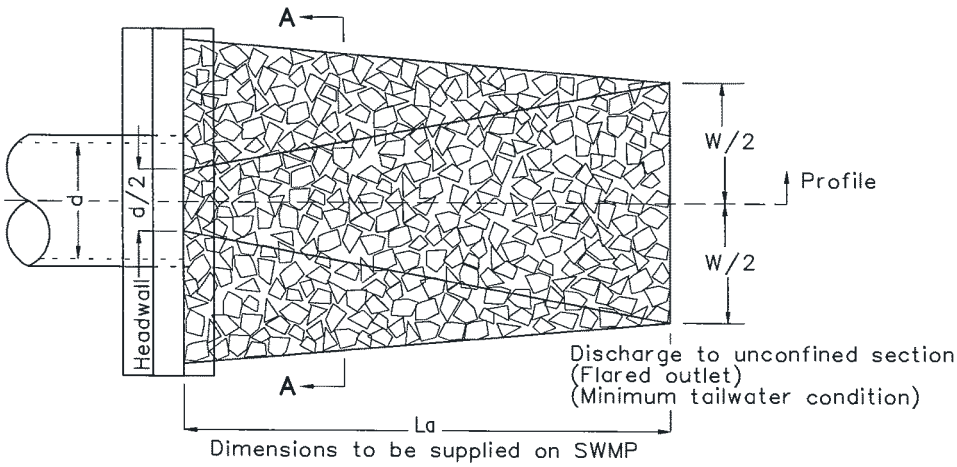




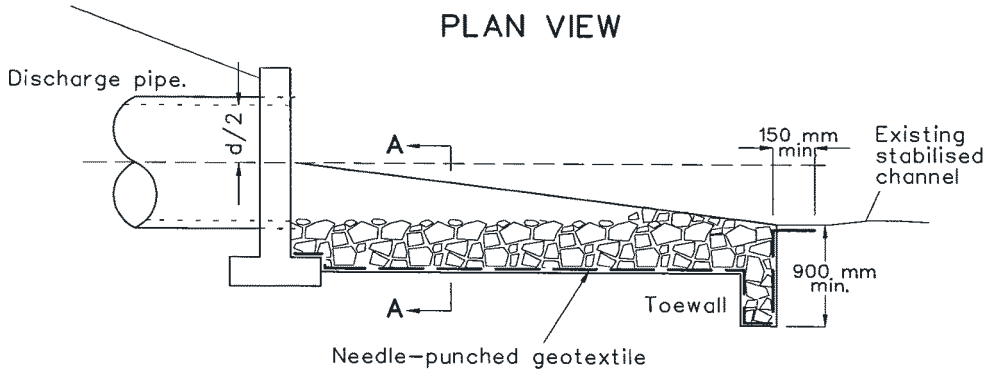
Construction Notes

1. Remove any rocks, clods, sticks or grass from the surface before laying matting
2. Ensure that topsoil is at least 75 mm deep.
3. Complete fertilising and seeding before laying the matting.
4. Ensure fabric will be continuously in contact with the soil by grading the surface carefully first.
5. Lay the fabric in "shingle-fashion", with the end of each upstream roll overlapping those downstream. Ensure each roll is anchored properly at its upslope end (Standard Drawing 5-7b).
6. Ensure that the full width of flow in the channel is covered by the matting up to the design storm event, usually in the 10-year ARI time of concentration storm event.
7. Divert water from the structure until vegetation is stabilised properly.

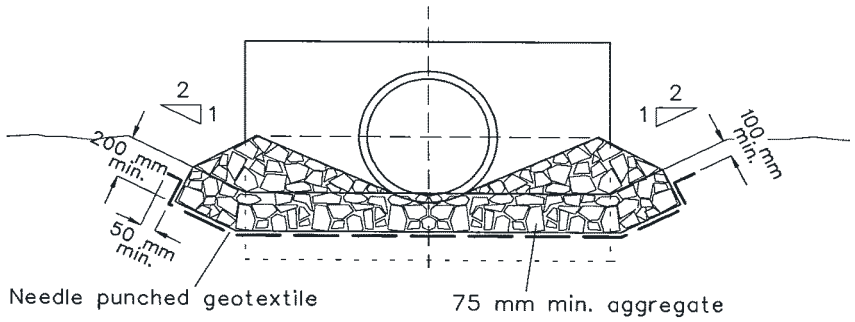
RECP : CONCENTRATED FLOW — SD 5-7



PLAN VIEW



PLAN VIEW

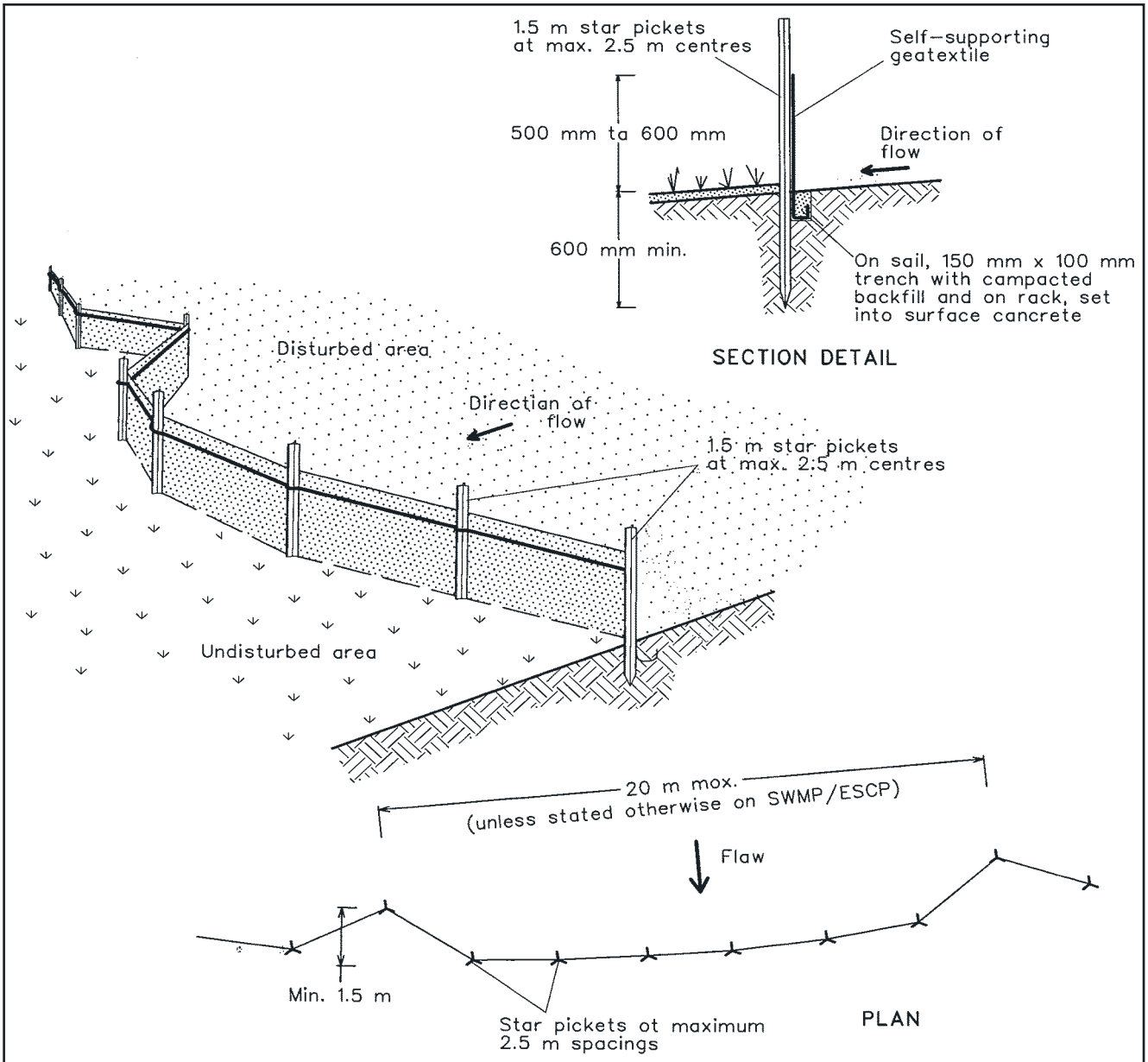


CROSS SECTION AA

Construction Notes

1. Compact the subgrade fill to the density of the surrounding undisturbed material.
2. Prepare a smooth, even foundation for the structure that will ensure that the needle-punched geotextile does not sustain serious damage when covered with rock.
3. Should any minor damage to the geotextile occur, repair it before spreading any aggregate. For repairs, patch one piece of fabric over the damage, making sure that all joints and patches overlap more than 300 mm.
4. Lay rock following the drawing, according to Table 5.2 of Landcom (2004) and with a minimum diameter of 75 mm.
5. Ensure that any concrete or riprap used for the energy dissipater or the outlet protection conforms to the grading limits specified on the SWMP.

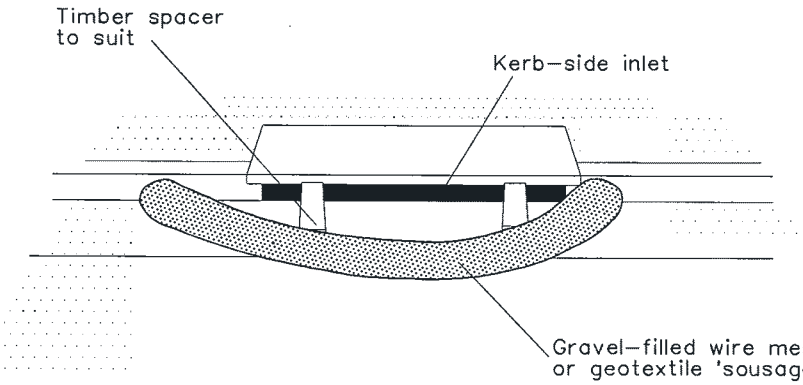
ENERGY DISSIPATER SD 5-8

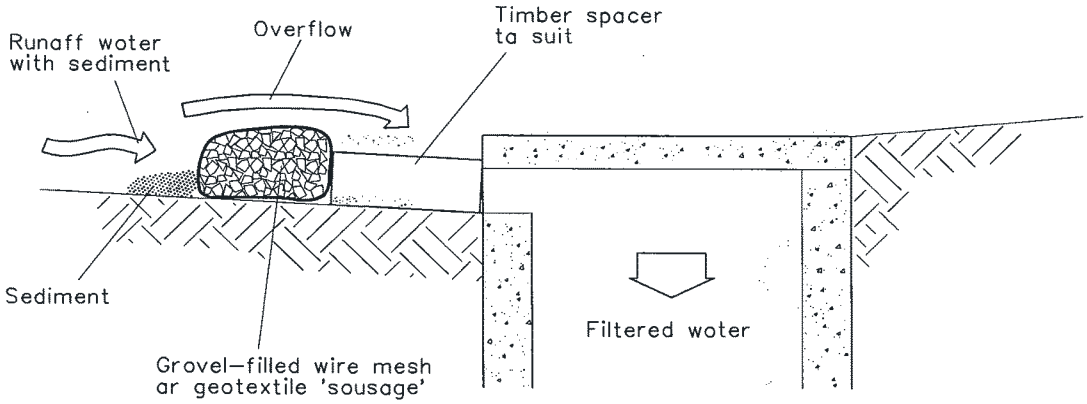


Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE — SD 6-8



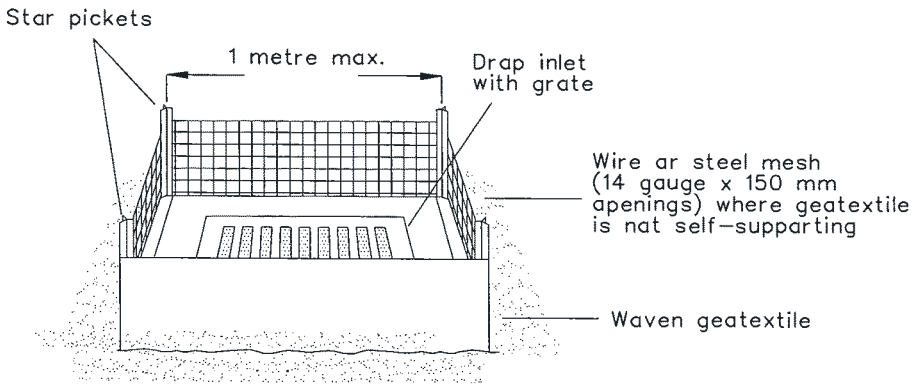


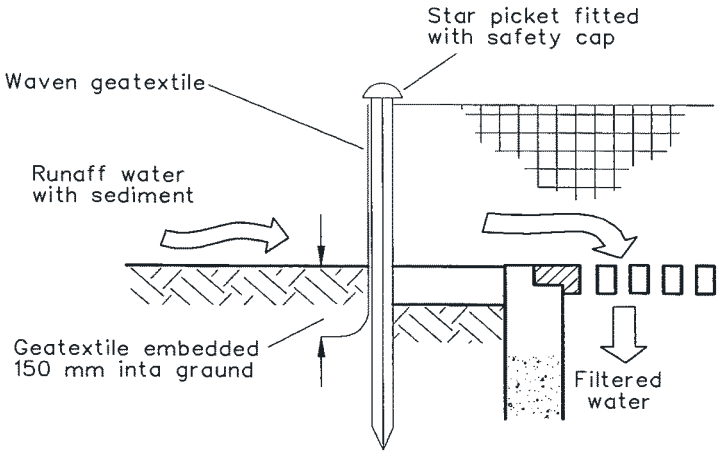
NOTE: This practice anly to be used where specified in an appraved SWMP/ESCP.

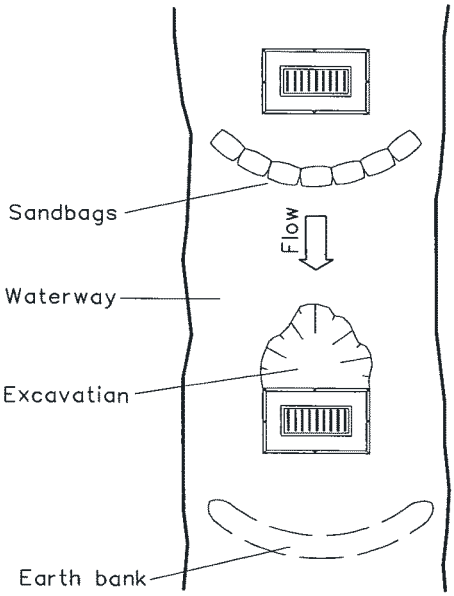
Construction Notes

1. Install filters to kerb inlets only at sag points.
2. Fabricate a sleeve made from geotextile or wire mesh longer than the length of the inlet pit and fill it with 25 mm to 50 mm gravel.
3. Form an elliptical cross-section about 150 mm high x 400 mm wide.
4. Place the filter at the opening leaving at least a 100-mm space between it and the kerb inlet. Maintain the opening with spacer blocks.
5. Form a seal with the kerb to prevent sediment bypassing the filter.
6. Sandbags filled with gravel can substitute for the mesh or geotextile providing they are placed so that they firmly abut each other and sediment-laden waters cannot pass between.

MESH AND GRAVEL INLET FILTER SD 6-11





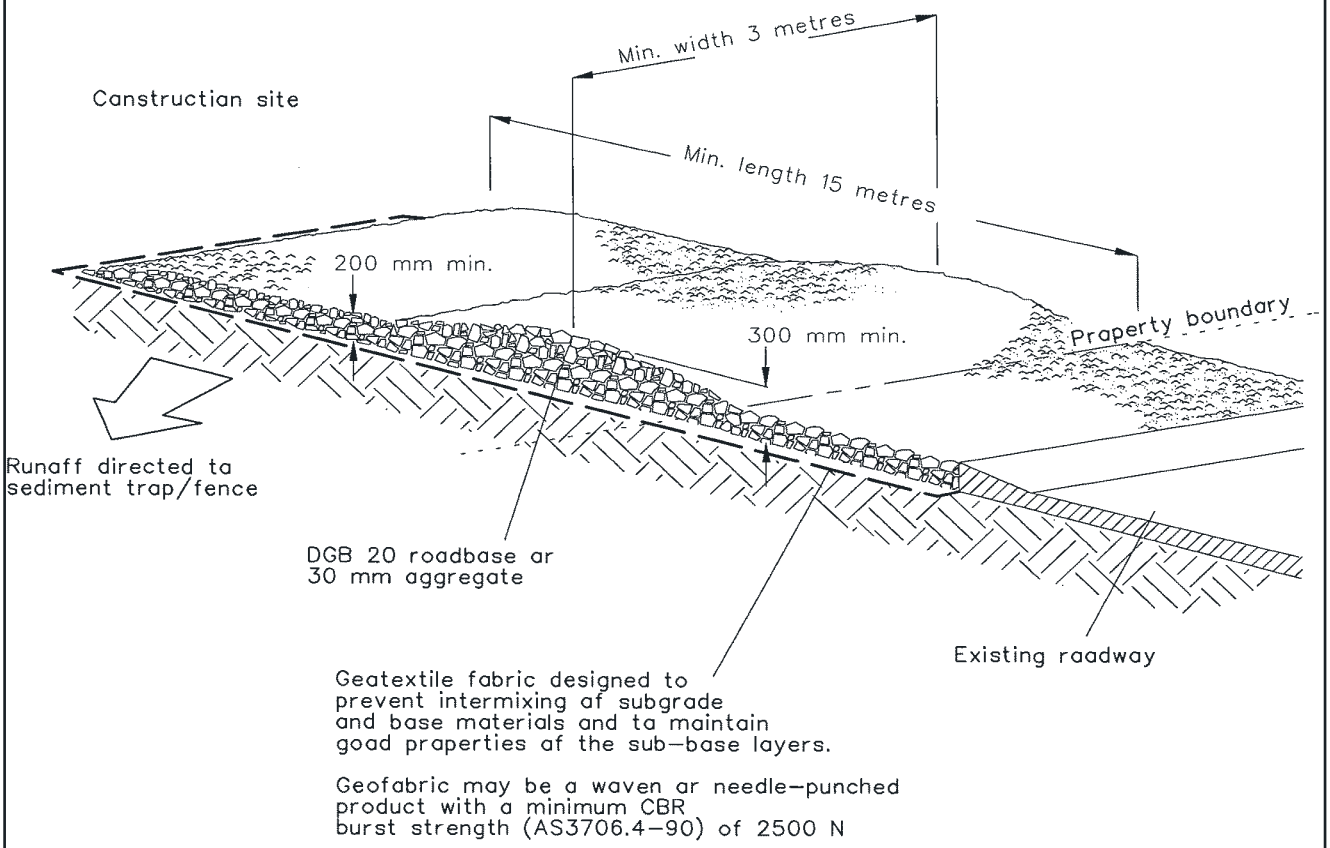


Far drap inlets at nan-sag paints, sandbags, earth bank ar excavatian used ta create artificial sag paint

Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

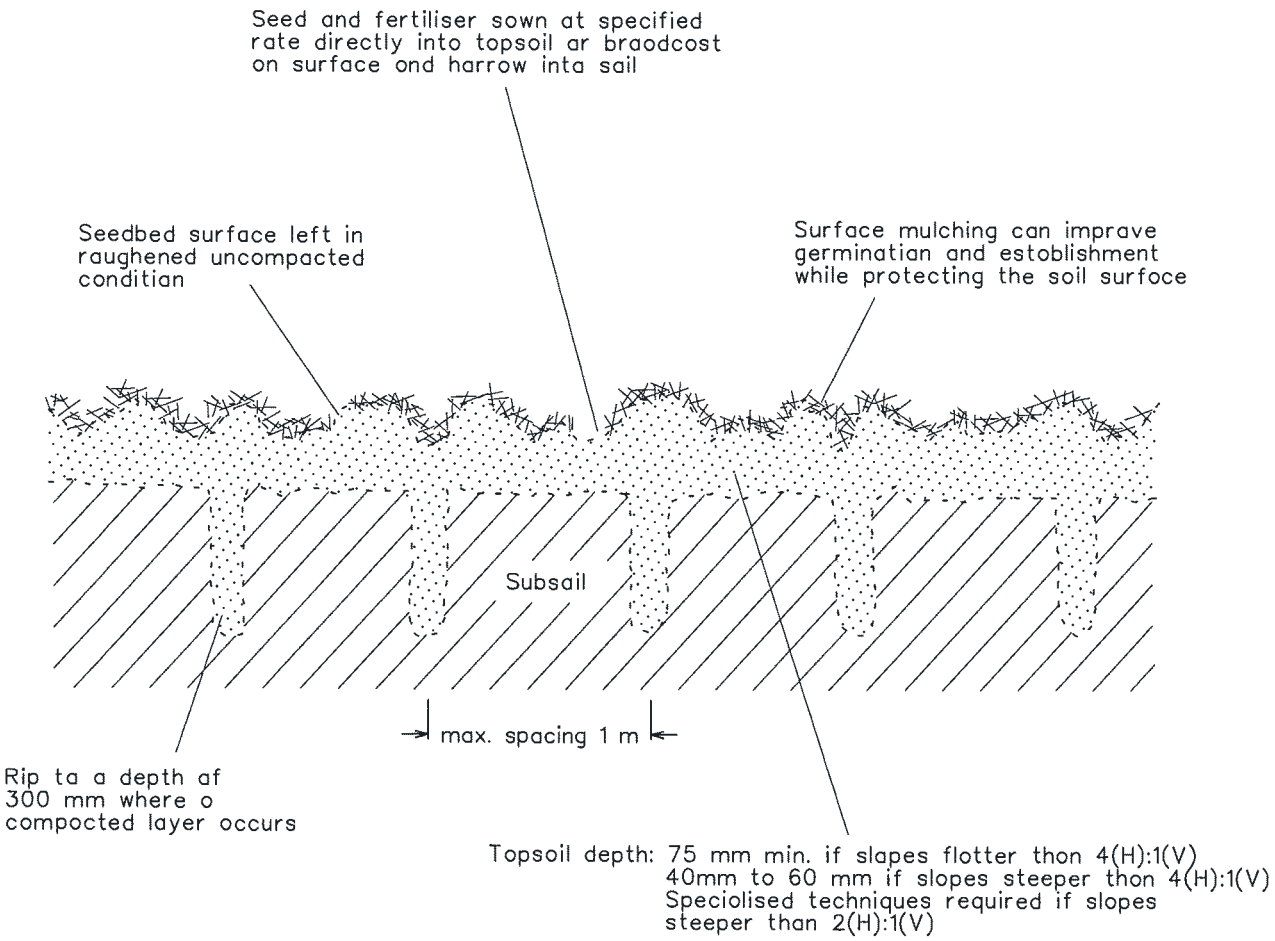
GEOTEXTILE INLET FILTER SD 6-12



Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

STABILISED SITE ACCESS SD 6-14

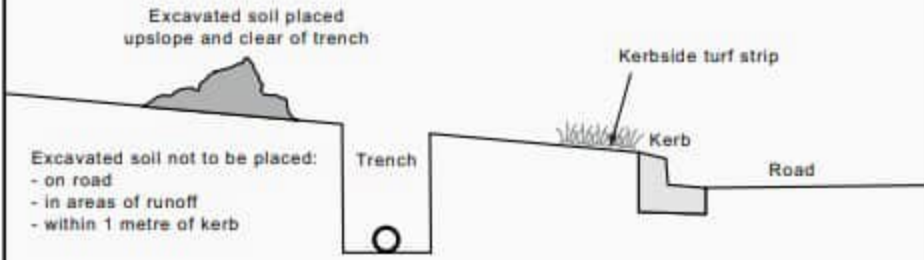


Construction Notes

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

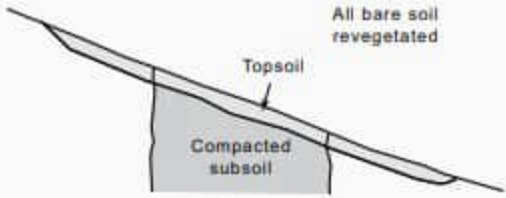
SEEDBED PREPARATION SD 7-1

When excavating trench...

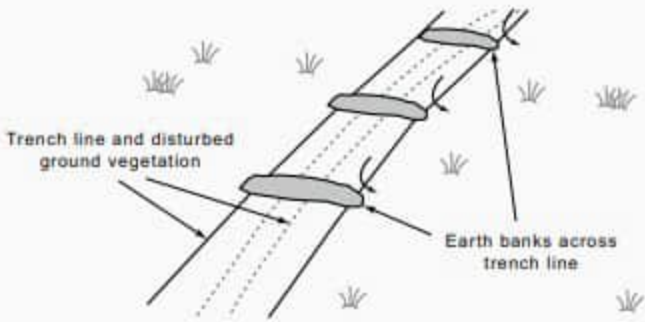


When backfilling trench...

Trench backfilled, compacted to 95 per cent standard compaction, topsoiled, levelled and topped up as necessary should subsidence occur



On steep and/or long sections of trench...



Construction notes for figure 6.1

1. Do not open any trench unless it is likely to be closed in three days
2. Place excavated material up-slope of the trench
3. Stockpile topsoil separately from subsoil
4. Divert runoff from the line of the cut with diversions as directed by SD 5-2
5. Rehabilitate in accordance with specification