



Works Approval

Works approval number	W6799/2023/1
Works approval holder	Shire of Ashburton
Registered business address	Lot 198 Pannawonica Drive PANNAWONICA WA 6716
DWER file number	DER2023/000240
Duration	20/11/2023 to 19/11/2028
Date of issue	20/11/2023
Date of amendment	16 May 2025
Premises details	Pilbara Regional Waste Management Facility Part Lot 550 and Lot 551 on Plan 414367, being Reserve 53324 Onslow Road TALANDJI WA 6710 Certificate of Title: Volume LR3169, Folio 963

Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)	Assessed design capacity
Category 61 – Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated, or irrigated.	21,000 tonnes per annual period
Category 61A – solid waste facility: premises (other than premises within category 67A) on which solid waste processed on other premises is stored, reprocessed, treated, or discharged onto land	20,000 tonnes per annual period

This works approval is granted to the works approval holder, subject to the attached conditions, on 16 May 2025, by:

Grace Heydon
MANAGER WASTE INDUSTRIES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Interpretation

In this works approval:

- (a) the words 'including', 'includes' and 'include' in conditions mean "including but not limited to", and similar, as appropriate;
- (b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
- (c) where tables are used in a condition, each row in a table constitutes a separate condition;
- (d) any reference to an Australian or other standard, guideline, or code of practice in this works approval:
 - (i) if dated, refers to that particular version; and
 - (ii) if not dated, refers to the latest version and therefore may be subject to change over time;
- (e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and
- (f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

The works approval holder must ensure that the following conditions are complied with:

Construction phase

Critical containment infrastructure

1. The works approval holder must:
 - (a) construct and/or install the infrastructure and/or equipment;
 - (b) in accordance with the corresponding design and construction / installation requirements; and
 - (c) at the corresponding infrastructure location; and
 - (d) within the corresponding timeframe,
 as set out in Table 1.

Table 1: Design and construction / installation requirements

Infrastructure	Design and construction / installation requirements	Construction timeframe	Infrastructure location
Evaporation ponds (three)	<ul style="list-style-type: none"> To be constructed of a geosynthetic clay liner (GCL) and 2 mm HDPE geomembrane. Liner system free of leaks and defects and designed to achieve a minimum coefficient of permeability of 3×10^{-11} m/s.or equivalent To be constructed a minimum of 3.0 m above groundwater level. To be constructed as depicted in Plans set out in in Schedule 1. Operational capacity of 7,000 m³ Maximum capacity of 9,000 m³ Crest dimensions of 65 m x 65 m. Base dimensions of 53 m x 53 m Able to maintain operating depth of 2.0 m in the shallow end and 3.0 m in the deep end with 0.5 m freeboard. Access road to be constructed in accordance with plan depicted in Figure 14 and Figure 15. Pond to be furnished with pond safety system consisting of weighted polyethylene rope ladders, a minimum of 600 mm wide fixed around the pond perimeters. 	Stage 1 (2 ponds) – 2023/24 Stage 2 (1 additional pond) – 2025/26	In the locations depicted in Figure 2 in Schedule 1

Infrastructure	Design and construction / installation requirements	Construction timeframe	Infrastructure location
	<ul style="list-style-type: none"> Pond sumps to be constructed in accordance with plan depicted in Figure 5 and Figure 6. 1.8m mesh fence compliant with AS 1752:2010 and access control gate to be installed accordance with plan depicted in Figure 11. Ballast comprising of weighted tubes placed in the pond valley drain, floor and on two sides of the inside toe of the of the pond perimeter bund. The valley line ballast is to weigh 100 kg/m and the toe ballast 50 kg/m. Prefabricated HDPE discharge apron to convey liquid waste into the evaporation ponds bolted to the concrete structure in accordance with plan depicted in Figure 12. Discharge structure that incorporates a sump for the collection of solid material received in the liquid waste. 		
Drying beds (two)	<ul style="list-style-type: none"> To be constructed of a geosynthetic clay liner (GCL) and 2 mm HDPE geomembrane. Liner system designed to achieve a minimum coefficient of permeability of 3×10^{-11} m/s. To be constructed a minimum of 3.0 m above maximum seasonal groundwater level. To be constructed as depicted in Plans set out in Schedule 1, Figure 5, Figure 6, Figure 7 and Figure 8. Base constructed with minimum 1% fall towards leachate extraction sump. To be constructed to achieve an operating depth of 0.5 m and a 0.5 m freeboard. In-built leachate collection system and leachate collection sump. Minimum 300 mm aggregate layer consisting of clean comprising high-strength, non-calcareous rock (blue metal) free of organic matter, lumps of clay, fines, or other 	<p>Stage 1 (1 bed) – 2023/24</p> <p>Stage 2 (1 additional bed) – 2025/26</p>	

Infrastructure	Design and construction / installation requirements	Construction timeframe	Infrastructure location
	<p>contaminants.</p> <ul style="list-style-type: none"> Aggregate grading requirements: <ul style="list-style-type: none"> no aggregate greater than 53.0 mm; no more than 5% below 13.2 mm; and 2% less than 4.75 mm. The aggregate shall be installed above the cushion geotextile in the drying pad to the extent shown in Figure 7 and Figure 8. 200 mm thick detection layer of crusher dust atop the aggregate leachate drainage layer. Site won earthen fill working surface pad installed. Access road to be constructed in accordance with plan depicted in Figure 14 and Figure 15. 1.8 m mesh fence compliant with AS 1752:2010 and access control gate to be installed accordance with plan depicted in Figure 11. 		

2. The works approval holder must ensure that no visible dust generated from construction activities crosses the boundary of the premises.

Construction quality assurance

3. The works approval holder must undertake construction quality assurance, including visual inspection and materials testing for the GCL and 2 mm HDPE geomembranes specified in condition 1 in accordance with the requirements set out in Schedule 3, Table 7, Table 8 and Table 9.

Compliance reporting

4. The works approval holder must within 30 calendar days of an item of infrastructure or equipment required by condition 1 being constructed and/or installed:
- undertake an audit of their compliance with the requirements of condition 1; and
 - prepare and submit to the CEO a Critical Containment Infrastructure Report on that compliance.
5. The Critical Containment Infrastructure Report required by condition 4, must include as a minimum the following:
- be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person;

- (b) certification by a suitably qualified engineer that each item of infrastructure or component(s) thereof, as specified in condition 1 have been build and installed in accordance with the relevant requirements specified in condition 1;
- (c) certification that the liner systems are free of fault or defect, built to the design specification and fit for the intended purpose;
- (d) an assessment of construction quality assurance test results as required by condition 3, including a summary of failures, corrective measures, and retest results;
- (e) as constructed plans and a detailed site plan showing the location and dimensions for each item of critical containment infrastructure or component thereof as specified in condition 1;
- (f) photographic evidence of the installation of the infrastructure against design plans set out in Schedule 1; and
- (g) a Quality Control / Quality Assurance Certificate from an independent third-party which demonstrates that specific component/s of critical containment infrastructure meets specification/s as detailed in condition 1 and condition 3.

Time limited operations phase

Commencement and duration

6. The works approval holder may only commence time limited operations for an item of infrastructure identified in condition 1;
 - (a) where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 3 meets the requirements of that condition (and related conditions 4 and 5).
7. The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 1 (as applicable):
 - (a) for a period not exceeding 361 calendar days from the day the works approval holder meets the requirements of condition 6 for that item of infrastructure: or
 - (b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 7(a).
8. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 2 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 2.

Table 2: Infrastructure requirements during time limited operations.

Infrastructure	Operational requirement	Infrastructure location
Evaporation ponds	<ul style="list-style-type: none"> Integrity of the containment infrastructure is maintained. Overtopping of ponds must not occur. Minimum freeboard of 0.5 m maintained. Vegetation (emergent or otherwise) and floating debris is prevented from growing or accumulating in ponds. Access gates shall remain locked to restrict access by fauna when ponds and pads are not in active use. 	In the location demonstrated in Figure 2 in Schedule 1
Drying beds	<ul style="list-style-type: none"> Integrity of the containment infrastructure is maintained. Site won earthen working surface maintained to prevent disturbance of crusher dust detection layer. Leachate sump maintained to prevent liquid accumulation. Incompatible materials separated by a sufficient safety buffer as determined by a chemist or suitably qualified person. Contaminated stormwater is not allowed to pond within and escape the drying bed. 	
Temporary ISO container storage area	<ul style="list-style-type: none"> Area must only be used for the storage of containers of bulk liquid waste prior to treatment. Containers must only be stored in this area for a maximum of 30 days. Sealed containers stored in a manner that prevents discharge of wastes to the environment; Containers to be inspected daily for leaks or spills Any spills to be managed in accordance with conditions 18 and 19 of this works approval 	

Waste Acceptance

9. The works approval holder must only accept into the evaporation ponds or onto drying beds wastes;
- of a type (waste stream) listed against that infrastructure in column 1 of Table 3;
 - at a rate of or below the relevant limits set out in column 3 of Table 3,

(c) which meets the relevant acceptance specifications as set out in column 4 of Table 3. And

Table 3: Waste acceptance.

Waste type	Controlled Waste Code	Rate at which waste is received (tonnes/annum) ¹	Acceptance specification ²
Drying pad waste streams			
Oil sludge	J180	20,000 (combined total)	None specified
Tannery wastes not containing chromium	K140		None specified
Industrial waste treatment plant residues	N205		None specified
Acidic solutions or acids in solid form	B100		None specified
Basic (alkaline) solutions or bases (alkalis) in solid form	C100		None specified
Metal carbonyls	D100		None specified
Inorganic fluorine compounds (excluding calcium fluoride)	D110		
Mercury and mercury compounds	D120		
Arsenic and arsenic compounds	D130		
Chromium compounds	D140		
Tannery waste containing chromium	D141		
Cadmium and cadmium compounds	D150		
Used nickel cadmium batteries	D151		
Beryllium and beryllium compounds	D160		
Antimony and antimony compounds	D170		
Thallium and thallium compounds	D180		
Copper compounds	D190		
Cobalt compounds	D200		
Nickel compounds	D210		
Used nickel metal hydride batteries	D211		
Lead and lead compounds	D220		
Zinc compounds	D230		
Selenium and selenium compounds	D240		
Tellurium and Tellurium compounds	D250		
Vanadium compounds	D270		
Barium and barium compounds	D290		
Nontoxic salts	D300		
Boron compounds	D310		
Inorganic sulfides	D330		
Perchlorates	D340		
Chlorates	D350		

Phosphorus compounds excluding mineral phosphates	D360		
Waste from production or formulation of photographic chemicals or processing materials.	T120		None specified
Aqueous-based wastes from the production, formulation and use of inks, dyes, pigments, paints, lacquers, and varnish	F100		None specified
Solvent based wastes from the production, formulation and use of resins, latex, plasticisers, glues and adhesives	F130		
Aqueous-based wastes from the production, formulation and use of resins, latex, plasticisers, glues and adhesives	F110		None specified
Solvent based wastes from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish	F120		
Ethers and highly flammable hydrocarbons	G100		None specified
Non-halogenated organic solvents	G110		
Dry-cleaning wastes containing perchloroethylene	G130		
Halogenated organic solvents not otherwise specified	G150		
Waste from the production, use and formulation of organic solvents not otherwise specified	G160		
Waste mineral oils unfit for their intended purpose	J100		None specified
Oil interceptor wastes	J130		
Used oil filters	J170		
Waste tarry residues arising from refining, distillation or pyrolytic treatment	J160		None specified
Food and beverage processing wastes	K200		None specified
Non-halogenated organic chemicals	M130		None specified
Phenols, phenol compounds including halogenated phenols	M150		
Cyanides (organic)/ nitriles	M210		
Isocyanate compounds	M220		
Surfactants and detergents	M250		
Highly odorous organic chemicals including mercaptans and acrylates	M260		
Containers or drums contaminated with residues of a controlled waste	N100		Excludes PFAS contaminated materials
Soils contaminated with a controlled waste	N120		

Fire debris or fire wash waters	N140		
Encapsulated, chemically fixed, solidified, or polymerised controlled wastes	N160		
Filter waste containing a controlled waste	N190		
Industrial waste treatment plant residues	N205		
Waste from the production or formulation of photographic chemicals or processing materials	T120		None specified
Acid sulfate soil	n/a		None specified
Hydrocarbon contaminated soil (Class I, II or III)	n/a		None specified
Evaporation pond waste streams			
Waste from grease traps	K110	21,000 (combined total)	None specified
Sewage waste from the reticulated sewerage system	K130		None specified
Septage wastes	K210		
Food and beverage processing wastes	K200		None specified
Waste oil and water mixtures or emulsions, and hydrocarbon and water mixtures or emulsions	J120		None specified
Car and truck wash waters	L100		None specified
Industrial wash waters contaminated with a controlled waste	L150		Excludes Per- and poly-fluoroalkyl substances (PFAS) contaminated wash water

Note 1: Additional requirements for the acceptance of controlled waste are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

10. Prior to the acceptance of any packaged controlled waste at the premises, the works approval holder must ensure that:
 - (a) Information on the characteristics of the waste is obtained; and
 - (b) A suitably qualified chemist assesses the information and determines whether the waste can be processed at the premises to meet the requirements of the works approval.
11. The works approval holder must maintain accurate and up to date register containing the details and waste characteristics of packaged controlled wastes stored or undergoing physical processing at the premises.
12. Packaged controlled waste must not be accepted onto the premises where:
 - (a) The works approval holder has not obtained a signed declaration from the supplier of the source material with each delivery that:
 - (i) sets out the waste type, characteristics and volume being delivered; and
 - (ii) sets out the carrier, registration number of the vehicle and the date of delivery.
13. The works approval holder must ensure that waste is not accepted onto the premises unless;
 - (a) sufficient treatment or storage capacity exists for that waste,
 - (b) and the site is adequately staffed to receive the waste to ensure the requirements of this works approval are met.

14. The works approval holder shall ensure that where waste does not meet the waste acceptance criteria set out in Condition 9 it is removed from the premises by the delivery vehicle or, where that is not possible, stored in a quarantined storage area or container and removed to an appropriately authorised facility as soon as practicable.

Waste characterisation

15. The works approval holder must ensure that all packaged liquid waste streams are subject to verification testing by a suitably qualified chemist upon arrival to confirm that:
- (a) the characteristics of each liquid waste stream is consistent with the details obtained in accordance with condition 10 for that waste; and
 - (b) the liquid waste stream is suitable for the proposed process determined in accordance with condition 10.
16. The works approval holder must ensure that all packaged wastes undergoing verification testing required by condition 10 are:
- (a) held in a segregated receival area within the drying bed, pending confirmation of their acceptability; and
 - (b) stored in such manner that ensures incompatible wastes are unable to mix.

Waste processing

17. The works approval holder must ensure that all waste accepted onto the premises are only subjected to the processes and storage as set out in Table 4, and in accordance with any storage and process requirements set out in Table 4.

Table 4: Waste processing

Waste type	Process(s)
Drying pad waste streams	<ul style="list-style-type: none"> Consolidation, evaporation, storage (pending offsite removal), blending with soil, neutralization, drying or absorption. Wastes must be stored or deposited onto drying pads in a manner that ensures there is no mixing of incompatible waste types. All solidified wastes, solid sludges, residues, or soils generated through onsite processing must be tested by a chemist or suitably qualified person, and deemed to meet the acceptance criteria for Class IV secure landfills as per the Landfill Definitions prior to disposal by landfilling on-site. No offsite disposal or reuse of dried sludges shall occur.
Hydrocarbon contaminated soils	<ul style="list-style-type: none"> Contaminated soils to be spread out in an uncompacted layer 30 mm to 500 mm in thickness. Soil moisture to be maintained between 20 and 30%. Only collected leachate from the drying beds or fresh, clean water shall be used for bioremediation activities. Soil to be turned at least once per week to ensure uniform moisture content and provide aeration. Only commercial fertiliser to be applied to promote biodegradation process. Treated soil to be tested against the Landfill Definitions prior to disposal to landfill.

Waste type	Process(s)
Evaporation pond waste streams	<ul style="list-style-type: none"> • Direct discharge to evaporation pond. • All dried sludges generated through pond desludging and drying activities must be tested by a chemist or suitably qualified person, and deemed to meet the acceptance criteria for Class IV secure landfills as per the Landfill Definitions prior to disposal by landfilling on-site. • No offsite disposal or reuse of dried sludge from evaporation ponds shall occur.

18. The works approval holder shall immediately recover, or remove and dispose of, spills of environmentally hazardous materials including fuel, oil, or other hydrocarbons, whether inside or outside an engineered containment system.
19. The works approval holder shall ensure that all material used for the recovery, removal, and/or disposal of environmentally hazardous materials is stored in an impermeable container prior to testing and disposal at an appropriately authorised facility.

Monitoring of waste inputs and outputs

20. The works approval holder must record the total amount of waste accepted onto the premises, for each waste type listed in Table 5, in the corresponding unit, and for each corresponding time period, as set out in Table 5.

Table 5: Monitoring of inputs and outputs

Waste type	Parameter	Units	Frequency
All waste types set out in column 1 of Error! Reference source not found.	Waste inputs	Tonnes	<ul style="list-style-type: none"> • Each waste consignment arriving at the premise for treatment via the evaporation ponds or drying pads.
	Waste outputs		<ul style="list-style-type: none"> • Each waste consignment rejected from or removed from the premises. • Each batch of treated waste sent for onsite burial in landfill.

Compliance reporting

21. The works approval holder must submit to the CEO a report on the time limited operations within 60 calendar days of the completion date of time limited operations or 60 calendar days before the expiration date of the works approval, whichever is the sooner.
22. The works approval holder must ensure the report required by condition 21 includes the following:
- a summary of the time limited operations, including timeframes and amount of waste processed;
 - a summary of waste acceptance as monitored in accordance with condition 20.
 - a summary of the environmental performance of all infrastructure as constructed, which includes records detailing the:
 - Performance of the drying beds; and
 - Performance of the evaporation ponds.

- (d) a review of performance and compliance against the conditions of the works approval for time limited operations.
- (e) where the conditions of this works approval have not been met, what measures will the works approval holder take to meet them, and what timeframes will be required to implement those measures.

Records and reporting (general)

- 23.** The works approval holder must record the following information in relation to complaints received by the works approval holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:
- (a) the name and contact details of the complainant, (if provided);
 - (b) the time and date of the complaint;
 - (c) the complete details of the complaint and any other concerns or other issues raised; and
 - (d) the complete details and dates of any action taken by the works approval holder to investigate or respond to any complaint.
- 24.** The works approval holder must maintain accurate and auditable books including the following records, information, reports, and data required by this works approval:
- (a) the works conducted in accordance with condition 1;
 - (b) any maintenance of infrastructure that is performed in the course of complying with condition 8 ;
 - (c) Waste information collected and retained in accordance with condition 11.
 - (d) Sampling results from each batch of dried sludge or waste blended in accordance with Condition 17 which demonstrates suitability for acceptance at the appropriate class landfill in accordance with the Landfill Definitions;
 - (e) monitoring programmes undertaken in accordance with conditions 10, 22 and 23; and
 - (f) complaints received under condition 23.
- 25.** The books specified under condition 24 must:
- (a) be legible;
 - (b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;
 - (c) be retained by the works approval holder for the duration of the works approval; and
 - (d) be available to be produced to an inspector or the CEO as required.

Definitions

In this works approval, the terms in Table 6 have the meanings defined.

Table 6: Definitions

Term	Definition
annual period	a 12-month period commencing from 1 January until 31 December of the same year.
AS 1752:2010	means AS 1752.1:2010 <i>Chain Link Fabric Fencing – Security Fences and Gates – General Requirements</i>
AS 3706–2	means AS 3706.2-2000 <i>Geotextiles - Methods of test Determination of tensile properties - Wide-strip method</i>
AS 3706–3	means AS 3706.3-2012 <i>Geotextiles - Methods of test Determination of tearing strength - Trapezoidal method (Reconfirmed 2023)</i>
AS 3706–4	means AS 3706.4-2001 <i>Geotextiles - Methods of test Determination of burst strength - California bearing ratio (CBR) - Plunger method</i>
AS 3706–6	means AS 3706.6-2012 <i>Geotextiles - Methods of test Determination of seam strength</i>
AS 1289-3.6.2	means AS 1289.3.6.3:2020 <i>Methods of testing soils for engineering purposes, Part 3.6.3: Soil classification tests — Determination of the particle size distribution of a soil — Standard method of fine analysis using an hydrometer</i>
ASTM D792	means ASTM D792-20 <i>Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement</i>
ASTM D1004	means ASTM D1004-21 <i>Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting</i>
ASTM D1505	means ASTM D1505-18 <i>Standard Test Method for Density of Plastics by the Density-Gradient Technique</i>
ASTM D1603	means ASTM D1603-20 <i>Standard Test Method for Carbon Black Content in Olefin Plastics</i>
ASTM D3895	means ASTM D3895-19 <i>Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry</i>

Term	Definition
ASTM D4833	means ASTM D4833/D4833M-07(2020) <i>Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products</i>
ASTM D5397	means ASTM D5397-20 <i>Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test</i>
ASTM D5820	means ASTM D5820-95(2018) <i>Standard Practice for Pressurized Air Channel Evaluation of Dual-Seamed Geomembranes</i>
ASTM D5885	means ASTM D5885/D5885M-20 <i>Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry</i>
ASTM D5596	means ASTM D5596-03(2021) <i>Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics</i>
ASTM D5641	means ASTM D5641/D5641M-16 <i>Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber</i>
ASTM D5887	means ASTM D5887/D5887M-22 <i>Standard Test Method for Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter</i>
ASTM D5890	means ASTM D5890-19 <i>Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners</i>
ASTM D5891	means ASTM D5891/D5891M-19 <i>Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners</i>
ASTM D5993	means ASTM D5993-18(2022) <i>Standard Test Method for Measuring Mass per Unit Area of Geosynthetic Clay Liners</i>
ASTM D5994	means ASTM D5994/D5994M-10(2021) <i>Standard Test Method for Measuring Core Thickness of Textured Geomembranes</i>
ASTM D6392	means ASTM D6392-12(2018) <i>Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods</i>
ASTM D6496	means ASTM D6496/D6496M-20 <i>Standard Test Method for Determining Average Bonding Peel Strength Between Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners</i>

Term	Definition
ASTM D6693 type IV	means ASTM D6693/D6693M-20 <i>Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes</i>
ASTM D6768	ASTM D6768/D6768M-20 <i>Standard Test Method for Tensile Strength of Geosynthetic Clay Liners</i>
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
controlled waste	has the meaning as defined within the Environmental Protection (Controlled Waste) Regulations 1994
critical containment infrastructure	means the items of infrastructure listed in condition 1.
Critical Containment Infrastructure Report	means a report to satisfy the CEO that works of critical containment infrastructure have been constructed in accordance with the works approval.
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V Division 3 of the EP Act.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
EP Act	<i>Environmental Protection Act 1986</i> (WA).
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA).
HDPE	means high density polyethylene
Landfill Definitions	means the document titled ' <i>Landfill Waste Classification and Waste Definitions 1996</i> ' published by the CEO of DWER and as amended from time to time
leachate	means liquid released by, or water that has percolated through, waste and which contains some of the constituents of the waste.

Term	Definition
liquid	has the meaning defined in the Landfill Definitions.
packaged	has the meaning as defined within the <i>Environmental Protection (Controlled Waste) Regulations 1994</i>
premises	the premises to which this works approval applies, as specified at the front of this works approval and as shown on the premises map (Figure 1) in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
quarantined storage area or container	means a hardstand storage area or sealed-bottom container that is separate and isolated from authorised waste disposal areas and is capable of containing all non-conforming waste and its constituents, these areas must be clearly marked, and their access restricted to authorised personnel.
solid	has the meaning defined in the Landfill Definitions.
time limited operations	refers to the operation of the infrastructure and equipment identified under this works approval that is authorised for that purpose, subject to the relevant conditions.
waste	has the same meaning given to that term under the EP Act.
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 54 of the EP Act, subject to the conditions.
works approval holder	refers to the occupier of the premises being the person to whom this works approval has been granted, as specified at the front of this works approval.

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).

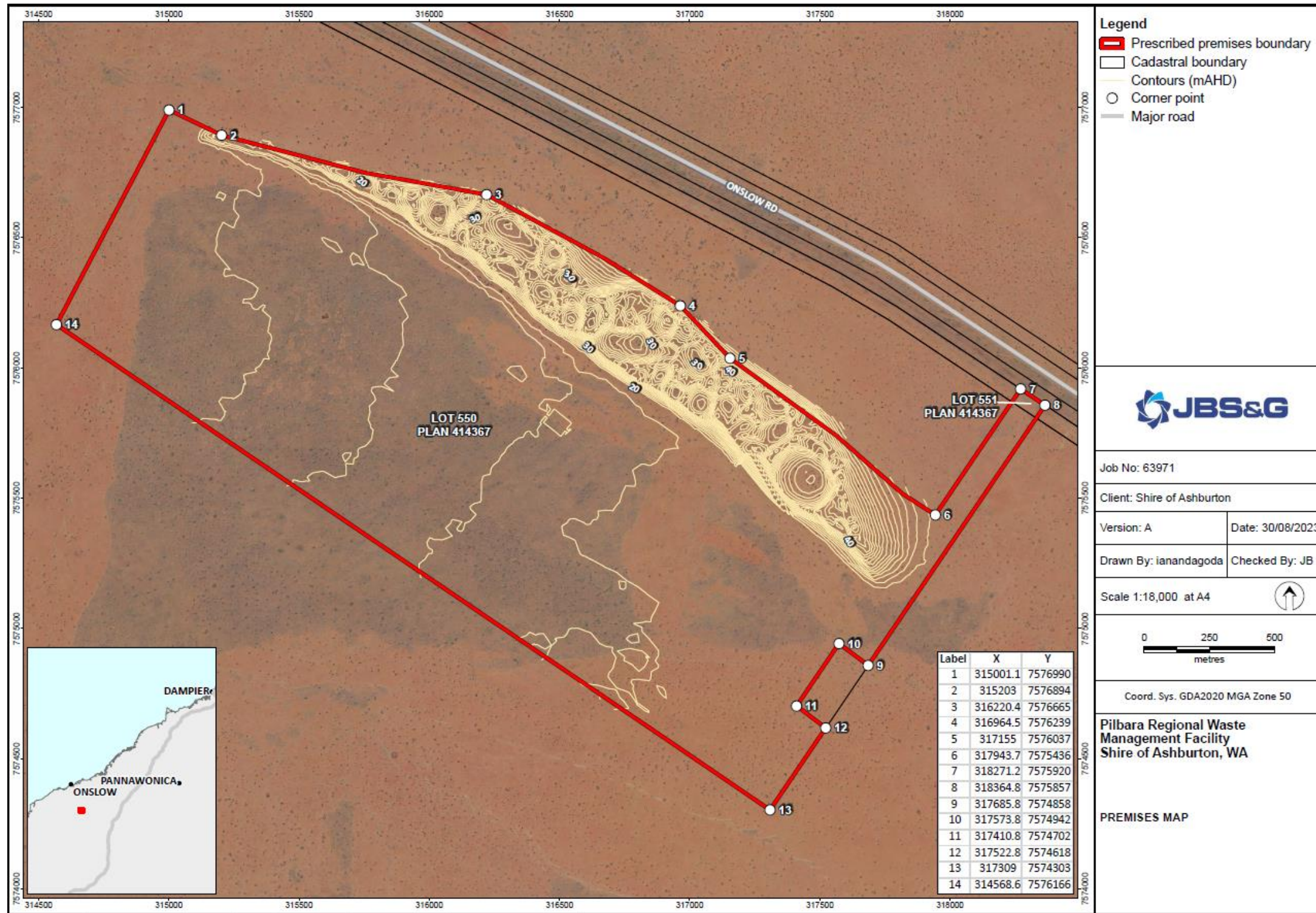


Figure 1: Prescribed premises boundary.

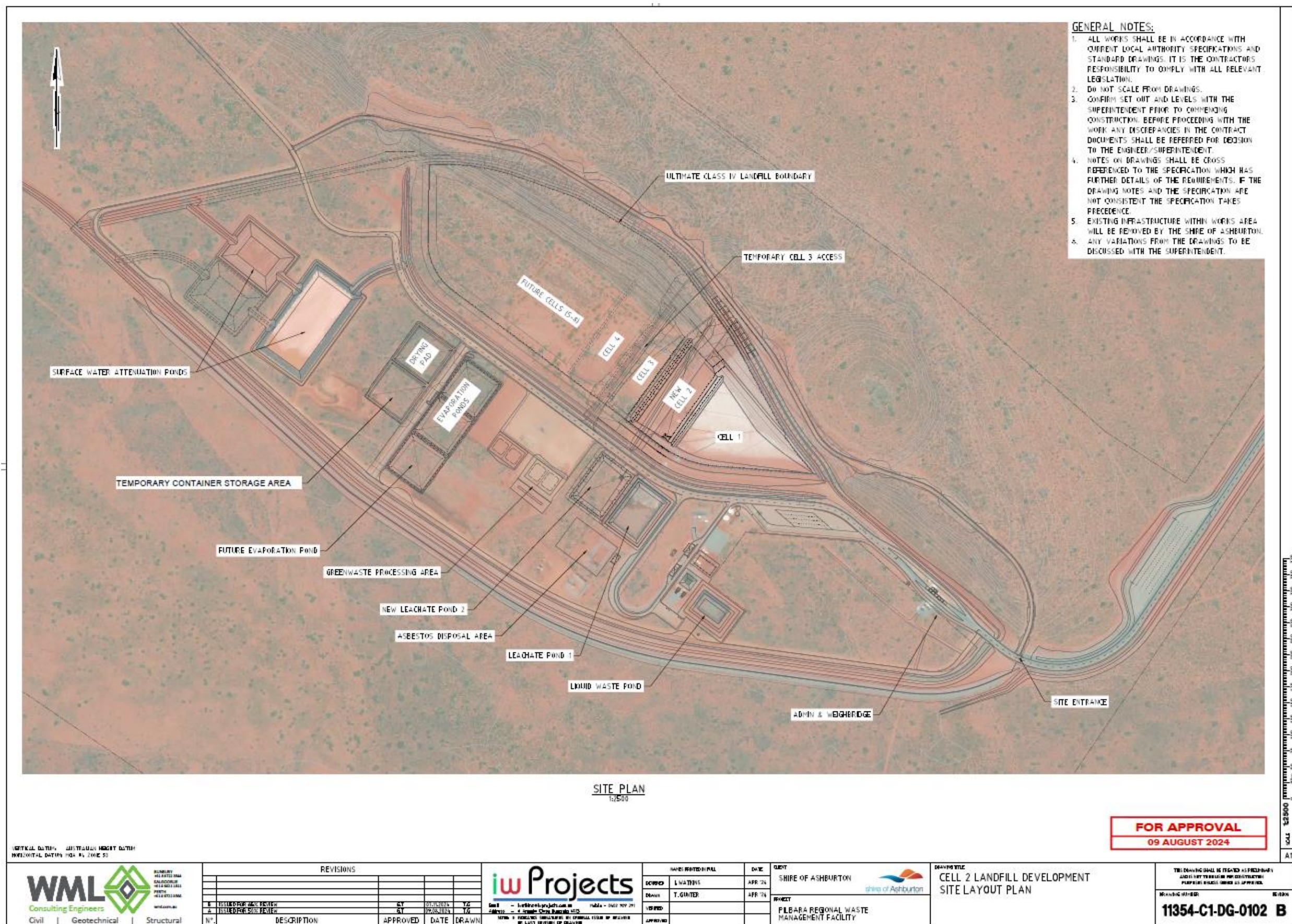


Figure 2: Approved drying pad and evaporation pond site plan.

W6799/2023/1 (Amended 16 May 2025)
IR-T05 Works approval template (v6.0) (September 2022)

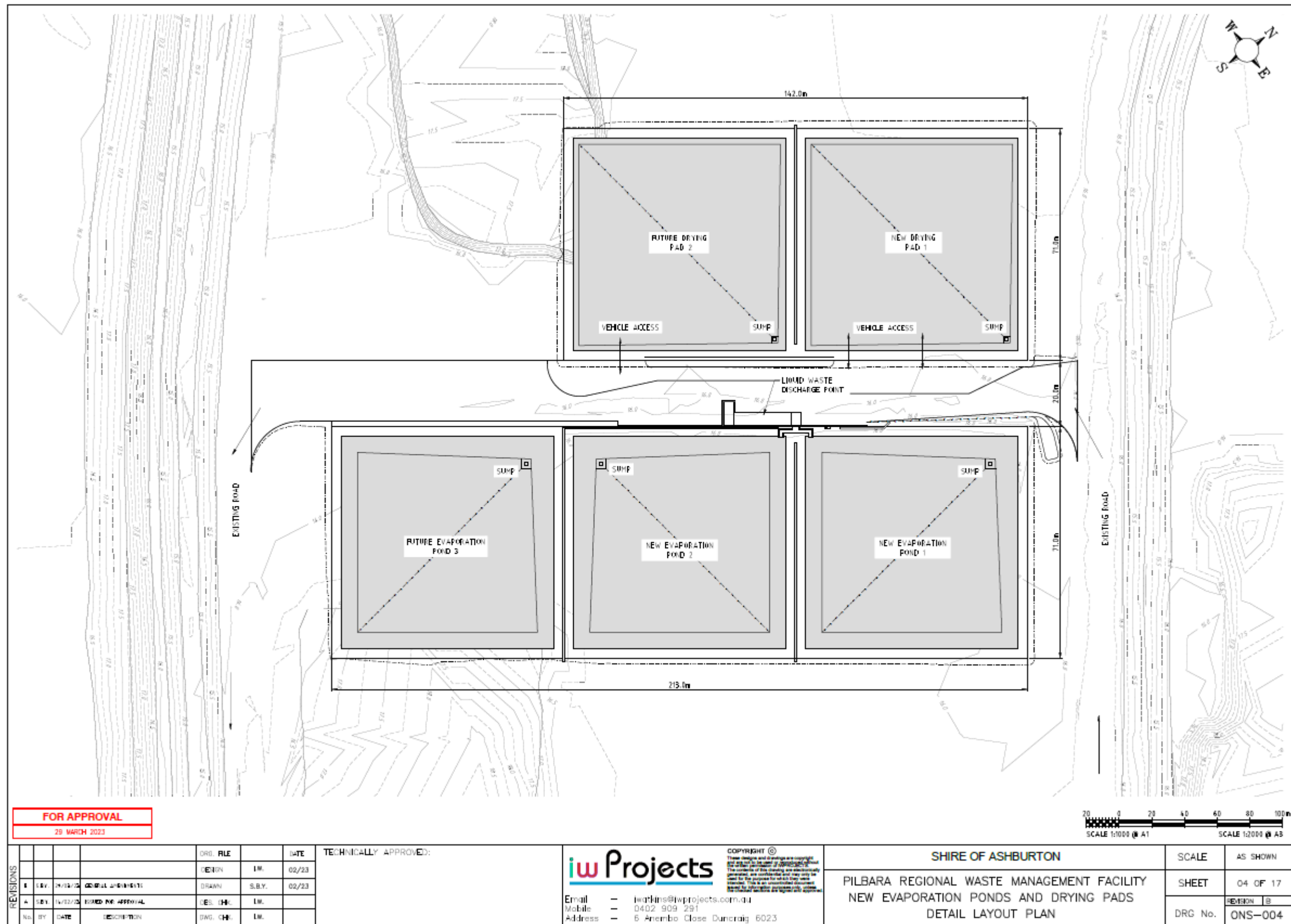


Figure 3: New drying pad and evaporation pond layout plan.

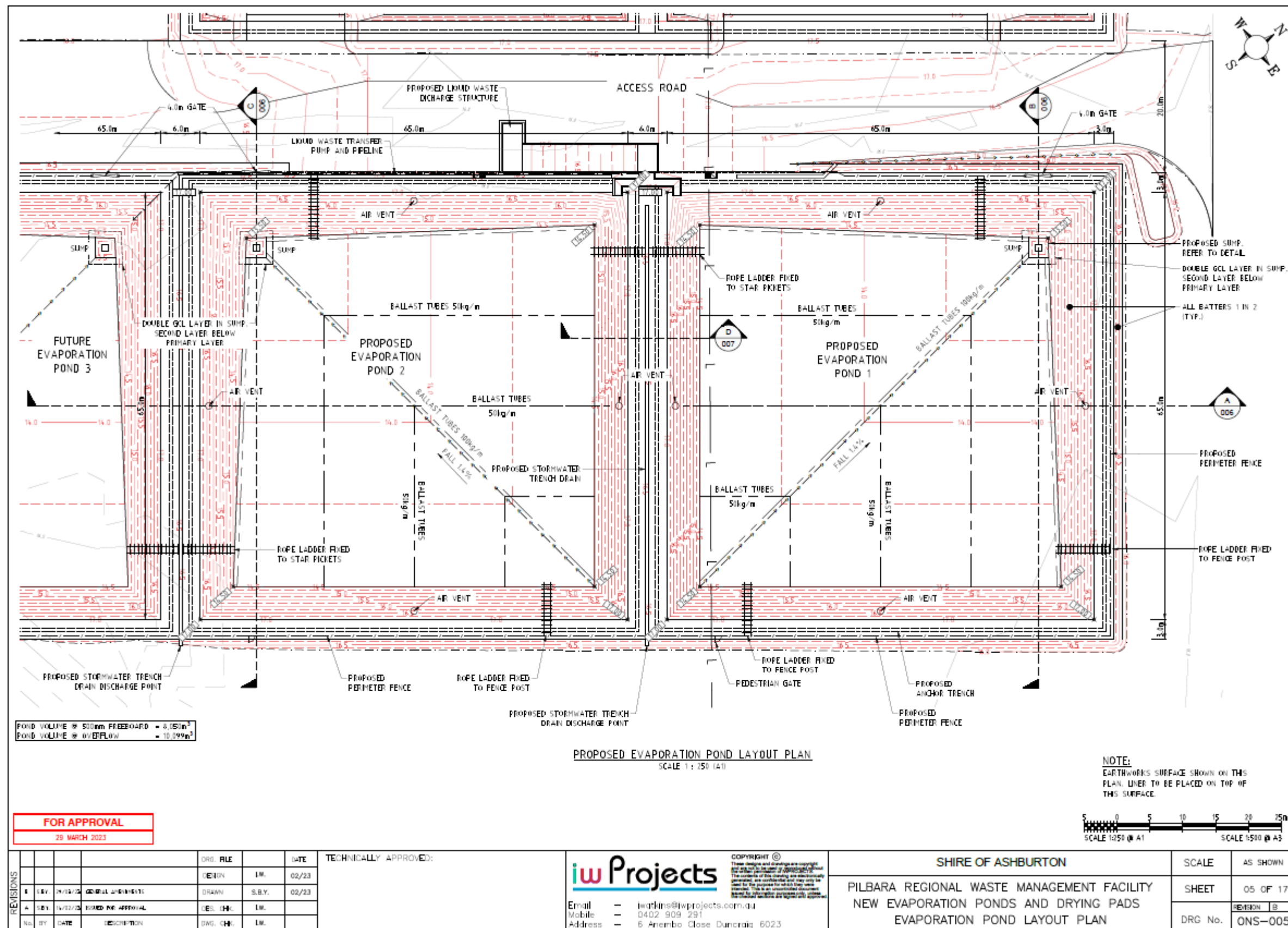


Figure 4: New evaporation pond 1 and 2 layout plan.

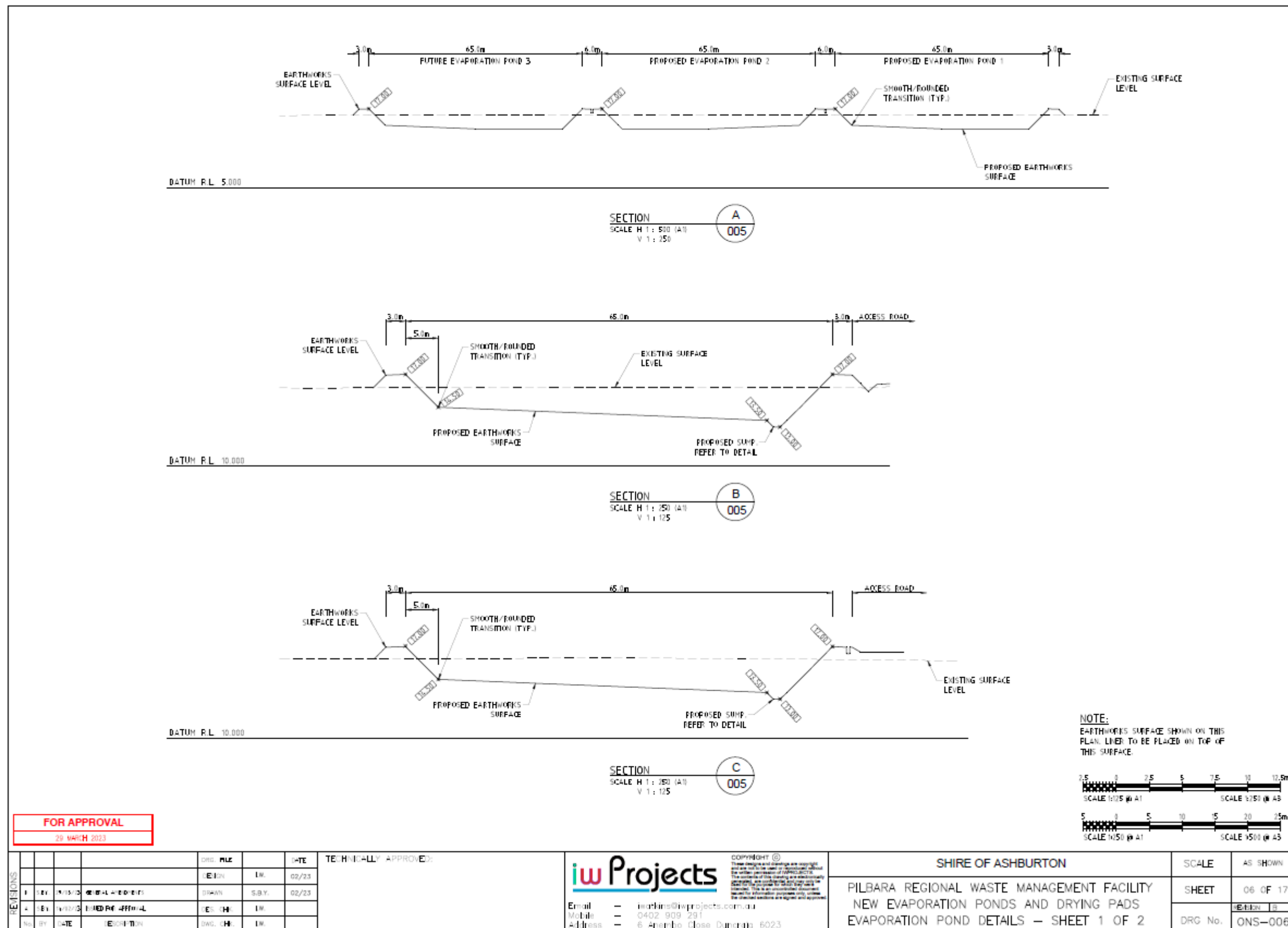


Figure 5: New evaporation pond design detail – Sheet 1 of 2.

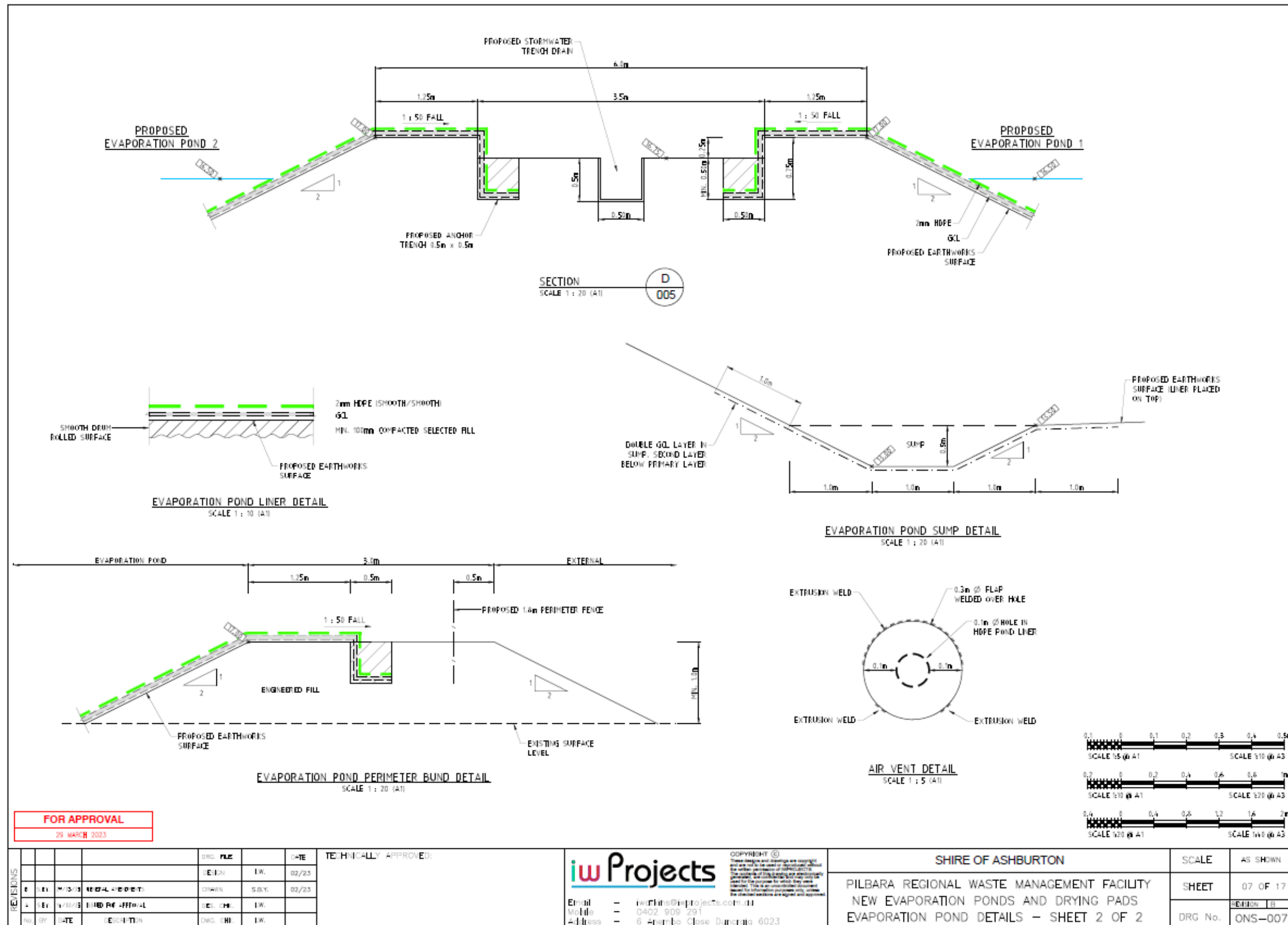


Figure 6: New evaporation pond design detail – Sheet 2 of 2.

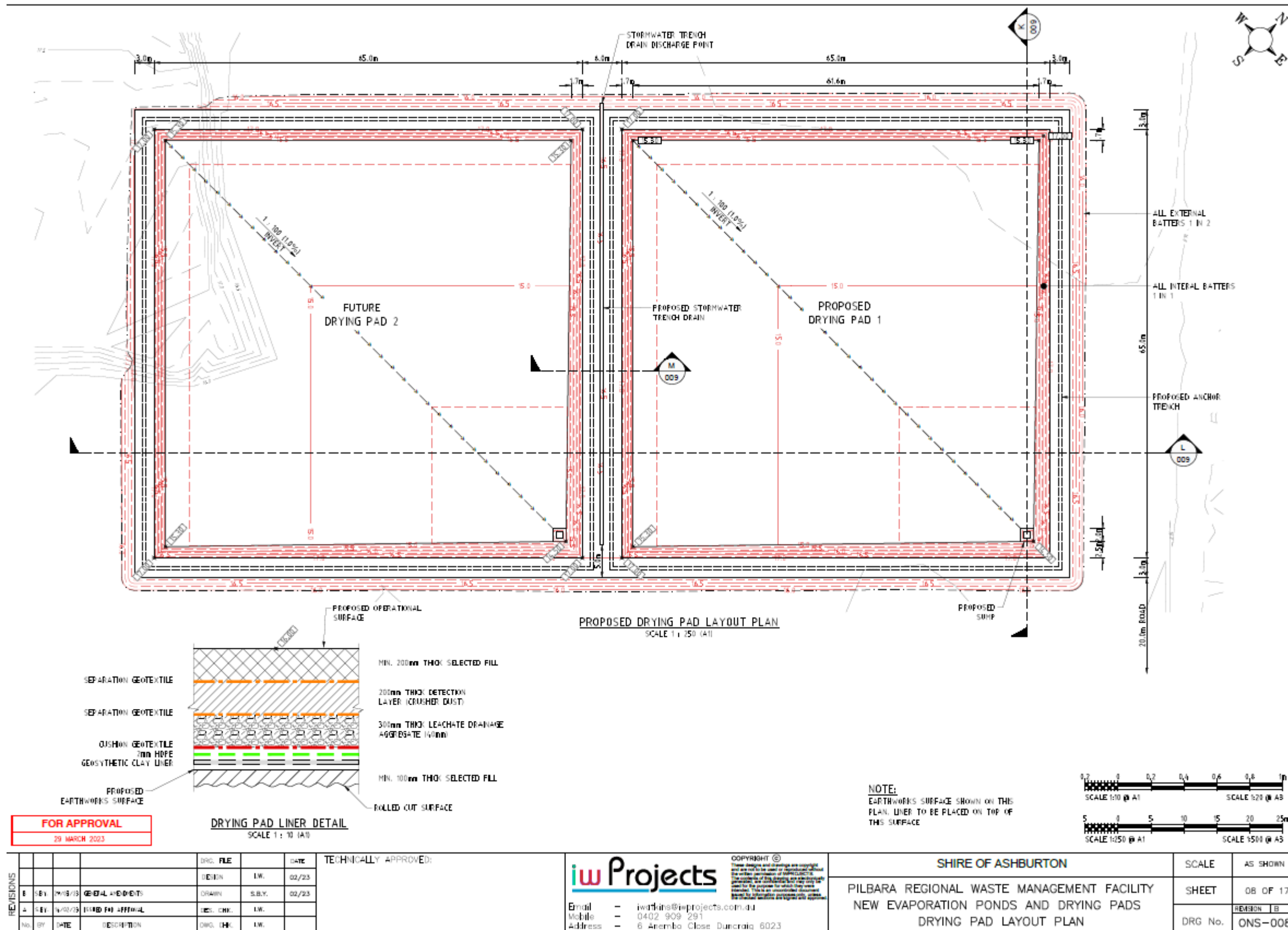


Figure 7: New drying pad 1 and 2 layout plan.

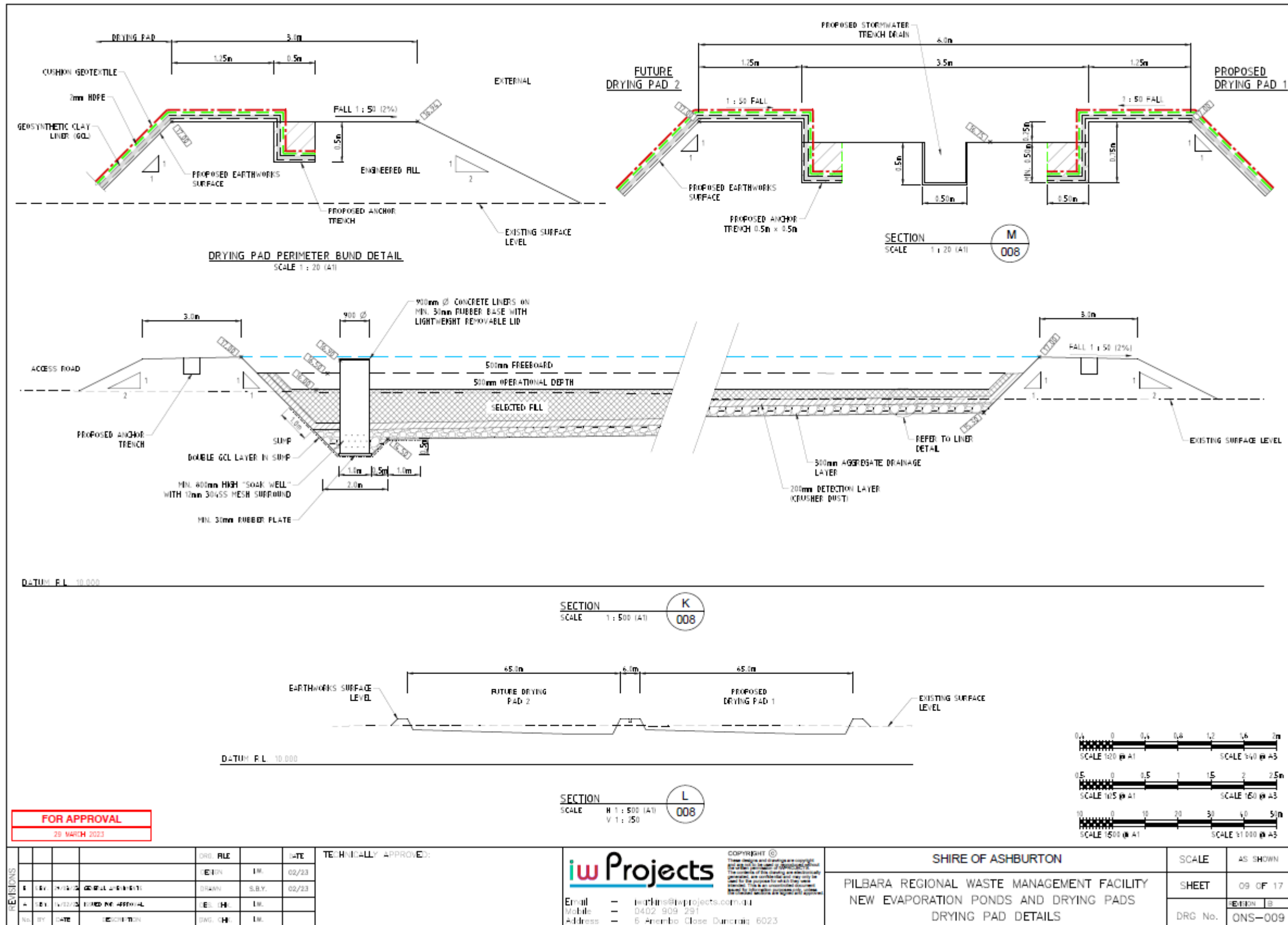


Figure 8: New drying pad details.

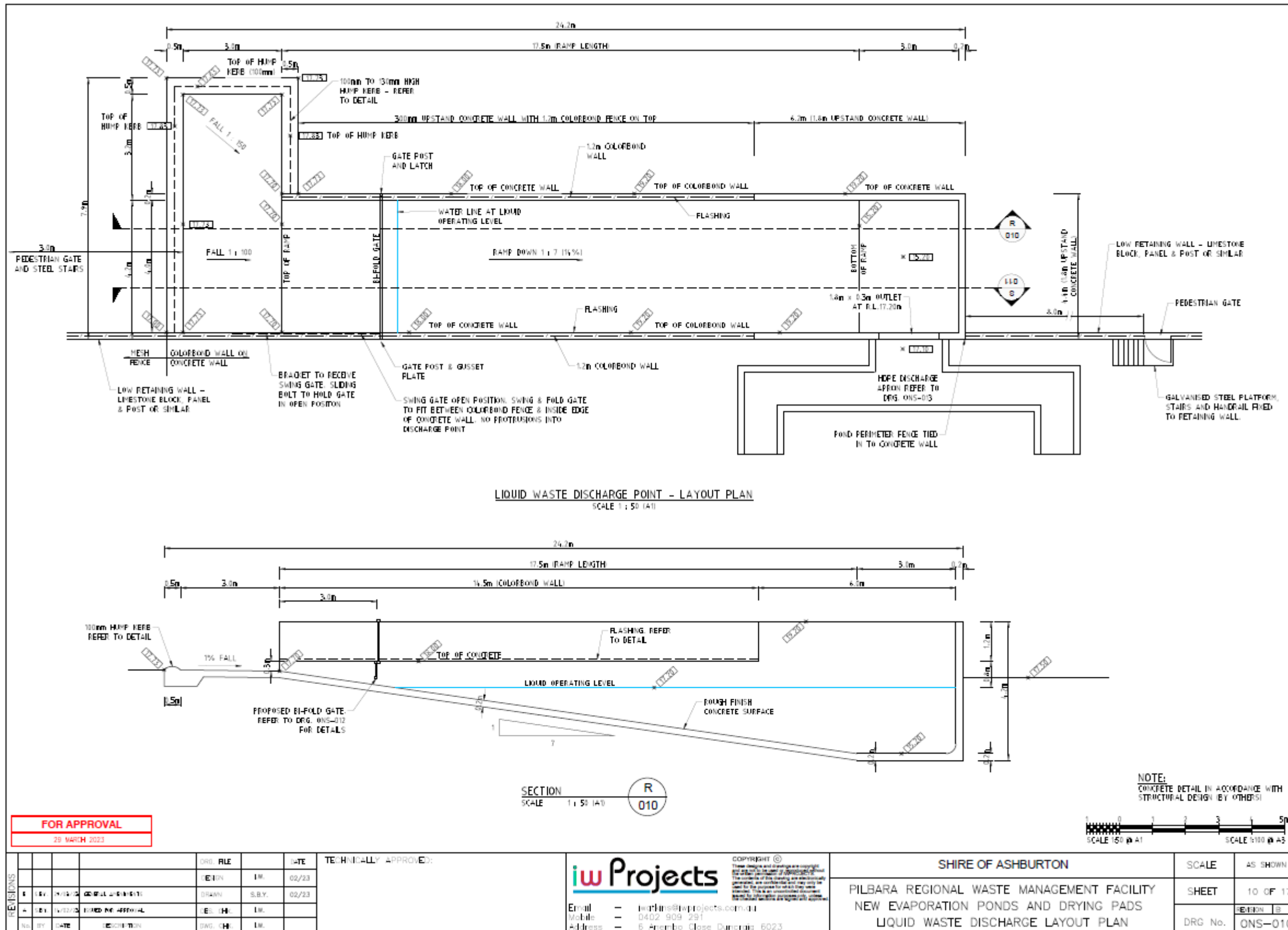


Figure 9: Liquid waste discharge layout plan.

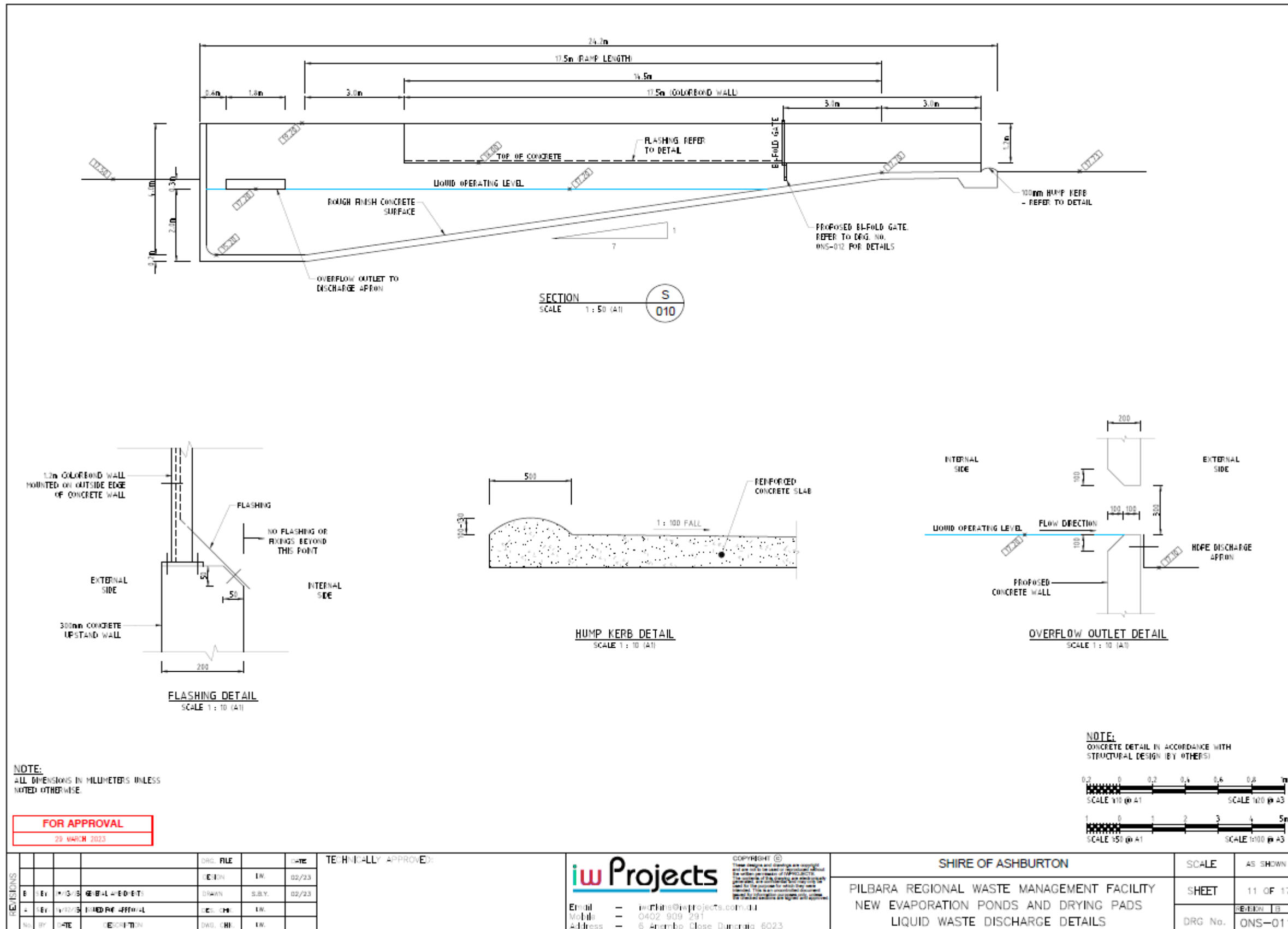


Figure 10: Liquid waste discharge details.

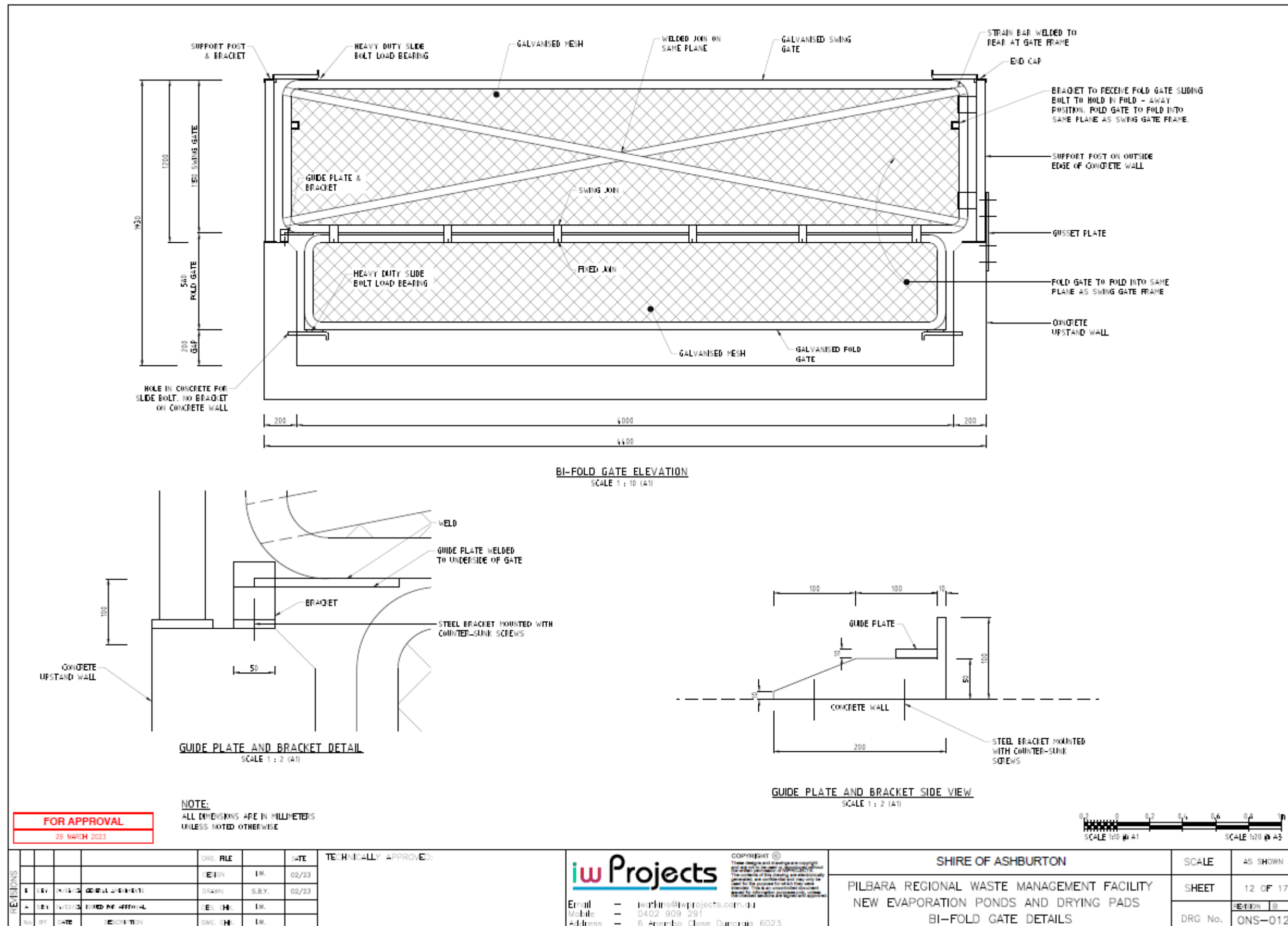


Figure 11: Bi-fold gate details.

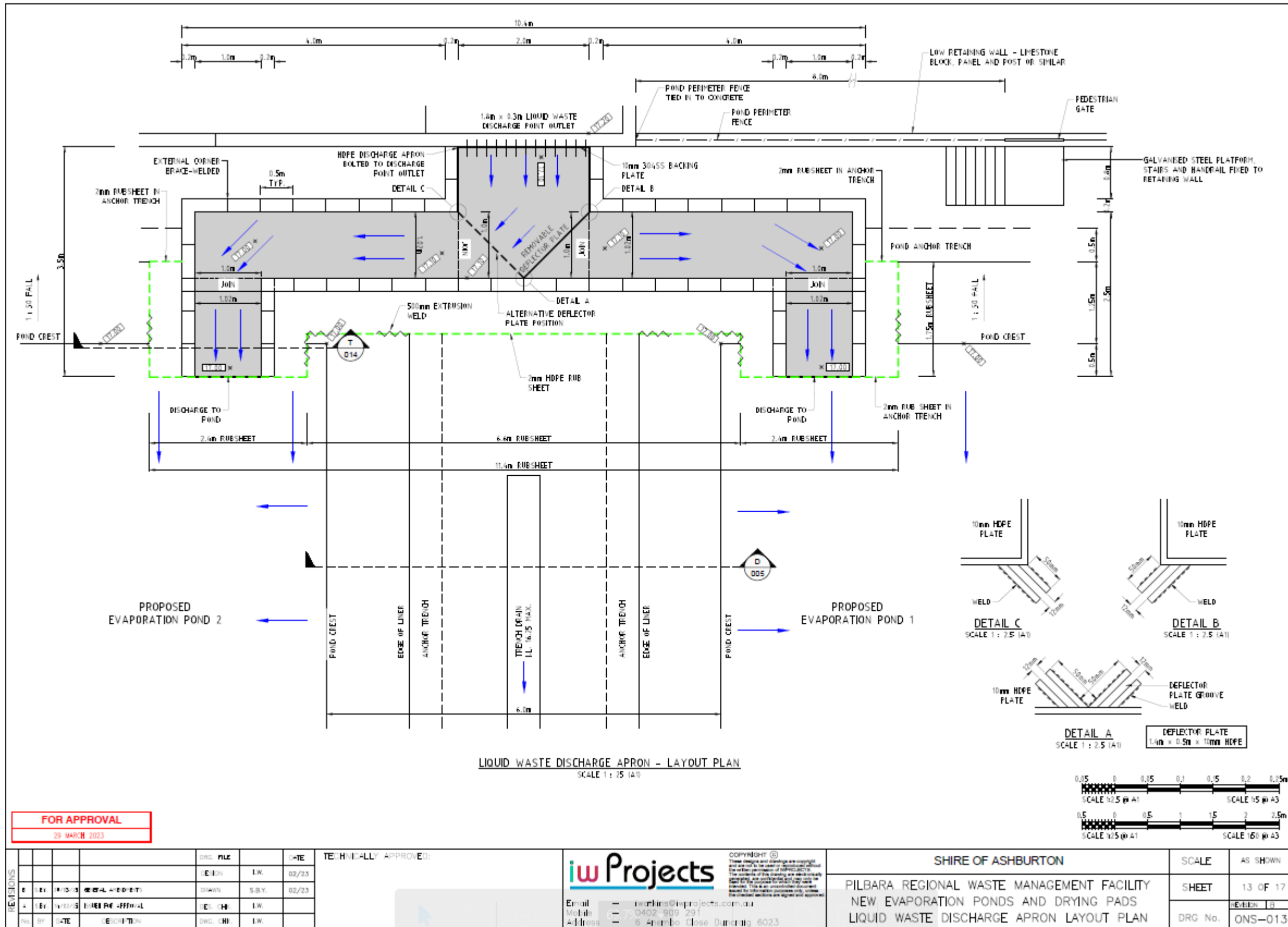


Figure 12: Liquid waste discharge apron layout plan.

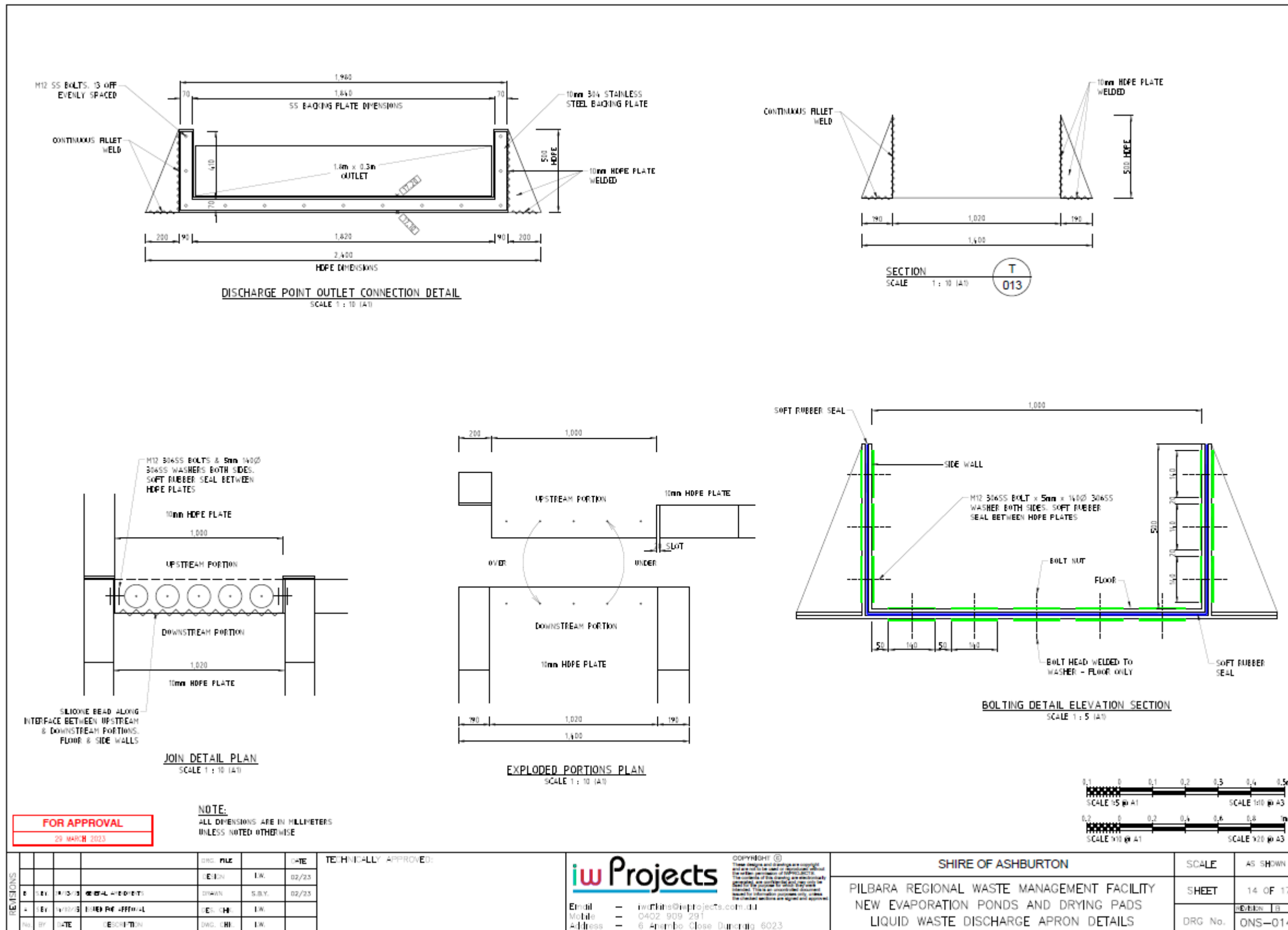


Figure 13: Liquid waste discharge apron details.

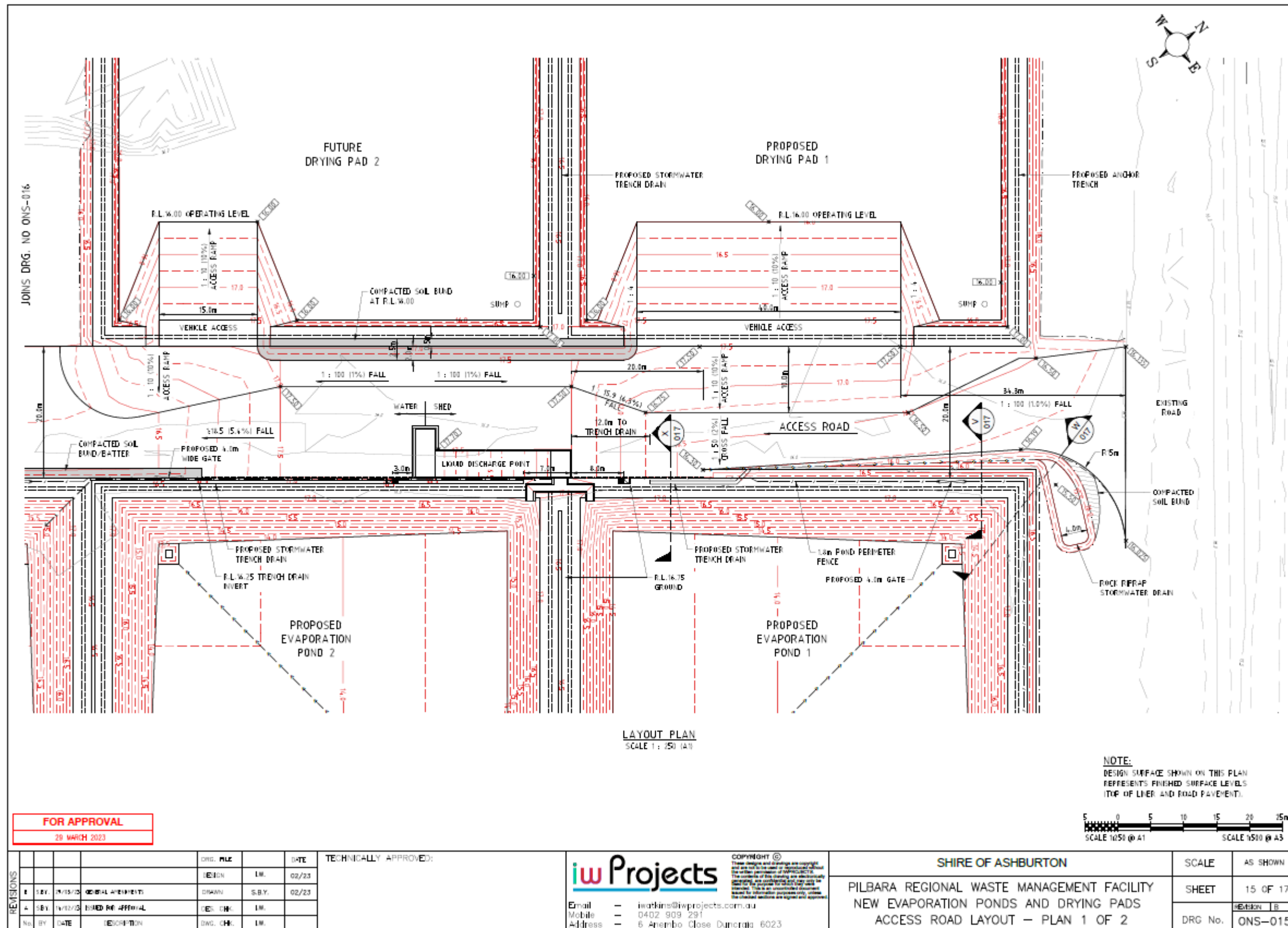


Figure 14: Access Road layout - Plan 1 of 2.

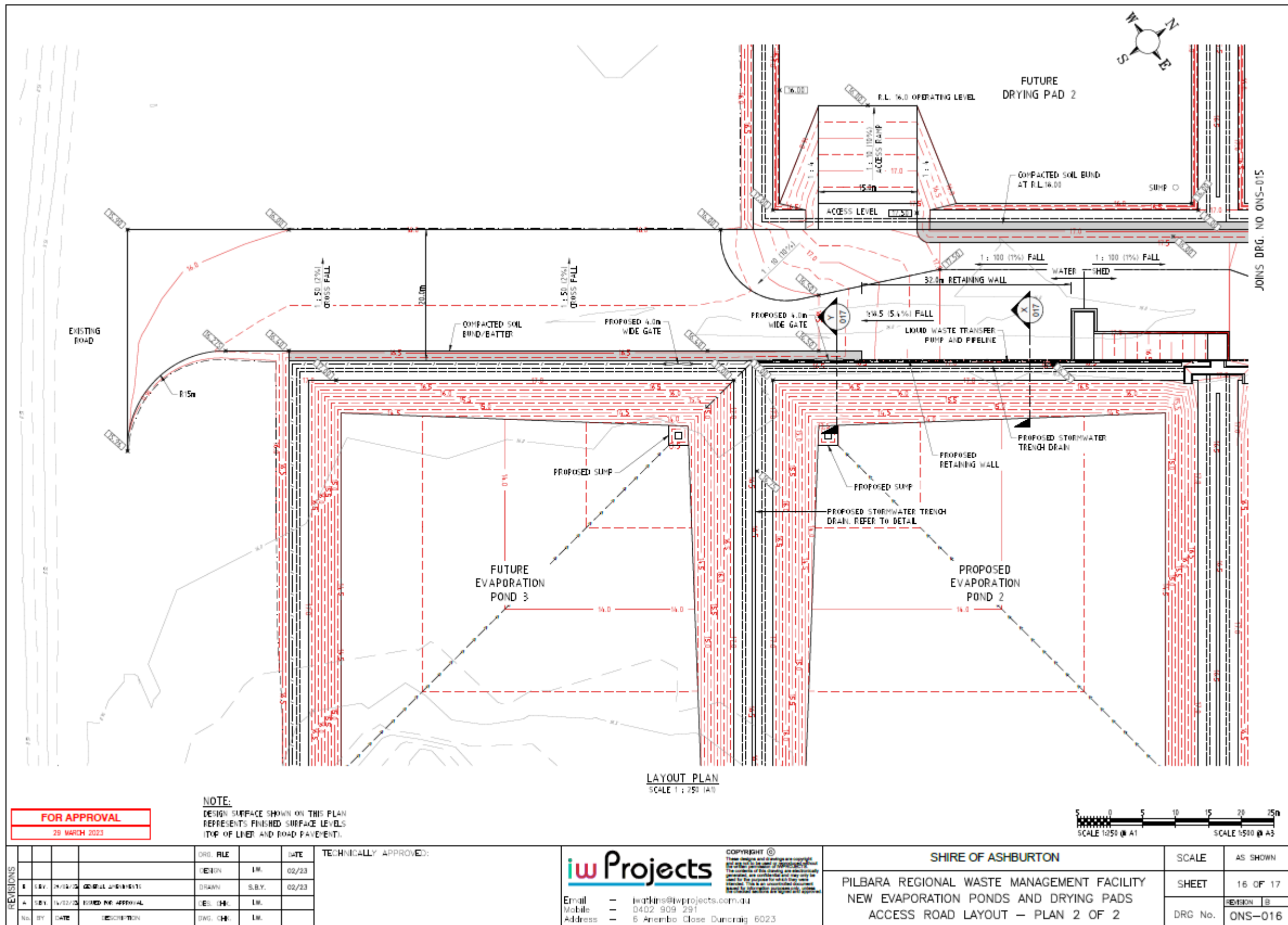


Figure 15: Access Road layout - Plan 2 of 2.

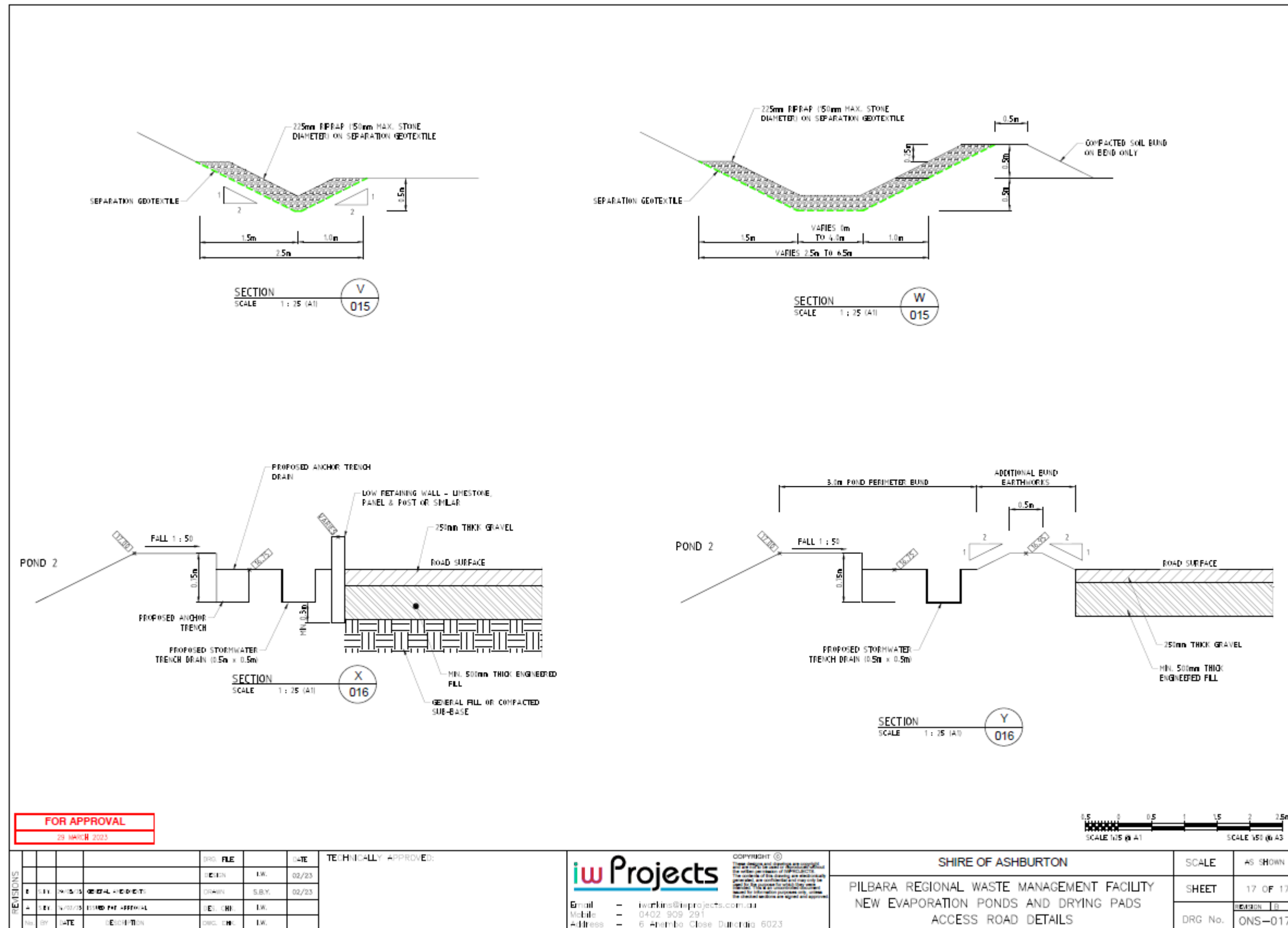


Figure 16: Access Road details.

Schedule 2: Evaporation Pond and Drying Pad Liner Installation Requirements

Infrastructure	Design Specifications/Construction Requirement
Geosynthetic Clay Liner (GCL)	<p>The GCL shall:</p> <ul style="list-style-type: none"> • Be new, first quality products manufactured for the works. • Be a proprietary product comprising a layer of natural sodium bentonite powder (6) of uniform thickness and consistency, reinforced by stitch-bonding or needle-punching to fully integrate the cover and carrier geotextile/s and constrained by thermally locking. • Comply with the acceptance criteria set out in Table 7: GCL CQA Testing. <p>Each roll of GCL delivered to the Site will be labelled by the manufacturer. The label will be firmly affixed and shall clearly state the following:</p> <ul style="list-style-type: none"> • Manufacturer's name; • Product identification (material type); • Date of manufacture • Batch number; • Roll number; • Roll length; • Roll weight; • Roll width; and, • Label with handling guidelines.
HDPE Geomembrane Material Specification	<p>The HDPE Geomembrane shall:</p> <ul style="list-style-type: none"> • Be new, first quality products manufactured for the works. • Comply with the acceptance criteria set out in Table 8: HDPE Geomembrane CQA Testing <p>Each roll or panel shall carry a label which identifies, as a minimum:</p> <ul style="list-style-type: none"> • Product name, grade, and name of manufacturer. • Date of manufacture, batch number. • Material thickness. • Roll number. • Roll length. • Roll weight. • Roll width. • Handling guidelines. • Reference numbers to raw material batch and laboratory certified reports. • Manufacturers approved quality assurance stamp and the technician's signature. <p>All geomembrane rolls and samples shall be identified in accordance with ASTM D4873. 2 mm HDPE geomembrane.</p> <p>Sandbags or equivalent ballast shall be used as necessary to temporarily hold the geomembrane in position and prevent uplift by wind (Sandbag material shall be sufficiently close-knit to prevent soil fines from working through the bags and discharging on the geomembrane).</p> <p>Only those geomembrane rolls which can be seamed or permanently anchored</p>

Infrastructure	Design Specifications/Construction Requirement
	on at least two sides on the same day shall be placed on a daily basis. All other sides shall be temporarily anchored.
Geotextile Cushion Layer	Cushion geotextile shall: <ul style="list-style-type: none"> • Be a needle-punched, non-woven geotextile. • Be certified by the manufacturer as needle free. • Be composed of polyester or polypropylene polymers. • Comply with the acceptance criteria set out in Table 9: Geotextile CQA Testing.
Geotextile Separation Layer	Separation geotextile shall: <ul style="list-style-type: none"> • Be a needle-punched, non-woven geotextile. • Be certified by the manufacturer as needle free. • Be composed of polyester or polypropylene polymers. • Comply with the acceptance criteria set out in Table 9: Geotextile CQA Testing.

Schedule 3 Construction Quality Assurance Testing

Geosynthetic Clay Liner

The Construction Quality Assurance Requirements for the installation of the geosynthetic clay liner are outlined in Table 7 below.

Table 7: GCL CQA Testing.

Item	Property	Standards test	Frequency	Minimum Value (MARV ¹)
Conformance Quality Assurance testing (sampled at the point of manufacture or on Site, as determined by an appropriately qualified Engineer)	Mass per unit area of bentonite component of GCL	ASTM D5993	1 sample per 2,500 m ²	≥ 4,000 g/m ²
	Mass per unit area of GCL	ASTM D5993	1 sample per 1,000 m ²	≥ 4,350 g/m ²
	Montmorillonite content	XRD (X-ray diffraction) Quantitative Mineralogy Analysis	1 sample per 10,000 m ²	> 70 wt%
	Bentonite particle size	AS 1289-3.6.2	1 sample per 1,000 m ²	Powdered (e.g., 70% passing 75-micron sieve) or Granulated (e.g. < 1% passing 75 micron)
	Cation exchange capacity of bentonite	Methylene blue method	1 sample per 1,500 m ²	≥ 70 meq/100g (or cmol/kg)
	Mass/unit length of bentonite in overlaps	ASTM D5993	1 sample per 1,000 m ²	≥ 4,000 g/m ²
	Moisture content of bentonite	ASTM D5993	1 sample per 2,500 m ²	≤ 25% at Manufacture ≤ 35% Site Samples
	Swell index/free swell of clay	ASTM D5890	1 sample per 1,500 m ²	≥ 24 mL/2g

Item	Property	Standards test	Frequency	Minimum Value (MARV ¹)
	Water absorption	ASTM D5891	1 sample per 1,500 m ²	≤ 15 ml max.
	Peel strength (for needle-punched products only)	ASTM D6496	1 sample per 1,000 m ²	≥ 360 N/m
	Tensile strength	ASTM D6768	1 sample per 10,000 m ²	≥ 8 kN/m
	Index flux	ASTM D5887	1 sample per 10,000 m ²	≤ 1.0 x 10 ⁻⁸ (m ³ /m ²)/s
	Permeability	ASTM D5887	1 sample per 2,500 m ²	≤ 3.0 x 10 ⁻¹¹ m/s
Visual inspection of GCL	Colour, needle punching, presence of needles or broken needles, and sewing density or other faults in the material.	n/a (visual accompanied by use of metal-detector)	Every roll	Free of faults or defects)
Thickness of GCL (i.e., uniformity of bentonite distribution) and apparent variations in the as placed moisture distribution.	On-site	n/a	n/a	Each roll during placement. If thickness appears to be variable a check of the variability of the mass per unit area shall be conducted.

Note 1: MARV = Minimum or Maximum Average Roll Value representing a confidence level of 97.5% of test results meet the required value

High Density Polyethylene Geomembrane

The Construction Quality Assurance Requirements for the installation of the HDPE geomembrane are outlined in Table 8 below.

Table 8: HDPE Geomembrane CQA Testing.

Item	Property	Standards test	Frequency	Minimum Value (MARV ¹)
Conformance Quality Assurance testing (sampled at the point of manufacture or on Site, as determined by appropriately qualified Engineer)	Thickness	ASTM D5994	Each roll	nom. (-5%) - 10% - 15%
	Density	ASTM D1505, ASTM D792	One sample per 5,000 m ² , or every five rolls delivered to site - whichever is the greatest number of tests.	0.940 g/cc
	Tensile properties: a) Yield strength b) Break strength c) Yield elongation d) Break elongation	ASTM D6693 type IV		a) 29 kN/m b) 21 kN/m c) 12% d) 100%
	Puncture resistance	ASTM D4833		534 N
	Tear resistance	ASTM D1004		249 N
	Carbon black content	ASTM D1603		2.0-3.0%
	Carbon black dispersion	ASTM D5596		Carbon black dispersion (only near spherical agglomerates) for 10 different views: 9 in Categories 1 or 2 and 1 in Category 3.
	Stress crack resistance	ASTM D5397	One sample every 10,000 m ² , or resin	500 hr.

Item	Property	Standards test	Frequency	Minimum Value (MARV ¹)
	Oxidative induction time: a) Standard OIT, and (b) High Pressure OIT	ASTM D3895, ASTM D5885	type or manufacturing Run.	a) 100 min. b) 400 min.
Start-up test weld	Welding equipment	N/A	Checked daily at start of Works, and whenever the welding equipment is shut-off for more than one hour. Also, after significant changes in weather conditions.	-
	Weld conditions	N/A	Test weld strips will be required whenever personnel or equipment are changed and/or wide temperature fluctuations are experienced. Minimum 1.5 m continuous seam.	-
Destructive weld testing	On-Site, hand tensiometer in peel and shear	ASTM D6392	Every 150 m (if fusion weld), Every 120 m (if extrusion weld)	-
	Off-Site — weld seam strength in peel and shear			-
Non-destructive weld testing	Weld strength	Air pressure test, ASTM D5820 Vacuum box test, ASTM D5641	All seams over full length	-

Item	Property	Standards test	Frequency	Minimum Value (MARV ¹)
Visual inspection of geomembrane	Tears, punctures, abrasions, cracks, indentations, thin spots, or other faults in the material.	N/A	Every roll	Free of faults or defects)
Leak detection survey	Leak detection survey across all geomembrane lined areas that have had leachate aggregate installed	ASTM D7007	Once the geomembrane has been installed and the drainage aggregate has been placed on top of the geomembrane, but before the separation layer has been installed.	Identify and repair and test/resurvey all identified leaks in the lining system.

Note 1: MARV = Minimum or Maximum Average Roll Value representing a confidence level of 97.5% of test results meet the required value

Geotextile CQA Testing

The Construction Quality Assurance Requirements for the installation of the geotextile are outlined in Table 9 below.

Table 9: Geotextile CQA Testing

Item	Property	Standards test	Frequency	Minimum Value (MARV ¹)
Conformance Quality Assurance testing (sampled at the point of manufacture or on Site, as determined by appropriately qualified Engineer)	Wide Strip Tensile Strength: a) Geotextile Cushion Layer b) Geotextile Separation Layer	AS 3706–2	sample per 2,500 m ²	a) ≥ 52.0/52.0 kN/m b) ≥ 18.5/18.5 kN/m
	Grab Tensile Strength: a) Geotextile Cushion Layer b) Geotextile Separation Layer	AS 3706–2		a) ≥ 4,000/4,000 N b) ≥ 1,270/1,270 N
	Trapezoidal Tear Strength: a) Geotextile Cushion Layer b) Geotextile Separation Layer	AS 3706–3		a) ≥ 1,200/1,200 N b) ≥ 440/440 N
	California bearing Ratio (CBR) Burst Strength: a) Geotextile Cushion Layer b) Geotextile Separation Layer	AS 3706–4		a) ≥ 9,000 N b) ≥ 3,400 N
Destructive tests	Tensile tests for joints.	AS 3706–6	As required.	-
Visual inspection of geotextile	Colour, thickness, tears, holes, punctures, needle - punching, presence of needles or broken needles, and other faults in the material.	n/a	Each roll during placement.	-

Note 1: MARV = Minimum or Maximum Average Roll Value representing a confidence level of 97.5% of test results meet the required value.