Permit

Environmental Protection Act 1994

Environmental authority P-EA-100516105

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: P-EA-100516105

Environmental authority takes effect on the date that your related development approval PTW-2023-3; 2306-34992 SRA takes effect**.** This is the take effect date.

Within 5 business days of the environmental authority taking effect, the administering authority must be given written notice of the occurrence. Prior to the commencement of the activity, the administering authority must be given written notice of the proposed date of commencement.

The first annual fee is payable within 20 business days of the take effect date.

The anniversary date of this environmental authority is the same day each year as the take effect date. The payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name(s)	Registered address
Mackay Regional Council	73 Gordon Street Mackay QLD 4740

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
ERA 16 - Extraction and Screening 1: Dredging, in a year, the following quantity of material (a) 1,000t to 10,000t	102RP726528, 482CI3405, 8RP718962, 900SP215375 and 9RP718962

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

Queensland Government

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days) that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority – on the nominated day; or

b) if the authority states a day or an event for it to take effect – on the stated day or when the stated event happens; or

c) otherwise – on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

The anniversary day of this environmental authority is the same day each year as the effective date. The payment of the annual fee will be due each year on this day.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.

Amanda Gray	30/11/2023
Signature	Date

Amanda Gray
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Permit and Licence Management
Department of Environment and Science
Phone: 1300 130 372
Email: palm@des.qld.gov.au

Date issued: 30/11/2023

Privacy statement

Pursuant to section 540 of the EP Act, the Department is required to maintain a register of certain documents and information authorised under the EP Act. A copy of this document will be kept on the public register. The register is available for inspection by members of the public who are able to take extracts, or copies of the documents from the register. Documents that are required to be kept on the register are published in their entirety, unless alteration is required by the EP Act. There is no general discretion allowing the Department to withhold documents or information required to be kept on the public register. For more information on the Department's public register, search 'public register' at www.qld.gov.au. For queries about privacy matters please email privacy@des.qld.gov.au or telephone 13 74 68.

Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access State controlled roads), the Department of Resources (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Development Approval

This permit is not a development approval under the *Planning Act 2016*. The conditions of this environmental authority are separate, and in addition to, any conditions that may be on the development approval. If a copy of this environmental authority is attached to a development approval, it is for information only, and may not be current. Please contact the Department of Environment and Science to ensure that you have the most current version of the environmental authority relating to this site.

Conditions of environmental authority

GENERAL	
G1	The **activity** authorised under this environmental authority must be conducted in accordance with the following limitations: a) **dredging** is limited to **capital dredging** for the purpose of the Petrie Street Flood Gate Replacement Project; b) **dredging** is limited to a maximum 2,000 tonnes in a year. c) **dredging** must only be undertaken by backhoe or excavator; d) **dredging** may only occur in accordance with the following plans: i. General Arrangement Plan prepared by AECOM dated 19/09/2023, reference A1-35981, revision C. ii. Demolition, Services Plan, Asbestos Register & Survey Setout prepared by AECOM dated 19/09/2023, reference A1-35982, revision C. iii. Structural Notes Sheet 1 of 2 prepared by AECOM dated 31/05/2023, reference A1-35983, revision B. iv. Structural Notes Sheet 2 of 2 prepared by AECOM dated 31/05/2023, reference A1-35984, revision B. v. Typical Sections, Details & Notes Sheet 1 of 3 prepared by AECOM dated 19/09/2023, reference A1-35985, revision C. vi. Typical Sections, Details & Notes Sheet 2 of 3 prepared by AECOM dated 19/09/2023, reference A1-35986, revision C. vii. Typical Sections, Details & Notes Sheet 3 of 3 prepared by AECOM dated 19/09/2023, reference A1-35987, revision C. viii. Retaining Wall Setout Plan prepared by AECOM dated 19/09/2023, reference A1-35989, revision C. ix. Levels Plan prepared by AECOM dated 19/09/2023, reference A1-35990, revision C; e) All **dredged material** must only be**:** i. Placed back into the construction footprint in accordance with condition G1(d); or ii. Disposed of at a facility that can lawfully accept the **dredged material**.
G2	All reasonable and practicable measures must be taken to prevent or minimise **environmental harm** caused, or likely to be caused, by the activities.
G3	Unless specifically authorised by a condition of this environmental authority, this environmental authority does not authorise a relevant act which is: a) an act that causes serious or material environmental harm or an environmental nuisance; or b) an act that contravenes a noise standard; or c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG of the *Environmental Protection Act 1994.*
G4.0	**Contravention of conditions** Unless specifically authorised by a condition of this environmental authority, details of any contravention of a condition of this environmental authority must: a) be reported to the administering authority within 24 hours of becoming aware of the contravention; and b) include the nature and circumstances of the contravention and any immediate actions taken.

G4.1	As soon as reasonably practicable but no later than 20 business days of a report made under condition G4.0 (or a longer period agreed to in writing by the administering authority), an investigation must be undertaken to determine: a) the potential circumstances and actions that may have contributed to the contravention; and b) reasonable and practicable measures that will be implemented to address the cause of the contravention to prevent future contraventions of this nature.
G4.2	As soon as reasonably practicable but no later than 20 business days of investigating a contravention under condition G4.1 (or a longer period agreed to in writing by the administering authority), the reasonable and practicable measures identified in the investigation must be implemented.
G4.3	The outcome of the investigation carried out under condition G4.1 and the reasonable and practicable measures implemented under condition G4.2 must be recorded.
G5.0	**Complaints** The following details must be recorded for all complaints received and provided to the administering authority upon request: a) date and time the complaint was received; and b) if authorised by the person making the complaint, their name and contact details; and c) nature and details of the complaint.
G5.1	As soon as reasonably practicable but no later than five (5) business days of receiving a complaint (or a longer period agreed to in writing by the administering authority), an investigation must be undertaken to determine: a) the potential circumstances and actions on site that may have contributed to the basis of the complaint; and b) reasonable and practicable measures that will be implemented to address the complaint.
G5.2	As soon as reasonably practicable but no later than five (5) business days of investigating a complaint under condition G5.1 (or a longer period agreed to in writing by the administering authority), the reasonable and practicable measures identified in the investigation must be implemented.
G5.3	The outcome of the investigation carried out under condition G5.1 and the reasonable and practicable measures implemented under condition G5.2 must be recorded.
G6	**Environmental risk management procedures** Written procedures must be developed and implemented by an appropriately qualified person that ensure: a) all potential risks to the environment from the carrying out of the activity are identified and assessed, including: i) during routine operations; and ii) outside routine operations (e.g., maintenance, start up and shut down); and iii) during preparation, rehabilitation, and closure; and iv) in an emergency (e.g., fire, flood or other natural disaster); and b) for each potential risk identified, any necessary measures to prevent or minimise the potential for environmental harm are implemented; and c) staff understand their obligations under this environmental authority and the *Environmental Protection Act 1994*; and d) environmental risk management procedures are continually reviewed and improved, based on a reasonable risk-management approach.
G7.0	**Plant and equipment** An appropriately qualified person must install, operate, calibrate, and maintain the plant and

	equipment required to carry out the activity (including monitoring devices) in a proper and effective manner.
G7.1	Records of installation, calibration and maintenance carried out under condition G7.0 must be kept.
G8	**Chemical storage** Chemicals and fuels in containers of greater than 15 litres must be stored within a secondary containment system.
G9	**Monitoring and Sampling** All monitoring and sampling required by the conditions of this environmental authority must be carried out, interpreted, and recorded by an **appropriately qualified person**.
G10	Unless otherwise authorised in writing by the administering authority, all laboratory analyses required under this environmental authority must be carried out by a laboratory that has National Association of Testing Authorities (NATA) accreditation for such analyses. The only exception to this condition is for *in situ* monitoring of dissolved oxygen and pH.
G11	At least 10 business days prior to commencing a dredge operation, written notification[1] must be provided to the administering authority of the following: a) Commencement date of the dredge operation; and b) Footprint of the area subject to the dredge operation; and c) Quantity of material (in tonnes) subject to the dredge operation; and d) Expected end date of the dredge operation. [1] Written notification can be via email to palm@des.qld.gov.au or mailed to: Department of Environment and Science Permit and Licence Management Implementation and Support Unit GPO Box 2454 Brisbane QLD 4001
G12.0	**Sediment Sampling** Prior to commencing a dredge operation, a **Sampling Program** must be designed and signed off by an **appropriately qualified person**, which meets the following minimum requirements in accordance with methodology provided in the latest edition of the: • *National Assessment Guidelines for Dredging 2009;* • *National Environment and Protection (Assessment of Site Contamination) Amendment Measure 1999; and* • *Queensland Acid Sulfate Soil Technical Manual 2014*.
G12.1	Prior to commencing a dredge operation, sediments from the **dredge footprint** must be sampled in accordance with the **Sampling Program**.
G12.2	A written statement of compliance must be submitted[2] to the administering authority at least 20 business days prior to commencing a dredge operation that: a) is prepared by an **appropriately qualified person**; and b) states whether the sampling was undertaken in accordance with the Sampling Program; and c) states whether the sediments sampled exceed the Practical Quantitation Limits for the parameters in *Table1: Practical quantitation limits for typical sediment contaminants, and other analytical parameters* of the *National assessment guidelines for dredging*; and d) contains any supporting information relied upon in making the statement. [2] Submission can be via email to palm@des.qld.gov.au or mailed to:

	Department of Environment and Science Permit and Licence Management Implementation and Support Unit GPO Box 2454 Brisbane QLD 4001
G13.0	A Dredge Operation Completion Report must be prepared by an **appropriately qualified person** and submitted[3] to the **administering authority** within 3 months of the completion of a dredge operation. [3] Submission can be via email to palm@des.qld.gov.au or mailed to: Department of Environment and Science Permit and Licence Management Implementation and Support Unit GPO Box 2454 Brisbane QLD 4001
G13.1	The Dredge Operation Completion Report required by condition **G13.0** must include: a) the results, including all raw data, from any monitoring conducted during the carrying out of the dredge operation; b) a description of actions taken to minimise any environmental risk identified during the dredge operation, including but not limited to actions taken as a result of risks identified from monitoring and environmental complaints; and c) a hydrographic survey prepared by an **appropriately qualified person** of the **dredge footprint** and the surrounding adjacent area likely to have been affected by the **dredging** during the relevant dredge operation; and d) the date and amount of material **removed** in tonnage and volume (m^3); and e) the methodology used to calculate tonnage and volume of material **removed**; and f) the date, tonnage and volume of material **placed** at the placement site; and g) a survey, prepared by an **appropriately qualified person**, of the placement site and the surrounding adjacent area likely to be affected by the placement. a) the date and amount of material **removed** in tonnage and volume (m^3); and b) the methodology used to calculate tonnage and volume of material **removed**; and c) the date, tonnage and volume of material **placed** at the placement site.
WASTE	
WS1	All waste generated in carrying out the **activity** must be reused, recycled or removed to a facility, that can lawfully accept the waste.
NOISE	
N1	Noise generated by the **activity** must not cause **environmental nuisance** to any **sensitive place** or **commercial place**.
AIR	
A1	Other than as permitted within this environmental authority, odours or airborne contaminants must not cause environmental nuisance to any **sensitive place** or **commercial place**.

LAND	
L1	Treatment and management of acid sulfate soils must comply with the guidance provided in the current edition of the *Queensland Acid Sulfate Soil Technical Manual*.
L2	Placement of **dredged material** must occur in a way that creates a safe, stable, non-polluting landform.
L3	Land that has been disturbed for activities conducted under this environmental authority must be rehabilitated in a manner such that: 1. suitable native species of vegetation for the location are established and sustained for earthen surfaces; 2. potential for erosion is minimised; 3. the quality of water released from the site, including seepage, does not cause environmental harm; 4. potential for environmental nuisance caused by dust is minimised; 5. the water quality of any residual water body does not have potential to cause environmental harm; 6. the final landform is stable and protects public safety.
L4	Other than as permitted within this environmental authority, contaminants must not be released to **land**.
Water	
WT1	Contaminants must not be released during transfer from the site of dredging to the placement site.
WT2.0	**Point source releases** Contaminants generated by the dewatering or treatment of dredged material must not be released to waters unless the contaminants being released: a) are only released from the release points specified in *Table 1 – Contaminant release points and release limits to water* b) comply with the release limits (limit and type) for each quality characteristic specified in *Table 1 – Contaminant release points and release limits to water*; and c) are monitored at the minimum monitoring frequency for each quality characteristic specified in *Table 1 – Contaminant release points and release limits to water*; and

Table 1 – Contaminant release points and release limits to water

Release Point	Quality characteristic	Release Limit		Minimum monitoring frequency**
		limit	type	
Immediately downstream of temporary berm 2 (GDA2020 latitude -21.16824 longitude 149.19218)	pH	6.5 – 8.4	%	Representative sample prior to each release
	Dissolved Oxygen (DO)	80 - 105	%	
	Turbidity	<10	NTU	
	slick or other visible evidence of	Not visible or otherwise noticeable		

	<table><tr><td></td><td>oil or grease, visible floating oil, grease, scum, litter or other visually objectionable matter.</td><td></td><td></td></tr></table> ***Associated monitoring requirements*** 1. *Monitoring must be conducted in accordance with the methods prescribed in the current edition of the **administering authority's*** Monitoring and Sampling Manual 2009. 2. *Water quality samples must be representative of water being tested.* 3. *All determinations must employ an analytical practical quantification limits of sufficient sensitivity to enable reliable comparisons to be made against the assessment criteria relevant to the particular water quality characteristic.* 4. *Monitoring must be undertaken during a release as per the frequency stated.* 5. *All monitoring devices must be correctly calibrated and maintained.*
WT2.1	Releases to surface waters must not cause: a) erosion of the bed and banks of the receiving waters; and/or b) disturbance to vegetation; and/or c) a build-up of sediment.
WT3.0	**Stormwater** Stormwater must be managed to: a) prevent stormwater from being contaminated by the activity; or b) direct stormwater that is contaminated by the activity to stormwater treatment and retention measures.
WT3.1	Stormwater treatment and retention measures must have capacity to retain stormwater runoff from disturbed areas generated by a rainfall event up to and including a 24-hour rainfall event with an Annual Exceedance Probability (AEP) of 10%.
WT3.2	Stormwater may only be released to waters where: a) beneficial reuse of contained stormwater runoff on site is not viable; and b) the release is necessary to maintain stormwater retention capacity required by condition DW3.1; and c) the release is in accordance with condition WT2.0.
WT4	**Groundwater** Contaminants must not be released to groundwater.
WT5.0	**Rehabilitation** Works undertaken for dewatering or treatment of dredged material must be rehabilitated in a manner that: a) The potential for erosion and sedimentation is minimised; and b) The potential for environmental nuisance caused by dust is minimised; and c) Land and water do not contain contaminants capable of causing environmental harm; and d) The landform is in stable condition; and e) The top layer of the soil profile is re-instated consistent with surrounding soils; and f) The land is re-profiled to original contours and established drainage lines; and g) The land is vegetated with groundcover that is established, actively growing, self-sustaining and is not a declared pest species.
WT5.1	Rehabilitation of disturbed areas required under condition **WT5.0**, must commence within 12 months of the area becoming no longer required for dewatering or treatment of dredged material.

Definitions

Key terms and/or phrases used in this document are defined in this section. Where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

Activity means the environmentally relevant activities, whether resource activities or prescribed activities, to which the environmental authority relates.

Administering authority means the Department of Environment and Science or its successor or predecessors.

Alert level represent tiers in a hierarchy of increasing environmental risk and are defined by trigger values. Three alert levels (low, moderate, and high) are typically used in a management action framework to indicate adverse conditions and guide management responses that aim to prevent and minimise environmental harm.

Appropriately qualified person(s) means a person or persons who has professional qualifications, training, skills or experience relevant to the EA requirement and can give authoritative assessment, advice and analysis in relation to the EA requirements using the relevant protocols, standards, methods or literature.

Baseline-based assessment means the dredge management plan involves a monitoring result assessment methodology that uses assessment criteria developed from a pre-disturbance baseline data collection phase.

Capital dredging—

(a) means **dredging** carried out for the purpose of**—**

(i) creating or enlarging a channel, basin, port, berth or other similar thing; or

(ii) removing material that is unsuitable as a foundation for a **port facility**; or

(iii) creating a trench for a pipe, cable or tube; or

(iv) an activity incidental to an activity mentioned in subparagraph (i) to (iii); but

(b) does not include **dredging** carried out for the purpose of**—**

(i) maintaining a channel, basin, port, berth or other similar thing for its intended use; or

(ii) protecting human life or property.

Commercial place means a place used as a workplace, an office or for business or commercial purposes and includes a place within the curtilage of such a place reasonably used by persons at that place.

Concern site means a site where a sensitive receptor occurs within the zone of influence of a sediment plume.

Continuous visual monitoring means visual appraisal of the sediment plume extent and intensity as performed by the dredge crew throughout the day on an ad hoc basis (i.e. whenever it is safe and non-disruptive to do so). The continuous visual monitoring requirement is intended to facilitate an early response feature in the **dredge management plan**, so that the dredge operator remains cognisant of the extent and intensity of the sediment plume being generated and reacts according to the **dredge management plan** accordingly. This requirement must be supplemented with empirical data (e.g. photography, when water quality instruments are not in use) taken at key indicative points in the tidal cycle (where applicable) to demonstrate the extent and intensity of the sediment plume.

Continuous visual monitoring means visual appraisal of the sediment plume extent and intensity as performed by the dredge crew throughout the day on an ad hoc basis (i.e. whenever it is safe and non-disruptive to do so). The continuous visual monitoring requirement is intended to facilitate an early response feature in the **dredge management plan**, so that the dredge operator remains cognisant of the extent and intensity of the sediment

plume being generated and reacts according to the **dredge management plan** accordingly. This requirement must be supplemented with empirical data (e.g. photography, when water quality instruments are not in use) taken at key indicative points in the tidal cycle (where applicable) to demonstrate the extent and intensity of the sediment plume.

Control site refers to a monitoring site located beyond the anticipated **zone of influence** of sediment plumes and has **site pairing** with one or more **test sites** or **sentinel sites**. In monitoring programs, **control sites** serve the same role as do **reference sites** but only for a defined subset of parameters.

Disturbed areas includes areas: 1. that are susceptible to erosion; 2. that are contaminated by the activity; and/or 3. upon which stockpiles of soil or other materials are located.

Dredge footprint is the area being dredged including batters.

Dredged material means mud, sand, coral, shingle, gravel, clay, earth and other material removed by dredging. Dredged material includes dredge spoil and extracted quarry material.

Dredging means the mechanical removal of material from below naturally occurring surface waters. It excludes minor adjustments to the bed surface to level troughs and peaks and where bed material is only redistributed locally (bed levelling).

Environmental harm as defined in Chapter 1 of the *Environmental Protection Act 1994* – is any adverse effect, or potential adverse effect 9whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.

Environmental nuisance as defined in Chapter 1 of the *Environmental Protection Act 1994*. PD208 - Environmental value – • a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or • another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.

Event-based actions refers to management responses (e.g. an increased level of monitoring) initiated in following 'an event', with the event being defined in the **dredge management plan** (e.g. 'an event' can occur when monitoring results indicate an exceedance of an adopted **trigger value**, or a non-compliance with the environmental authority condition).

Groundwater means water that occurs naturally in, or is introduced artificially into, an aquifer.
Land means any land, whether above or below the ordinary high-water mark at spring tides (i.e. includes **tidal land**).

High Ecological Value (HEV) is the 'management intent' for the 'ecosystem condition' as defined in Schedule 1 of the Environmental Protection Policy (Water) 2019 for scheduled waters, or the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC & ARMCANZ 2000) for non-scheduled waters. HEV ecosystems are intact and typically exhibit relatively insignificant levels of anthropogenic impacts.

Measures has the broadest interpretation and includes:

- Procedural measures such as standard operating procedures for dredging operations, environmental risk assessment, management actions, departmental direction and competency expectations under relevant guidelines
- Physical measures such as plant, equipment, physical objects (such as bunding, containment systems etc.), ecosystem monitoring and bathymetric surveys.

NATA means National Association of Testing Authorities.

New dredging activity means a dredging activity that is currently not underway, the next stage of a dredging campaign that is currently underway, or a discretely separate area in a larger dredge campaign that is currently underway.

Nominated delegate means another government agency that provides services to the administering authority. Noxious means harmful or injurious to health or physical well-being. Offensive means causing offence or displeasure; is unreasonably disagreeable to the senses; disgusting, nauseous or repulsive.

Port facility means a facility or land used in the operation or strategic management of a port authority's port. Port facility does not include a small-scale port facility to be used for a tourism or recreation purpose. Examples of a small-scale port facility—boat ramp, boat harbour, marina. Prescribed water contaminants means contaminants listed within Schedule 10 of the Environmental Protection Regulation 2019.

Records include breach notifications, written procedures, analysis results, monitoring reports and monitoring programs required under a condition of this authority.

Reference site refers to a monitoring site located not only beyond the anticipated **zone of influence** of a sediment plume, but also beyond other sources of environmental impacts, and has **site pairing** with one or more **test sites** or **sentinel sites**. In monitoring programs, reference sites serve the same role as do control sites but can generally be suitable for a broader set of parameters.

Release of a contaminant into the environment means to:

- deposit, discharge, emit or disturb the contaminant
- cause or allow the contaminant to be deposited, discharged, emitted or disturbed
- fail to prevent the contaminant from being deposited, discharged emitted or disturbed
- allow the contaminant to escape
- fail to prevent the contaminant from escaping.

Restricted area means an area that is within the Great Barrier Reef World Heritage Area but outside the Commonwealth marine park.

> Note—See the Commonwealth *Marine Park Act* for prohibitions relating to the Commonwealth marine park and Great Barrier Reef Region under that Act.

Sediment plume-associated impacts are impacts associated with sediment plumes including turbidity and suspended solids concentrations, light attenuation or sedimentation rates elevated above either **control site** or **reference site** readings or baseline conditions for an equivalent time of year. Where **dredge material** possesses acid sulfate soil-related properties, sediment plume-associated impacts may also include pH, dissolved oxygen and metal and metalloid-related toxicity impacts.

Sensitive place includes the following and includes a place within the curtilage of such a place reasonably used by persons at that place:

1. a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
2. a motel, hotel or hostel; or
3. a kindergarten, school, university or other educational institution; or
4. a medical centre or hospital; or
5. a protected area under the Nature Conservation Act 1992, the Marine Parks Act 2004 or a World Heritage Area; or
6. a public park or garden; or

7. for noise, a place defined as a sensitive receptor for the purposes of the *Environmental Protection (Noise) Policy 2019.*

Sensitive receptor includes biological sensitive receptors together with other environmental values sensitive to the effects of dredge-generated **sediment plume-associated impacts**.

Slightly disturbed is the 'management intent' for the 'ecosystem condition' as defined in Schedule 1 of the Environmental Protection (Water and Wetland Biodiversity) Policy 2019. Slightly disturbed ecosystems should generally be regarded as **high ecological value** ecosystems in all respects except for some relatively minor disturbances (usually water-quality related e.g. nutrient concentrations exceeding the water quality objective).

Spot-checking refers to a non-continuous monitoring approach performed at a fixed distance and direction from a mobile impact source (in the context of this guidance, dredging vessels) or at other key points of interest. Spot-checking may be routine or **event-based**, and may also include monitoring at fixed monitoring sites, such as **reference sites** or **control sites** and **test sites** or **sentinel sites**, although the same sites need not necessarily be monitored on every sampling event.

Suitable in this instance means the dredged material must meet the backfill material specifications

Test site is a **concern site** that functions as a test point for compliance, is a monitoring site situated within the area where a **sensitive receptor** occurs and where environmental monitoring-related assessment criteria (e.g. **trigger values**) apply.

Tidal land means land that is submerged at any time by tidal water.

Trigger values are physicochemical, parameter-specific measurement values used to indicate a condition where an environmental value or sensitive receptor may be at low, moderate or high risk, or some other risk-related indicator.

Waters includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water, natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

Waters includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water, natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

You means the holder of the environmental authority.

Zone of Influence of a sediment plume is, in its broadest application, defined by the **dredge footprint** and the area beyond the **dredge footprint** where at least some level of **sediment plume-associated impacts** are expected to occur. The overall zone of influence may be broken down into more risk-relevant sub-categories, such as the Zone of Unavoidable Loss (the **dredge footprint** and immediately adjacent areas), the Zone of Moderate Impact, or the Zone of Marginal Impact, with each zone being defined according to its purpose or role in environmental management.

Appendices

Appendix 1: General Arrangement Plan prepared by AECOM dated 19/09/2023, reference A1-35981, revision C.

Appendix 2: Demolition, Services Plan, Asbestos Register & Survey Setout prepared by AECOM dated 19/09/2023, reference A1-35982, revision C.

Appendix 3: Structural Notes Sheet 1 of 2 prepared by AECOM dated 31/05/2023, reference A1-35983, revision B.

Appendix 4: Structural Notes Sheet 2 of 2 prepared by AECOM dated 31/05/2023, reference A1-35984, revision B.

Appendix 5: Typical Sections, Details & Notes Sheet 1 of 3 prepared by AECOM dated 19/09/2023, reference A1-35985, revision C.

Appendix 6: Typical Sections, Details & Notes Sheet 2 of 3 prepared by AECOM dated 19/09/2023, reference A1-35986, revision C.

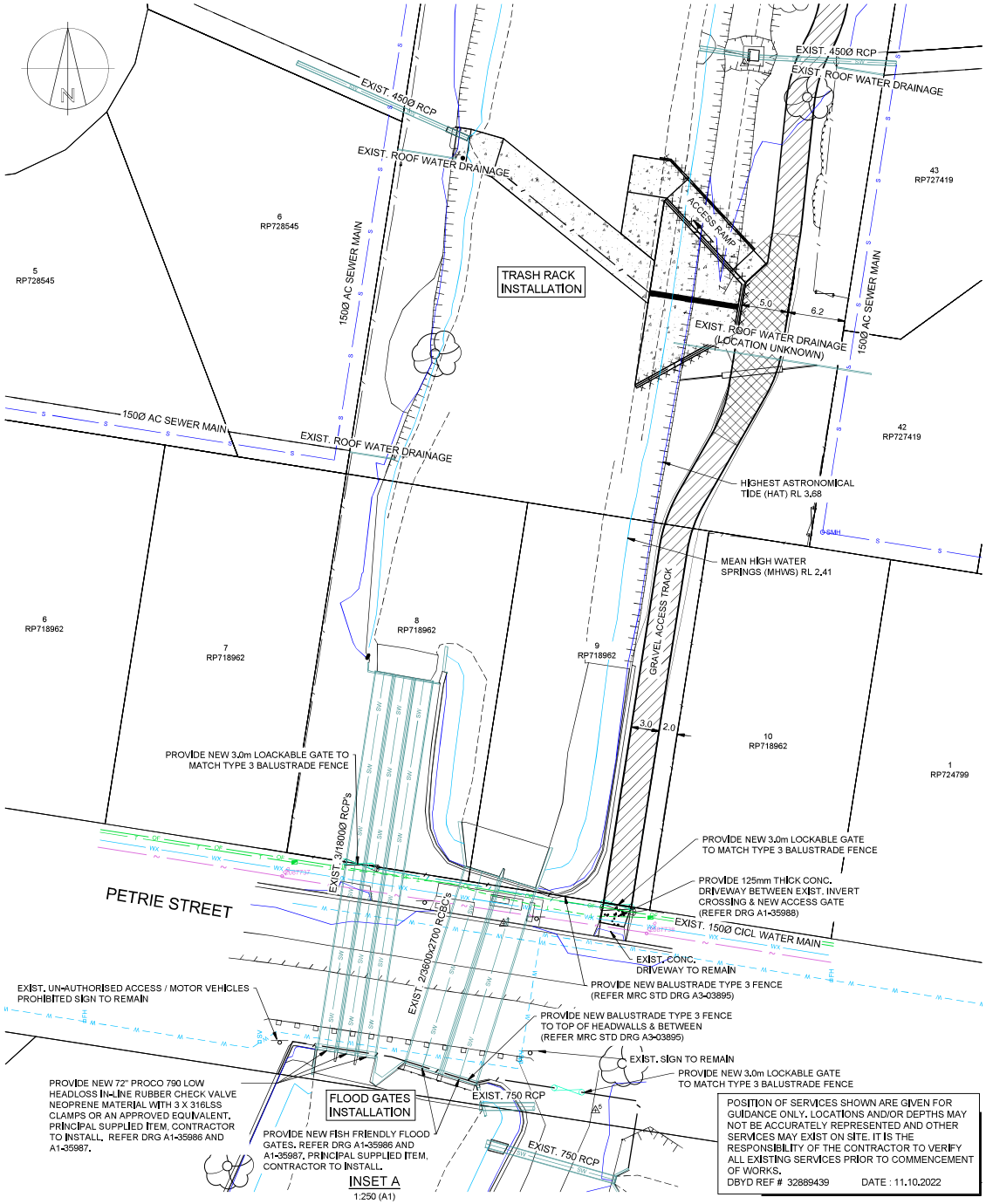
Appendix 7 Typical Sections, Details & Notes Sheet 3 of 3 prepared by AECOM dated 19/09/2023, reference A1-35987, revision C.

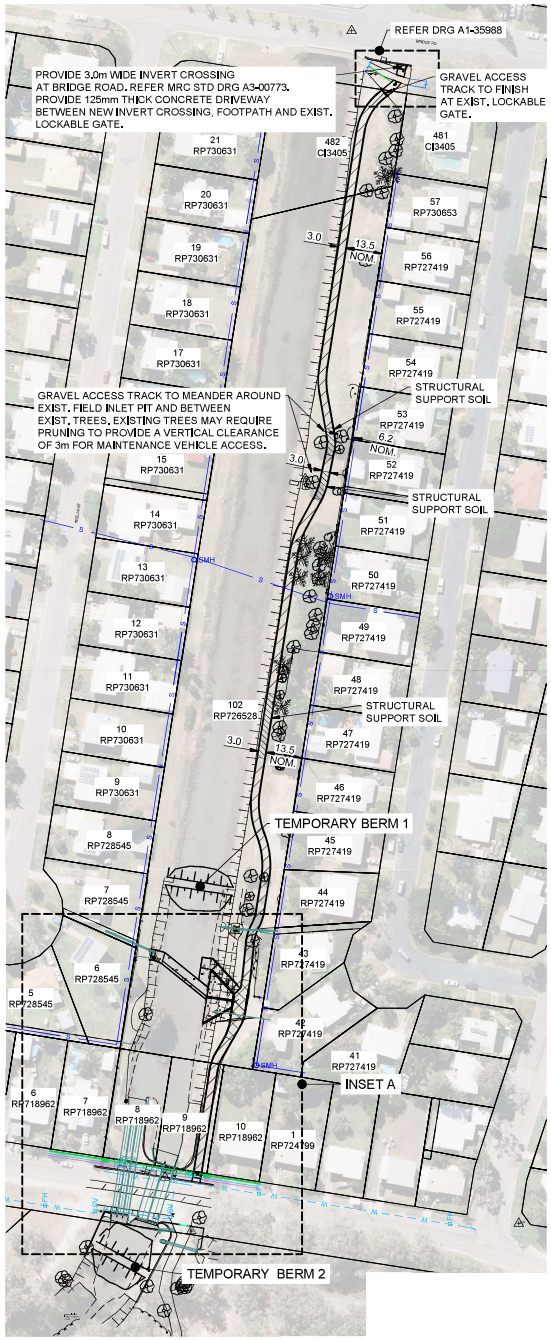
Appendix 8: Retaining Wall Setout Plan prepared by AECOM dated 19/09/2023, reference A1-35989, revision C.

Appendix 9: Levels Plan prepared by AECOM dated 19/09/2023, reference A1-35990, revision C.

END OF ENVIRONMENTAL AUTHORITY

Appendix 1





PLAN
1:1000 (A1)

POSITION OF SERVICES SHOWN ARE GIVEN FOR GUIDANCE ONLY. LOCATIONS AND/OR DEPTHS MAY NOT BE ACCURATELY REPRESENTED AND OTHER SERVICES MAY EXIST ON SITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS.
DBYD REF # 32889439 DATE : 11.10.2022

LEGEND

- NEW CONCRETE ACCESS RAMP / TRASH RACK FLOOR
- NEW CONCRETE DRIVEWAY
- ROCK SCOUR PROTECTION
- GRAVEL ACCESS TRACK (3.0m WIDE, 100mm THICK SUBBASE TYPE 2.3)
- STRUCTURAL SUPPORT SOIL
- GRAVEL HARDSTAND, 200mm THICK SUBBASE TYPE 2.3
- PROPERTY BOUNDARY
- ELECTRICITY O/H EXISTING
- SEWER EXISTING
- TELSTRA EXISTING
- WATER EXISTING
- NEW TYPE 3 BALUSTRADE FENCE
- TELSTRA PIT
- PP POWER POLE
- PLP POWER POLE WITH LIGHT
- SMH SEWERAGE MANHOLE
- FH FIRE HYDRANT
- SV SLUICE VALVE
- SURVEY STATION
- GATE EXISTING
- STREET SIGN EXISTING
- RETAINING WALL
- TREE EXISTING
- HIGHEST ASTRONOMICAL TIDE LEVEL
- MEAN HIGH WATER SPRINGS LEVEL

GENERAL NOTES:

1. LEVEL DATUM : VIDE PM66479 - (DDR & CONC. COLLAR AT CNR PETRIE ST & BEVERLEY ST) RL 3.596 (3rd ORDER)
2. CONSTRUCTION UNDER TRAFFIC. TRAFFIC MANAGEMENT TO BE IN ACCORDANCE WITH THE CURRENT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PART 3, WORKS ON ROAD.
3. CONTRACTOR IS TO LIAISE WITH APPOINTED SURVEYOR REGARDING AMENDMENTS TO EXISTING SURVEY MARKS.
4. ALL DISTURBED AREAS TO BE REVEGETATED AFTER FINAL EARTHWORKS.
5. THE CONTRACTOR IS TO DEVELOP A SITE SPECIFIC EROSION & SEDIMENT CONTROL PLAN IN ACCORDANCE WITH CURRENT COUNCIL & STATE GOVERNMENT POLICIES. REFER MRC STD DRGS A1-27001 TO A1-27006 FOR FURTHER DETAILS.
6. REFER A1-35985 TO A1-35987 FOR TYPICAL SECTIONS.
7. HEIGHTS, CHAINAGES AND CO-ORDINATES ARE ALL IN METRES. ALL OTHER DIMENSIONS ARE IN MILLIMETRES U.N.O.
8. REFER A1-35982 FOR DEMOLITION / SERVICES PLAN, ASBESTOS REGISTER AND SURVEY SETOUT PLAN.
9. THERE IS TO BE NO EXCAVATION DOWNSTREAM OF TEMPORARY BERM 2.
10. ALL WORKS ALONG DRAIN ACCESS TRACK TO DRAIN FREELY TO PETRIE ST DRAIN & EXIST. FIELD INLET PIT.
11. BERMS CONSTRUCTED TO PROVIDE IMMUNITY FOR TIDAL FLOW ONLY. WORKS TO BE CONSTRUCTED IN DRY SEASON.

    TIDAL PLANE TO AHD:
    HIGHEST ASTRONOMICAL TIDE (HAT) 3.68
    MEAN HIGH WATER SPRINGS (MHWS) 2.41
    MEAN LOW WATER SPRINGS (MLWS) -2.15
    LOWEST ASTRONOMICAL TIDE (LAT) -2.71
    BERM HEIGHT = RL 3.0
12. STRUCTURAL SUPPORT SOILS TO BE PROVIDED WITHIN TPZ ZONES ALONG PROPOSED MAINTENANCE TRACK (REFER TO ARBORIST REPORT). THIS PRODUCT MUST BE SUITABLE FOR ADVANCED TREE PLANTING IN URBANISED ENVIRONMENT. IT SHOULD HAVE NOMINAL:
    - 63mm HARD ROCK AGGREGATE (BASALTS OR GRANITE)* - 80% BY VOLUME
    - CLAY LOAM / SANDY CLAY / CLAY - 20% BY VOLUME

    * THE AGGREGATE (NOMINAL 63mm SIZE) MUST BE FREE-DRAINING GRANULAR MATERIAL CAPABLE OF SUSTAINING THE ANTICIPATED LOAD BEARING REQUIREMENTS OF THE PAVEMENT. AS A GUIDE, AN AGGREGATE THAT CONFORMS TO THE REQUIREMENTS OF AS2758.7 FOR CLASS L 60mm IS RAILWAY BALLAST.
    STRUCTURAL SOILS MUST BE UNIFORMLY BLENDED MIXTURE OF AGGREGATE AND CLAY LOAM AND ARE PRONE TO SEGREGATION DURING HANDLING AT THE SOURCE AND DURING TRANSPORT. PARTICULAR CARE MUST BE TAKEN TO ENDURE THAT ALL STRUCTURAL SOIL IS THOROUGHLY HOMOGENISED BEFORE PLACEMENT AND COMPACTION, TO ASSIST THIS, AND TO PREVENT SEGREGATION, ENSURE THAT THE MIXTURE REMAINS MOIST AT ALL TIMES DURING MIXING, TRANSPORT, STORAGE AND PLACEMENT. PRODUCT MUST BE FREE OF UNWANTED MATERIALS I.E. FREE OF STONE AND GRAVEL GREATER THAN 8mm AND BE FREE FROM TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH.

AECOM
AECOM Australia Pty Ltd A.B.N. 20 093 846 925
THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM AUSTRALIA QUALITY ASSURANCE SYSTEM CERTIFIED TO AS/NZS ISO 9001:2015
AECOM NUMBER 60694097

NO.	DATE	DESCRIPTION	DRAWN	APPROVED
C	19/09/23	FOR CONSTRUCTION	LNR	
B	31/5/23	FOR CONSTRUCTION	LNR	CAF
A	20/06/17	FOR CONSTRUCTION	KHS	SMR

AMENDMENTS AND REVISIONS

SURVEYED BY R.JANKER (MRC)
SURVEY FILE No 273502, 273506
LEVEL DATUM A.H.D.
HOR. DATUM / DATE MGA 55 RTK GPS
SCALES (A1) 1:250 1:1000
FOR BEST RESULTS PRINT THIS PLAN IN COLOUR. THIS TEXT WILL PRESENT IN RED.

DRAWN	AECOM	SIGNED AECOM	DATE 20/06/17
DESIGNED	AECOM	SIGNED AECOM	DATE 20/06/17
CHECKED	AECOM	SIGNED AECOM	DATE 20/06/17
MANAGER / CO-ORDINATOR ORIGINALLY SIGNED BY:	GRAEME HAWES		28/6/2017
	GRAEME HAWES		DATE

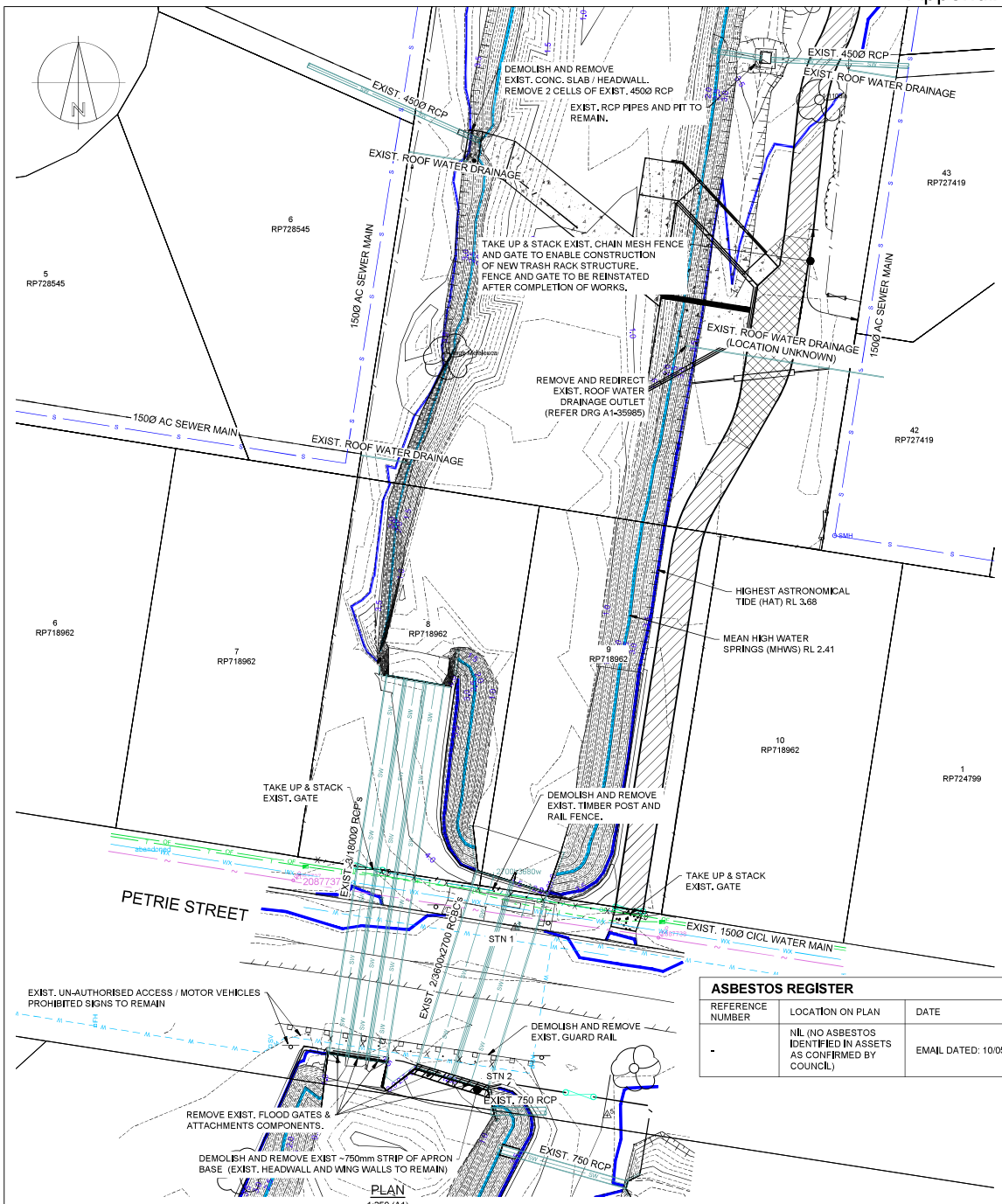
ASSET OWNER ORIGINALLY SIGNED BY:
JASON DEVITT 28.06.17
JASON DEVITT DATE
CERTIFIED
SHANE RITCHIE 20/06/17
SHANE RITCHIE RPEQ 10823 DATE

Mackay REGIONAL COUNCIL

PETRIE STREET CULVERTS
SOUTH EAST MACKAY MAIN DRAIN
GENERAL ARRANGEMENT PLAN

SHEET 2 OF 13
WORKS JOB No. 57282
DRAWING No. A1-35981
AMEND. C

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PLAN
1:250 (A1)

LEGEND

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- RETAINING WALL
- TREE EXISTING
- HIGHEST ASTRONOMICAL TIDE LEVEL
- MEAN HIGH WATER SPRINGS LEVEL

SERVICES NOTES:

1. A DIAL BEFORE YOU DIG (DBYD) SEARCH HAS BEEN UNDERTAKEN FOR THIS SITE. THE SERVICES SHOWN ARE GIVEN FOR GUIDANCE ONLY. LOCATIONS AND/OR DEPTHS MAY NOT BE ACCURATELY REPRESENTED AND OTHER SERVICES MAY EXIST ON SITE. REF NO. 32889439 DATE: 11/10/2022
2. THE CONTRACTOR SHALL PERFORM A DBYD SEARCH AND VERIFY THE POSITION OF ALL SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS.
3. NO WORKS SHALL BE UNDERTAKEN WITHIN 3m OF ANY SERVICE WITHOUT FIRST CONSULTING WITH THE RELEVANT SERVICE AUTHORITY (OR OWNER).
4. ALL RELEVANT WORKS SHALL BE DONE IN ACCORDANCE WITH THE SERVICE AUTHORITIES ADVICE.
5. A TELSTRA REPRESENTATIVE MUST BE PRESENT WHEN EXCAVATING NEAR EXISTING TELSTRA CABLES. CONTACT MR KEVIN EVANS, COMMERCIAL WORKS SPECIALIST AT TELSTRA. PHONE 0429 618 749. EMAIL: Kevin.L.Evans@team.telstra.com
6. ERGON CONTACT: JADE HAMMER, DESIGN TECHNICAL OFFICER MACKAY. PHONE: (07) 4957 1433 EMAIL: jade.hammer@ergon.com.au

SURVEY MARK SETOUT TABLE

PT No.	SURVEY No.	EASTING	NORTHING	LEVEL (m)	COMMENT
1	STN 1	727660.421	7657709.802	3.740	GI Nail in invert of kerb nth side of Petrie St at cen of culvert
2	STN 2	727656.497	7657694.374	3.838	GI Nail in Dumpy Peg sth side of Petrie St culvert
3	STN 3	727686.277	7657802.118	3.278	GI Nail conc Stm Wtr inlet
66479	PM 66479	727792.907	7657692.550	3.596	DDM NE cnr of Beverley St and Petrie St

ASBESTOS REGISTER

REFERENCE NUMBER	LOCATION ON PLAN	DATE	ASSET OWNER	TYPE OF ASBESTOS	FRIABLE OR NON-FRIABLE	CONDITION	ACCESSIBLE/ INACCESSIBLE	CONFIRMED / PRESUMED	ACTION	ACTION BY
-	NIL (NO ASBESTOS IDENTIFIED IN ASSETS AS CONFIRMED BY COUNCIL)	EMAIL DATED: 10/05/2017	-	-	-	-	-	-	-	-

POSITION OF SERVICES SHOWN ARE GIVEN FOR GUIDANCE ONLY. LOCATIONS AND/OR DEPTHS MAY NOT BE ACCURATELY REPRESENTED AND OTHER SERVICES MAY EXIST ON SITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS.
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DEMOLITION, SERVICES PLAN, ASBESTOS REGISTER & SURVEY SETOUT

SHEET 3 OF 13
WORKS JOB No. 57282
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AMEND. C

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GENERAL NOTES

G1. REFER ANY DISCREPANCY, AMBIGUITY, OMISSION OR INCONSISTENCY TO THE CONTRACT ADMINISTRATOR BEFORE PROCEEDING WITH THE WORK.

G2. DO NOT OBTAIN DIMENSIONS BY SCALING THE STRUCTURAL ELEMENTS.

G3. VERIFY ALL SETTING OUT DIMENSIONS WITH THE CONTRACT ADMINISTRATOR.

G4. SETTING OUT DIMENSIONS SHALL BE VERIFIED ON SITE BY THE CONTRACTOR PRIOR TO CONSTRUCTION/FABRICATION, WHO SHALL BE RESPONSIBLE FOR THEIR CORRECTNESS.

G5. DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.

G6. SERVICES SHOWN ON DRAWINGS ARE INDICATIVE ONLY. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS, THE CONTRACTOR IS TO IDENTIFY ALL EXISTING SERVICES. ANY DAMAGES TO THE EXISTING SERVICES ARE TO BE RECTIFIED AT THE CONTRACTOR'S EXPENSE.

G7. DURING CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE STRUCTURES AND EXCAVATIONS ARE MAINTAINED IN A SAFE AND STABLE CONDITION AT ALL TIME AND NO PART IS TO BE OVERSTRESSED. THE CONTRACTOR SHALL DEVELOP WORK METHOD STATEMENTS FOR ALL ERECTION OF STRUCTURAL STEEL/FORMWORK/ DEMOLITION/EXCAVATION/TILT PANELS ETC. AND PROVIDE TEMPORARY WORKS SUCH AS BRACING, PROPPING AND SHORING ETC. TO KEEP THE WORKS AND EXCAVATIONS STABLE AND FREE FROM WATER AT ALL TIMES. THE CONTRACTOR IS TO ENGAGE AN NPER REGISTERED STRUCTURAL ENGINEER TO DESIGN AND CERTIFY THE TEMPORARY WORKS.

G8. REDUCED LEVELS AND GRID DIMENSIONS SHOWN IN THESE DRAWINGS ARE APPROXIMATE ONLY AND ARE FOR THE SOLE PURPOSE OF ASSISTING THE STRUCTURAL DOCUMENTATION. THEY MUST NOT BE USED FOR CONSTRUCTION. REFER TO ARCHITECT'S DRAWINGS FOR ALL CONSTRUCTION REDUCED LEVELS.

G9. ALL PROPRIETARY PRODUCTS ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS UNLESS NOTED OTHERWISE.

G10. WHERE STRUCTURAL INSPECTIONS ARE REQUIRED FOR CERTIFICATION, THE INSPECTIONS ARE TO BE PERFORMED BY THE STRUCTURAL ENGINEER, THE CONTRACTOR IS REQUIRED TO ALLOW TIME FOR THE STRUCTURAL ENGINEER TO INSPECT AT THE FOLLOWING POINTS: COMPLETED EXCAVATION, FORMWORK, REINFORCEMENT, MEMBRANES AND EMBEDMENT PRIOR TO PLACING CONCRETE, COMPLETED ERECTED STRUCTURAL ELEMENTS PRIOR TO PLACING COVERING (UNLESS COVERED BY AS1684 RESIDENTIAL TIMBER-FRAMED CONSTRUCTION).

LOADING NOTES

L1. ALL LOADINGS HAVE BEEN ASSESSED IN ACCORDANCE WITH AS1170.0:2002 AND THE NATIONAL CONSTRUCTION CODE (NCC)

L2. THE STRUCTURAL COMPONENTS IN THESE DRAWINGS HAVE BEEN DESIGNED FOR THE FOLLOWING LOADINGS:

a) DESIGN TRAFFIC LOAD:

FLOOR USAGE / DESCRIPTION	PERMANENT ACTIONS	IMPOSED ACTIONS	
	SUPERIMPOSED DEAD LOAD (kPa)	UNIFORM LIVE LOAD (kPa)	CONCENTRATED ACTIONS (kN)
12t CRANE	**1.0**	**15**	**150kN**

b) CONCRETE UNIT WEIGHT (INCLUDING STEEL REINFORCEMENT): 25 kN/m^3 (IN-SITU)

c) EARTH PRESSURE: UNIT WEIGHT 22 kN/m^3, SOIL INTERNAL FRICTION ANGLE = 30

d) SURCHARGE: WALL - 10 kPa

FOOTING NOTES

F1. FOOTINGS HAVE BEEN DESIGNED FOR AN ULTIMATE BEARING PRESSURE OF 200 kPa OR AS SHOWN ON THE FOOTING DRAWINGS, FOUNDED ON RESIDUAL SOIL/ENGINEERED FILL. THE CONTRACTOR SHALL ENGAGE AN RPEQ GEOTECHNICAL ENGINEER TO VERIFY THAT THE GROUND AT EACH FOOTING IS CAPABLE OF CARRYING THIS PRESSURE.

F2. ALL FOOTING EXCAVATIONS SHALL BE CLEANED OF LOOSE MATERIAL AND WATER PRIOR TO CASTING FOOTINGS.

F3. REFER TO THE FOLLOWING GEOTECHNICAL REPORTS:
i) REPORT No. **U24208 FACTUAL REPORT ON GEOTECHNICAL INVESTIGATION.** DATED: **MARCH 2016** BY: **CARDNO**

F4. UNLESS OTHERWISE NOTED ON THE DRAWINGS, LOCATE ALL PIPES, RETAINING WALLS AND EXCAVATIONS OUTSIDE THE ZONE OF INFLUENCE FROM THE BOTTOM EDGE OF THE FOOTING.

F5. WHERE SIDE SHEAR IS REQUIRED TO BE DEVELOPED, CLEAN AND ROUGHEN THE SIDES OF THE EXCAVATION TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR. WHERE VERIFIED FOUNDATION MATERIAL IS LOWER THAN THE UNDERSIDE OF FOOTINGS AS DETAILED, BACKFILL ADDITIONAL EXCAVATION WITH 10 MPa MASS CONCRETE.

F6. FOOTINGS TO BE CONSTRUCTED AND BACKFILLED AS SOON AS POSSIBLE FOLLOWING EXCAVATION TO AVOID SOFTENING OR DRYING OUT BY EXPOSURE.

F7. THE CONTRACTOR IS TO ALLOW FOR COST OF GEOTECHNICAL INSPECTIONS.

SLAB ON GROUND NOTES

SG1. BEFORE PLACING FILL, PROOF ROLL EXPOSED SUBGRADE WITH 6 PASSES OF A 10-TONNE MINIMUM ROLLER TEST SUBGRADE AND THEN REMOVE SOFT SPOTS (AREAS WITH MORE THAN 3mm MOVEMENT UNDER ROLLER). SOFT SPOTS TO BE REPLACED WITH SELECT FILL AS PER TABLE:

SIEVE APERTURE (mm) TO AS1152:1993	PERCENTAGE PASSED (BY MASS)
75.0	100
9.5	50-100
2.36	30-100
0.6	15-60
0.075	<25

PLASTICITY INDEX TO BE > OR = 2% AND < OR = 15%
NO DISPERSIVE (A RATING OF NIL AS DIRECTED BY THE "DISPERSION" TEST IN AS1289.3.8.1:2006)

SG2. COMPACT FILL AREAS AND SUBGRADE UNDER CONCRETE WORKS AND PAVEMENTS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS1289.5.1.1:2003.

SG3. ALL BASE COURSE MATERIAL TO COMPLY WITH RELEVANT GOVERNMENT SPECIFICATIONS AND COMPACTED TO MINIMUM 98% MODIFIED STANDARD DRY DENSITY IN ACCORDANCE WITH AS1289.5.2.1:2003.

REINFORCEMENT NOTES

R1. SYMBOLS ON DRAWINGS FOR GRADE AND STRENGTH OF REINFORCEMENT ARE:

- N DENOTES GRADE D500N HOT-ROLLED DEFORMED REINFORCEMENT BAR TO AS/NZS 4671:2019.
- SL DENOTES GRADE 500L WELDED WIRE REINFORCEMENT MESH TO AS/NZS 4671:2019.
- L DENOTES GRADE D500L STEEL REINFORCEMENT TO AS/NZS 4671:2019.
- R DENOTES GRADE 250R PLAIN ROUND BAR REINFORCEMENT TO AS/NZS4671:2019.
- TM DENOTES HARD DRAWN STEEL TRENCH MESH, GRADE 500L TO AS/NZS 4671:2019.

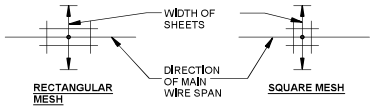
R2. BAR NOTATION GIVES THE FOLLOWING INFORMATION IN THIS ORDER:

NO OF BARS; GRADE; BAR SIZE (mm); SPACING (mm, IF REQUIRED); PLACING INFORMATION EG, 20-N16-200 BTM.

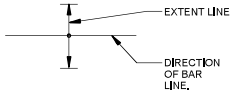
R3. MESH NOTATION GIVES THE FOLLOWING INFORMATION IN THIS ORDER:

SL OR RL SYMBOL; AS REFERENCE NUMBER IF STANDARD MESH OR SPECIAL CODE IF NON-STANDARD MESH; PLACING INFORMATION. EG, RL918 TOP.

R4. MAIN WIRES OF MESH AND COVERAGE OF SHEETS SHOWN IN PLAN-VIEW AND ELEVATION THUS:



R5. EXTENT OF BARS AND MESH SHOWN THUS:



R6. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.

R7. REINFORCEMENT DIMENSIONS SHALL NOT BE SCALED.

R8. SPLICE REINFORCEMENT ONLY AT LOCATIONS SHOWN IN THE DRAWINGS. LAP LENGTH SHALL COMPLY WITH AS3600:2018.

REINFORCEMENT SHALL NOT BE SPLICED EXCEPT WHERE SHOWN IN THE DRAWINGS. IF SPLICES ARE NOT INDICATED IN THE DRAWINGS, SUITABLE LOCATIONS SHALL BE PROPOSED FOR WRITTEN APPROVAL BY STRUCTURAL ENGINEER. THE SPLICED LENGTH OF BARS SHALL BE AS GIVEN IN THE FOLLOWING TABLE, EXCEPT WHERE OTHER DIMENSIONS ARE STATED ON THE ACTUAL DETAIL:

TYPE OF MEMBER	TENSILE LAP LENGTH (mm) FOR GRADE 500N DEFORMED BARS.							
	N10	N12	N16	N20	N24	N28	N32	N36
SLAB OR WALL (WITH 300mm OR LESS DEPTH OF CONCRETE BELOW THE BAR) AND ALL VERTICAL BARS	400	500	750	1000	1250	1500	1800	2200

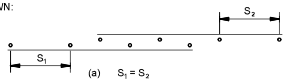
EMBEDMENT LENGTHS FOR STARTER BARS AND SPLICE LENGTHS FOR COLUMN BARS SHALL BE AS GIVEN IN THE FOLLOWING TABLE, EXCEPT WHERE OTHER DIMENSIONS ARE STATED ON THE ACTUAL DETAIL. THE DIMENSIONS IN THE TABLE ALSO INDICATE OVERALL ANCHORAGE (DEVELOPMENT) LENGTHS FOR STARTER / DOWEL BARS. ANY COGS USED SHALL BE DETAILED AS PER AS3600:2018.

BAR SIZE (mm)	SPLICE LENGTH (mm)	NUMBER OF FITMENTS AT COLUMN BAR CRANK
N10	400	1-R10
N12	500	1-R10
N16	650	1-R10
N20	800	2-R10
N24	1000	1-N12
N28	1150	2-N12
N32	1300	3-N12
N36	1450	3-N12

R9. REINFORCEMENT SHALL BE BENT COLD IN ACCORDANCE WITH AS3600:2009 EXCEPT WHERE APPROVED BY THE CONTRACT ADMINISTRATOR. NO REBENDING SHALL BE PERMITTED UNLESS APPROVED BY THE CONTRACT ADMINISTRATOR.

REINFORCEMENT NOTES (CONT')

R10. WHERE LAP IS SPECIFIED, MESH SHALL BE LAPPED SUCH THAT THE TWO OUTERMOST WIRES LAP WITH THOSE OF THE OTHER SHEET AS SHOWN:



ALL LAPS ARE TO BE WIRED TOGETHER AT 1000 CRS.

R11. ALL REINFORCEMENT IS TO BE ACCURATELY POSITIONED, ADEQUATELY SUPPORTED, AND THEN INSPECTED BY THE CONTRACT ADMINISTRATOR BEFORE ANY CONCRETE IS PLACED.

R12. WELDING OF REINFORCEMENT INCLUDING TACK-WELDING FOR FIXING PURPOSES SHALL COMPLY WITH AS3600:2018 AND AS1554.3:2014. WELDING IS PERMITTED ONLY WHERE SHOWN IN THE DRAWINGS OR WHERE OTHERWISE APPROVED BY THE CONTRACT ADMINISTRATOR.

R13. WHERE NO REINFORCEMENT IS SHOWN ON THE DRAWINGS AT RIGHT ANGLES TO THE MAIN REINFORCEMENT, PLACE N12-300 TRANSVERSE TO THE REINFORCEMENT SHOWN TO SUIT THE BAR LAYING SEQUENCE. ALL OPENINGS AND RE-ENTRANT CORNERS IN THE CONCRETE SHALL HAVE 2-N12 BARS x 1200 LONG TOP AND BOTTOM DIAGONALLY ACROSS THE CORNER.

R14. FIRST SLAB BAR IS TO BE POSITIONED MAX. 100mm FROM FACE OF BEAMS, R.C. WALLS AND SLAB THICKENINGS PARALLEL TO BAR. FIRST TIE TO BE PLACED MAX. 50mm FROM FACE OF COLUMN OR SUPPORTING WALL UNDER.

R15. REINFORCEMENT SHALL NOT BE CUT, BENT OR HEATED ON SITE WITHOUT THE CONTRACT ADMINISTRATOR'S PRIOR APPROVAL. DO NOT CUT REINFORCEMENT ON SITE TO CLEAR PENETRATIONS. DISPLACE REINFORCEMENT SLIGHTLY AS NECESSARY. MAINTAIN COVER DURING POUR.

R16. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON PLASTIC OR CONCRETE CHAIRS UNLESS NOTED OTHERWISE MAXIMUM CENTRES OF SUPPORTING CHAIRS SHALL BE 600mm FOR FABRIC, 600mm FOR BARS UP TO 12mm DIAMETER, 900mm FOR BARS 16mm AND GREATER. REINFORCEMENT SHALL BE SECURELY TIED WITH GALVANISED WIRE TIES AND ALL TIE ENDS SHALL BE TURNED INTO THE MEMBER CLEAR OF THE COVER ZONE.

R17. REFER TO THE CONCRETE NOTES FOR THE COVER TO REINFORCEMENT NEAREST THE CONCRETE SURFACE. UNLESS NOTED OTHERWISE ON DRAWINGS.

R18. THE REQUIRED COVER SHALL BE MAINTAINED TO ALL PIPES, CONDUITS, REGLETS, DRIP GROOVES ETC.

R19. UNLESS NOTED OTHERWISE SLAB REINFORCEMENT AT SUPPORTING WALLS AND SLAB REINFORCEMENT BARS SHALL EXTEND 100mm ONTO SUPPORTING WALLS. WITH 50% OF BOTTOM BARS COGGED TO ACHIEVE ANCHORAGE AT SIMPLY SUPPORTED ENDS. MESH IN SLABS SHALL EXTEND 100mm ONTO SUPPORTING WALLS AND INCLUDE AT LEAST ONE CROSS WIRE.

LEGEND/ABBREVIATIONS

ABBREVIATION	DESCRIPTION
HORIZ	HORIZONTAL
VERT	VERTICAL
CENTRAL	CENTRALLY PLACED
CRS	CENTRES
T or TOP	TOP or TOP FACE
B or BTM	BOTTOM or BOTTOM FACE
T&B	TOP & BOTTOM
NF	NEAR FACE
FF	FAR FACE
INTF	INTERNAL FACE
EXTF	EXTERNAL FACE
EF	EACH FACE
EW	EACH WAY
EQ	EQUAL
NSOP	NOT SHOWN ON PLAN
NSOE	NOT SHOWN ON ELEVATION
UNO	UNLESS NOTED OTHERWISE
TYP	TYPICAL
CL	CENTRE LINE
PL	PLATE
SV	SIZE VARIES
STG	STAGGERED
N/S	NEAR SIDE
F/S	FAR SIDE
B/S	BOTH SIDES
U/S	UNDER SIDE
L	LENGTH/LONG
W	WIDTH/WIDE
H	HEIGHT/HIGH
D	DEPTH/DEEP
NOM	NOMINAL
REQ'D	REQUIRED
REINF	REINFORCEMENT
OPP	OPPOSITE

LEGEND/ABBREVIATIONS (CONT')

ABBREVIATION	DESCRIPTION
SIM	SIMILAR
GA	GENERAL ARRANGEMENT
PT	POST TENSION
DRG	DRAWINGS
NTS	NOT TO SCALE
LV	LENGTH VARIES
ABR	ALTERNATE BAR REVERSED
MAX	MAXIMUM
MIN	MINIMUM
CONT	CONTINUOUS
CJ	CONSTRUCTION JOINT

NOTE:
SPECIFICATION REQUIREMENTS SHOWN ON DRAWINGS TAKE PRECEDENCE OVER TECHNICAL SPECIFICATIONS PROVIDED ELSE WHERE IN DOCUMENTATION.

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AECOM NUMBER 60694097

NO.	DATE	DESCRIPTION	DRAWN	APPROVED
B	31/5/23	FOR CONSTRUCTION	AECOM	ANL
A	20/06/17	FOR CONSTRUCTION	KHS	DC

AMENDMENTS AND REVISIONS

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SURVEYED BY: R.JANKER (MRC)
SURVEY FILE No: 273502, 273506
LEVEL DATUM: A.H.D.
HOR. DATUM / DATE: MGA 55 RTK GPS
SCALES (A1): NOT TO SCALE
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	SIGNED	DATE
DRAWN: AECOM	AECOM	20/06/17
DESIGNED: AECOM	AECOM	20/06/17
CHECKED: AECOM	AECOM	20/06/17
MANAGER / CO-ORDINATOR ORIGINALLY SIGNED BY: GRAEME HAWES		28/6/2017
GRAEME HAWES		DATE

ASSET OWNER ORIGINALLY SIGNED BY:
JASON DEVITT 28.06.17
JASON DEVITT DATE
CERTIFIED
DAVID CARTWRIGHT 20/06/17
DAVID CARTWRIGHT RPEQ 11338 DATE

Mackay REGIONAL COUNCIL

PETRIE STREET CULVERTS
SOUTH EAST MACKAY MAIN DRAIN
STRUCTURAL NOTES
SHEET 1 OF 2

SHEET 4 OF 13
WORKS JOB No. 57282
DRAWING No. A1-35983
AMEND. B

CONCRETE NOTES

C1. ALL CONCRETE, WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600:2018, AS2870:2011 AND THE SPECIFICATION.

C2. CONCRETE QUALITY, AND REQUIRED PROPERTIES OF CONCRETE SHALL BE IN ACCORDANCE TO AS1379:2007.

C3. SURFACE FINISH, FORMWORK IS TO BE IN ACCORDANCE WITH THE SAI FORMWORK CODE AS3610:2018.

C4. CONCRETE REQUIREMENTS AS SHOWN IN TABLE BELOW UNLESS NOTED OTHERWISE ON THE DRAWINGS. NO "BRECCIA" TYPE AGGREGATE IS TO BE USED.

MEMBER LOCATION	EXPOSURE CLASSIFICATION	CONCRETE STRENGTH f'c (MPa) AT 28 DAYS	CONCRETE CLASS	SLUMP AT SITE +/- 15mm	Nom. MAX. AGGREGATE SIZE (mm)	MAX. 56 DAY SHRINKAGE x10-6	REQUIRED COVER (mm)
SLAB	**C2**	**50**	**N50**	80	20	**20**	**65**
FOOTING	**C2**	**50**	**N50**	80	20	**20**	**65**
WALL	**C2**	**50**	**N50**	80	20	**20**	**65**

BLINDING CONCRETE N20/20

C5. NORMAL CLASS CONCRETE SHALL HAVE CEMENT OF TYPE GENERAL PURPOSE BLENDED CEMENT (GP) OR FOR THE ELEMENTS MARKED "*" (GREEN CONCRETE) ALL CEMENT TO BE GENERAL BLEND, GB (SLAG) [EQUIVALENT OF 70% TYPE GP, PLUS 30% GROUND GRANULATED BLAST FURNACE SLAG] PLUS 25% FLY ASH.

C6. THE CONTRACTOR IS TO SEEK APPROVAL FROM THE STRUCTURAL ENGINEER IN WRITING IF ANY ADMIXTURES TO BE USED IN THE CONCRETE MIX. CALCIUM CHLORIDE WILL NOT BE PERMITTED AND SHALL NOT BE USED UNDER ANY CIRCUMSTANCES.

C7. ALL CONCRETE SHALL BE SUBJECT TO PROJECT ASSESSMENT AND TESTING TO AS1379:2007.

C8. MECHANICALLY VIBRATE CONCRETE IN THE FORM TO GIVE MAXIMUM COMPACTION WITHOUT SEGREGATION OF THE CONCRETE.

C9. CURE CONCRETE AS REQUIRED BY SECTION 17 OF AS3600:2018 AND AS SET OUT IN THE SPECIFICATION.

C10. IN THE DRAWINGS, THE BEAM DEPTH IS WRITTEN FIRST AND INCLUDES SLAB THICKNESS IF ANY.

C11. UNLESS SHOWN ON THE DRAWINGS, THE LOCATION OF ALL CONSTRUCTION JOINTS SHALL BE SUBMITTED TO THE CONTRACT ADMINISTRATOR FOR REVIEW.

C12. NO CHASES, HOLES GREATER THAN 150mm DIAMETER, OR EMBEDMENT OF PIPES GREATER THAN 40mm DIAMETER OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN THE CONCRETE SLABS. FOR ALL OTHER CONCRETE MEMBERS, NO PENETRATIONS, CHASES OR EMBEDMENT SHALL BE MADE WITHOUT PRIOR APPROVAL BY THE STRUCTURAL ENGINEER.

C13. SLURRY USED TO LUBRICATE CONCRETE PUMP LINES IS NOT TO BE USED IN ANY STRUCTURAL MEMBERS.

C14. CONCRETE SIZES AS DRAWN ARE MINIMUM AND DO NOT INCLUDE APPLIED FINISHES.

C15. UNLESS NOTED OTHERWISE, ALL SLABS CAST ON GROUND REQUIRE 50mm THICK COMPACTED FREE DRAINING SAND BEDDING WITH A 0.2mm POLYTHENE MEMBRANE.

C16. GENERALLY, DRAWINGS ARE DETAILED IN ACCORDANCE WITH THE PRINCIPLES SET OUT IN THE CONCRETE INSTITUTE OF AUSTRALIA (CIA) "REINFORCEMENT DETAILING HANDBOOK" OF 2010.

C17. ALL FORMED EXPOSED EDGES AND RE-ENTRANT CORNERS SHALL BE CHAMFERED OR FILLETED 15mm UNLESS NOTED OTHERWISE ON THE ARCHITECTURAL OR STRUCTURAL DRAWINGS. REFER TO ARCHITECT'S DRAWINGS AND SPECIFICATION FOR ALL FALLS IN SLAB, REGLETS AND CHAMFERS ETC. PROVIDE DRIP GROOVES AT ALL EXPOSED EDGES, COVER TO BE MAINTAINED.

C18. THE FACE OF ALL CONCRETE WHICH HAS REINFORCEMENT PROJECTING FROM IT AND AGAINST WHICH NEW CONCRETE IS TO BE CAST, IS TO BE THOROUGHLY MECHANICALLY SCABBLED, FULLY EXPOSING THE AGGREGATE MATRIX.

CHEMICAL & MECHANICAL ANCHOR NOTES

CA1. "CHEMSETS" DENOTES RAMSET GRADE 5.8 HOT DIPPED GALV. STUDS FIXED WITH RAMSET CHEMSET REO 502 WITH THE FOLLOWING MINIMUM EMBEDMENT:

- M12 CHEMSETS - 110mm EMBEDMENT UNO
- M16 CHEMSETS - 125mm EMBEDMENT UNO
- M20 CHEMSETS - 150mm EMBEDMENT UNO
- M24 CHEMSETS - 160mm EMBEDMENT UNO

CA2. ALL ANCHORS ARE TO BE FIXED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN RECOMMENDATIONS. IN PARTICULAR ENSURE HOLES ARE CLEAN OF DUST PRIOR TO INSTALLATION OF CHEMICAL ANCHORS.

CA3. CONTRACTOR IS TO LOAD TEST 5% OF CHEMICAL ANCHORS AT RANDOM TO MANUFACTURER NOMINATED PROOF LOAD FOLLOWING INSTALLATION. IF ANY ANCHORS FAIL TESTING, LOAD TEST 100% OF REMAINING CHEMICAL ANCHORS.

CA4. DESIGN HAS BEEN CARRIED OUT USING THE PRODUCTS ABOVE. PRODUCTS MAY BE SUBSTITUTED SUBJECT TO ENGINEER'S APPROVAL.

NOTE:
SPECIFICATION REQUIREMENTS SHOWN ON DRAWINGS TAKE PRECEDENCE OVER TECHNICAL SPECIFICATIONS PROVIDED ELSE WHERE IN DOCUMENTATION.

STRUCTURAL STEELWORK NOTES

S1. DESIGN, FABRICATION AND ERECTION:
DESIGN CONFORMS TO AS4100:2020, AS/NZS 4600:2018 AND AS2327.1:2017 AS APPROPRIATE.

FABRICATION AND ERECTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE PROVISION OF AS4100:2020 AND AS3828:1998, AS APPROPRIATE.

S2. SETTING OUT DIMENSIONS SHALL BE VERIFIED ON SITE BY THE CONTRACTOR WHO SHALL BE RESPONSIBLE FOR THEIR CORRECTNESS.

S3. THE CONTRACTOR SHALL PROVIDE AND LEAVE IN PLACE UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED. SUCH TEMPORARY BRACING AS IS NECESSARY TO STABILISE THE STRUCTURE DURING ERECTION.

S4. UNLESS OTHERWISE NOTED ALL MATERIAL SHALL BE:

- GRADE 250 HOT-ROLLED PLATES COMPLYING WITH AS/NZS 3678:2016
- GRADE 300 HOT-ROLLED UB, UC, PFC, TFC, TFB, EA, UA AND FLATS COMPLYING WITH AS/NZS 3679.1:2016,
- GRADE 300 WB, WC COMPLYING WITH AS/NZS 3679.2:2016
- GRADE 350 RHS, SHS, CHS COMPLYING WITH AS1163:2016

S5. WELDING:
WELDING IS TO BE CARRIED OUT IN ACCORDANCE WITH AS/NZS 1554.1:2014, AS/NZS 1554.2:2021

WELDING CONSUMABLES TO BE E48XX OR W50X UNLESS NOTED OTHERWISE.

ALL WELDS TO BE 6mm CONTINUOUS FILLET WELD (CFW) SP CATEGORY UNLESS NOTED OTHERWISE.

ALL BUTT WELDS TO BE FULL PENETRATION BUTT WELD (FPBW) AND TO BE SP CATEGORY UNLESS NOTED OTHERWISE.

INSPECTIONS TO BE CARRIED OUT TO AS/NZS 1554.1:2014 UNLESS NOTED OTHERWISE IN THE DRAWINGS OR SPECIFICATION. MINIMUM EXTENT OF NON-DESTRUCTIVE EXAMINATION (NDE) SHALL BE AS FOLLOWS:

	EXTENT OF NDE, %			
WELD CATEGORY	VISUAL MEANS		OTHER MEANS	
	VISUAL SCANNING	VISUAL EXAMINATION	MAGNETIC PARTICLE (FOR FILLET WELD)	RADIOGRAPHY OR ULTRASONIC (FOR BUTT WELD)
GP	100	15	2	-
SP	100	50	10	10

S6. BOLTS, NUTS AND WASHERS:
STEEL BOLTS, NUTS AND WASHERS SHALL COMPLY WITH THE RESPECTIVE STANDARDS AS APPROPRIATE.

DESIGNATION:
4.6/S REFERS TO GRADE 4.6 COMMERCIAL BOLTS TO AS1111.1:2015, TIGHTENED TO A SNUG TIGHT CONDITION TO AS4100:2020.

8.8/S REFERS TO GRADE 8.8 HIGH STRENGTH STRUCTURAL BOLTS TO AS1252:2016, TIGHTENED TO A SNUG TIGHT CONDITION TO AS4100:2020.

8.8/TB REFERS TO GRADE 8.8 HIGH STRENGTH STRUCTURAL BOLTS TO AS1252:2016 FULLY TENSIONED TO AS4100:2020 AS A BEARING TYPE JOINT.

8.8/TF REFERS TO GRADE 8.8 HIGH STRENGTH STRUCTURAL BOLTS TO AS1252:2016 FULLY TENSIONED TO AS4100:2020 AS A FRICTION JOINT WITH CONNECTING SURFACES LEFT UNCOATED.

S7. CONNECTIONS:
ALL DETAILS, GAUGE LINES, ETC. WHERE NOT SPECIFICALLY SHOWN ARE TO BE IN ACCORDANCE WITH AISC DESIGN CAPACITY TABLES FOR STRUCTURAL STEEL AND ASI STANDARDISED STRUCTURAL CONNECTIONS.

ALL PLATES TO BE 10mm THICK, EX-STANDARD SQUARE EDGE FLATS UNLESS NOTED OTHERWISE.

ALL BOLTS TO BE GRADE 8.8/S UNLESS NOTED OTHERWISE.
ALL BOLTS TO BE GALVANISED M20 UNLESS NOTED OTHERWISE.

ALL HOLD-DOWN BOLTS SHALL BE GRADE 4.6 TO AS1111.1:2015 AND HOT DIP GALVANISED AFTER FABRICATION UNLESS NOTED OTHERWISE.
ALL HOLD DOWN BOLTS TO BE M20 UNLESS NOTED OTHERWISE.

ALL CAST-IN FERRULES AND MASONRY ANCHORS TO BE PASSIVATED ZINC COATED. ALL GALVANISED COMPONENTS TO BE CAST INTO CONCRETE MUST BE PASSIVATED.

ALL CAST-IN H.D. BOLTS ARE TO BE ALIGNED WITHIN STUD WALLS AND SURVEYED PRIOR TO CASTING OF SLAB TO ENSURE SETOUT ACCURACY. FOLLOWING CONFIRMATION OF SETOUT, TACK WELD BOLTS TO REINFORCEMENT MAT TO SECURE.

MINIMUM CONNECTION DETAILS SHALL CONSIST OF 2-M20 8.8/S BOLTS AND 10mm CLEAT PLATE UNLESS NOTED OTHERWISE.

SLOTTED HOLES, WHERE 8.8/TF BOLTS ARE USED IN SLOTTED HOLES, A SPECIAL WASHER OR COVER PLATE, NOT LESS THAN 8mm THICK, IS TO BE USED TO COMPLETELY COVER THE SLOTTED HOLE IN ACCORDANCE WITH AS4100:2020.

ALL BOLT HOLES 2mm OVERSIZE UNLESS NOTED OTHERWISE. HOLES FOR H.D. BOLTS 6mm OVERSIZE. OVERSIZE HOLES FOR HD BOLTS WILL REQUIRE OVERSIZE WASHERS UNDER NUTS.

UNLESS OTHERWISE SPECIFIED, SHEAR STUDS SHALL BE WELDED 19mm DIAMETER HEADED STUDS WITH ALL WORKMANSHIP AND MATERIALS IN ACCORDANCE WITH AS1554.2:2021.

STRUCTURAL STEELWORK NOTES (CONT')

S08. CORROSION PROTECTION:
CLEANING AND PAINTING OF STRUCTURAL STEELWORK:

- ABRASIVE BLAST CLEAN TO CLASS 2
- ONE COAT PRIMER (GREY) MINIMUM DRY FILM THICKNESS OF 0.05mm
- ONE COAT (SELECTED COLOUR) TO A DRY FILM THICKNESS OF 0.04mm

THE FOLLOWING STEELWORK SHALL BE HOT DIPPED GALVANISED AFTER FABRICATION TO AS4680:2006 WITH A MINIMUM AVERAGE ZINC COATING MASS OF 900g/m2:

- ALL COLD FORM SECTIONS
- PLATE/ANCHOR ROD ASSEMBLIES CAST INTO CONCRETE
- ALL MEMBERS BUILT INTO BRICK OR BLOCKWORK
- ALL EXTERNAL STEELWORK

FOR CONCRETE ENCASED STEELWORK, PAINTING SHALL EXTEND 100mm INTO THE CONCRETE. THE REMAINDER OF THE ENCASED STEELWORK SHALL BE UNPAINTED AND FREE OF LOOSE RUST, LOOSE MILLSCALE, DIRT, OIL AND GREASE.

ALL STRUCTURAL STEELWORK BELOW GROUND TO BE ENCASED BY N25 CONCRETE 75mm ALL ROUND, UNLESS NOTED OTHERWISE.

CONCRETE ENCASED STEELWORK SHALL BE WRAPPED WITH SL81 MESH, UNLESS OTHERWISE SHOWN.

S09. SHOP DRAWINGS:
THE STEEL FABRICATOR IS TO PROVIDE THE CONTRACT ADMINISTRATOR WITH 1 HARD COPY OF WORKSHOP DRAWINGS FOR REVIEW BEFORE FABRICATION IS STARTED, ALLOWING A MINIMUM OF 5 WORKING DAYS FOR REVIEW COMMENTS TO BE MADE.

S10. GROUT THICKNESS UNDER BASE PLATES SHALL BE MINIMUM 30mm UNLESS NOTED OTHERWISE.

S11. BASE PLATES SHALL BE GROUTED AFTER MEMBER IS LEVELLED AND PLUMBED, AND BEFORE MEMBER IS SUBSTANTIALLY LOADED. GROUT SHALL BE APPROVED PROPRIETARY FLOWABLE NON-SHRINKING PORTLAND CEMENT GROUT, PROPORTIONED AND USED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS WITH A MINIMUM 28-DAYS COMPRESSIVE STRENGTH OF 40MPa.

S12. THE CONTRACTOR SHALL PROVIDE ALL CLEATS AND DRILL ALL HOLES NECESSARY FOR FIXING STEEL, TIMBER OR OTHER ELEMENTS TO STEEL WHETHER OR NOT DETAILED ON THE DRAWINGS.

S13. THE ENDS OF ALL HOLLOW SECTIONS ARE TO BE SEALED WITH NOMINAL THICKNESS PLATES AND CONTINUOUS SEAL WELD UNLESS NOTED OTHERWISE SHOWN, WITH 'BREATHER' HOLES IF MEMBERS ARE TO BE HOT DIP GALVANISED.

S14. STIFFENER PLATES WHERE DETAILED ARE TO BE PLACED ON BOTH SIDES OF WEB TO UB's AND UC's.

S15. ALL HOLES IN PLATES AND STEEL MEMBERS SHALL BE DRILLED.

S16. WHERE DETAILS PREVENT THE NORMAL INSTALLATION OF CFW's, GRIND THE EDGE OF THE MEMBER TO FACILITATE THE INSTALLATION.

RETAINING WALL NOTES

RW1. RETAINING WALLS SHALL BE BACKFILLED AS FOLLOWS:
CBR 15 MAX. P.I. = 12.
FILL SHALL BE PLACED IN 200mm MAX. (LOOSE) LAYERS AND COMPACTED TO 100% STANDARD IN ACCORDANCE WITH AS1289.0:2019, TEST E2.1

RW2. TESTING OF BACKFILL AS FOLLOWS:
ONE FIELD DENSITY TEST PER 400 sq/m. (OR PART THEREOF) EVERY FOURTH LAYER TO AS1289,0:2019, TEST E2.1 BY A 'N.A.T.A.' REGISTERED LABORATORY.

RW3. RETAINING WALLS SHALL NOT BE BACKFILLED UNTIL A MINIMUM 14 DAYS AFTER CASTING. UNLESS NOTED OTHERWISE ON THE DRAWINGS.

RW4. PROVIDE 100mm DIA. AGRICULTURAL DRAINS BEHIND ALL RETAINING WALLS AND AS INDICATED ON DETAILS WITH ADEQUATE FALL TO OUTLET. DRAINS SHALL BE BEDDED IN 20mm GRAVEL, MINIMUM 150mm COVER.

RW5. PROVIDE 50mm DIA. WEEPHOLES AT 1200mm MAXIMUM CENTRES UNLESS NOTED OTHERWISE OR IN LOCATIONS AS INDICATED ON RETAINING WALL DETAILS.

RW6. ALL CONTROLLED BACKFILL BEHIND RETAINING WALLS IS TO BE COMPACTED USING METHODS SUCH THAT EXCESSIVE LATERAL LOADS FROM EARTHMOVING EQUIPMENT DOES NOT PLACE EXCESSIVE LOADS ON RETAINING WALLS. THE CONTRACTOR SHOULD USE LIGHT COMPACTION EQUIPMENT, WHACKER PACKERS OR EQUIVALENT.

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AMENDMENTS AND REVISIONS

SURVEYED BY R.JANKER (MRC)
SURVEY FILE No 273502, 273506
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HOR. DATUM / DATE MGA 55 RTK GPS
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GRAEME HAWES		DATE

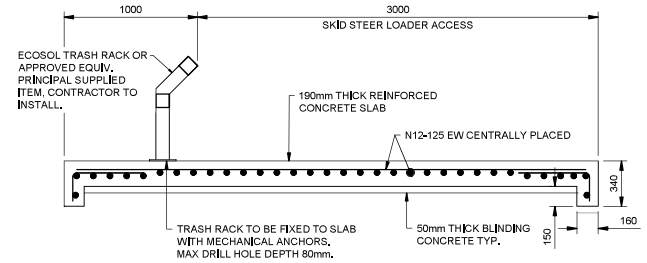
ASSET OWNER ORIGINALLY SIGNED BY:
JASON DEVITT 28.06.17
JASON DEVITT DATE
CERTIFIED
DAVID CARTWRIGHT 20/06/17
DAVID CARTWRIGHT RPEQ 11338 DATE

Mackay REGIONAL COUNCIL

PETRIE STREET CULVERTS
SOUTH EAST MACKAY MAIN DRAIN
STRUCTURAL NOTES
SHEET 2 OF 2

SHEET 5 OF 13
WORKS JOB No. 57282
DRAWING No. A1-35984
AMEND. B

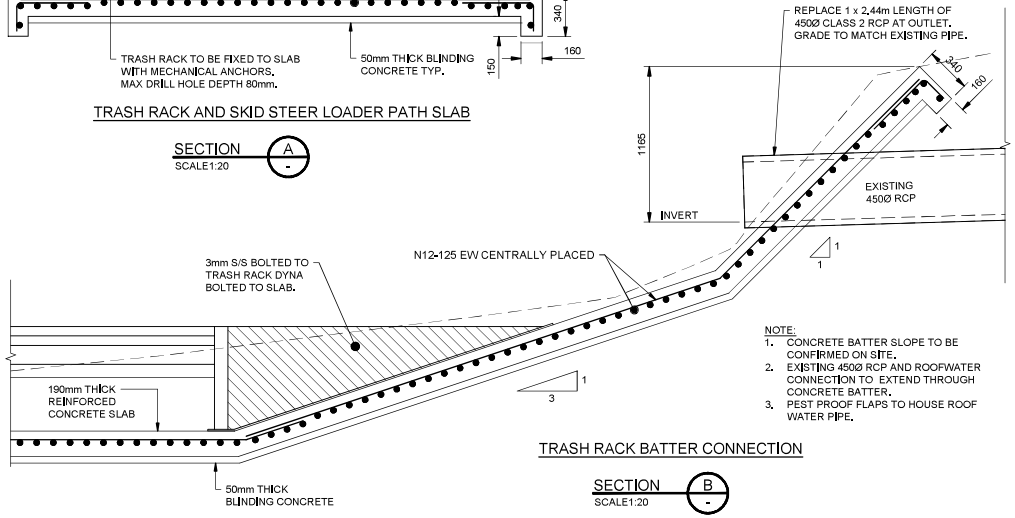
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TRASH RACK AND SKID STEER LOADER PATH SLAB

SECTION A
SCALE1:20

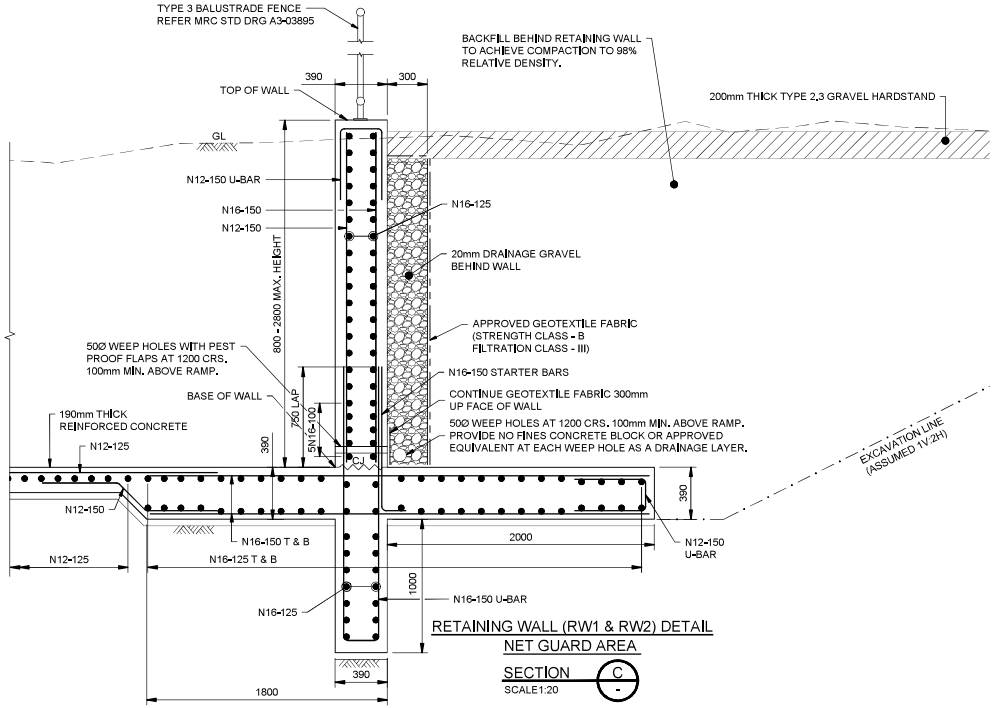
REFER A1-35983 & A1-35984 FOR ALL NOTES RELATING TO CONCRETE & STRUCTURAL COMPONENTS



NOTE:
1. CONCRETE BATTER SLOPE TO BE CONFIRMED ON SITE.
2. EXISTING 450Ø RCP AND ROOFWATER CONNECTION TO EXTEND THROUGH CONCRETE BATTER.
3. PEST PROOF FLAPS TO HOUSE ROOF WATER PIPE.

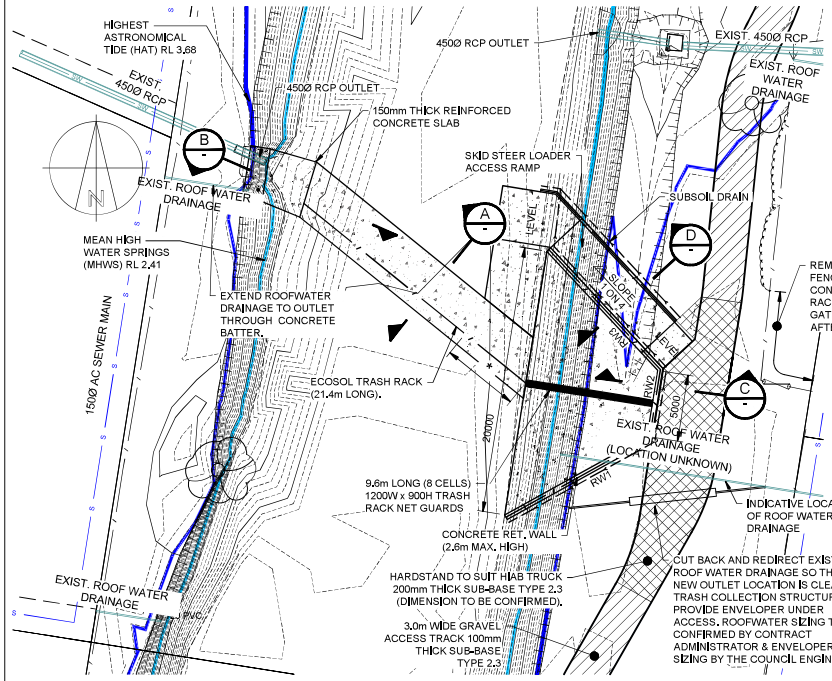
TRASH RACK BATTER CONNECTION

SECTION B
SCALE1:20



RETAINING WALL (RW1 & RW2) DETAIL
NET GUARD AREA

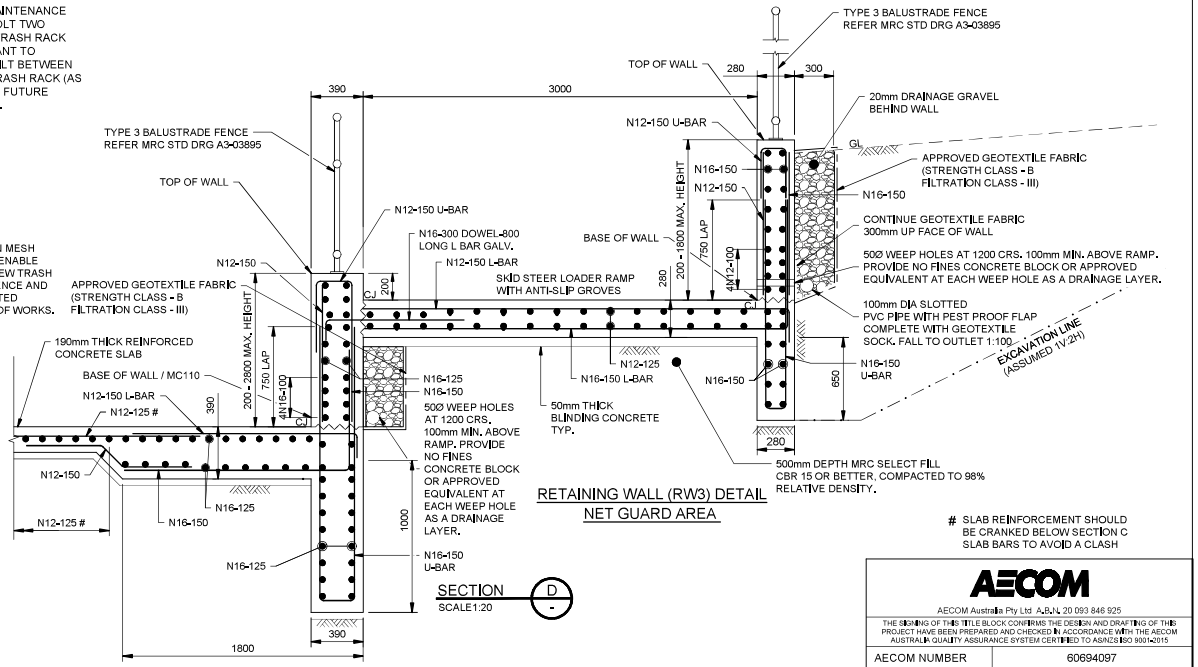
SECTION C
SCALE1:20



* IN FUTURE MAINTENANCE CREW TO UNBOLT TWO SECTIONS OF TRASH RACK TO ENABLE PLANT TO ACCESS & DESILT BETWEEN CULVERTS & TRASH RACK (AS REQUIRED FOR FUTURE MAINTENANCE).

REMOVE EXIST. CHAIN MESH FENCE AND GATE TO ENABLE CONSTRUCTION OF NEW TRASH RACK STRUCTURE. FENCE AND GATE TO BE REINSTATED AFTER COMPLETION OF WORKS.

CUT BACK AND REDIRECT EXIST. ROOF WATER DRAINAGE SO THAT NEW OUTLET LOCATION IS CLEAR OF TRASH COLLECTION STRUCTURE. PROVIDE ENVELOPER UNDER ACCESS. ROOFWATER SIZING TO BE CONFIRMED BY CONTRACT ADMINISTRATOR & ENVELOPER SIZING BY THE COUNCIL ENGINEER.



RETAINING WALL (RW3) DETAIL
NET GUARD AREA

SECTION D
SCALE1:20

SLAB REINFORCEMENT SHOULD BE CRANKED BELOW SECTION C SLAB BARS TO AVOID A CLASH

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A	20/06/17	FOR CONSTRUCTION	KHS	DC

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MANAGER / CO-ORDINATOR ORIGINALLY SIGNED BY: GRAEME HAWES 28/6/2017
GRAEME HAWES DATE

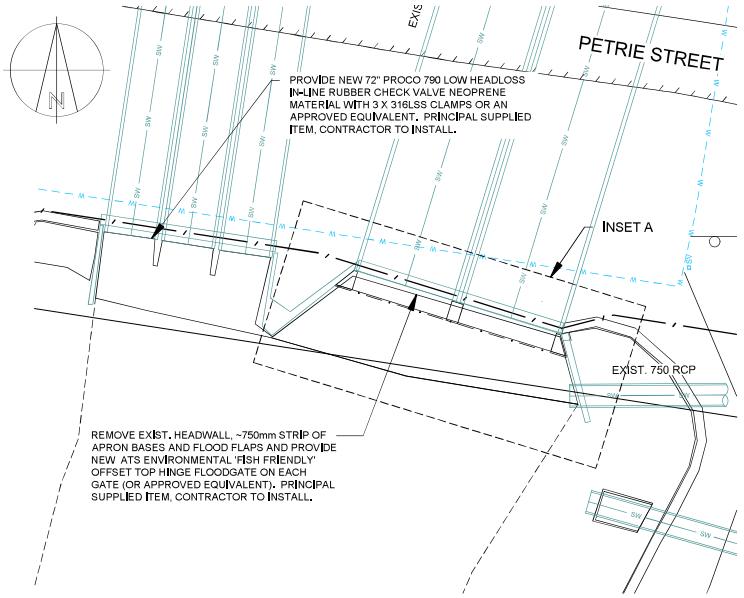
ASSET OWNER ORIGINALLY SIGNED BY: JASON DEVITT 28.06.17
JASON DEVITT DATE
CERTIFIED
DAVID CARTWRIGHT 20/06/17
DAVID CARTWRIGHT RPEQ 11338 DATE

Mackay REGIONAL COUNCIL

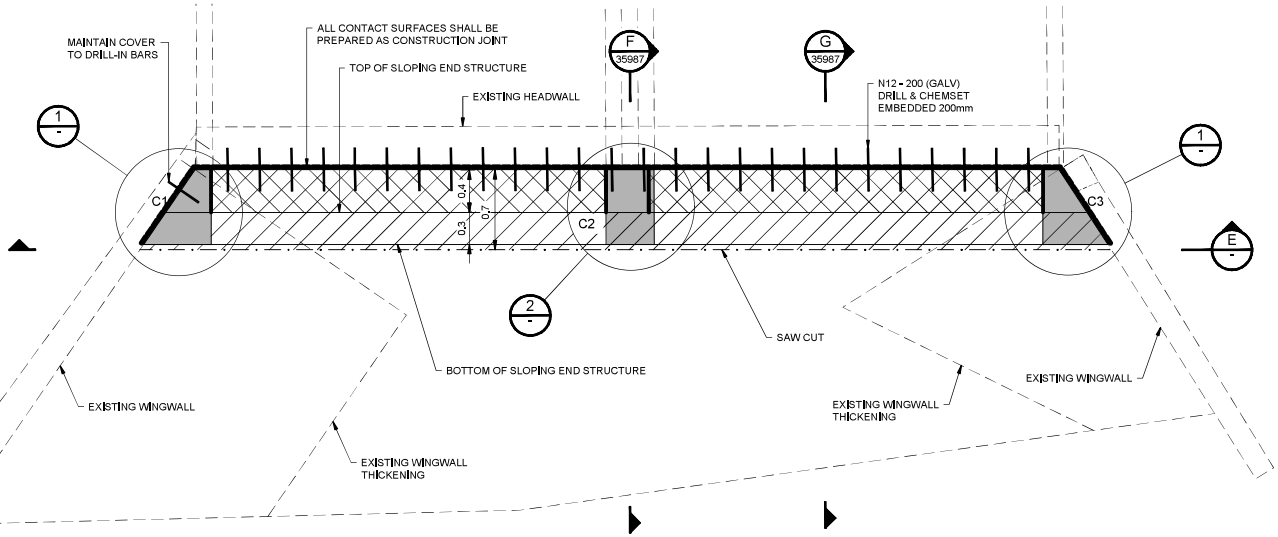
PETRIE STREET CULVERTS
SOUTH EAST MACKAY MAIN DRAIN
TYPICAL SECTIONS, DETAILS & NOTES
SHEET 1 OF 3

SHEET 6 OF 13
WORKS JOB No. 57282
DRAWING No. A1-35985
AMEND. C

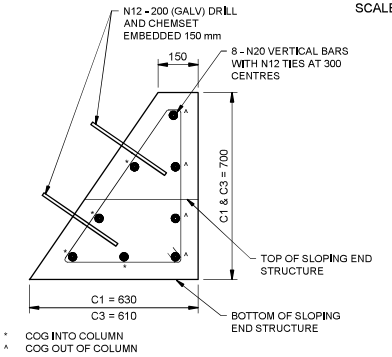
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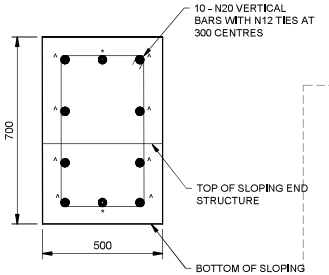
PLAN
SCALE 1:200



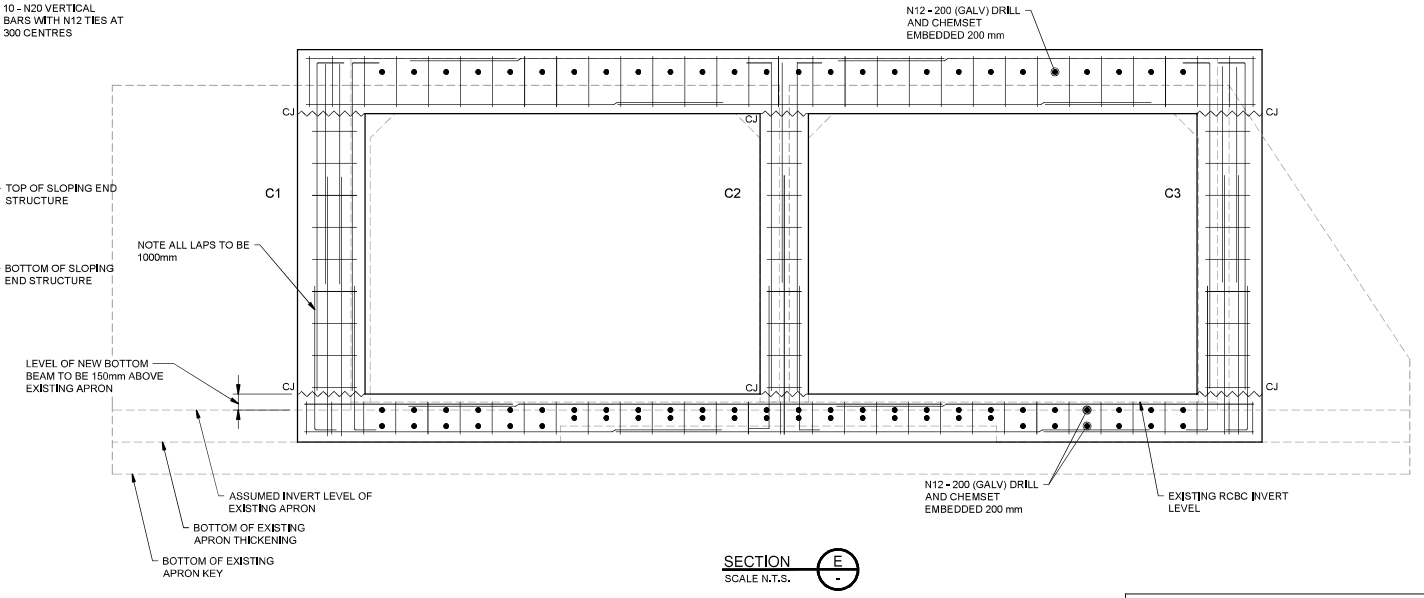
INSET A
SCALE 1:20



DETAIL 1
SCALE N.T.S



DETAIL 2
SCALE N.T.S



SECTION E
SCALE N.T.S.

REFER A1-35983 & A1-35984
FOR ALL NOTES RELATING TO CONCRETE
& STRUCTURAL COMPONENTS

AECOM
AECOM Australia Pty Ltd A.B.N. 20 093 846 925
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AECOM NUMBER 60694097

NO.	DATE	DESCRIPTION	DRAWN	APPROVED
C	19/09/23	FOR CONSTRUCTION	LNR	ANL
B	31/5/23	FOR CONSTRUCTION	AECOM	ANL
A	20/06/17	FOR CONSTRUCTION	KHS	DC

AMENDMENTS AND REVISIONS

SURVEYED BY R.JANKER (MRC)
SURVEY FILE No 273502, 273506
LEVEL DATUM A.H.D.
HOR. DATUM / DATE MGA 55 RTK GPS
SCALES (A1) 1:200 2 1 0 2 4 6 8m
FOR BEST RESULTS PRINT THIS PLAN IN COLOUR. THIS TEXT WILL PRESENT IN RED.

	SIGNED	DATE
DRAWN AECOM	AECOM	20/06/17
DESIGNED AECOM	AECOM	20/06/17
CHECKED AECOM	AECOM	20/06/17

MANAGER / CO-ORDINATOR ORIGINALLY SIGNED BY:
GRAEME HAWES 28/6/2017
GRAEME HAWES DATE

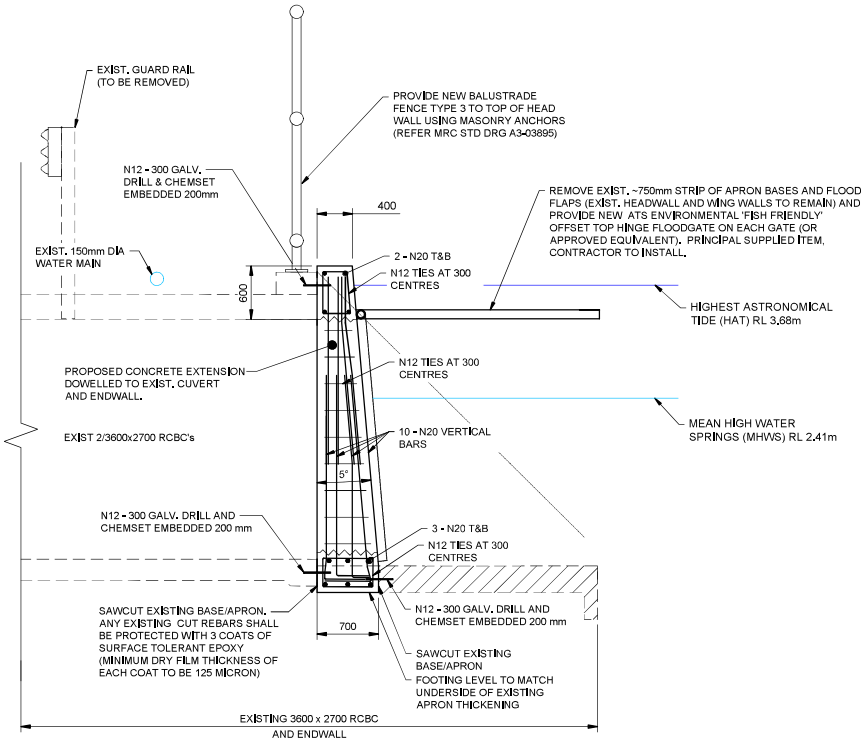
ASSET OWNER ORIGINALLY SIGNED BY:
JASON DEVITT 28.06.17
JASON DEVITT DATE
CERTIFIED
DAVID CARTWRIGHT 20/06/17
DAVID CARTWRIGHT RPEQ 11338 DATE

Mackay REGIONAL COUNCIL

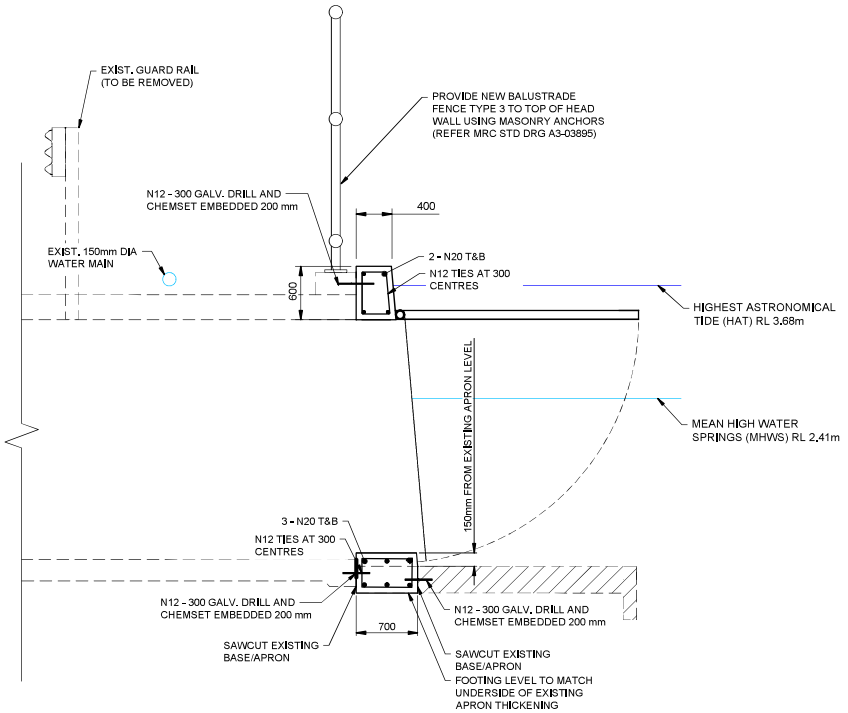
PETRIE STREET CULVERTS
SOUTH EAST MACKAY MAIN DRAIN
TYPICAL SECTIONS, DETAILS & NOTES
SHEET 2 OF 3

SHEET 7 OF 13
WORKS JOB No. 57282
DRAWING No. A1-35986
AMEND. C

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SECTION F
SCALE N.T.S.
35986



SECTION G
SCALE N.T.S.
35986

REFER A1-35983 & A1-35984
FOR ALL NOTES RELATING TO CONCRETE
& STRUCTURAL COMPONENTS

AECOM

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AECOM NUMBER 60694097

NO.	DATE	DESCRIPTION	DRAWN	APPROVED
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B	31/5/23	FOR CONSTRUCTION	AECOM	ANL
A	20/06/17	FOR CONSTRUCTION	KHS	DC

AMENDMENTS AND REVISIONS

SURVEYED BY R.JANKER (MRC)
SURVEY FILE No 273502, 273506
LEVEL DATUM A.H.D.
HOR. DATUM / DATE MGA 55 RTK GPS
SCALES (A1) 1:200
FOR BEST RESULTS PRINT THIS PLAN IN COLOUR. THIS TEXT WILL PRESENT IN RED.

DRAWN	AECOM	SIGNED AECOM	DATE 20/06/17
DESIGNED	AECOM	SIGNED AECOM	DATE 20/06/17
CHECKED	AECOM	SIGNED AECOM	DATE 20/06/17
MANAGER / CO-ORDINATOR ORIGINALLY SIGNED BY: GRAEME HAWES			DATE 28/6/2017
GRAEME HAWES			DATE

ASSET OWNER
ORIGINALLY SIGNED BY:
JASON DEVITT — 28.06.17
JASON DEVITT — DATE

CERTIFIED
DAVID CARTWRIGHT — 20/06/17
DAVID CARTWRIGHT RPEQ 11338 — DATE

Mackay REGIONAL COUNCIL

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PETRIE STREET CULVERTS

SOUTH EAST MACKAY MAIN DRAIN

TYPICAL SECTIONS, DETAILS & NOTES

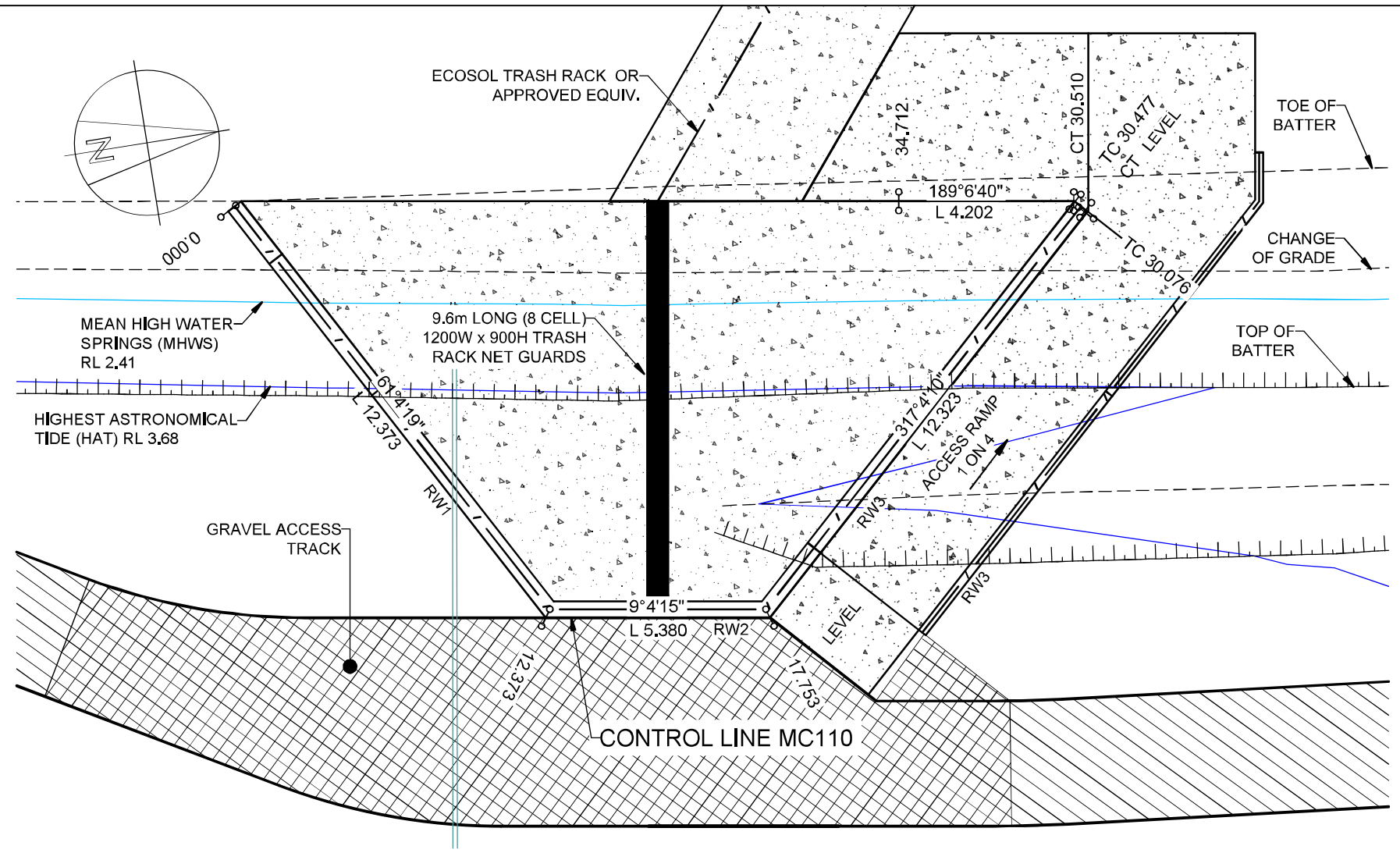
SHEET 3 OF 3

SHEET 8 OF 13

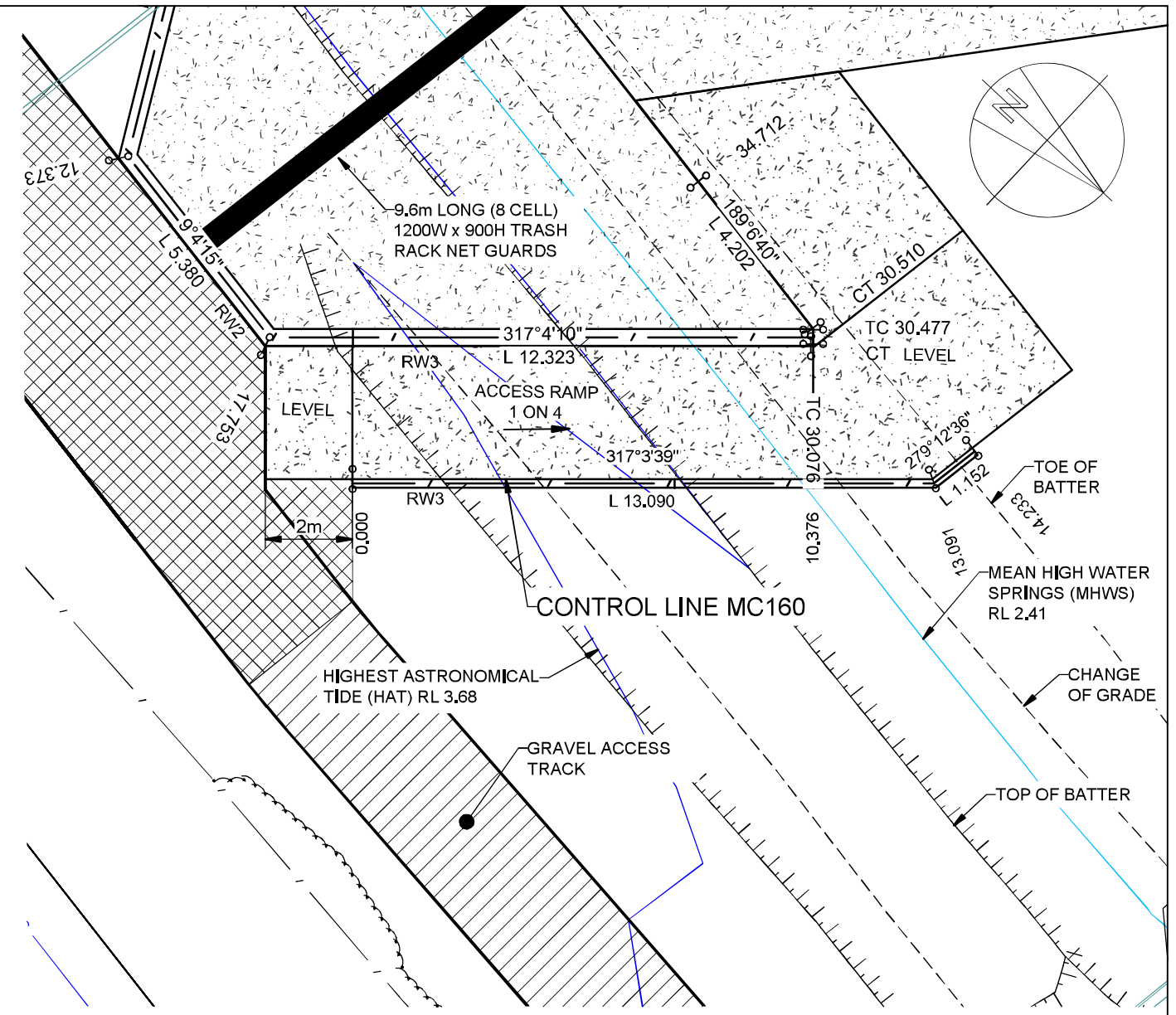
WORKS JOB No. 57282

DRAWING No. A1-35987

AMEND. C



RETAINING WALLS 1 & 2 PLAN
1:100 m



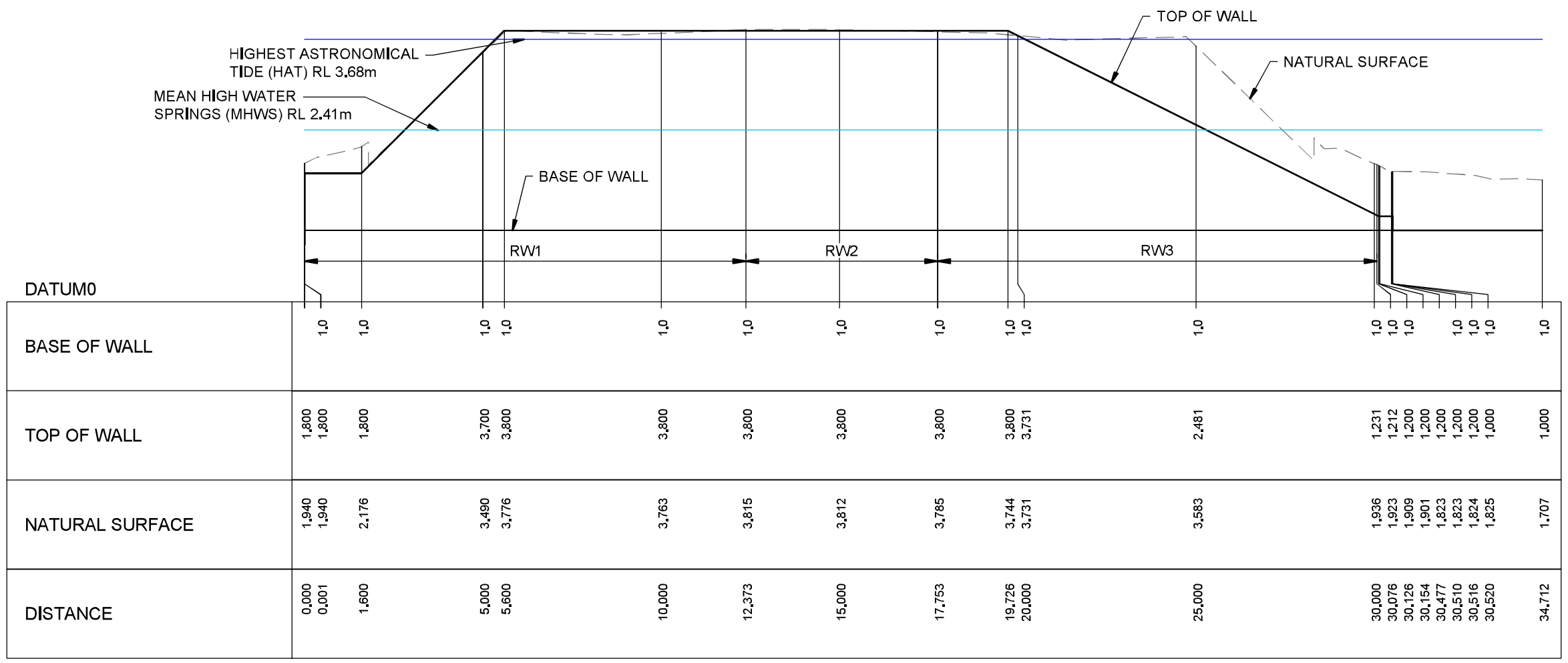
RETAINING WALL 3 PLAN
1:100 m

CONTROL SETOUT MC110

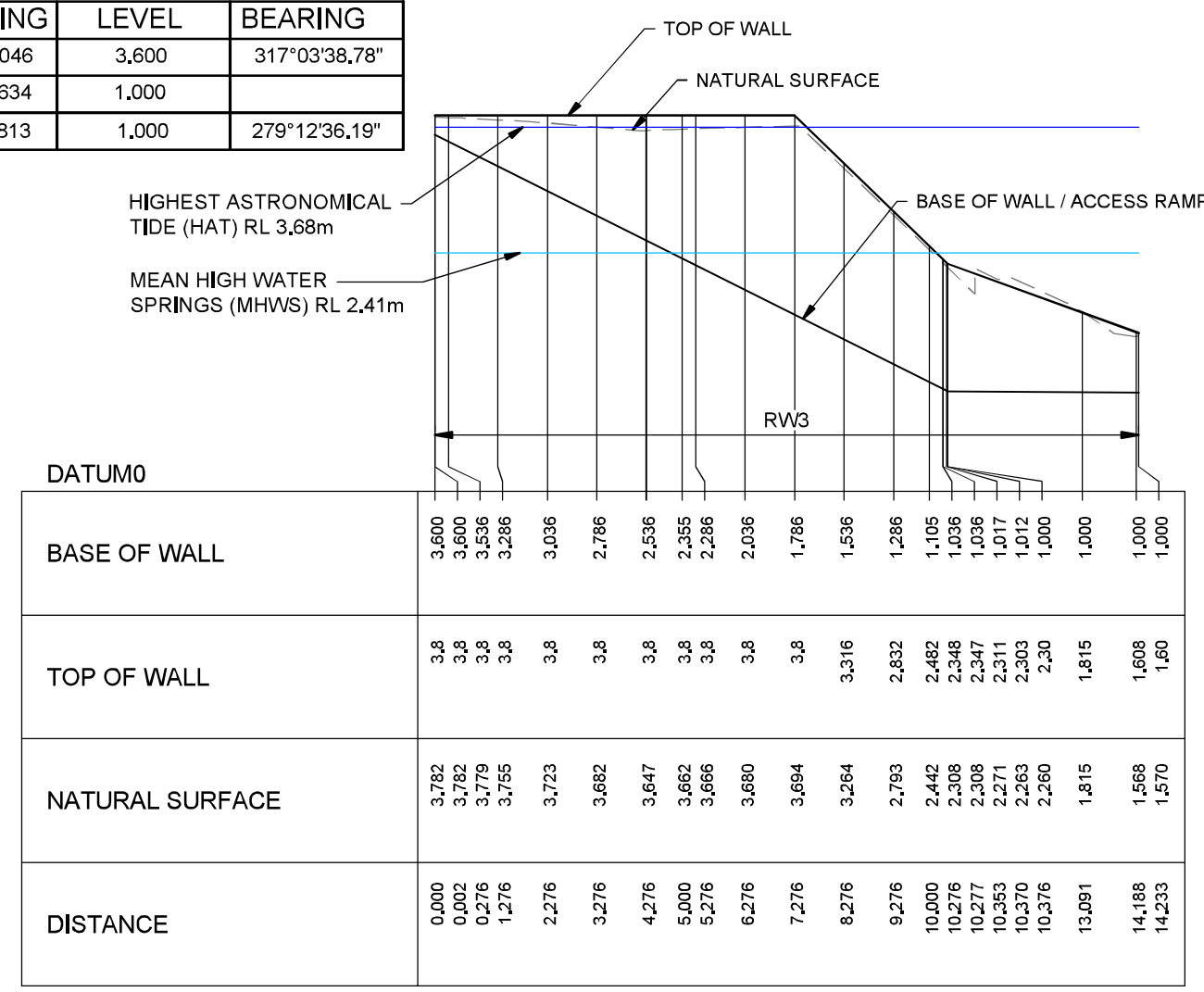
PT	CHAINAGE	EASTING	NORTHING	LEVEL	BEARING	RAD/SPIRAL	A.LENGTH	D.ANGLE
4001	0	727674.706	7657767.262	1.800	61°04'19.36"			
4002	12.373	727685.535	7657773.247	3.800				
4003	17.753	727686.383	7657778.56	3.800				
4004	30.076	727677.99	7657787.582	1.212	317°04'09.82"			
4005	30.115	727677.956	7657787.619	1.203		-0.05	0.079	90°00'04.92"
4006	30.154	727677.919	7657787.585	1.200	227°04'04.91"			
4007	30.477	727677.683	7657787.365	1.200	227°04'04.91"			
4008	30.493	727677.67	7657787.353	1.200		-0.05	0.033	37°57'24.89"
4009	30.51	727677.668	7657787.336	1.200	189°06'40.02"			
4010	34.712	727677.002	7657783.188	1.000	189°06'40.02"			

CONTROL SETOUT MC160

PT	CHAINAGE	EASTING	NORTHING	LEVEL	BEARING
4011	0	727687.238	7657782.046	3.600	317°03'38.78"
4012	13.09	727678.318	7657791.634	1.000	
4013	14.242	727677.195	7657791.813	1.000	279°12'36.19"



WALL ELEVATION CONTROL–MC110



WALL ELEVATION CONTROL – MC160

AECOM

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AECOM NUMBER 60694097

NO.	DATE	DESCRIPTION	DRAWN	APPROVED
C	19/09/23	FOR CONSTRUCTION	LNR	
B	31/5/23	FOR CONSTRUCTION	LNR	CAF
A	20/06/17	FOR CONSTRUCTION	KHS	SMR

AMENDMENTS AND REVISIONS

SURVEYED BY R.JANKER (MRC)
SURVEY FILE No 273502, 273506
LEVEL DATUM A.H.D.
HOR. DATUM / DATE MGA 55 RTK GPS

SCALES (A1) 1:100 1:1000

FOR BEST RESULTS PRINT THIS PLAN IN COLOUR. THIS TEXT WILL PRESENT IN RED.

DRAWN AECOM — SIGNED AECOM — DATE 20/06/17
DESIGNED AECOM — SIGNED AECOM — DATE 20/06/17
CHECKED AECOM — SIGNED AECOM — DATE 20/06/17
MANAGER / CO-ORDINATOR ORIGINALLY SIGNED BY: GRAEME HAWES 28/6/2017, GRAEME HAWES DATE

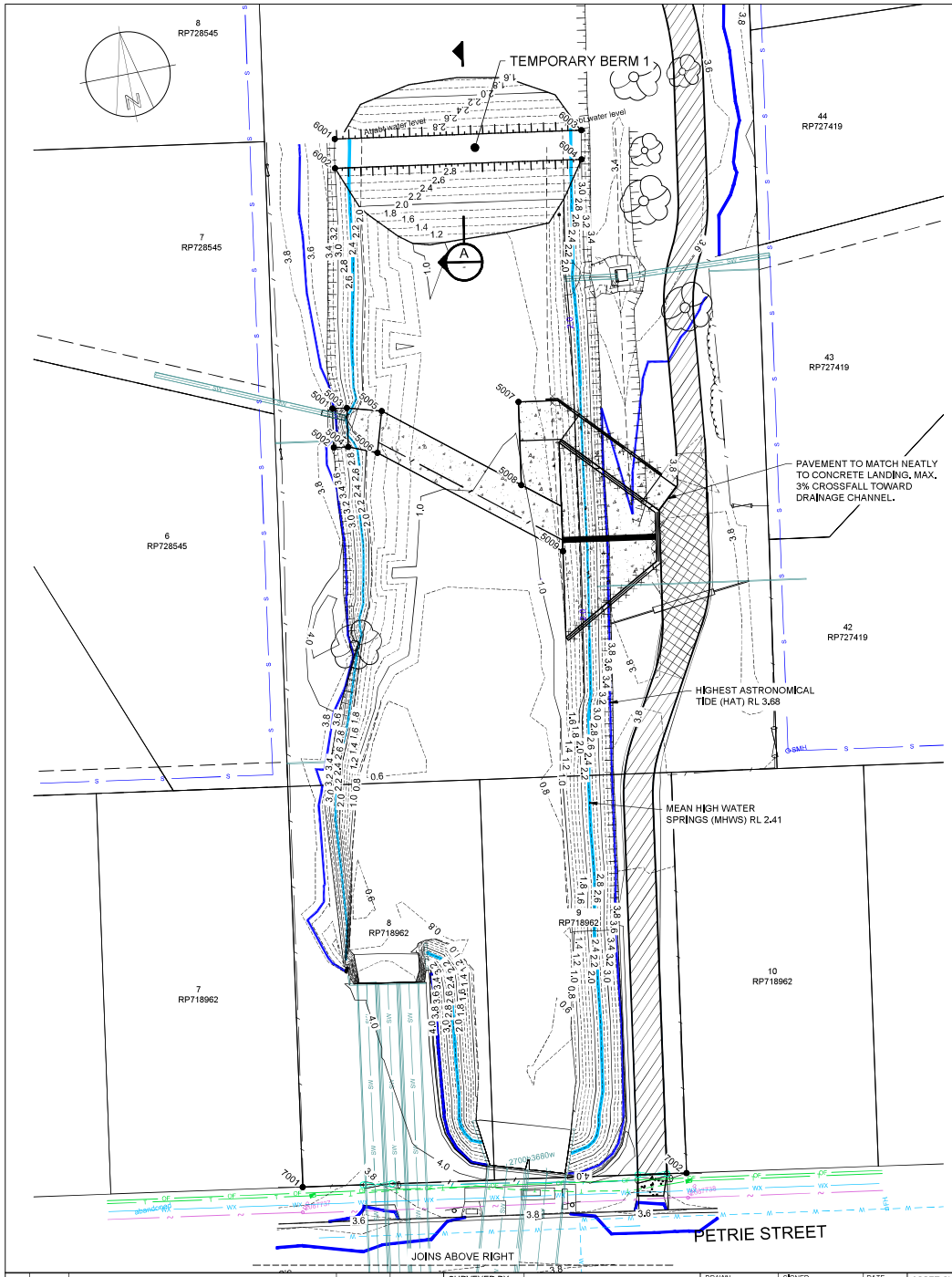
ASSET OWNER ORIGINALLY SIGNED BY: JASON DEVITT 28.06.17, JASON DEVITT DATE
CERTIFIED SHANE RITCHIE 20/06/17, SHANE RITCHIE RPEQ 10823 DATE

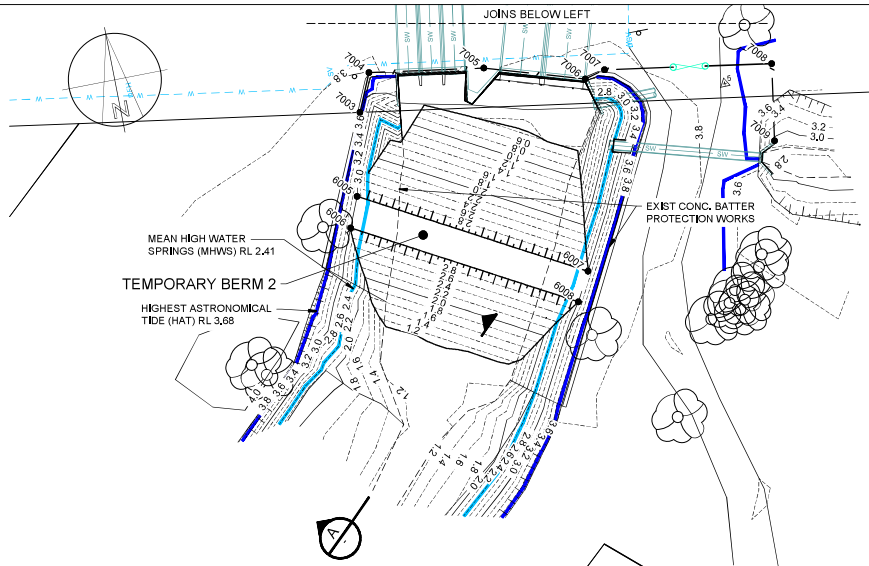
Mackay REGIONAL COUNCIL

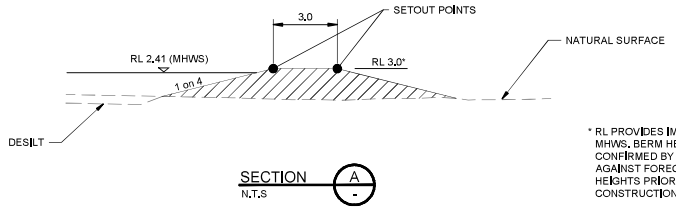
PETRIE STREET CULVERTS
SOUTH EAST MACKAY MAIN DRAIN
RETAINING WALL SETOUT PLAN

SHEET 10 OF 13
WORKS JOB No. 57282
DRAWING No. A1-35989
AMEND. C

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SECTION A
N.T.S

TEMPORARY EARTH BUND

* RL PROVIDES IMMUNITY UP TO MHWS. BERM HEIGHT TO BE CONFIRMED BY CONTRACTOR AGAINST FORECASTED TIDE HEIGHTS PRIOR TO CONSTRUCTION.

CONCRETE SLAB SETOUT TABLE

PT NO	EASTING	NORHTING	RL
5001	727655.494	7657795.263	3.73
5002	727654.869	7657791.311	3.73
5003	727656.955	7657795.031	2.2
5004	727656.329	7657791.081	2.2
5005	727660.416	7657794.033	1.0
5006	727659.156	7657789.907	1.0
5007	727674.368	7657792.264	1.0
5008	727673.021	7657783.826	1.0
5009	727675.913	7657776.338	1.0

TEMPORARY BUND SETOUT TABLE

PT NO	EASTING	NORHTING	RL
6001	727661.044	7657822.361	3
6002	727660.494	7657819.411	3
6003	727686.064	7657818.400	3
6004	727685.507	7657815.451	3
6005	727634.476	7657685.985	3
6006	727633.318	7657683.197	3
6007	727654.344	7657674.956	3
6008	727652.917	7657672.317	3

FENCE SETOUT TABLE

PT NO	EASTING	NORTHING
7001	727637.151	7657717.422
7002	727676.098	7657711.266
7003	727636.245	7657693.658
7004	727637.794	7657697.146
7005	727648.425	7657695.502
7006	727657.552	7657692.674
7007	727659.489	7657693.174
7008	727674.956	7657690.729
7009	727673.827	7657683.591

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AMENDMENTS AND REVISIONS

SURVEYED BY R.JANKER (MRC)
SURVEY FILE No 273502, 273506
LEVEL DATUM A.H.D.
HOR. DATUM / DATE MGA 55 RTK GPS

SCALES (A1) 1:250

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	SIGNED	DATE
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DESIGNED AECOM	AECOM	20/06/17
CHECKED AECOM	AECOM	20/06/17

MANAGER / CO-ORDINATOR ORIGINALLY SIGNED BY:
GRAEME HAWES 28/6/2017
GRAEME HAWES DATE

ASSET OWNER ORIGINALLY SIGNED BY:
JASON DEVITT 28.06.17
JASON DEVITT DATE

CERTIFIED
SHANE RITCHIE 20/06/17
SHANE RITCHIE RPEQ 10823 DATE

Mackay REGIONAL COUNCIL

PETRIE STREET CULVERTS
SOUTH EAST MACKAY MAIN DRAIN
LEVELS PLAN

SHEET 11 OF 13
WORKS JOB No. 57282
DRAWING No. A1-35990
AMEND. C

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