TWEED SHIRE COUNCIL

Review of Environmental Factors

ISW16 – Hunter Street Stormwater Pipe Upgrade, Burringbar

February 2023

Version control

Version number	Date	Prepared by	Reviewed by
1.0 Draft for internal review	10/01/2023	Environmental Scientist Unit	Environmental Scientist Unit
1.1 Final Draft for Project Client and Project Manager Signoff	14/2/2023	Environmental Scientist Unit	[redacted]
1.2 Final	15/3/2023	Environmental Scientist Unit	Environmental Scientist Unit

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Contents

Important notes and definitions

This Review of Environmental Factors (REF) has been prepared in accordance with the Tweed Shire Council Procedure titled: Environmental assessment procedures for Council Infrastructure Works V1.0, 2019 (the Procedure).

REF (Type A projects) template: Infrastructure works assessed using the REF (Type A project) template include routine maintenance works, emergency works, and projects with minor or predictable environmental impacts that can be managed using standard operating procedures and work methods, and industry adopted mitigation measures and management approaches.

Projects assessed using this template typically have minor environmental impacts, and do not require detailed assessment and environmental management plans to manage or offset project impacts. Refer to Part C, Section 5.0 of the Procedure for further guidance on REF assessment pathways.

Prior to works commencing

An activity under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A) must not be commenced prior to both the REF being "determined" by an appropriately delegated staff member and the determination report (the certified REF) being recorded in the Council's electronic data/records system.

The REF must sign off that Council has fulfilled its duty to consider the environmental impact of the activity pursuant to Section 5.5 of the EP&A Act. This includes certifying that the environmental safeguards and mitigation measures proposed ensure the environmental impact is not significant.

It is the responsibility of the person completing this REF that:

- Section 9.0 (certification and signoff) of this REF has been completed
- the project can proceed subject to project mitigation measures and relevant environmental safeguards outlined in Section 10.0 and any associated plans and external authorities
- all relevant approvals, licences, and permits have been obtained prior to works commencing
- all relevant construction personnel are aware of:
    - their responsibilities under this REF
    - the project specific mitigation measures and environmental safeguards outlined in Section 10.0
    - the conditions in any approvals, licences or permits
    - the project details and likely impacts of the project on the community.

Consultation

Environmental planning instruments (EPIs) set out obligations to notify and/or consult with stakeholders, including state agencies, councils and the community as part of the Division 5.1 process of the EP&A Act. Community consultation and referrals may also be required for certain types of approvals (consents, licences and permits) granted by determining authorities under legislation other than the EP&A Act. Proponents and determining authorities must consider any feedback from stakeholders on the proposed activity and/or its environmental impacts. EPIs set out obligations to notify stakeholders. All notification and consultation requirements must be met before a determination is made on the activity. A decision statement by each determining authority needs to be published alongside the published REF document.

Determining authorities will keep the following REF documentation available for public access once a determination has been made:

- the final REF document including appendices
- any associated SIS or BDAR
- the Decision Statement
- any REF document addenda.

The REF must be published on the determining authority's website or the NSW planning portal if the activity is triggered by any of the requirements outlined in clause 171(4) of the EP&A Regulation (clause 171(4)). For further information, refer to Section 6.0 of this REF.

Terms of reference for the assessment

For the purposes of this assessment, the following terms of reference are used:

- Disturbance footprint – refers to the direct footprint subject to development, including any disturbance associated with ancillary works (e.g. temporary access tracks or stockpile sites).
- Study area – the study area includes the disturbance footprint and any additional lands approximately 50 m either side of the disturbance footprint that could be affected directly or indirectly from the proposal. The objective of the assessment would ensure that impacts beyond the direct disturbance footprint are also considered where relevant.
- Subject site – refers to the parcel/s of land on which the development is proposed.
- Broader study area – lands within 10 km of the local study area and includes the Office of Environment and Heritage (OEH) Atlas of NSW Wildlife and Commonwealth Protected Matters database search areas.
- IBRA bioregion and subregion – the Interim Biogeographic Regionalisation for Australia (IBRA) identifies the lands within the Tweed Shire as within the South Eastern Queensland IBRA bioregion. Subregions within this bioregion include the Sunshine Coast-Gold Coast Lowlands, Burringbar-Conondale Ranges and Scenic Rim. These terms are used to describe the occurrence of threatened species, populations and communities at a regional level.

Direct and indirect impacts are defined in accordance with DPE (2022) as follows:

- Direct impacts are those that usually occur at the same time as the project and in the vicinity of the site.
    - For example, impacts may directly affect the habitat of species and ecological communities and of individuals using the study area. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat
- Indirect impacts are those that occur as a consequence of the project of the direct impacts of a project. They may be delayed and happen further away from the site.
    - For example, impacts may sterilise or reduce the habitability of adjacent or connected habitats. They can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, reduction in viability of adjacent habitat due to edge effects, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, noise, light spill, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas.

Impact significance is rated as low, medium or high in this REF. Examples of low and high adverse impacts are as follows:

Low adverse impacts typically:	**High adverse impacts typically:**
are small scale	are large scale
are localised	are extensive
are short term	are long term
have a small impact dispersed over a long period	have a large impact over a short or long period
have reversible impacts	have potentially irreversible impacts
have effective mitigation measures available	have unavailable or untested mitigation measures
are totally compliant with standards, plans and policies	have uncertain or part compliance with standards, plans and policies
have a low interest from the public	have a high interest from the public
have a high level of understanding of the activity and expected impacts	have a low level of information on and understanding of the key issues

For further guidance on evaluating impacts, refer to Attachment A of the Department of Planning and Environment, Guidelines for Division 5.1 assessments, February 2022.

1.0 Project details

Table 1: Project details

Project Details	
Project Name	Hunter Street Stormwater Pipe Upgrade, Burringbar
Project Location	Dignan Street road reserve; Hunter Street road reserve; and 14 Hunter Street, Burringbar (Figure 1 and 2).
Project Owner	Tweed Shire Council
Project Brief Number	ISW16
Environmental Scientist (assessing officer)	[redacted]
Determining Officer	[redacted]
Project Client	[redacted]
Project Manager	[redacted]

2.0 Site details

Table 2.1: Site details

Site / Parcel description	Zoning	Land owner
Dignan Street (segment 10)	RU5 – Village (Figure 3)	Tweed Shire Council (Figure 4)
Hunter Street (segment 10)	RU5 – Village	Tweed Shire Council
14 Hunter Street (4/2/DP2853)	RU5 – Village	[redacted]
Burringbar Creek	W1 – Natural Waterway	Crown Land waterway

TABLE NOTES:
A: For works on Crown Land refer to Activity Specific Procedure – Council Infrastructure Works on Crown Land.
B: Owner's consent is not required for the preparation of Part 5 assessments of private land. Prior to works commencing on private land, Council officers are to notify property owners advising details of project and entry to land as permitted by the Powers of Entry provisions in sections 191A-193 of the Local Government Act, 1993.

3.0 Proposal description and permissibility

Table 3.1: Project proposal details

Description	Comment
Project background and need	Local residents have made numerous complaints over the years that the area floods during moderate storm events due to undersized stormwater pipes and the water not being able to drain away adequately. To rectify the flooding, it is proposed that the stormwater system be replaced and upgraded. The pits/lintels in Dignan and Hunter streets will be upgraded in the same location and a larger stormwater pipe will replace the existing pipe. This is supported by the private property owner in which the stormwater pipe and outlet are located on their land.
Alternatives considered	An option to construct a swale drain was proposed through 14 Hunter Street, Burringbar (the same private property in which the stormwater pipe and outlet is located). The drainage swale was proposed to be located above the existing stormwater pipe, however there are major Telstra services located in the road reserve of Hunter Street (northern side) which prevent the construction of a swale drain, unless the Telstra services are relocated. The current proposed option to replace and upgrade the pits/lintels and stormwater pipe is the preferred option as it is supported by the private property owner, is the most cost effective option and will not interfere with other public infrastructure.
Proposal description key project elements (e.g. nature, scale and extent of proposed activity)	Key project elements would involve the translocation and protection of threatened flora species, removal of vegetation within the disturbance footprint, removing tyre revetment and replacing with rock gabion revetment, upgrading and replacing 4 stormwater pits/lintels and upgrading and replacing approximately 38 m of stormwater pipe. The proposed works are routine in nature for council crews and contractors. The disturbance footprint would be limited to the road reserves of Dignan and Hunter streets, the private property of 14 Hunter Street, Burringbar and Burringbar Creek.

Description	Comment
	Refer to design plans in Appendix A.
Construction activities (e.g. how will the project be constructed?). Explain construction footprint, site preparation activities (e.g. vegetation clearing, alternate access etc.), construction timeframes, hours of operation, relevant work methods, plant and equipment, earthworks, management of materials, traffic and access management, sensitive receivers etc.)	In summary, the proposed activity would involve: • translocating threatened species to Lots A and B DP6624 – works to be undertaken by external restoration contractor prior to any other works being undertaken on site (Figure 1) • installing no-go / exclusion fencing around other threatened species and native vegetation outside of the disturbance footprint to be protected during construction • installing environmental management controls • removing vegetation within the disturbance footprint • replacing and upgrading 4 stormwater pits/lintels • replacing and upgrading 450 mm diameter reinforced concrete stormwater pipe 750 mm diameter and 900 mm diameter steel reinforced concrete pipe, approximately 23 m in private property and 15 m in Hunter Street road reserve • removing and replacing the existing manhole with a 1200 mm diameter manhole • remove existing headwall and replace with a precast headwall with Tideflex Duckbill valve (or approved equivalent) at the outlet into Burringbar Creek • constructing rock mattress protection (500 mm diameter rock on top of geotextile fabric) at the pipe outlet into Burringbar Creek, approximately 1.5 m long and up to 6 m wide • replacing approximately 13 m of kerb and channel in Hunter Street • removing existing tyre and rock revetment within the disturbance footprint and reinstating rock revetment only—tyre revetment outside of disturbance footprint will remain in situ • reinstating vegetation in disturbed areas including turf in road reserve areas and densely

Description	Comment
	planted *Lomandra hystrix* in private property and Burringbar Creek riparian area • offset planting and maintenance of 30 native tubestock to be located at Lots A and B DP6624 (refer to Appendix F) – works to be undertaken by external restoration contractor. One threatened flora species will be fenced off and protected during works and will be a no-go zone. Three other threatened flora species will need to be translocated (by licenced and experienced restoration ecologists) prior to works being undertaken as they are within the proposed disturbance footprint.
Ancillary facilities (e.g. site compounds, stockpiles, set down areas, vegetation clearing and protection requirements, sensitive receivers etc.)	Ancillary activities associated with construction of the proposed works would include: • the translocation of threatened species by a suitably qualified and licenced restoration ecologist within the disturbance footprint prior to works being undertaken • the installation of vegetation protection fencing • removal of vegetation within the disturbance footprint • a site compound • stockpile areas • set down areas for materials • environmental management activities (including erosion and sediment controls within the road reserve and Burringbar Creek) • offset planting and maintenance of 30 tubestock within a separate site (Lots A and B DP6624) by a suitably qualified restoration ecologist. Ancillary activities such as a site compound, stockpile areas and material set down areas will be undertaken in previously cleared road reserve areas adjacent the subject site.
Property access and acquisition requirements	The proposed works will be undertaken on public road reserve and private land. The private property owners have been consulted with prior to undertaking works.

Description	Comment
	No acquisitions will be required. Access to the site is generally unrestricted.
Estimated construction commencement date	June 2023
Estimated construction completion date	August 2023
Estimated cost of works	[redacted]
Construction hours	7 am to 6 pm Monday to Saturday. No work on Sunday or public holidays.

Table 3.2: Environmental site description

Description	Comment
Include a brief background description of the following environmental assessment elements	
Biodiversity (vegetation communities, flora and fauna species)	The proposed disturbance footprint comprises road reserve within an established village residential area that has been previously cleared of vegetation. Works will also extend into private property where native and exotic vegetation has grown since the early 1990s when this area of Hunter Street and Dignan Street had been developed. The Tweed Vegetation Management Strategy (TVMS) mapping (Kingston, 2004) identifies 2 vegetation types within the subject site including 'Substantially Cleared of Vegetation' and 'Not Assessed'. Field investigations confirmed the road reserve was substantially cleared of vegetation except for maintained grass groundcover. The vegetation within the private property is a mixture of native and exotic trees with an understorey of exotic garden plants. The groundcover stratum is generally overgrown, and the tree stratum has a closed canopy. Native and exotic tree species may have been purposefully planted or regenerated naturally.

Description	Comment
	 Refer to Appendix C for the Flora and Fauna Assessment.
Surface water and ground water	The subject site is adjacent to Burringbar Creek. The stormwater system receives water from Dignan and Hunter streets, before exiting the system into Burringbar Creek.
Flood prone land	The entire subject site is within flood prone land. Inundation levels between 18.9 m and 19.2 m are expected to be reached during a 1-in-100 year flood. During periods of heavy rainfall local residents have stated that the existing stormwater system does not sufficiently allow the stormwater to drain away and therefore adds to flooding that occurs in the localised area.
Soils and geology	The soil landscape within the proposed works alignment is identified as the Crabbes Creek (cr) landscape (Morand, 1996). The Crabbes Creek landscape is described as level to gently undulating mid to upper alluvial plains and valley flats of smaller streams draining hills on the metamorphics of the Neranleigh-Fernvale Group. Many terrace remnants common. The vegetation of this landscape is described as extensively cleared closed-forest (rainforest). Soils of this landscape are described as deep (>200 cm), well-drained Brown Alluvial Clays and Clay Loams on lower terraces; deep (>200 cm), well-drained Brown Alluvial Clays on upper terraces.
Bushfire risk	The northern section of the subject site adjacent to Burringbar Creek is identified on the Bushfire prone

Description	Comment
	land map (2012) as being within a Bushfire Category 2 area which has a low bushfire risk. The remainder of the subject site is either within the vegetation buffer area or is outside of bushfire prone land mapping.
Coastal hazards	The subject site is located outside of the coastal hazard zone as per the Tweed Shire Coastal Hazards Assessment completed in November 2013.
Extreme climate/weather events	The site does receive impacts from extreme weather events namely heavy rainfall causing flooding or flooding caused by either heavy or prolonged rainfall within the upper catchment.
Traffic and transport	The proposed disturbance footprint occurs within the road reserves of Dignan and Hunter streets including within the road pavement and nature strip. Hunter Street and Dignan Street are identified as urban local access roads. Hunter Street had an approximate daily traffic volume count of 399 in 2007. Hunter Street provides access to Dignan Street and Waranga Crescent. The number of houses present within the Hunter Street catchment has not changed since 2007 and therefore it can be assumed that the daily traffic volumes will be similar to those in 2007.
Noise and vibration	The subject site is situated within a village residential area which is considered to be a low noise environment. Background sources of noise at the site include vehicular traffic noise associated with Hunter Street, Dignan Street and Tweed Valley Way.
Scenic value	The proposed works occur within the road reserve of Dignan and Hunter streets and within private property. The subject site is also adjacent to Burringbar Creek where works are proposed within private property. The Draft Scenic Landscape Strategy mapping tool identifies the subject site as having a very low scenic visibility, however the vegetation would provide scenic value for the nearby local residents.

Description	Comment
Property and land use	The proposed works occur within the road reserves of Dignan and Hunter streets. Works will also extend into the private property of 14 Hunter Street, Burringbar and Burringbar Creek which is a Crown Land waterway. Land uses adjoining the site include further residential properties.
Public access	The proposed disturbance footprint comprises an active road reserve which has unrestricted access to the public. The private property has restricted access to the public.
Aboriginal heritage and historic (non-Aboriginal) heritage	[redacted] The subject site is not within any non-Aboriginal heritage areas.
Any other environmental elements	The subject site is within a class 5 acid sulfate soil (ASS) mapped area.

Table 3.3: Consultation

Description	Comment
Include a description of the public authority and community consultation requirements and outcomes	
Public authorities	Part 2, Division 1 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) defines the consultation required with relevant public authorities during the assessment process and prior to development commencing. Sections 2.15(1) and 2.15(2) refer to the proponent's consultation requirements with public authorities other than Councils for a specified development. Section 2.15(1) states that a public authority must not carry out specified development that this Policy provides may be carried out without consent, unless the authority has provided notice to respective authorities as per subsection 2.15(1)(a) and (b).

Description	Comment
	The proposed works are not considered specified development.
Community consultation	Consultation has occurred with the private property owner where works will be undertaken. The proposed works would be advertised to the public prior to their commencement through on site signage and media releases via social media channels and the Tweed Link.

Table 3.4: Permissibility of the proposal

Description	Comment
Relevant planning instrument	State Environmental Planning Policy (Transport and Infrastructure) 2021
Division / section / subsection	Division 20 Stormwater management systems Section 2.137 Development permitted without consent
Controlling provisions / performance criteria	(1) Development for the purpose of stormwater management systems may be carried out by or on behalf of a public authority without consent on any land. (2) A reference in this section to development for the purpose of stormwater management systems includes a reference to development for any of the following purposes if the development is in connection with a stormwater management system— (a) construction works (c) environmental management works
Comments	Section 2.136 Definitions In this Division— ***stormwater management system*** means— (a) works for the collection, detention, harvesting, distribution or discharge of stormwater (such as channels, aqueducts, pipes, drainage works, embankments, detention basins and pumping stations)

Description	Comment
	(b) stormwater quality control systems (such as waste entrapment facilities, artificial wetlands, sediment ponds and riparian management

Table 3.5: Design options

Description	Comment
Include a description of design constraints and measures taken to avoid and minimise potential environmental impacts	
Avoid / minimise / offset measures	Avoid The proposed works have been designed to remain within the footprint of the existing stormwater pipe location. The proposed design has taken into consideration possible environmental impacts including but not limited to the threatened species present within and adjacent to the disturbance footprint and the outlet of the stormwater pipe into Burringbar Creek. Construction has been designed to avoid threatened species where possible and no-go fencing will be installed. Construction was designed to improve the outlet point in Burringbar Creek to reduce current impacts. Minimise [redacted] Existing vegetation within the proposed disturbance footprint will be removed and post-works, dense Lomandra plantings will occur. This is to provide soil stability, will reduce weed incursion, will provide a native seedbank to downstream areas of Burringbar Creek and will improve the bank vegetation immediately upstream and downstream of the creek. Offset

Description	Comment
	Approximately 7 mature native and exotic trees will be required to be removed within the proposed disturbance footprint. Although not required under legislation, to ensure maintain or improve outcomes for biodiversity, an offset is proposed of 30 native tubestock to be planted i[redacted] and to be maintained to ensure their success for 5 years. This will enhance the receiving site and improve the habitat within the area.

4.0 Duty to consider environmental impacts pursuant to Section 5.5 of the *Environmental Planning and Assessment Act 1979*

4.1 Confirmation of design and construction footprint

This section is to confirm the design and construction footprint of the proposed activity prior to undertaking the environmental impact assessment in the following sections.

Table 4.1: Confirmation of design and construction footprint

Footprint type	**Confirmed** (Yes/No)	**Date confirmed**	**Comment or outcome** (e.g. Design footprint confirmed by Civil Engineering Designer; construction footprint confirmed by Construction Engineer; not relevant as works are within an existing building)
Design footprint	Yes	9/11/2022	Design footprint confirmed by Civil Engineering Designer
Construction footprint	Yes	9/11/2022	Construction footprint confirmed by Construction Engineer

4.2 Environmental planning requirements

This section is intended to fulfil the duty to consider environmental impacts pursuant to Section 5.5 of the EP&A Act 1979:

"a determining authority in its consideration of an activity shall … examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity."

Table 4.2: Environmental planning, cultural, and community impact considerations and assessment

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
Environmental and ecological considerations					
1	Does the subject site contain Environmental Protection Zones (as defined under the Tweed LEP 2014)?	No	N/A	N/A	N/A
2	Are works within or adjacent to a national park, nature reserve, Aboriginal area, conservation area, marine park or marine reserve?	No	N/A	N/A	N/A
3	Does the subject site contain Matters of National Environmental Significance (NES) (RAMSAR Wetlands, threatened species, migratory birds, World Heritage, National Heritage, nature reserve etc.) or on Commonwealth land (refer Commonwealth Department of Agriculture, Water and the Environment)?	Yes	Refer to Appendix B for the assessment of the matters of NES.  No other matters of national environmental significance are contained within the subject site.	Low	A, C

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
4	Will the project impact upon Matters of NES described above?	Yes	[redacted]	Low	A
5	Are works within or near areas protected by State Environmental Planning Policies (SEPP) for conservation purposes?	No	N/A	N/A	N/A
6	Does the subject site contain NSW endangered or vulnerable species, populations, or ecological communities or their habitats, pursuant to the NSW *Biodiversity Conservation Act 2016* (BC Act) or the *Fisheries*	Yes	[redacted]	Medium Low	A

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
	Management Act 1994 (FM Act)?		[redacted]	Low Low	
7	Will the project impact upon NSW endangered or vulnerable species, populations, or ecological communities or their habitats, pursuant to the NSW BC Act or the FM Act?	Yes	[redacted]	Low Low Low	A

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
			[redacted] The proposed works are not considered likely to impact threatened species outside of the subject site.	Low	
8	Does the subject site contain, or is the site adjacent to a flying-fox colony?	No	[redacted]	Low	A
9	Does the subject site contain, or is the site adjacent to a raptor nest?	No	N/A	N/A	N/A
10	Does the subject site contain habitat areas falling within an identified wildlife corridor?	No	The subject site is not within a regional or sub-regional wildlife corridor.	N/A	N/A
11	Is native vegetation (including understorey vegetation layers), or native trees likely to be	Yes	Native and exotic trees and shrubs will be impacted by the works. The proposed disturbance footprint will require 7 mature trees of 5 different species to be removed. These include:	Low	A

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
	affected? Native vegetation includes marine vegetation (i.e. mangroves, saltmarsh, or seagrass), freshwater wetlands with emergent or floating plants, sedgelands, native grasslands, heath and shrub lands, woodlands, open forests and rainforests?		<u>Native</u> • Guioa (*Guioa semiglauca*) x3 • Foambark (*Jagera pseudorhus*) x1 • Red ash (*Alphitonia excelsa*) x1 <u>Exotic</u> • Jacaranda (*Jacaranda mimosifolia*) x1 • Alexandra palm (*Archontophoenix alexandrae*) x1 Trees and native vegetation outside of the proposed disturbance footprint will have protective no-go fencing installed prior to any works construction works being undertaken. Where possible the construction engineer with the arborist will retain mature vegetation listed above if deemed not required to be removed for machinery access Refer to Appendix C for further information.		
12	Removing or lopping trees within an area mapped under a Tree Preservation Order?	No	N/A	N/A	N/A
13	Does the proposed works include artificial lighting?	No	N/A	N/A	N/A
14	Does works involve dredging and/or reclamation of water land (refer Department of Primary Industries (DPI) Fisheries)?	Yes	The proposed works requires the reclamation of the creek bank where the stormwater pipe outlet will be. The existing headwall and pipe will be removed and replaced with an upgraded diameter pipe and headwall with a Tideflex Duckbill valve (or approved equivalent). Rock mattress protection will be installed at the outlet into Burringbar Creek to reduce erosion.	Low	A, B

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
			Accordingly, a NSW Department of Primary Industries – Fisheries permit under Part 7 of the *Fisheries Management Act 1994* (FM Act) will be applied for prior to works being undertaken.		
15	Would development comprise a fixed or floating structure in or over navigable waters (consultation required with Transport for NSW – Maritime)?	No	N/A	N/A	N/A
16	Working within a Crown Land waterway, Coastal Reserve, or other Crown Land reserve?	Yes	Works will occur within the bed and banks of Burringbar Creek which is identified as a Crown Land waterway. Section 191A of the *Local Government Act 1993* (LG Act) states that a council employee (or other person) authorised by a council may enter any premises to carry out stormwater drainage work on or under the premises (being work that the council is authorised by this or any other Act to carry out). Accordingly, a Crown Land licence is not required to undertake the proposed works. As per section 193 of the LG Act, written notice will be given to Crown Lands prior to works being undertaken.	Low	A
Historic Archaeological Heritage Considerations					
17	Are works within the 'place' of a 'Heritage Item' identified on the Register of the National Estate, under the NSW *Heritage Act 1977* or an environmental	No	N/A	N/A	N/A

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
	planning instrument (refer Commonwealth and State Heritage Registers, Schedules of the Tweed Local Environmental Plan 2014 (TLEP))?				
18	Are works within or adjacent to a mapped predictive or known location of Aboriginal Cultural Heritage (ACH) identified in the Aboriginal Cultural Heritage Management Plan (ACHMP) 2018? Is it located in or near a declared site or place identified by the Aboriginal Heritage Information Systems (AHIMS) Web Services?	Yes	[redacted]	Low	A
Community considerations					
19	In regards to specified development described in Division 1 of the SEPP Transport and Infrastructure, is consultation required with other public authorities?	No	N/A	N/A	N/A

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
20	Will the project involve generating, handling, storing, transporting or disposing of special (e.g. asbestos, clinical, tyres), liquid, hazardous (batteries, coal tar, lead paint waste etc.), or restricted solid waste (e.g. contaminated soil etc.), dangerous goods, or controlled chemicals?	Yes	The removal and disposal of tyres currently used as revetment is required. Tyres can be disposed of at the Stotts Creek Resource Recovery Centre or other licenced recovery centre that accepts tyres. Under clause 76 of the Protection of the Environment Operations (Waste) Regulation 2014, tracking of loads of waste tyres greater than 200 kg or 20 tyres within NSW is required. The online tracking tool WasteLocate has been developed to allow both generators and transporters to record the required information. Accordingly, if 20 or more tyres or more than 200 kg of tyres is required to be disposed of, the Project Manager will use the WasteLocate tracking tool to record the required information. Refer to the Asbestos and Waste Tyres Guidelines for more information.	Low	A
21	Involve discharging anything to a waterway or stormwater drain?	Yes	Runoff from the subject site during construction is expected to enter Burringbar Creek. Erosion and sediment controls will be installed prior to construction works occurring. Maintenance of these controls will be undertaken periodically and after weather events to reduce impacts on the local waterway systems. Without these controls it is expected that a medium impact would occur on these waterways due to sediment entering the system. These controls would aim to divert water away from the construction site, and any water that does flow from the construction site would be directed towards the controls. These controls reduce the sediment entering the waterways and therefore a low impact is expected during construction. The proposed works would be upgrading and replacing the stormwater drains which then enter the local waterway system of Burringbar Creek. Once construction is complete all disturbed surfaces will be stabilised and controls will be removed. The stormwater system will drain stormwater from the nearby catchment of Hunter and Dignan streets. It is expected that there would be negligible impacts on waterways post-construction.	Low	A

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
22	Disturb subsurface or above ground utilities – Country Energy, Telstra, local council water and sewer?	Yes	Subsurface and above ground utilities are present within the disturbance footprint. The proposed works have been designed to avoid all utilities. Consultation with utility infrastructure owners will occur prior to construction where required.	Low	A
23	Works requiring interception of a ground aquifer (i.e. dewatering)?	No	N/A	N/A	N/A
24	Works that intercept acid sulfate soils (ASS) or potential acid sulfate soils (PASS)?	Yes	The proposed disturbance footprint is within a mapped Class 5 ASS area. Works are not within 500 m of adjacent Class 1, 2, 3 or 4 land that is below 5 m and the water table is not likely to be lowered below 1 m AHD, therefore it is unlikely that ASS will be intercepted. Refer to Section 4.5 for further ASS information.	Low	A
25	Works involving noise generating activities such as pile drivers, hydraulic hammers, machine-mounted rock breakers, generators or similar equipment in an urban area?	Yes	It is expected during construction that there will be an increase in noise caused by machinery and personnel undertaking works. Works will be limited to between the hours of 7 am and 6 pm Monday to Saturday, with no works on Sundays or public holidays. Mitigation measures outlined in Section 10 aim to reduce the impact of noise to nearby receivers. Post-construction there would be no noise generating activities.	Low	A
26	Is it expected that traffic volumes would be similar to the most recent traffic counts? Is it expected that the proposed works would impact traffic?	Yes	The number of houses present within the Hunter Street catchment has not changed since 2007 and therefore it can be assumed that the daily traffic volumes will be similar to those in 2007. It is expected that minor delays to traffic would be experienced by local road users during construction. Post-construction there would be no impacts to road users.	Low	A
Will works occur in other sensitive or constrained areas as outlined below?					

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
27	Working on a classified road including freeway, highway, main road, tourist road etc.?	No	N/A	N/A	N/A
28	Using flames during a total fire ban or working within bushfire protected lands?	No	N/A	N/A	N/A
29	Areas or items of high architectural, historical, environmental protection or scientific value?	No	N/A	N/A	N/A
30	Coastline and dune fields, caves, wetlands (not state significant) or other unique landforms?	Yes	The proposed works are adjacent to and within Burringbar Creek. It is expected that there would be negligible impacts to the creek during and after construction.	Low	A
31	Areas or items of high scenic value?	Yes	The proposed works are located in the road reserves of Dignan and Hunter streets, in private property of number 14 Hunter Street and within Burringbar Creek. Works within the road reserves and the private property are visible to neighbouring properties and traffic using these roads. Visibility of the proposed works within Burringbar Creek is limited to the adjacent private property owners. The site generally has a low visibility value (as per the Draft Scenic Landscape Strategy Interactive Mapping Tool) and the proposed works are of routine in nature, therefore a basic visual impact assessment is satisfactory. During construction, vegetation will be removed within the private property to allow for machinery to enter the site and therefore short-term negligible visual impacts would be experienced by traffic goers and neighbouring properties.	Low	A

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
			After construction, the site will be revegetated with native groundcover species. It is expected that the visual amenity of the site will be similar to that prior to the stormwater upgrade works in the long term once plants have established and matured.		
32	Recreational areas (beaches, foreshores, parks, picnic areas, lookouts, national features, tourist areas, tourist roads/routes etc.)?	Yes	[redacted] and offset planting of native species will occur within Council owned operational land at Lots A and B DP6624 at 6 Clarkes Road at Mooball. The lots are foreshore land to Burringbar Creek. The proposed [redacted] and planting of native species will not impact the use of this land.	N/A	N/A
33	Erosion prone areas?	No	N/A	N/A	N/A
34	Bush regeneration areas, dune regeneration areas etc.?	No	N/A	N/A	N/A
35	Areas of high bushfire risk?	Yes	The subject site within Vegetation Category 2 and Vegetation Buffer bushfire prone land mapped under the Bushfire prone land mapping (2012). Vegetation Category 2 is considered to be lower bushfire risk and has lower combustibility or fire size. The proposed works are not expected to increase the bushfire risk, and it is expected that post-construction the bushfire risk will be similar to prior to works.	Low	A
36	Weeds?	Yes	Exotic species are present within the private property. Garden plants, regenerating native species and environmental weeds are all within the proposed disturbance footprint. Of these species within the disturbance footprint, the Small-leaved privet (*Ligustrum sinense*) is identified as an additional species of concern in the North Coast Local Land Services region (LLS, 2017). This species is a high priority for asset protection and minimising its impacts is practicable.	Low	A

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
			As part of the works this species and others will be cleared from the disturbance footprint and disposed of appropriately. The area will be revegetated post-works with native *Lomandra hystrix* species.		
37	Urban bushland or remnant roadside vegetation?	No	N/A	N/A	N/A
38	Major pedestrian routes (e.g. foreshore walks, around sporting venues etc.)?	No	N/A	N/A	N/A
39	Schools, childcare centres, playgrounds etc.?	No	N/A	N/A	N/A
40	Works on private land?	Yes	Works will occur within private property. Section 191A of the *Local Government Act 1993* states that a council employee (or other person) authorised by a council may enter any premises to carry out stormwater drainage work on or under the premises (being work that the council is authorised by this or any other Act to carry out). Accordingly, as per section 193 of the LG Act, written notice will be given to the private property owner prior to works being undertaken.	Low	A

[1] For further guidance on evaluating impacts, refer to Attachment A, Department of Planning and Environment, Guidelines for Division 5.1 assessments, February 2022.
[2] See the Terms of Reference for the Assessment section of this REF for explanation of low and high adverse impacts (pg 3).

[#]MITIGATION ACTIONS – the following actions are required as part of completing Table 4.1:
A: Include specific environmental safeguards if required within Section 8.0 to avoid, minimise or mitigate impacts of the project.
B: Attach a copy of the relevant approval, licence, permit or record of correspondence.

C: If the subject site contains Matters of National Environmental Significance, and works are not considered to impact upon these species, populations, or ecological communities, then complete the Matters of NES template and append to this application. If impacts are likely, a separate referral is required to the Commonwealth Department of Agriculture, Water and the Environment (AWE) and the project is not eligible to be lodged as an REF (Type A Project) template format. Refer to Part C, Section 5 for guidance on preparing an REF (Type B Project) template assessment.

D: If works are within the SEPP Resilience and Hazards area, and the Action Type is N/A, then comments or further assessment must be appended providing justification. There is no requirement to address matters within the SEPP Resilience and Hazards for activities under Part 5 of the EP&A Act unless required under the SEPP Transport and Infrastructure. Similarly, there are no requirements to undertake a SEPP Biodiversity and Conservation Koala assessment report for activities under Part 5 of the EP&A Act, however, clearing of koala feed trees within the Tweed Coast Comprehensive Koala Plan of Management area must be justified in accordance with Clause 5.4 of that plan.

E: A referral to the relevant authority is required under the SEPP Transport and Infrastructure and a period of 21 days allowed for response. All responses are to be considered and included in this assessment.

F: Undertake relevant database searches as described in Part C, Section 3.2, Section 5.0 and as identified within relevant Activity Specific Procedures in Part D of the Procedure.

G: If the subject site contains NSW endangered or vulnerable species, populations, or ecological communities or their habitats, pursuant to the BC Act or the FM Act, but these species or populations will not use on-site habitats on occasion, or will not be influenced by off-site impacts of the proposal as per the NSW Office of Environment and Heritage (OEH) Threatened Species Test of Significance Guidelines (OEH, 2018), then the project can proceed with caution subject to standard environmental safeguards in Section 8.0.

H: If the subject site contains NSW endangered and vulnerable species, populations, or ecological communities or their habitats, pursuant to the BC Act or the BC Act and the works are not considered to impact significantly upon these (refer to the NSW OEH Threatened Species Test of Significance Guidelines), then details must be appended providing justification. If impacts are likely and non-standard biodiversity mitigation measures are required to offset these impacts, the project is not eligible to be lodged as an REF (Type A Projects) template assessment and an REF (Type B Projects) template assessment must be used. Refer to Part C, Section 5.0, Table C5 of the Procedure for further guidance on REF template selection and to the Activity Specific Procedure – Biodiversity assessment and mitigation for guidance on offsetting approaches and requirements.

I: Councils are exempt from Controlled Activity Approvals under the Water Management Act 2000 (WM Act).

J: Geotechnical investigations would be undertaken prior to the commencement of works to determine the depth of groundwater and the presence of ASS. Should investigations identify that ASS would be impacted during construction, then an ASS management plan would be prepared prior to the commencement of works. Additionally, should investigations identify that groundwater is likely to be intercepted, then a dewatering management plan would be prepared prior to the commencement of works. Refer to the relevant Activity Specific Procedures in Part D of the Procedure for further guidance.

K: A biosecurity matter and a biosecurity impact are described in Section 10 and Section 13 of the Biosecurity Act 2015. Refer to Schedule 3 of the Biosecurity Regulation and the North Coast Regional Weed Strategic Management Plan 2017 for further information on priority weeds and their management.

4.3 Species Impact Statements (SIS) and Biodiversity Development Assessment Report (BDAR) requirements

Section 7.8 of the BC Act states that a proposal that is regarded as an activity that significantly affects terrestrial threatened species and ecological communities, or their habitats, is taken to also significantly affect the environment.

Section 221ZX of the FM Act states that an activity is likely to significantly affect the environment if aquatic threatened species, populations or ecological communities will be affected according to the test in section 220ZZ of the FM Act.

Table 4.3: Requirements of significant impacts

Significant impacts	**Test to identify significant impact**	**Significant impacts likely for this proposal?**	**Required outcome of tests**	**Required for this activity?** (N/A, REF, SIS, BDAR)
Will there be significant impacts on terrestrial threatened species, ecological communities or their habitats?	• Test of significance Section 7.3 of BC Act.	No (Refer to App. C)	No = REF Yes = REF & SIS or REF & BDAR If proponent elects to provide BDAR in place of SIS, then needs to consider whether proposed activity would exceed the biodiversity offset scheme threshold.	REF
Will there be significant impacts on aquatic threatened species, populations or ecological communities?	• Test in Section 220ZZ of FM Act.	No (Refer to App. C)	No = REF Yes = REF & SIS	REF
Will there be significant impacts on both terrestrial and aquatic threatened species, populations and/or ecological communities?	• Test of significance Section 7.3 of BC Act and • Test in Section 220ZZ of FM Act.	No (Refer to App. C)	No = REF Yes = REF & SIS & BDAR	REF

4.4 Tweed Shire Council's Contaminated Land Policy Assessment

Table 4.4: Response to TSC's Contaminated Land Assessment (V1.1) items of consideration

Item	Consideration	Response
1	Please specify all land uses to which the site has been put, including the current use.	A review of available historical aerial photography from 1962 to 2022 indicates that the subject area was historically cleared. In the 1962 imagery the subject site was cleared of all vegetation, the surrounding areas were present as low stature vegetation presumably grazing and cropping paddocks. Some houses were present along Tweed Valley Way and Hunter Street. Burringbar Creek predominantly had no vegetation present. No major changes were present in the 1971 image. It wasn't until 1987 that Dignan Street was constructed and some houses had also begun to be constructed. Some creekline vegetation had begun to regenerate and was evident in the imagery, but still very sparse. In the 1991 imagery more houses had been constructed in Dignan Street and a new housing development to the west had roads begun to be constructed, namely Gumly Close. In the 1997 image houses in the Gumly Close development had begun to be constructed. Both Dignan and Hunter Street had been completely built out with houses on available land and creekline vegetation continued to spread. From the 2004 to present 2022 imagery there have been no major changes for the subject site and surrounding area, Gumly Close housing development had been completed and creekline vegetation had continued to grow and spread. Refer to Figures 5 to 12 in Section 11.
2	Is the proponent aware of uses to which properties adjoining the site have been put?	No. Refer above.

Item	Consideration	Response
	If so, please specify.	
3	Do any of the uses correlate with the potentially contaminating activities from current or historical land use? Refer to Table 1 in Schedule 1 of the Contaminated Land Policy for potential contaminants of concern.	No. Although agricultural land use was apparent on the surrounding land, prior to this the historical land use of the subject site is not known. No sheds, yards or structures are visible in the sequence of historical aerial photos from 1962 through to 2022. Earthworks had been undertaken as part of the original subdivision and installation of the existing stormwater pipe network, disturbing surface soils and landshaping. The closest cattle dip site (the Burringbar Dip) is located approximately 205 m north-east from the works footprint, and is removed from the subject site.
4	If the answer to 3 is yes - has there been any testing or assessment of the site and, if so, what were the results?	A site walkover has been undertaken to identify and assess any evidence of historical or recent surface contamination at the site such as chemical drums, odours, discoloured patches of earth etc. This investigation did not identify any such evidence within or adjacent to the proposed alignment.
5	Is the proponent aware of any contamination on the site?	No. The subject site has original rock revetment present that has also been built on top of with tyre revetment (assumed by a private land owner). Tyre revetment will be removed from the disturbance footprint and will be disposed of accordingly.
6	What remediation work, if any (carried out voluntarily or ordered by a government agency), has been taken in	Nil, proceed with caution. Works would cease immediately if any potential source of contamination (e.g. soil discolouration, odours or asbestos material) is uncovered during construction. In such instances, further site investigations would be undertaken to determine if additional investigations or remediation in accordance with a council approved Remediation Action Plan would be required.

Item	Consideration	Response
	respect to contamination which is or may have been present on the site?	

Refer to the following document for further information: Tweed Shire Council Contaminated Land Policy Version 1.1, November 2007.

TABLE NOTES:
A: Refer to the Activity Specific Procedure – Preliminary contaminated land use assessments in Part D of the Procedure for further guidance.
B: In the event that contamination is suspected, chemical testing should be undertaken and a contamination assessment report appended to confirm that contaminated lands are not present and /or would not be impacted by the proposal.
C: Under section 60 of the Contaminated Land Management Act 1997, a person whose activities have contaminated land or a landowner whose land has been contaminated is required to notify NSW Environment Protection Authority (EPA) when they become aware of the contamination.

4.5 Preliminary acid sulfate soils assessment

Table 4.5: Preliminary acid sulfate soils assessment

Item	Consideration	Response
1	Is the project site located within a known mapped ASS constraint area as per Table 4.4 of classes below? If yes, please specify. If no, further assessment for ASS is NOT required.	Yes. The 1:25000 ASS Planning maps indicate that the subject site occurs within a Class 5 mapped area. The proposed works are not within 500 metres of Class 1, 2, 3 or 4 land.
2	Will the projects maximum depth of excavation impact the identified ASS class? Please specify.	No. Further investigations are required of works within 500 metres of Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the water table is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land. Based on the current scope of works it is unlikely that ASS would be intercepted.
3	Has soil sampling and analysis been carried out to determine if an Acid Sulfate Soils Management Plan (ASSMP) is required? Please specify.	No. ASS is not expected to be intercepted therefore no soil sampling has been undertaken.

Item	Consideration	Response
4	Based on the above items is an ASSMP required? Please specify.	In consideration of the proposed depth of excavations which would not intercept native soil (e.g. estuarine material) an ASSMP is not required.

Refer to the following documents for further information: TSC Acid Sulfate Soil Management Plan for Minor Works and Acid Sulfate Soil Manual (published by the Acid Sulfate Soil Management Advisory Committee (ASSMAC) 1998).

TABLE NOTES:

A: Refer to the Activity Specific Procedure – Preliminary contaminated land use assessments in Part D of the Procedure for further guidance.

B: In the event that ASS is suspected, chemical testing should be undertaken and an assessment report appended to confirm that ASS lands are not present and /or would not be impacted by the proposal and therefore requiring an ASSMP.

C: Under Part 7 Additional Local Provisions, Clause 7.1 ASS of the TLEP (2014), a person must not, without development consent, carry out works on land shown as being Class 1, 2, 3, 4 or 5 land on the series of maps held in the office of the Council and marked "Acid Sulfate Soils Map", being the works specified for the class of land.

Table 4.6: Classes of ASS as per ASS Maps (TLEP 2014)

Class of land	Specified works
1	• Any works.
2	• Works below the natural ground surface. • Works by which the water table is likely to be lowered.
3	• Works more than 1 metre below the natural ground surface. • Works by which the water table is likely to be lowered more than 1 metre below the natural ground surface.
4	• Works more than 2 metres below the natural ground surface. • Works by which the water table is likely to be lowered more than 2 metres below the natural ground surface.
5	• Works within 500 metres of Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the water table is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.

4.6 Aboriginal cultural heritage preliminary assessment

As explained within the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECC&W, 2010), the NSW Aboriginal cultural heritage due diligence assessment is a code of practice developed to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for consent in the form of an Aboriginal Heritage Impact Permit (AHIP). The *National Parks and Wildlife Act 1974* (NPW Act) provides that a person who exercises due diligence is determining that their actions will not harm Aboriginal objects and has a defence against prosecution for the strict liability offence if they later unknowingly harm an object without an AHIP.

Tweed Shire Council has developed a Preliminary Aboriginal Cultural Heritage Assessment (PACHA) to ensure Council infrastructure projects minimise the risk of harm to Aboriginal

places and objects of cultural heritage significance. The objective is to identify those projects with a significant risk of harm to Aboriginal cultural heritage and conversely, those projects for which the risk of harm is low. Projects determined to have a high risk of harm to ACH require a more detailed assessment in the form of an Aboriginal Cultural Heritage Assessment Report (ACHAR) and potentially an Aboriginal Heritage Impact Permit (AHIP). Those determined to have a low risk of harm to ACH may proceed with caution without an ACHAR or AHIP.

A PACHA is provided in Appendix D. In summary, the PACHA found that harm to Aboriginal places and objects can be avoided and an ACHAR and AHIP is not required.

5.0 Clause 171(2) factors

According to clause 171(2) of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation 2021), Council must take into account the following factors when consideration is being given to the likely impact of the activity on the environment.

Table 5.1: Clause 171(2) assessment conditions

Matters for consideration	**Likely impact** (nil/positive/negative)
(a) Any environmental impact on a community	The assessment of this REF has demonstrated that there would be improved environmental impact on the community, whereby stormwater drainage will be improved and reduce the effects of flooding after the completion of the works.
(b) Any transformation of a locality	The proposed activity would result in a temporary transformation of the locality during construction in association with construction machinery, equipment and materials. Following construction, the area of garden where vegetation will be removed will be replaced with a dense planting of Lomandras. The locality will look visually different until the plants have time to mature, noting that trees will not be replanted into this area to ensure there will be no future impacts to infrastructure.

Matters for consideration	**Likely impact** (nil/positive/negative)
(c) Any environmental impact on the ecosystems of the locality	The environmental impact on local ecosystems is expected to be minimal based on the minor scope of works, short duration of construction works and mitigation measures that will be put in place. The dense Lomandra planting is expected to provide a seed bank for this species where Burringbar Creek downstream may benefit. The Lomandras will improve bank and soil stabilisation and possibly water quality for into the future.
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality	There would be a minor reduction in the aesthetic value of the locality due to the temporary presence of construction workers and associated plant and control measures.
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations	The proposed activity is not expected to negatively impact on any locality, place or building having aesthetic, anthropological, archaeological, architectural, or historic value.
(f) Any impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016)	The site is disturbed from past and current land uses and the vegetation present is a mix of overgrown garden escapee, weeds and native plants and trees. Vegetation within the proposed footprint only will be removed. The proposed disturbance footprint has minimal habitat value for fauna. Accordingly, the proposal would not have a significant impact on habitat of protected fauna species.
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	The site is disturbed from past and current land uses and is overgrown with predominantly exotic shrubs and groundcovers. Native and exotic trees are present in the canopy. [redacted] success. Accordingly, the proposal would not have a significant impact on habitat relied upon by threatened, endangered or vulnerable species.

Matters for consideration	**Likely impact** (nil/positive/negative)
(h) Any long-term effects on the environment	Mitigation measures listed in Section 10 of this REF would be implemented during construction to ensure that there are no long-term effects on the environment.
(i) Any degradation of the quality of the environment	Construction works would likely result in some minor short-term impacts on the environment. Mitigation measures as listed in Section 10 of this REF would ensure that these impacts do not degrade the quality of the environment in the longer term.
(j) Any risk to the safety of the environment	The proposed activity would have minimal risk to the safety of the environment. A range of risk management measures would be utilised during construction which are summarised in Section 10 of this REF. Following construction it is expected that there would be an improvement on the risk to the safety of the environment due to the expected reduction in flooding.
(k) Any reduction in the range of beneficial uses of the environment	The proposed activity would not reduce the overall range of beneficial uses of the environment.
(l) Any pollution of the environment	Mitigation measures as listed in Section 10 of this REF would minimise the risk of pollution to the environment during works.
(m) Any environmental problems associated with the disposal of waste	There would be no environmental problems associated with the disposal of waste. There would be only a minor contribution of construction waste to landfill.
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	Some demand for additional materials would be generated as part of the proposed development. There would also be a minor contribution to reliance upon non-renewable fuel resources during construction.
(o) Any cumulative environmental effect with other existing or likely future activities	Construction machinery and plant relies on non-renewable fuel which contributes to atmospheric

Matters for consideration	**Likely impact** (nil/positive/negative)
	greenhouse gasses and, subsequently, anthropogenic climate change. Council's operations generate greenhouse gas emissions primarily from the use of fossil-fuel powered electricity (79% at July 2019), from burning transport fuels across Council's fleet (15% at July 2019) and from nitrous oxide and methane emissions from wastewater treatment plants (6% at July 2019). Although there are currently limited alternative energy sources for Council's plant and machinery, Council's Renewable Energy Action Plan (REAP) have set a target of reducing its greenhouse gas emissions from electricity use by 50% by 2025. Although there is currently a cumulative environmental effect from the generation of greenhouse gas emissions, measures listed within Council's REAP will mitigate long-term effects.
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The subject site is located outside the coastal hazard zone as per the Tweed Shire Coastal Hazards Assessment completed in November 2013. Therefore, the proposal is unlikely to impact upon coastal processes or hazards.
(q) Any applicable local strategic planning statements, regional strategic plans or district plans made under the Act, Division 3.1	The Local Strategic Planning Statement 2020 (LSPS) themes align with 4 goals from the North Coast Regional Plan 2036 (NCRP) being: 1. Natural environment 2. Thriving economy 3. Liveable communities 4. Diverse housing and lifestyles. The planning priorities within the LSPS are broadly consistent with the NCRP and the Community Strategic Plan 2017–2027 (CSP) strategic direction.

Matters for consideration	**Likely impact** (nil/positive/negative)
	This project incorporates the following planning priorities of the LSPS: • Planning priority 1: Protect the Tweed's significant natural environment, resources and landscape qualities, while cultivating sustainable growth and development, which promotes the health and vitality of the community. • Planning priority 3: Increase resilience and adapt to the impacts of natural hazards and climate change to ensure our future prosperity and wellbeing. • Planning priority 12: Foster enhanced partnerships and collaboration with local Aboriginal and Torres Strait Islander communities. • Planning priority 15: Deliver housing supply and associated infrastructure to meet the needs of a growing population whilst sensitive environmental and agricultural hinterlands are protected. • Planning priority 17: Deliver well-planned residential and rural residential housing. This project incorporates the following goals from the CSP: • Goal 1.2: Protection of people and property by managing the risk of flooding and its impacts on property owners, the environment and the broader community. • Goal 1.3: Provide high quality and secure water, sewer, rubbish and recycling services that meet health and environmental requirements. • Goal 3.2: Provide places for people to live, work, visit, play and enjoy the Tweed.
(r) Any other relevant environmental factors	There are no other relevant environmental factors requiring consideration.

6.0 Publication requirements

According to clause 171(4) of the EP&A Regulation 2021, Council must publish REFs and all relevant information if identified in Table 6.1.

Table 6.1 Clause 171(4) publication requirements

Publication requirements[1, 2]	**Publication requirement** (yes or no)	**Published** (n/a, TSC website)
A capital investment value of more than $5 million	No	N/A
An approval or permit for activity that requires approval under:		
• FM Act sections 144, 200, 205 or 219	Yes	TSC website
• *Heritage Act 1977* section 57	No	N/A
• *National Parks and Wildlife Act 1974* section 90	No	N/A
• *Protection of the Environment Operations Act 1977* sections 47–49 or 122	No	N/A
If the determining authority considers it to be in the public interest[3]	No	N/A

TABLE NOTES:

1: There are allowances for exceptional circumstances where publication is not required; this is at the Planning Secretary's discretion.

2: Where certain parts of this REF document is sensitive, such as sensitive cultural information requested to be redacted by Aboriginal parties or cyber security impacts and mitigation measures, in these instances, the REF document content can be redacted where required. The REF document (excluding sensitive information) needs to be available online

3: For further guidance refer to Point 6 in Attachment A of the Department of Planning and Environment, Guidelines for Division 5.1 assessments, February 2022.

7.0 Supporting documentation

Table 7.1 below provides a summary of additional assessment, management plans, permits, licences and approvals required for the proposed activity.

Table 7.1: Summary of additional assessments, plans and approvals

Checklist of additional assessments, management plans, permits, licences, or approvals:	**Required?** (yes/no)	**Attached?** (yes/no)
DATA BASE SEARCHES		
NSW Wildlife Atlas Flora and Fauna Records Search	Yes	No – Information on file and incorporated into Appendix C.
Commonwealth Protected Matters Search	Yes	No – Information on file and incorporated into Appendix B.
Aboriginal Heritage Information Management System search (AHIMS)	Yes	No – Information on file.
State Heritage Inventory	Yes	No – Information on file.
Maritime Heritage Database	No	N/A
ASSESSMENTS		
Assessment of matter of National Environmental Significance	Yes	Yes. Refer to Appendix B.
Contaminated Lands Assessment	No	Due diligence assessment provided in Section 4.2.
Preliminary Flora and Fauna Assessment	Yes	Yes. Refer to Appendix C.
MANAGEMENT PLANS		
Acid Sulfate Soil Management Plan for Minor Works	No	N/A
Project-specific Acid Sulfate Soil Management Plan	No	N/A
Dewatering Management Plan	No	N/A
Landscape Management Plan	No	N/A

Checklist of additional assessments, management plans, permits, licences, or approvals:	**Required?** (yes/no)	**Attached?** (yes/no)
Vegetation Management Plan	Yes	Yes. Refer to Appendix F.
Waste Management Plan	Yes	Yes. Refer to Appendix E.
PERMITS / LICENCES / APPROVALS		
A water access licence (WAL) or water supply works approval under the Water Management Act 2000.	No	N/A
NSW DPI Fisheries Permit	Yes	Yes. Reclamation works are required. Accordingly a DPI Fisheries reclamation permit will be sought prior to construction works occurring. Refer to Appendix G.
NSW DPI Crown Lands – General or Short-term Licence	No	Notice of intention to enter Crown Land will be completed prior to construction works as per section 193 of the LG Act.
CONSULTATION		
NSW Environment, Energy and Science (EES)	No	N/A
Transport for NSW	No	N/A
PUBLISHING REQUIREMENTS		
Sensitive information required to be redacted prior to publishing online	Yes	Redacted copy will be published on the Tweed Shire Council website prior to construction works being undertaken.

Link to information on file:

http://sp-prod-app:84/Projects/built/stormwater/ISW16/default.aspx

8.0 Conclusions

This REF has assessed the proposed activity and any potential impacts. The activity is unlikely to significantly affect the environment, and therefore an EIS is not required.

The activity is unlikely to significantly affect threatened species, populations, ecological communities or their habitats and therefore an SIS and/or BDAR is not required.

9.0 Certification and determination

The determination of this REF certifies that the Project Client confirms:

- the REF provides an accurate description of the project scope of works
- the mitigation measures proposed within the REF are budgeted for and forms part of the final scope of works.

The determination of this REF certifies that the Project Manager confirms:

- they have reviewed the design and construction footprint as assessed within this REF
- the mitigation measures proposed within the REF will be implemented as described during construction and operation of the works
- any changes to the project scope of works or disturbance footprint will be communicated to Council's Engineering Division Environmental Scientist, for further assessment (if required).

Table 9.1: Certification by Environmental Scientist preparing the assessment

Certification (person preparing the assessment)
I certify to the best of my knowledge that: a. this REF provides a true and fair review of the proposed activity in relation to its likely effects on the environment. It assesses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed activity b. this REF has established that the activity is not likely to significantly affect the environment and an Environmental Impact Statement is not required c. the REF has concluded that there will be no significant impacts on matters of national environmental significance or any impacts on Commonwealth land d. the proposal should proceed subject to the implementation of all environmental safeguards and management actions identified in the REF and compliance with all other relevant statutory approvals, licenses, permits and authorisations. Note 1: Projects with unacceptable impacts are recommended not to proceed (with reasons stated) or be subject to further investigation and assessment in accordance with an Environmental Impact Statement process.

Note 2: The imposition of environmental safeguards and management actions identified in the REF are to minimise any adverse impact the activity may cause and to give effect to the objectives of Part 5 of the *Environmental Planning and Assessment Act 1979*.	
Name	[redacted]
Signature	
Position	Environmental Scientist
Date	14/2/2023

Table 9.2: Review and final determination under delegated authority

Review and Final Determination (person with delegated authority to review and determine the assessment)	
I certify: • to the best of my knowledge that based on the completed REF and my knowledge of the project, the assessment has been adequately completed, and the conclusion as to the likely environmental impact of the project is reasonable and the project can proceed subject to the relevant management measures and environmental safeguards and other relevant authorities described within the REF. • that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading.	
Name	[redacted]
Signature	
Position	Acting Senior Planning Applications Officer
Date	15/03/2023

10.0 Project mitigation measures

Table 10.1: Project mitigation measures

General and/or non-standard mitigation measures	Code
The activity is to be completed in general accordance with the Review of Environmental Factors.	**GNS1**
All work associated with this activity is to be carried out so as not to cause a nuisance to residents in the locality from noise, water or air pollution.	**GNS2**
All construction and/or demolition site work including the entering and leaving of vehicles is limited to the following hours, unless otherwise permitted by Council: • Monday to Saturday from 7.00 am to 6.00 pm • No work to be carried out on Sundays or Public Holidays.	**GNS3**
Written notice shall be given to any affected residences at least two weeks prior to any works commencing.	**GNS4**
All construction personnel working at the site would be inducted prior to commencement of works.	**GNS5**
The Project Environmental Scientist responsible for preparing the REF would be present at the start-up meeting to brief staff on environmental management requirements.	**GNS6**
A site specific erosion and sediment control plan would be prepared prior to works commencing.	**GNS7**
All required erosion and sediment control works would be installed and maintained in accordance with the Sediment and Erosion Control Plan and in accordance with the Blue Book – *Managing Urban Stormwater – Soils and Construction.*	**GNS8**
[redacted]	**GNS-ISW16-1**
Tyres will be removed and disposed of to a licenced facility such as the Stotts Creek Resource Recovery Centre.	**GNS-ISW16-2**

General and/or non-standard mitigation measures	Code
Where 20 or more tyres or more than 200 kg of tyres is required to be disposed of, the Project Manager will use the WasteLocate tracking tool to record the required information. Refer to the Asbestos and Waste Tyres Guidelines for more information.	**GNS-ISW16-3**
Works will be completed in accordance with the conditions of the Fisheries reclamation permit.	**GNS-ISW16-4**
Disturbed areas are to be revegetated as per the Vegetation Management Plan.	**GNS-ISW-5**
Offset planting will occur in line with the Vegetation Management Plan.	**GNS-ISW16-6**

Flora and fauna	Code
Pre-construction	
Vegetation that is to be retained, including high conservation zones, is to be clearly identified and delineated from the construction footprint. High-visibility temporary fencing (e.g. scrim or flicker tape) identifying no-go zones is to be installed prior to the commencement of construction works.	**F&F1**
Where construction works or movement of materials are considered likely to damage trees (trunks, branches or roots), precautionary measures including trunk and branch protection in line with Section 4 of AS4970-2009 would be installed.	**F&F2**
A pre-clearing site walkover would be undertaken by a suitably qualified Ecologist/Environmental Scientist to survey for any threatened species present within the disturbance footprint which may have been overlooked during previous surveys or established since surveys were undertaken. Pre-clearing surveys would target those threatened species short-listed as most likely to occur on site.	**F&F3**
In the event that threatened fauna species are identified within the disturbance footprint, construction would avoid disturbance of the individuals and, if necessary, the individuals would be relocated by experienced wildlife handlers.	**F&F4**

Flora and fauna	Code
If nests and/or eggs of threatened species are identified within the disturbance footprint, the construction works would be postponed until the eggs are hatched and the hatchlings have dispersed on their own accord or an experienced wildlife handler has safely relocated them.	**F&F5**
All machinery used on site is to be clean – i.e. tracks, vehicle tyres, buckets and attachments are to be visibly free of soil and plant material to minimise the risk of introduction and spread of weed propagules.	**F&F9**
During construction	
Earthworks are to be managed such that areas outside the scope of the works remain undisturbed as far as possible and vegetation clearing is kept to the absolute minimum required.	**F&F10**
No construction materials, stockpiles, or construction equipment including heavy vehicles and machinery shall be located or parked within the drip line of trees adjacent the project.	**F&F11**
All works in regards to the management of vegetation (pruning of roots or branches or removal of identified trees) would be supervised by a suitably qualified arborist.	**F&F12**
The width of trenching during works in proximity to trees is to be reduced where possible to minimise potential impacts.	**F&F13**
Roots for trees to be retained which are encountered during excavations would be clean cut using a saw or hydro-jet (water knife) and not ripped or torn with an excavator or bucket etc. Trimming or pruning of above ground branches or limbs would be undertaken with a saw.	**F&F14**
Branches or trees to be removed should be felled towards cleared areas and away from vegetation to be retained.	**F&F15**
Cleared vegetation should not to be pushed into areas of retained vegetation.	**F&F16**
Care would be taken to replace dead wood and retain dead trees in areas of retained vegetation for wildlife habitat values. Replacement locations would be determined in consultation with Project Environmental Scientist or an ecologist.	**F&F17**
Remove all waste containing weeds and seeds from the site and dispose of so that the spread of weeds is minimised.	**F&F18**

Flora and fauna	Code
When controlling weeds, refer to measures stipulated by the *New South Wales Weed Control Handbook – A guide to weed control in non-crop, aquatic and bushland situations.*	**F&F19**
If aquatic snags are present within the disturbance footprint at the time of construction, they require relocation in accordance with the following guidelines: • Snags are to be realigned and/or relocated to a zone of low velocity and at an angle of 20º to 40º to the bank facing downstream. The location is to be determined in consultation with the Project Environmental Scientist. • Snags with rootballs are to be aligned so that the root-ball is against the bank and at the upstream end.	**F&F20**
Post-construction	
Areas which are disturbed during construction and not permanently transformed are to be revegetated.	**F&F22**

Erosion and sediment control	Code
Pre-construction	
All required erosion and sediment controls would be in place prior to the commencement of work and maintained until all works are completed.	**ESC1**
During construction	
Where practicable, construction works would be staged to minimise the area of disturbance at any one time.	**ESC2**
Trenching would be staged so that the minimum amount of ground disturbance occurs at any one time.	**ESC3**
Works would be stopped if unsuitable weather conditions are predicted, such as during and after heavy rain.	**ESC4**

Erosion and sediment control	Code
The condition of sediment control structures would be monitored and maintained in proper working order throughout the time they are in place. They would be kept clear of debris at all times and cleared of sediment if filled >50% capacity.	**ESC5**
Stockpile sites would be located in existing cleared areas away from drains and surface water flows and protected with an upslope diversion bund and down slope sediment fencing (if required).	**ESC6**
'Clean' run-on water would be diverted around the disturbance area.	**ESC7**
Construction plant should be floated on-site using established access roads/tracks or areas previously cleared of vegetation.	**ESC8**
In the event that significant tracking of mud and soil occurs on adjacent roads, cleaning of the road will be undertaken as soon as practically possible.	**ESC10**
Post-construction	
Following completion of construction works, the site would be cleared of all debris, waste soil and foreign matter.	**ESC11**
All disturbed surfaces would be reinstated and stabilised as soon as possible after completion using turf and/or grass seed.	**ESC12**
All temporary erosion and sediment control structures would be removed once the site is stabilised.	**ESC13**

Water quality management	Code
During construction	
In-stream sediment fences are to be provided at all work sites where riparian or in-stream works are to be undertaken and sediment is to be mobilised with a potential endpoint within the waterway**.**	**WQ1**
In-stream sediment fences are to remain in place throughout the duration of works.	**WQ2**

Water quality management	Code
In-stream sediment fencing is to cover the entire depth of the water column and is to be weighted or installed in a manner such that the bottom of the sediment fence is flush with the riverbed directly downstream of the area of works.	**WQ3**
In-stream sediment fencing is not to cover the full width of the stream in order to allow for fish passage.	**WQ4**
In-stream sediment fencing is to surround the work footprint and be installed as close as possible to the work area.	**WQ5**
In-stream sediment fencing is to consist of geofabric of suitable mesh size such that the smallest anticipated sediments will be trapped within the mesh.	**WQ6**
In-stream sediment fences can either be supported on a floating boom or staked in place with star pickets or similar. Floating booms are appropriate in deeper channels and/or in slow moving streams. Stakes are more appropriate in shallow streams and/or where increased velocity is experienced.	**WQ7**
The condition of sediment control structures would be monitored and maintained in proper working order throughout the time they are in place. They would be kept clear of debris at all times and cleared of sediment if filled >50% capacity.	**WQ8**
There is to be no release of dirty water into drainage lines and/or waterways.	**WQ9**
Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis to identify any potential spills or deficient erosion and sediment controls.	**WQ10**
Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc.) entering drain inlets or waterways.	**WQ11**
All materials including paints, coatings and fuels used when working over a waterway are to be appropriately contained and hand held tools tethered correctly.	**WQ12**
During construction, sediment from silt curtains will be regularly cleared, and weather forecasts will be monitored to reduce the potential for sediment release during flood events.	**WQ17**
To minimise the risk of water pollution and disturbance to the streambed substrate, machinery is not to enter or work from the waterway without prior written approval.	**WQ18**

Water quality management	Code
To avoid fines, clay and other sediments unnecessarily entering the waterway, only clean rock is to be used for construction works within the waterway.	**WQ19**

Acid sulfate soil management	Code
During construction	
In the event that acid sulfate soils are expected to have been excavated stockpiles should be immediately bunded and the soil material returned to excavation points and backfilled within 12 hours. Should acid sulfate soils require disposal off-site, treatment and management would be required and the site supervisor should organise the implementation of a project acid sulfate soil management plan in consultation with a Council Environmental Scientist. Acid sulfate soils indicators include the following: • Jarosite soil horizons including pale yellow mineral deposits within the soil • Iron oxide mottling of soils within excavations • Clear or milky blue-green surface water • Iron stains on water surfaces • Waterlogged soils including unripe muds that are soft, buttery, blue grey or dark greenish grey • Soil pH <4 and/or strong reaction to peroxide.	**ASM5**

Land use and amenity	Code
During construction	
The proposed activity would be managed such that the development footprint is limited to the extent necessary to complete the scope of works.	**LUA1**
All plant, equipment, materials and waste would be removed from the site at the completion of works.	**LUA2**

Public access	Code
To ensure public safety during works, standard construction site access restrictions would apply.	**PA1**
The works alignment would be fenced in nominated locations to restrict public access.	**PA2**
Alternate pedestrian access would be provided where works impact upon pedestrian infrastructure such as footpaths or cycleways.	**PA3**
Signage would be utilised along the alignment to direct and inform the public regarding access to and around the site.	**PA4**

Noise and vibration	Code
Pre-construction	
Closely affected residents would be notified accordingly of the works being performed in close proximity and informed of the process for making a complaint. For this project, complaints would be made to the constructor.	**N&V1**
During construction	
Ensure site workers are aware of the process for receiving complaints and direct complainants to the responsible site supervisor.	**N&V2**
The operation of plant and equipment would be restricted to standard hours of 7:00 am to 6:00 pm Monday to Saturday. No work would be undertaken on Sunday or public holidays.	**N&V3**
Trucks and equipment would not arrive or queue outside the site before 7 am Monday to Saturday.	**N&V4**
Operating periods for particularly noisy activities (i.e. rock breaking/drilling, if required) would be reduced where possible to provide respite periods.	**N&V5**
Machines/equipment would be turned off when not in use or throttled down to a minimum.	**N&V6**

Noise and vibration	Code
Reversing of vehicles would be minimised where possible to alleviate the annoyance of beeping reverse alarms (or less tonal 'broadband' or 'quacker' type alarms would be utilised).	**N&V7**

All reasonable steps shall be taken to muffle and acoustically baffle all plant and equipment. In the event of complaints from the neighbours, which Council deem to be reasonable, the noise from the construction site is not to exceed the following:
• Short Term Period – 4 weeks.
  ○ LAeq, 15 min noise level measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 20dB(A) at the boundary of the nearest likely affected residence.
• Long term period – the duration.
  ○ LAeq, 15 min noise level measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 15dB(A) at the boundary of the nearest affected residence.
	N&V8

All plant would be maintained in good condition, with all reasonable and feasible acoustic treatments (i.e. residential mufflers and plant enclosures) installed and maintained (refer to AS 2436 – 1981 ‘Guide to noise control on construction, maintenance and demolition sites’).	**N&V9**
Any stationary equipment (e.g. generators) would be located as far as possible from residential receptors.	**N&V10**
Plant operators would be instructed to operate equipment in a manner that does not generate unnecessary noise, such as: • avoiding excessive revving • avoiding dragging objects or dropping objects from a height • minimising impact with solid objects where possible • using excavator bucket heads or rock claw attachment to move solid objects • using excavator bucket, claw or rock ripper pick in preference to rock drillers or splitters, where possible • turning off machines/plant equipment when not in use or throttled down to idling.	**N&V11**
Complaint based noise monitoring would be performed throughout construction as required to confirm the effectiveness of noise management controls.	**N&V12**

Noise and vibration	Code
A noise complaint register would be maintained throughout construction. The register would record all complaints including: • Complainant contact details • Source/type of noise causing disturbance • Time and duration of noise causing disturbance • Times when the noise would cause least disruption • Measures taken to address the complaint Complaints handling is to occur in a prompt and responsive manner.	**N&V13**
Where there are complaints about noise from an identified work activity, it would be reviewed and, where feasible and reasonable, actions additional to those in place implemented to minimise noise output and disruption to sensitive receptors (e.g. reschedule activity causing disturbance to a time which causes least disruption to the complainant and other receptors).	**N&V14**

Air quality management	Code
During construction	
All plant and machinery would be serviced at regular intervals to minimise exhaust emissions.	**AQ1**
The constructor would observe local meteorological conditions and predicted forecasts on a daily basis and prepare site for extreme weather events (i.e. high winds, rainfall).	**AQ2**
Works would be staged, where practicable, to minimise the area of disturbance at any one time.	**AQ3**
All necessary precautions shall be taken to minimise impacts from dust during construction works and from construction vehicles.	**AQ4**
Dust dispersion would be managed via stockpile control (e.g. soil stockpiles covered during high wind conditions), erosion and sediment controls, and wetting down if required.	**AQ5**
Any transport trucks would be covered during journeys to and from the site.	**AQ6**
Vehicles would be switched off when not in use.	**AQ7**

Air quality management	Code
Dust screens will be considered where necessary to protect adjacent residences from wind-blown dust.	**AQ8**
All stockpiles, exposed areas, unsealed trafficable areas and compound areas will be covered where practicable (using plastic, mulch, hydromulch, etc.) or wet down as required to minimise wind-blown and traffic generated dust. Wetting down of these areas should not be done to the extent that run-off occurs.	**AQ9**
Post-construction	
Disturbed areas would be stabilised once works are complete, or progressively where appropriate.	**AQ10**

Traffic Management	Code
Pre-construction	
Prior to the commencement of construction, a Traffic Management Plan must be prepared by an RMS accredited person in accordance with AS1742 and the RMS publication "Traffic Control at Work Sites" (current version).	**TM1**
Where a Traffic Management Plan is required it shall be submitted to Council for approval not less than 7 days prior to commencement of works.	**TM2**
During construction	
Where works would result in delays to traffic, where possible, they would be scheduled to occur outside of morning and afternoon peak traffic periods and the public would be notified in advanced.	**TM3**
Parking for construction workers would be accommodated within the construction footprint and existing cleared areas within the nearby road reserve.	**TM4**
Traffic would be managed by traffic controllers throughout construction.	**TM5**
Where possible, all loading and unloading operations will be conducted within the internal construction zone to alleviate the need for lifting materials from off the street.	**TM6**

Contaminated lands	Code
During construction	
Works are to cease immediately if any potential source of contamination is uncovered during works (e.g. chemical drums). In such an instance remediation in accordance with a Council approved Remediation and Validation Action Plan would be required.	**CLM1**
All imported fill material shall be from an approved source. Prior to commencement of construction, details of the source of the fill, description of the material, and evidence that the material is free of contaminants, must be produced.	**CLM2**

Hazard management	Code
During construction	
Appropriate spill kits, advocated for use in association with fuels and chemicals are to be maintained on-site. These are to include spill booms and other methods aimed at the containment of fuels and chemicals spilled within the aquatic environment.	**HAZ5**
Fuels and chemicals are to be stored off-site, however, if required to be stored on-site, they are to be located in a bunded area away from drainage lines.	**HAZ6**
No refuelling is recommended within the subject site. If however, refuelling is required at the subject site, areas designated for the storage, refuelling and maintenance of plant are to be established where native vegetation has previously been cleared and at least 30 m from a waterway.	**HAZ7**
Forecast checks of the Bureau of Meteorology site would be undertaken daily. In the event that heavy rain is predicted, arrangements are to be made immediately to remove any plant and equipment from within the banks of the waterway prior to the rain event. All plant and equipment would be removed to higher ground above the 1 in 100 year flood level.	**HAZ8**
In the event of flooding, no workers would be directed into flood waters.	**HAZ9**

Hazard management	Code
Any debris and spoil accumulated within the works site as a result of flooding would be removed to the designated stockpile area.	**HAZ10**
All environmental controls would be reinstated as soon as possible following flooding.	**HAZ11**

Cultural heritage management	Code
During construction	
If an Aboriginal object or objects, or any cultural heritage material is identified during the works, all works would stop immediately and the Manager Infrastructure Deliver, Tweed Shire Council (TSC) notified. The TSC contact is to advise the Tweed Byron Local Aboriginal Land Council (TBLALC) Aboriginal Sites Officer (on 07 553601926) and OEH. No works or development may be undertaken until the required investigations have been completed and any permits or approvals obtained, where required, in accordance with the *National Parks and Wildlife Act 1974*. It is possible that in such a case there may be a necessity to apply for an AHIP and further investigations may be required. The *National Parks and Wildlife Act* requires that, if any person finds an Aboriginal object on land and the object is not already recorded on AHIMS, they are legally bound under Section 89A of the Act to notify OEH as soon as possible of the object's location.	**CH1**
In the event that objects suspected of being of Aboriginal Cultural Heritage significance are uncovered, the TSC ACHMP unexpected finds procedure must be followed.	**CH2**
If human remains are found during the works, then all works shall cease immediately. The area must be secured within an exclusion zone to prevent unauthorised access and the NSW Police and OEH must be informed as soon as possible.	**CH3**
If non-aboriginal heritage is discovered, work should stop and the item demarcated. An in-situ heritage assessment is required to determine whether the item is a relic. If the item is concluded to be a relic, the NSW Heritage Council are to be contacted as soon as practical. The NSW Heritage Council would advise the appropriate course of action to be taken.	**CH4**

Cultural heritage management	Code
N.B. The Heritage Act 1977 defines '*Relic'* as meaning any deposit, artefact, object or material evidence that: (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and is of State or local heritage significance.	

Biosecurity management	Code
Suspicious sightings of red imported fire ants or their mounds that have been identified within a site must be reported to NSW Department of Primary Industries immediately on 1800 680 244 or via their online form https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants. If red imported fire ants are suspected, do not: • disturb the ants or nests • treat the infestation yourself. If red imported fire ants are suspected, do (if safe to do so): • take a photo of the suspicious ants including a scale (use coin or key) and attach it to the report • keep a sample in a jar or zip lock sandwich bag in case it needs to be submitted for further investigation	**BM1**
Red imported fire ants are regulated as prohibited matter under the *NSW Biosecurity Act 2015*. Their possible movement and spread can be in or on hay or straw bales, turf, agricultural and earth moving equipment, organic mulch including manure, soil and potted plants. • To move hay, straw bales, turf agricultural and earth moving equipment into NSW from or through the fire ant biosecurity zones in Queensland it must be accompanied by a Plant Health Certificate. • To move soil and organic mulch including manure into NSW from or through the fire ant biosecurity zones in Queensland it must be accompanied by either a Plant Health Certificate or a Biosecurity Certificate. • To move potted plants into NSW from or through the fire ant biosecurity zones in Queensland it must be accompanied by either a Plant Health Certificate, a Plant Health Assurance Certificate or a Biosecurity Certificate.	**BM2**

Biosecurity management	Code
Prior to the use of materials and equipment that has travelled through or from a Queensland biosecurity zone, Project Managers are to ensure that contractors supply the necessary certificates for any of the materials and equipment.	**BM3**
Any requirements identified by the NSW Department of Primary Industries for prohibited matter must be complied with.	**BM4**

Waste minimisation and management	Code
During construction	
All waste materials generated by the project should be managed in accordance with the project Waste Management Plan. A preliminary waste management plan is included in Appendix E and will be further updated and communicated at the pre-start construction meeting following waste classification testing of soil materials that would be encountered during construction.	**WM2**
All reasonable efforts will be made to avoid and minimise waste and to reuse or recycle where possible.	**WM3**
Separate waste and recycling bins will be provided on site for the removal of workers and building rubbish.	**WM4**
All waste bins on site will have self-closing lids preventing waste from being airborne.	**WM5**
All general rubbish and construction waste would be removed from the site and disposed of in an appropriate bin or Council waste recovery facility.	**WM6**

11.0 Figures and plates

Figure 1: Locality of subject site (pink polygon) and translocation receiving site (yellow polygon)

Figure 2: Subject site (pink polygon)

Figure 3: Tweed Local Environmental Plan 2014 zoning; pink polygon = disturbance footprint

Figure 4: Tenure; white shading = freehold; pink polygon = disturbance footprint

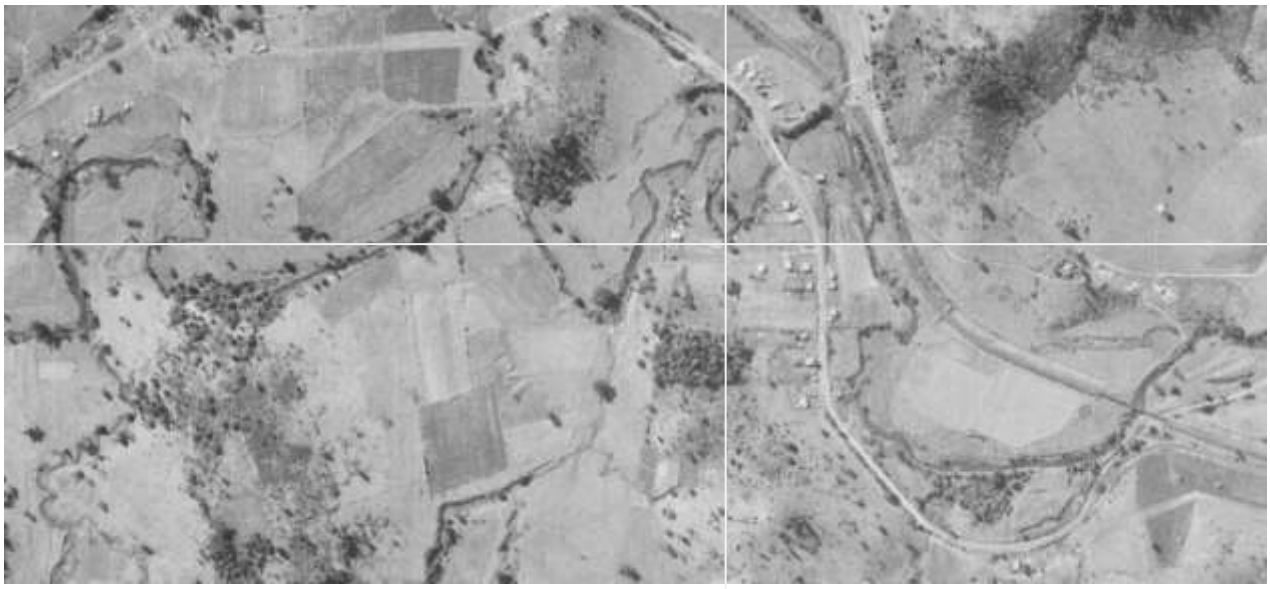

Figure 5: Historic aerial imagery from 1962 (source: NSW Historic Imagery Viewer)

Figure 6: Historic aerial imagery from 1971 (source: NSW Historic Imagery Viewer)

Figure 7: Historic aerial imagery from 1987 (source: NSW Historic Imagery Viewer)

Figure 8: Historic aerial imagery from 1991 (source: NSW Historic Imagery Viewer)

Figure 9: Historic aerial imagery from 1997 (source: NSW Historic Imagery Viewer)

Figure 10: Historic aerial imagery from 2004 (source: TSC Weave)

Figure 11: Historic aerial imagery from 2015 (source: TSC Weave)

Figure 12: Historic aerial imagery from 2022 (source: TSC Weave, Nearmap image)

Plate 1: View looking north along stormwater pipe alignment; garden plants and weeds with occasional native plants present

Plate 2: Existing stormwater manhole to be replaced

Plate 3: Looking north to exit point into Burringbar Creek, manhole in bottom right corner.

12.0 References

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13.0 Appendices

Appendix A Design plans

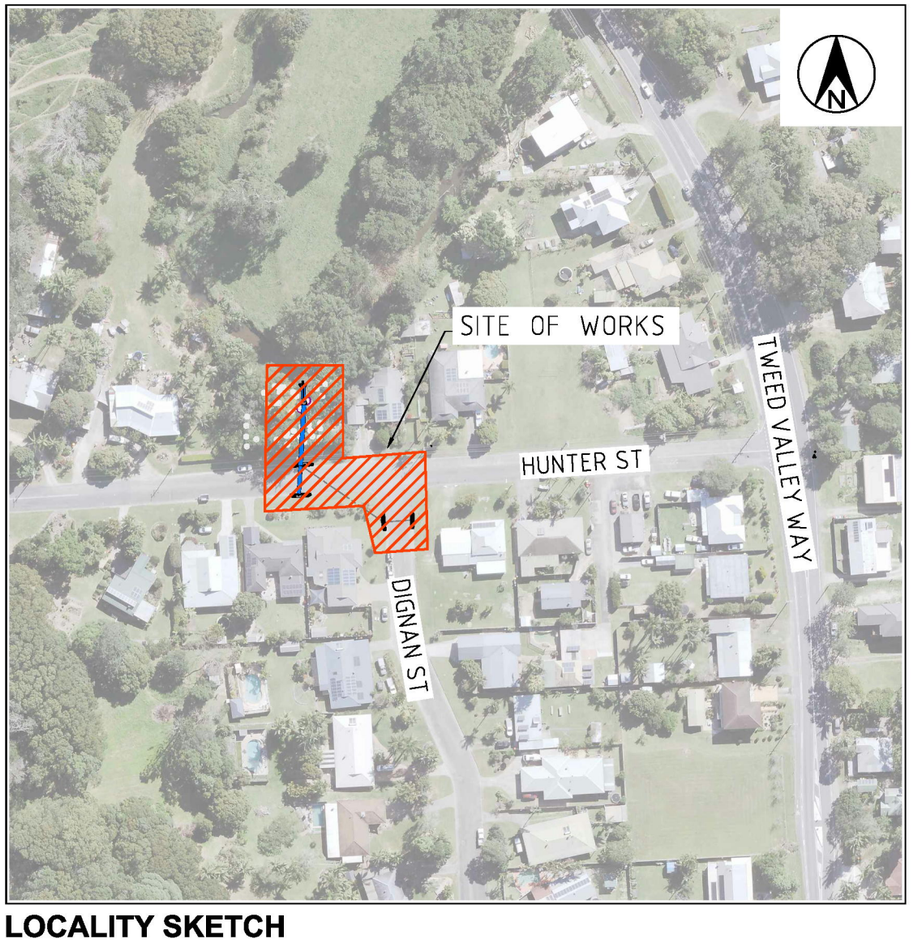
STORMWATER DRAINAGE - UPGRADE
HUNTER STREET, BURRINGBAR

ROAD SEGMENT NUMBER - 10

TWEED SHIRE COUNCIL

PROJECT MANAGER
CON[redacted]ECK
.....
PROJECT MANAGER
DATE: 10.10.2022

APPROVALS
O[redacted]
.....
DATE: 04.11.2022



LOCALITY SKETCH

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LEGEND

ISSUE A, B, C, etc. = PRELIMINARY APPROVALS / TENDER DRAWINGS (NOT FOR CONSTRUCTION)
ISSUE 1, 2, 3, etc. = CONSTRUCTION ISSUE DRAWINGS

THE WORK WAS PERFORMED IN ACCORDANCE WITH THE DESIGN DRAWINGS.		
THE WORK PERFORMED HAS CHANGED FROM THE DESIGN DRAWINGS. REFER TO THE RED LINE CHANGES NOTED ON THE DRAWING SET.		
GANGER'S NAME	GANGER'S SIGNATURE	DATE
SUPERVISOR'S NAME	SUPERVISOR'S SIGNATURE	DATE

Project No.
ISW16
Job No. A4757

ISSUED FOR CONSTRUCTION
DATE .....10.10.2022.....

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_01-1.dwg

GENERAL

1. THIS NOTE AND THE FOLLOWING NOTES FORM AN INTEGRAL PART OF THIS DRAWING SET.
2. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE RELEVANT TWEED SHIRE COUNCIL (TSC) DEVELOPMENT DESIGN SPECIFICATIONS AND STANDARD DRAWINGS.
3. ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE.
4. DIMENSIONS SHALL NOT BE SCALED FROM THE DRAWINGS.
5. MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS, TOGETHER WITH THE REQUIREMENTS OF ALL APPLICABLE CODES OF PRACTICE, AUSTRALIAN STANDARDS AND STATUTORY AUTHORITIES.
6. SURVEY DATA HAS BEEN COMPILED FROM FIELD PICK-UPS AND OFFICE RECORDS. THE PROJECT MANAGER SHOULD CONFIRM THAT SUFFICIENT DATA IS SHOWN TO ENABLE CONSTRUCTION WITHOUT DISTURBANCE TO FEATURES THAT ARE NOT SHOWN ON THE DRAWINGS.
7. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITIES SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATION OF ALL SERVICES (DIAL BEFORE YOU DIG 1100).
8. THE TITLE BOUNDARIES SHOWN HEREON WERE NOT FIELD INVESTIGATED OR MARKED AT THE TIME OF SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY.
9. THE ORIGIN OF CO-ORDINATES IS MGA.
10. THE DATUM FOR LEVELS IS AHD.

SITE WORKS

1. ALL SOILS CONTAINING ORGANIC MATTER (E.G. ROOTS, GRASS ETC.) MUST BE STRIPPED FROM THE CONSTRUCTION SITE PRIOR TO EARTHWORKS AND MUST NOT BE USED AS FILL MATERIAL.
2. CUT SLOPES MUST BE LIMITED TO 1 IN 1.5. THE SLOPE SHOULD THEN BE GRASSED OR PAVED TO PREVENT SCOUR AND EROSION DAMAGE. REFER TO THE DESIGN ENGINEER FOR POSSIBLE UNDERMINING OF ANY ADJACENT PERIMETER FOOTING.
3. FILL BATTERS AT 1 IN 2 SLOPE, OR LESS, MUST BE FORMED TO THE NATURAL GROUND, AND ANTI-SCOUR / EROSION MEASURES TAKEN. A SLOPE STEEPER THAN 1 IN 0.5 WILL REQUIRE RETAINING.
4. EXTENT OF ANY EARTHWORKS (CUT OR FILL) SHOULD NOT ENCROACH ANY CLOSER THAT 600mm TO ANY ADJACENT PROPERTY BOUNDARY UNLESS OTHERWISE NOTED.
5. ALL OVERSIZED MATERIAL, WHICH MAY IMPEDE COMPACTION, MUST BE REMOVED FROM THE FILL PLATFORM.
6. FILL IS TO BE UNIFORMLY COMPACTED IN 200-300mm HORIZONTAL LAYERS AND MUST ACHIEVE A MINIMUM STANDARD OF COMPACTION OF GREATER THAN 95% STANDARD COMPACTION TO A.S.1289 FOR COHESIVE SOILS, OR A DENSITY INDEX OF GREATER THAN 65% FOR COHESIONLESS SOILS. BENCHING OF THE NATURAL GROUND WILL BE REQUIRED ON SLOPING GROUND PRIOR TO COMMENCEMENT OF FILL OPERATIONS.
7. CLAYS OF HIGH PLASTICITY OR HIGH IN-SITU MOISTURE CONTENT ARE NOT TO BE USED AS FILL.
8. AN IMPORTED GRANULAR FILL WITH A PLASTICITY INDEX PREFERABLY LESS THAN 15%, WITH NO EXCESSIVE OVERSIZED MATERIAL, MAY BE USED.
9. FIELD DENSITY TESTS, OR EQUIVALENT, SHOULD BE CARRIED OUT TO VERIFY THAT THE STANDARD OF COMPACTION IS ACHIEVED. FIELD DENSITY TESTS ARE TO BE TAKEN OVER THE FULL DEPTH OF THE LAYER OR FROM THE BOTTOM OF THE LAYER.

TRAFFIC MANAGEMENT

1. TRAFFIC SHALL BE MANAGED WITHIN OR NEAR TO THE PROJECT SITE IN ACCORDANCE WITH THE TRAFFIC MANAGEMENT PLAN ATTACHED TO THIS DRAWING SET.
2. IF TRAFFIC MANAGEMENT REQUIRES TRAFFIC CONTROLLERS THEY ARE TO BE RESPONSIBLE FOR THE FOLLOWING:
   a. TO ADVISE PEDESTRIANS WHERE TO WALK.
   b. TO WARN DRIVERS OF PLANT OR WORK VEHICLES THAT PEDESTRIANS ARE IN THE VICINITY OF THE WORK SITE.
   c. TO ASSIST WITH THE TURNING OR REVERSING OF PLANT AND VEHICLES.
   d. TO REMAIN IN COMMUNICATION WITH THE PROJECT MANAGER OR SITE SUPERVISOR AND TO FOLLOW THEIR DIRECTIONS (USING TWO WAY RADIO IF REQUIRED).
3. PLANT AND WORK VEHICLES ARE NOT TO OPERATE OUTSIDE THE TRAFFIC CONTROL AREA UNLESS IN TRANSIT.

STORMWATER DRAINAGE NOTES

1. DESIGN OF STORMWATER DRAINAGE HAS BEEN CARRIED OUT AS PER TWEED SHIRE COUNCIL DEVELOPMENT DESIGN SPECIFICATION D5 AND SUBDIVISION MANUAL SECTION A5.
2. STORMWATER DRAINAGE CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE THE TWEED SHIRE COUNCIL DEVELOPMENT CONSTRUCTION SPECIFICATIONS, IN PARTICULAR, C220 TO C233.
3. STORMWATER DRAINAGE PIPES SHALL BE STEEL REINFORCED CONCRETE PIPES (CLASS SPECIFIED ON DRAWINGS) UNLESS OTHERWISE APPROVED.

RESTORATION OF SURFACES

1. THE CONSTRUCTOR SHALL CLEAN PAVEMENTS, LAWNS AND OTHER IMPROVED AREAS AND LEAVE THEM IN THE SAME ORDER AS THEY WERE AT THE COMMENCEMENT OF THE WORKS. THE CONSTRUCTOR SHALL RESTORE ANY FENCING REMOVED DURING CONSTRUCTION AND SHALL RESTORE LAWNS WITH TURF CUT AND SET ASIDE FROM THE ORIGINAL SURFACE AND WITH IMPORTED TURF FROM A SOURCE APPROVED BY THE CONSTRUCTION ENGINEER. (WSA 02 2002 PART 3, SECTION 25).
2. IMMEDIATELY AFTER BACKFILLING OF A TRENCH EXCAVATED THROUGH A PAVEMENT HAS BEEN COMPLETED, THE CONSTRUCTOR SHALL TEMPORARILY RESTORE THE PAVEMENT. WHERE THE TRENCH CROSSES BITUMEN OR CONCRETE PAVEMENT, THE SURFACE IS TO BE PROTECTED FROM DETERIORATION. A PRE-MIXED ASPHALTIC MATERIAL MAY BE USED FOR SUCH TEMPORARY RESTORATION. THE CONSTRUCTOR SHALL MAINTAIN THE TEMPORARY RESTORATION UNTIL FINAL RESTORATION IS CARRIED OUT. FINAL RESTORATION OF THE PAVEMENT SHALL BE CARRIED OUT TO RESTORE THE PAVEMENT AND ITS SUB-BASE TO NO LESS THAN THE ORIGINAL CONDITION. FINAL RESTORATION MAY INCLUDE, IF REQUIRED BY THE CONSTRUCTION ENGINEER, THE REMOVAL OF TEMPORARY RESTORATION.
3. IN OTHER THAN ROADWAYS, THE CONSTRUCTOR SHALL PLACE THE BACKFILL SUFFICIENTLY HIGH TO COMPENSATE FOR EXPECTED SETTLEMENT AND FURTHER BACKFILLING SHALL BE CARRIED OUT OR THE ORIGINAL BACKFILL TRIMMED AT THE END OF THE DEFECTS LIABILITY PERIOD IN ORDER THAT THE SURFACE OF THE COMPLETED TRENCH MAY THEN CONFORM WITH THE ADJACENT SURFACE. SURPLUS MATERIAL SHALL BE REMOVED AND DISPOSED OF TO AREAS ARRANGED BY THE CONSTRUCTOR. WHERE DRY WEATHER CONDITIONS HAVE PERSISTED AFTER THE ORIGINAL BACKFILLING, INCLUDING DURING THE DEFECTS LIABILITY PERIOD, THE CONSTRUCTOR SHALL TAKE ALL NECESSARY STEPS TO CONSOLIDATE THE TRENCH BEFORE REMOVING SURPLUS MATERIALS FROM THE SITE.
4. IN LOCATIONS WHERE, IN THE OPINION OF THE CONSTRUCTION ENGINEER, SURPLUS MATERIAL LEFT IN THE VICINITY OF THE TRENCH WOULD NOT BE OBJECTIONABLE, THE SURPLUS MATERIAL MAY BE DISPOSED BY SPREADING NEATLY IN THE VICINITY OF THE TRENCH TO THE SATISFACTION OF THE CONSTRUCTION ENGINEER IN SUCH A WAY AS TO AVOID FUTURE EROSION OF THE BACKFILL AND ADJACENT GROUND SURFACES. THE CONSTRUCTOR SHALL MAINTAIN THE BACKFILL AND ADJACENT GROUND UNTIL THE EXPIRY OF THE DEFECTS LIABILITY PERIOD.
5. WHERE, WITHIN PUBLIC OR PRIVATE PROPERTY, THE REASONABLE CONVENIENCE OF PERSONS WILL REQUIRE SUCH, THE CONSTRUCTION ENGINEER MAY ORDER THE CONSTRUCTOR TO LEVEL TRENCHES AT THE TIME OF BACKFILLING. THE CONSTRUCTOR SHALL MAKE GOOD ANY SUBSEQUENT SETTLEMENT, AS REQUIRED BY PLACING ADDITIONAL FILL.
6. THE CONSTRUCTOR SHALL IMMEDIATELY RESTORE ANY DAMAGED OR DISTURBED PRIVATE PROPERTY AND SERVICES.
7. SHOULD THE CONSTRUCTOR ELECT TO TUNNEL UNDER PAVING, KERB AND GUTTER OR OTHER IMPROVED SURFACES IN LIEU OF TRENCHING, BACKFILLING SHALL BE SO CARRIED OUT AS TO RESTORE FULL SUPPORT TO THOSE SURFACES. THE CONSTRUCTOR SHALL REMAIN RESPONSIBLE FOR THE REPAIR OF THE IMPROVED SURFACES, IF SUBSEQUENTLY DAMAGED DUE TO SUBSIDENCE OF
8. THE BACKFILL, UNTIL THE END OF THE DEFECTS LIABILITY PERIOD. THE CONSTRUCTOR SHALL PROVIDE NOTICE TO AFFECTED PROPERTY OWNERS OF ANY PENDING WORKS.

EARTHWORKS

1. THE CONSTRUCTOR SHALL CARRY OUT ALL EXCAVATIONS FOR STRUCTURES AND PIPELINES TO THE LINES, GRADES AND FORMS SHOWN ON THE DESIGN PLANS, OR AS DIRECTED BY THE CONSTRUCTION ENGINEER, WITHIN THE SPECIFIED TOLERANCES. THE CONSTRUCTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE APPROPRIATE AUTHORITY INCLUDING HAVING REGARD FOR DRAINAGE, DEWATERING, SILT CONTROL, NOISE ABATEMENT, PROXIMITY TO EXISTING BUILDINGS AND GENERALLY FOR THE AMENITY OF ADJACENT OWNERS. (WSA 02-2002 SECTIONS 13.1 & 13.5).
2. THE CONSTRUCTOR SHALL LEAVE A CLEAR SPACE OF 600mm MINIMUM BETWEEN THE EDGE OF ANY EXCAVATION AND THE INNER TOE OF STOCKPILES. NO EXCAVATED MATERIALS SHALL BE STOCKPILED AGAINST THE WALLS OF ANY BUILDING OR FENCE WITHOUT THE WRITTEN PERMISSION OF THE OWNER OF SUCH BUILDING OR FENCE. TOPSOIL FROM EXCAVATIONS SHALL BE STOCKPILED SEPARATELY AND UTILISED TO RESTORE THE SURFACE AFTER BACKFILLING. (WSA 02-2002 SECTION 14.7).
3. AT THE COMPLETION OF WORK EACH DAY, THE CONSTRUCTOR SHALL INSTALL SAFETY FENCING TO STATUTORY REQUIREMENTS ALONG THE EDGES OF OPEN EXCAVATIONS TO ISOLATE THEM FROM THE PUBLIC. THE CONSTRUCTOR SHALL PROVIDE FENCED WALKWAYS AND VEHICULAR CROSSWAYS ACROSS TRENCHES TO MAINTAIN ACCESS AT ALL TIMES FROM CARRIAGEWAY TO INDIVIDUAL PROPERTIES OR WITHIN INDIVIDUAL PROPERTIES AND ADVISE BEFOREHAND ALL AFFECTED RESIDENTS. ALL SUCH INSTALLATIONS SHALL BE OF ADEQUATE SIZE AND STRENGTH AND SHALL BE ILLUMINATED TO PREVENT ACCIDENTS. (WSA 02-2002 SECTIONS 13.4 & 13.5).
4. THE CONSTRUCTOR SHALL LOCATE, PROTECT AND REPAIR, AS NECESSARY, ALL SERVICES AFFECTED BY THE WORKS AT THE CONSTRUCTOR'S EXPENSE. (WSA 02-2002 SECTION 13.5.2).
5. THE CONSTRUCTOR SHALL CARRY OUT EROSION AND SEDIMENTATION CONTROL AT ALL CONSTRUCTION SITES IN ACCORDANCE WITH SPECIFICATION FOR CONTROL OF EROSION AND SEDIMENTATION.
6. THE CONSTRUCTOR SHALL TAKE ACCOUNT OF SAFETY ISSUES AND POSSIBLE WET WEATHER EFFECTS TO LIMIT THE EXTENT OF EXCAVATION LEFT OPEN.

EXISTING SERVICES

1. EXISTING SERVICES SHOWN ON PLANS ARE AN INDICATION OF SERVICES FOUND AT THE TIME OF DESIGN INVESTIGATION.
2. QUALITY OF INFORMATION ON EXISTING UNDERGROUND SERVICES SHOWN ON PLANS ARE CLASSIFIED USING AS5488-2013 WITH QUALITY LEVELS A, B, C AND D;
   - (A) POSITIVE IDENTIFICATION OF A POINT POSITION IN THREE DIMENSIONS WITH HORIZONTAL AND VERTICAL TOLERANCE OF 50mm
   - (B) LOCATION RELATIVE TO SUBSURFACE FEATURE LOCATION IN THREE DIMENSIONS. E.G. INTERPRETATION BETWEEN TWO QL-A POINTS
   - (C) INTERPRETATION OF APPROXIMATE HORIZONTAL LOCATION USING EXISTING RECORDS AND SITE SURVEY OF VISIBLE SURFACE FEATURES. PROVIDES RELATIVE SPATIAL POSITIONING.
   - (D) COMPILED FROM ANY OR A COMBINATION OF:
     a. EXISTING RECORDS
     b. CURSORY SITE INSPECTION
     c. ANECDOTAL EVIDENCE
3. BY DEFAULT, IF THE DRAWINGS DO NOT INDICATE A QUALITY LEVEL THEN THE INFORMATION SHALL BE ASSUMED TO BE AT QUALITY LEVEL D.
4. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF EXISTING SERVICES PRIOR TO COMMENCING WITH THE WORKS.
5. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF ANY EXISTING SERVICES DAMAGED DURING CONSTRUCTION WITH NEW SERVICES OF EQUIVALENT TYPE AND SPECIFICATIONS.
6. WHEN CONSTRUCTING OR WORKING NEAR EXISTING PRESSURE MAINS IT SHOULD BE EXPECTED THAT THERE ARE CONCRETE THRUST BLOCKS LOCATED AT BENDS OR OTHER FITTINGS ON THE EXISTING MAIN. IT IS VERY IMPORTANT NOT TO DISTURB THE BEARING SOIL BEHIND THE THRUST BLOCK TO AVOID FAILURE OF THE EXISTING PRESSURE MAIN. IF EXCAVATION AROUND EXISTING THRUST BLOCKS CAN NOT BE AVOIDED THEN THE EXISTING PRESSURE MAIN SHALL BE TAKEN OFF LINE DURING THE EXCAVATION WORKS.

SERVICES NOTES

1. AFTER LAYING AND JOINTING OF A PIPELINE HAS BEEN COMPLETED THE CONSTRUCTOR SHALL PRESENT THE LAID AND JOINTED PIPES FOR INSPECTION BY THE CONSTRUCTION ENGINEER PRIOR TO COMMENCEMENT OF TRENCH BACKFILLING. (WSA 02 2002, SECTION 21).
2. BACKFILL SHALL NOT BE PLACED UNTIL THE CONSTRUCTION ENGINEER HAS GIVEN APPROVAL.

CONCRETE & REINFORCEMENT

1. MATERIALS AND CONSTRUCTION: TO AS 3600, AS 3610 STEEL REINFORCEMENT MATERIALS: TO AS 4671
2. CONCRETE QUALITY: TO AS 1379, READY MIX CONCRETE: TO AS 1379 - DO NOT USE ADMIXTURES WITHOUT WRITTEN APPROVAL FROM THE SUPERINTENDENT (SUPERVISING OFFICER). CEMENT: TYPE 'GP' OR 'GB' TO AS 3972. MAXIMUM SIZE OF COARSE AGGREGATE: 20mm.
3. STRUCTURAL DIMENSIONS DO NOT INCLUDE TOPPINGS OR FINISHES.
4. FORM CONSTRUCTION JOINTS ONLY AT LOCATIONS SHOWN ON DRAWINGS. DO NOT VARY.
5. CHAMFERS OR FILLETS: 20mm TO EXPOSED FORMED EDGES U.N.O.
6. SUPPORT ALL REINFORCEMENT ON PLASTIC CHAIRS OR CONCRETE BLOCKS OF SUITABLE STRENGTH AT 800mm MAXIMUM SPACING.
7. LAP REINFORCING MESH 2 CROSS WIRES PLUS 25mm.
8. PREPARE COLD JOINTS BY LIGHT SCABBLING, REMOVAL OF DEBRIS AND WASHING WITH CLEAN WATER.
9. DO NOT PLACE CONCRETE UNTIL REINFORCEMENT AND FORMWORK ARE INSPECTED BY THE SUPERINTENDENT (SUPERVISING OFFICER).
10. THOROUGHLY CLEAN OUT ALL FORMWORK PRIOR TO POURING.
11. VIBRATE CONCRETE DURING PLACEMENT TO GIVE MAXIMUM COMPACTION WITHOUT SEGREGATION.
12. SURFACE FINISH: LIGHT BROOM SLAB SURFACE PERPENDICULAR TO TRAFFIC DIRECTION TO PRODUCE AN EVEN NON-SLIP FINISH.
13. COMMENCE CURING OF ALL CONCRETE SURFACES IMMEDIATELY ON FINISHING AND CONTINUE FOR 7 DAYS MINIMUM. WET CURE UNDER SEALED PLASTIC SHEETS.
14. FLEXURAL STRENGTH OF 4MPa WITH MIN. CHARACTERISTICS COMPRESSIVE STRENGTH OF 32MPa.

'WORK AS EXECUTED' REPORTING REQUIREMENTS

WORK AS EXECUTED INFORMATION MUST BE PROVIDED TO THE DESIGN UNIT BY THE CONSTRUCTION ENGINEER OR SITE FOREMAN AS A PART OF THIS WORK.

1. WHERE WORK IS CONSTRUCTED BY TSC STAFF REFER TO THE WATER UNIT'S 'WORK AS EXECUTED' PROCEDURE FOR WATER UNIT CAPITAL WORKS'.
2. WHERE WORK IS CONSTRUCTED BY CONTRACTORS REFER TO THE CONTRACT SPECIFICATIONS FOR 'WORK AS EXECUTED' REQUIREMENTS.

SET OUT INFORMATION

1. SET OUT INFORMATION FOR CONSTRUCTION IS PROVIDED TO THE CONSTRUCTION SURVEYOR IN DIGITAL FORM.
2. SET OUT FOR ALL PIPEWORK IS CENTRE OF PIT (U.N.O.)
3. SET OUT FOR ALL KERB AND GUTTER (INCLUDING DISH DRAIN) IS LIP OF KERB (REFER FIG 1 BELOW)
4. SET OUT FOR ALL KERB ONLY (INCLUDING FLUSH EDGE STRIP) IS BITUMEN LEVEL AT FRONT FACE OF KERB (REFER FIG 1 BELOW)
5. SET OUT FOR BITUMEN IS FINISHED SURFACE
6. SET OUT FOR ROAD FORMATION IS HINGE POINT (REFER FIG 2)
7. FINISHED SURFACE LEVEL SET OUT FOR STORMWATER DRAINAGE GULLY PITS IS AT THE LIP OF KERBING (REFER FIG 3 BELOW)
8. FINISHED SURFACE LEVEL SET OUT FOR MANHOLES (SEWER AND STORMWATER), JUNCTION PITS, FIELD INLETS ETC. IS CENTRE OF LID / GRATE. (REFER FIG 3 BELOW)

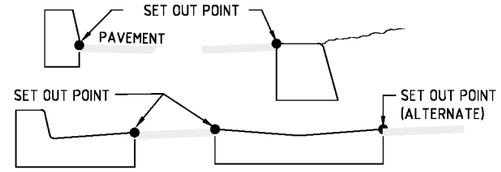

FIGURE 1

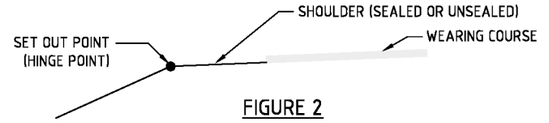

FIGURE 2

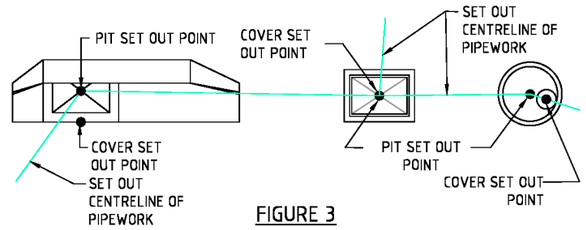

FIGURE 3

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

DESIGN UNIT
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TWEED SHIRE COUNCIL

DESIGN ENGINEER	[redacted]		DATE	08.08.22
DESIGNED	WB	21.02.22		
DRAWN	JH	28.03.22	COORDS ADOPTED	PM 106541
CHECKED	WB	??.??.22	EASTING	546762.944
HORIZONTAL DATUM	MGA		NORTHING	6854097.175
VERTICAL DATUM	AHD		R.L.	17.520

PROJECT: **STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR**

PLAN TITLE: **NOTES**

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: **ISW16**
DRAWING NUMBER: **ISW16-02**
ISSUE: 1

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_02-1.dwg

PIPE INSTALLATION SPECIFICATION

THIS SPECIFICATION IS PREPARED TO ENSURE THE PIPE INSTALLATION CONFORMS WITH THE REQUIREMENTS OF AS/NZS3725:2007 DESIGN FOR INSTALLATION OF BURIED CONCRETE PIPES.

THIS SUPPORT REPRESENTS AN INSTALLATION WITH CONTROLLED COMPACTION IN THE BED ZONE AND HAUNCH ZONE.

EXCAVATION AND BEDDING

1. THE TRENCH WIDTH FOR BOTH TRENCH CONDITION AND EMBANKMENT CONDITION SHALL BE AS SHOWN ON THE DRAWINGS.
2. ANY DEVIATION IN TRENCH WIDTH IN THE FIELD FROM THAT SPECIFIED MUST BE APPROVED IN ACCORDANCE WITH THE CURRENT SWMS RA0017 TRENCHING AND EXCAVATION.
3. THE REQUIRED TRENCH FOR THE INSTALLATION, TO THE WIDTH AND DEPTH SHOWN ON THE DRAWINGS SHALL BE EXCAVATED CENTRALLY THROUGH THE ABOVE COMPACTED SELECT FILL MATERIAL.
4. EXCAVATION SHALL BE TO LINE AND LEVEL SHOWN ON THE DRAWINGS.
5. SHOULD THE EXCAVATION TO THE REQUIRED FOUNDATION AT THE BOTTOM OF THE BED LEVEL REVEAL MATERIAL, WHICH IN THE OPINION OF THE SUPERINTENDENT IS UNSUITABLE, THE TRENCH SHALL BE OVER-EXCAVATED TO A DEPTH REQUIRED TO REMOVE THE UNSUITABLE MATERIAL AND REFILLED WITH COMPACTED MATERIAL CONFORMING TO THE REQUIREMENTS FOR THE BED ZONE.

BEDDING

BED ZONE MATERIAL SHALL BE SELECT FILL. SELECT FILL AS DEFINED IN AS/NZS3725:2007 IS SAND MATERIAL OBTAINED FROM EXCAVATION OF THE PIPE TRENCH OR SAND WITH A PARTICLE SIZE NOT GREATER THAN 19mm, AND WHICH CONFORMS WITH THE SOIL CLASSES AS DEFINED IN APPENDIX D OF AS1726.

SELECT FILL GRADING REQUIREMENTS ARE DEFINED AS BELOW:

THE MATERIAL PASSING THE 0.075m SIEVE MUST HAVE LOW PLASTICITY AS DESCRIBED IN APPENDIX D OF AS1726.

1. THE BED ZONE SHALL BE PLACED TO THE FINAL MINIMUM THICKNESS OF 100mm.
2. THE BED MATERIAL SHALL EXTEND OVER THE FULL WIDTH OF THE TRENCH AND SHALL BE COMPACTED BY TAMPING, ROLLING AND/OR VIBRATION TO A MINIMUM DENSITY INDEX (DI) OF 60.
3. COMPACTION ACHIEVED SHALL BE MONITORED BY FIELD TESTING IN ACCORDANCE WITH AS1289.
4. THE BED LEVEL SHALL BE GRADED TO PROVIDE FOR A UNIFORM FALL TO THE DISCHARGING END OF THE PIPELINE, WITH LINE AND LEVEL AS SHOWN ON THE DRAWINGS.
5. FOR PIPES WITH SOCKETS PROTRUDING BEYOND THE BARREL OUTSIDE SURFACE, CHASES SHALL BE DUG INTO THE BED AND FOUNDATION IF NECESSARY, IN THE APPROPRIATE POSITIONS, SO THAT EACH PIPE IS SUPPORTED ALONG THE FULL LENGTH OF THE BARREL AND THE SOCKET IS NOT SUBJECTED TO POINT LOADING.

REFILLING

THE REFILLING SHALL BE CARRIED OUT IN FOUR STAGES AND THESE ARE TO BE IDENTIFIED AS:

- HAUNCH ZONE
- SIDE ZONE
- OVERLAY ZONE
- BACKFILL OR EMBANKMENT FILL

THE HAUNCH ZONE SHALL EXTEND FROM THE TOP OF THE BED ZONE FOR 0.3 TIMES PIPE OUTSIDE DIAMETER AND SHALL BE FILL MATERIAL COMPLYING WITH THE REQUIREMENTS SHOWN ABOVE FOR THE BED ZONE.

1. THE MATERIAL SHALL BE PLACED OVER THE FULL WIDTH OF THE TRENCH EITHER IN LAYERS NOT EXCEEDING 150MM COMPACTED THICKNESS AND COMPACTED BY CONVENTIONAL METHODS OR COMPACTED IN ONE OPERATION BY SATURATION AND VIBRATION TO ACHIEVE A MINIMUM DENSITY INDEX (DI) OF 60.
2. THE SELECT FILL IN THE HAUNCH ZONE SHOULD BE PLACED AND COMPACTED IN RELATIVELY THIN LAYERS OF NOT MORE THAN 150MM. COMPACTION ACHIEVED SHALL BE MONITORED BY FIELD TESTING IN ACCORDANCE WITH AS 1289.

THE SIDE ZONE SHALL EXTEND FROM THE TOP OF THE HAUNCH ZONE TO 0.5 TIMES PIPE OUTSIDE DIAMETER AND SHALL CONSIST OF SELECT FILL MATERIAL COMPLYING GRADING

SIEVE SIZE (mm)	75	9.5	2.36	0.60	0.075
% MASS PASSING	100	100-50	100-30	50-15	25-0

THE MATERIAL SHALL BE PLACED OVER THE FULL WIDTH OF THE TRENCH IN LAYERS NOT EXCEEDING 150MM COMPACTED THICKNESS AND COMPACTING BY TAMPING, ROLLING OR VIBRATION TO A MINIMUM RELATIVE DENSITY OF 90% OR A MINIMUM DENSITY INDEX OF 60

PIPE INSTALLATION SPECIFICATION (CONTINUED)

THE OVERLAY ZONE SHALL EXTEND FROM THE TOP OF THE HAUNCH ZONE TO 300MM ABOVE THE TOP OF THE PIPE AND AROUND THE PIPE MEASURED RADIALLY FROM ANY POINT. THE FILL MATERIAL IN THE OVERLAY ZONE SHALL BE ORDINARY FILL CONSISTING OF MATERIAL FROM THE EXCAVATION OR ELSEWHERE. IT SHALL NOT CONTAIN ANY STONES LARGER THAN 150MM, NOR MORE THAN 20% WITH A SIZE BETWEEN 75MM AND 150MM. NO DEFINED DEGREE OF COMPACTION IS SPECIFIED YET MATERIAL SHOULD BE COMPACTED AS NECESSARY TO PREVENT EXCESSIVE SETTLEMENT IN THE GROUND SURFACE LEVEL OVER THE INSTALLED PIPELINE.

1. FILL MATERIAL SHOULD BE PLACED AND COMPACTED IN RELATIVELY THIN LAYERS. FOR ORDINARY FILL THE LAYER THICKNESS SHOULD NOT EXCEED 200MM.

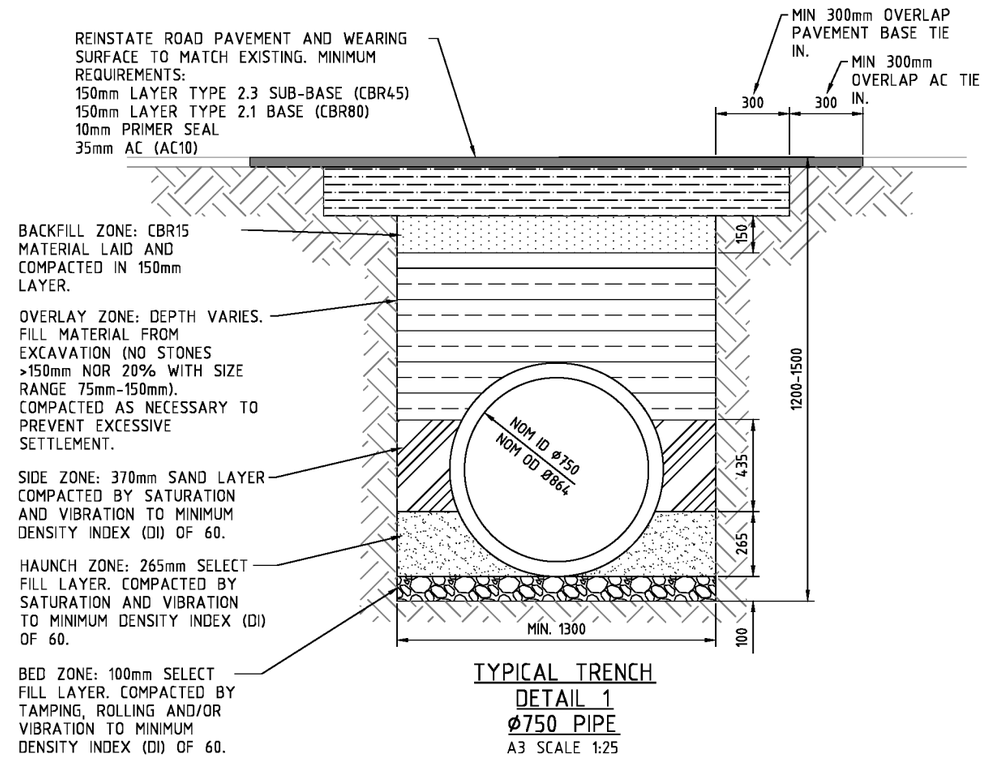
BACKFILL IS TO BE THE REMAINDER OF THE REFILLING AND SHOULD CONSIST OF ANY AVAILABLE MATERIAL UP TO FINISHED LEVELS AS SHOWN ON THE DRAWINGS WHERE THE FINISHED SURFACE IS TURF. WHERE FINISHED SURFACE IS ROAD PAVEMENT BACKFILL SHALL BE LAID AND COMPACTED IN 150mm LAYERS TO 800mm BELOW FINISHED SURFACE LEVEL AND A LAYER OF CBR15 MATERIAL PLACED ON THE BACKFILL TO ACT AS SUBGRADE FOR THE PAVEMENT.

REFILLING OF SHEETED TRENCHES SHALL BE CARRIED OUT TO THE FOLLOWING REQUIREMENTS:

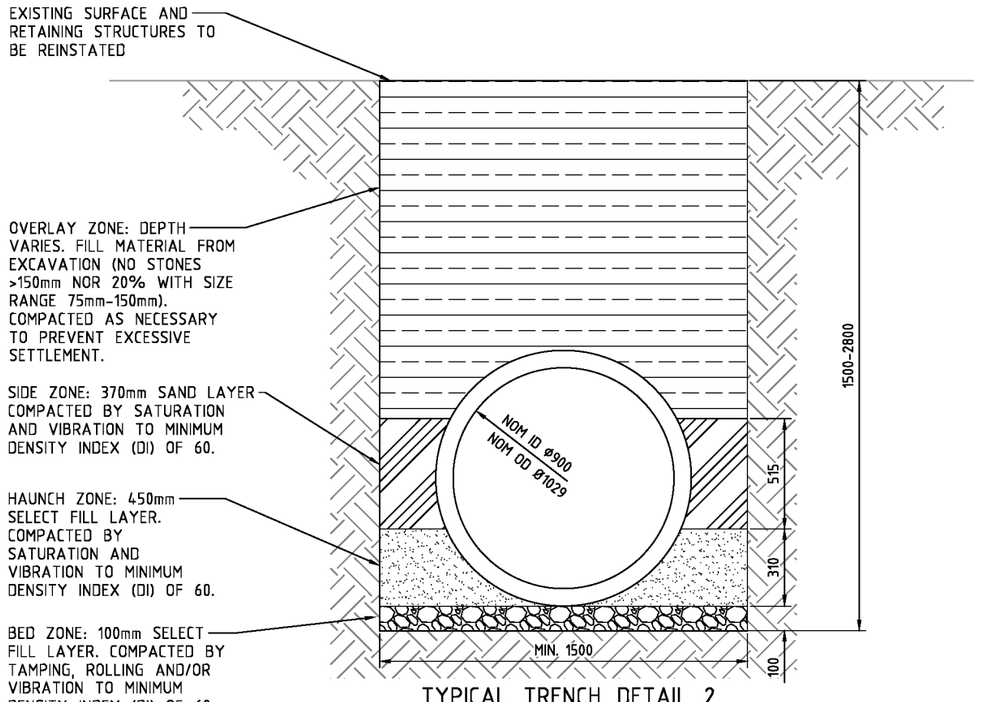
- NO STRUTS, WALLING OR OTHER SUPPORTS SHALL BE REMOVED UNTIL THE TOP OF THE COMPACTED REFILLING HAS REACHED THE LEVEL OF THESE SUPPORTS.
- NO WALL SHEETING IS TO TOTALLY REMOVED FROM THE TRENCH UNTIL THE LEVEL OF THE COMPACTED REFILL IS WITHIN 1500mm OF THE SURFACE.
- NO WALL SHEETING IS TO BE REMOVED, IN DEWATERED TRENCHES, UNTIL THE LEVEL IN WATER TABLE BETWEEN NATURAL GROUND AND REFILL MATERIAL IS LESS THAN 500MM.
- THE WALL SHEETING IS TO BE WITHDRAWN OR REMOVED IN SUCH A MANNER THAT THE PIPE AND COMPACTED BED AND HAUNCH SUPPORT ARE NOT DISTURBED DURING SUCH WITHDRAWAL OR REMOVAL.

IMPORTANT NOTES:

- ENSURE THE BED ZONE IS EVEN AND WELL GRADED TO PROVIDE UNIFORM SUPPORT FOR THE PIPE.
- DO NOT COMPACT DIRECTLY OVER THE PIPE.
- ENSURE THE PIPE IS APPROPRIATELY EMBEDDED AND COVERED BEFORE ALLOWING ANY CONSTRUCTION EQUIPMENT OR PLANT OVER THE TOP.
- COMPACT AS YOU GO AND ENSURE THAT THE APPROPRIATE LEVELS OF COMPACTION ARE REACHED.



TYPICAL TRENCH DETAIL 1
ø750 PIPE
A3 SCALE 1:25



TYPICAL TRENCH DETAIL 2
ø900 PIPE
A3 SCALE 1:25

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_03-1.dwg

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TWEED SHIRE COUNCIL

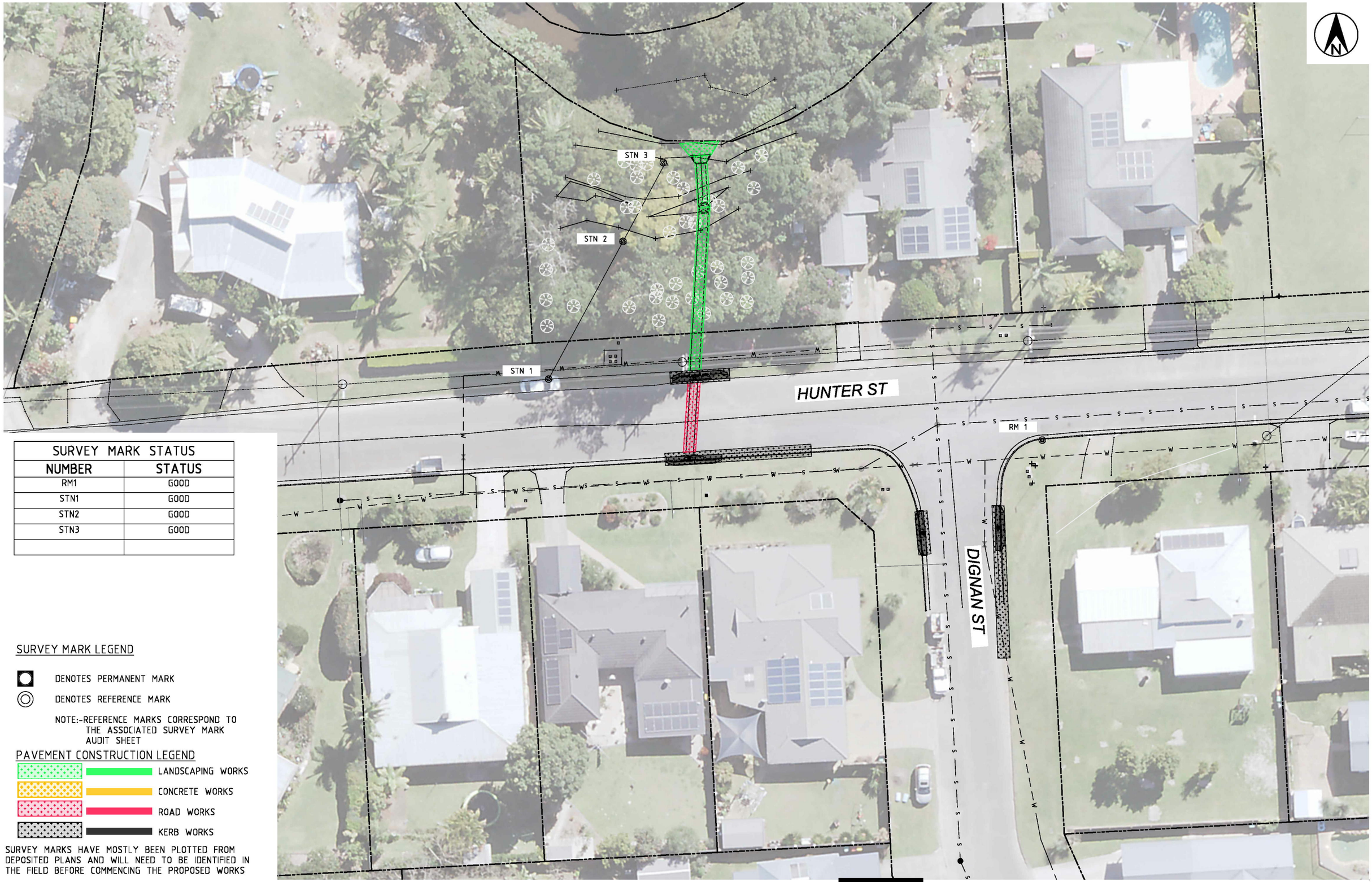
DESIGN ENG [redacted] DATE 08.08.22

DESIGNED	WB	21.02.22		
DRAWN	JH	28.03.22	COORDS ADOPTED	PM 106541
CHECKED	WB	??.??.22	EASTING	546762.944
HORIZONTAL DATUM		MGA	NORTHING	6854097.175
VERTICAL DATUM		AHD	R.L.	17.520

PROJECT: STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR

PLAN TITLE: TRENCH DETAIL

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-03
ISSUE: 1



SURVEY MARK STATUS	
NUMBER	STATUS
RM1	GOOD
STN1	GOOD
STN2	GOOD
STN3	GOOD

SURVEY MARK LEGEND

DENOTES PERMANENT MARK

DENOTES REFERENCE MARK

NOTE:-REFERENCE MARKS CORRESPOND TO THE ASSOCIATED SURVEY MARK AUDIT SHEET

PAVEMENT CONSTRUCTION LEGEND

LANDSCAPING WORKS

CONCRETE WORKS

ROAD WORKS

KERB WORKS

SURVEY MARKS HAVE MOSTLY BEEN PLOTTED FROM DEPOSITED PLANS AND WILL NEED TO BE IDENTIFIED IN THE FIELD BEFORE COMMENCING THE PROPOSED WORKS

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:100, A3 SHEET 1:200

0 1 2 4 6 8 10 m

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VERTICAL DATUM	AHD		R.L.	17.520

PROJECT: STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR

PLAN TITLE: SURVEY MARK PRESERVATION PLAN

ROAD SEGMENT: 10

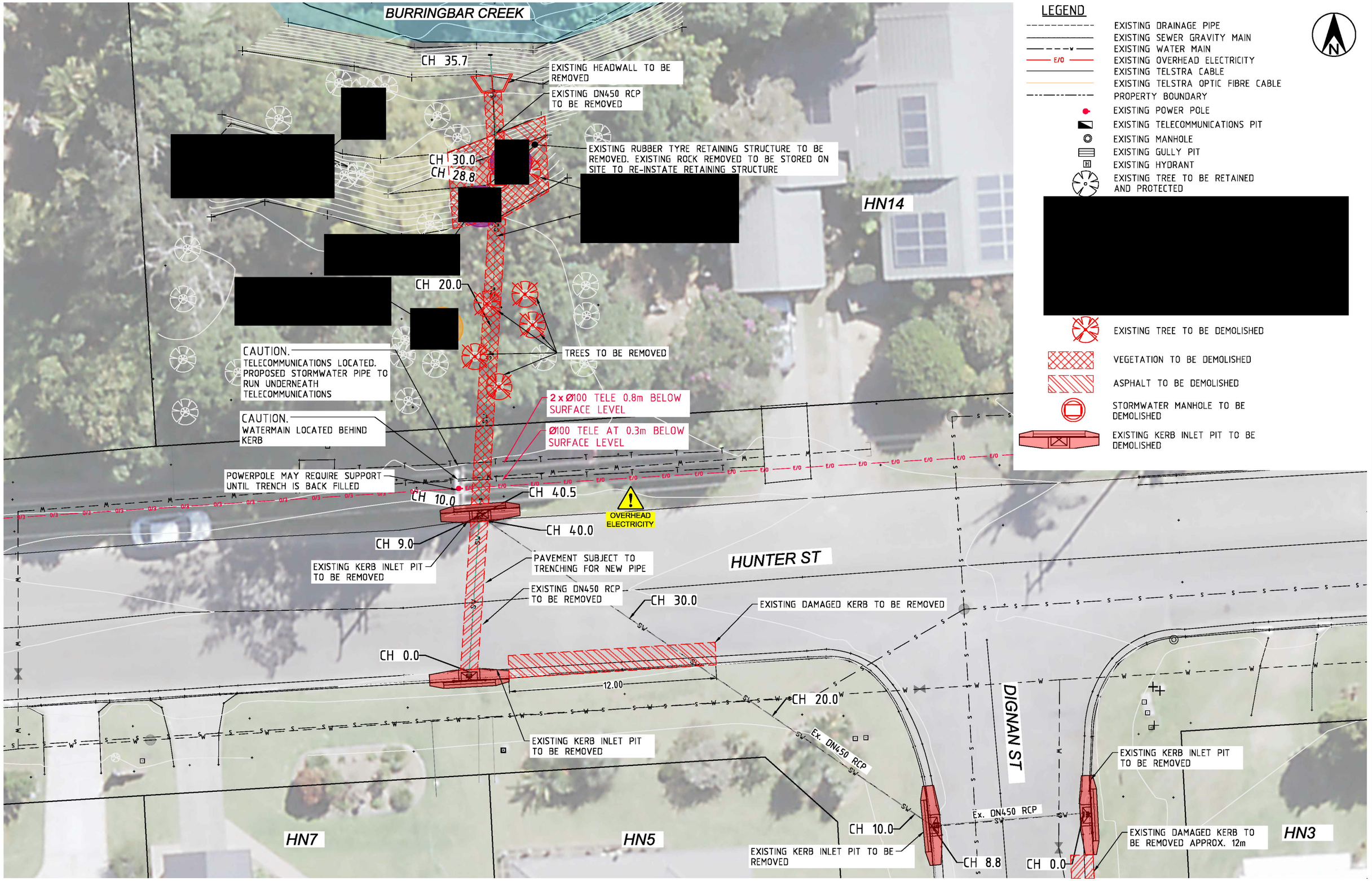
JOB NUMBER: A4757

PROJECT NUMBER: ISW16

DRAWING NUMBER: ISW16-04

ISSUE: 1

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_04-1.dwg



ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:100, A3 SHEET 1:200

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ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_05-1.dwg

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DESIGN ENGINEER	[redacted]		DATE	08.08.22
DESIGNED	WB			
DRAWN	JH	28.03.22	COORDS ADOPTED	PM 106541
CHECKED	WB	??.??.22	EASTING	546762.944
HORIZONTAL DATUM		MGA	NORTHING	6854097.175
VERTICAL DATUM		AHD	R.L.	17.520

PROJECT: **STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR**

PLAN TITLE: **DEMOLITION PLAN**

ROAD SEGMENT:	10
JOB NUMBER:	A4757
PROJECT NUMBER:	ISW16
DRAWING NUMBER	ISSUE
ISW16-05	1

BURRINGBAR CREEK

REFER ISW16-12 FOR OUTLET PROTECTION

CH 35.5

PROPOSED DN900 RCP

PROPOSED IN-SITU CONCRETE HEADWALL WITH TIDEFLEX TF 1 SLIP ON DUCK BILL VALVE OR APPROVED EQUIVALENT FLOODGATE. OBVERT OF PROPOSED HEADWALL TO MATCH EXISTING. REFER ISW16-11

CH 30.0

CH 28.8

EXISTING ROCK RETAINING WALL TO BE REINSTATED. ALL DISTURBED TYRES TO BE REMOVED FROM SITE AND REPLACED WITH ROCK TO MATCH EXISTING.

HN14

PROPOSED Ø1200 CONCRETE CIRCULAR MANHOLE. PROPOSED STORMWATER PIPES TO MAINTAIN EXISTING PIPE OBVERTS

CH 20.0

PROPOSED DN900 RCP

CAUTION.
TELECOMMUNICATIONS LOCATED. PROPOSED STORMWATER PIPE TO RUN UNDERNEATH TELECOMMUNICATIONS

CAUTION.
WATERMAIN LOCATED BEHIND KERB

2 x Ø100 TELE 0.8m BELOW SURFACE LEVEL

Ø100 TELE AT 0.3m BELOW SURFACE LEVEL

POWERPOLE MAY REQUIRE SUPPORT

CH 10.0

CH 40.5

OVERHEAD ELECTRICITY

CH 40.0

CH 9.0

PROPOSED DOUBLE GRATE LIP IN LINE INLET PIT. REFER ISW16-14

CONNECT EXISTING Ø450 PIPE TO NEW PIT (2/1)

PROPOSED DN750 RCP

HUNTER ST

CH 30.0

SECTION OF DAMAGED KERB TO BE RENEWED AND REPLACED. SPECIFICATION OF KERB TO MATCH EXISTING

CH 0.0

12m

CH 20.0

Ex. DN450 RCP

PROPOSED DOUBLE GRATE LIP IN LINE INLET PIT. REFER ISW16-13

DIGNAN ST

PROPOSED SINGLE GRATE LIP IN LINE INLET PIT WITH 3m CLEAR OPENING LINTEL

HN3

HN7

HN5

Ex. DN450 RCP

CH 10.0

CH 8.8

CH 0.0

PROPOSED SINGLE GRATE LIP IN LINE INLET PIT WITH 3m CLEAR OPENING LINTEL

SECTION OF APROX. 12m OF DAMAGED/SAGGING KERB TO BE RENEWED AND REPLACED. SPECIFICATION OF KERB TO MATCH EXISTING.

LEGEND

- EXISTING DRAINAGE PIPE
- EXISTING SEWER GRAVITY MAIN
- EXISTING WATER MAIN
- EXISTING OVERHEAD ELECTRICITY
- EXISTING TELSTRA CABLE
- EXISTING TELSTRA OPTIC FIBRE CABLE
- PROPERTY BOUNDARY
- EXISTING POWER POLE
- EXISTING TELECOMMUNICATIONS PIT
- EXISTING MANHOLE
- EXISTING GULLY PIT
- EXISTING HYDRANT
- EXISTING TREE TO BE RETAINED AND PROTECTED
- [redacted]
- EXISTING TREE TO BE DEMOLISHED
- ASPHALT RE-SEAL AREA
- PROPOSED SRCP (TRENCH EXTENT IN ROAD SHOWN)
- CIRCULAR STORMWATER MANHOLE (SIZE AS SHOWN) TO TSC S.D. 106.
- SINGLE INLET SAG GULLY PIT WITH 3m CLEAR OPENING
- DOUBLE INLET SAG GULLY PIT (SIZE AS SHOWN) REFER TO ISW16-11 & ISW16-12.

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:100, A3 SHEET 1:200
0 1 2 4 6 8 10 m

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

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TWEED SHIRE COUNCIL

DESIGN ENGINEER	[redacted]		DATE 08.08.22	
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CHECKED	WB	??.??.22	NORTHING	6854097.175
HORIZONTAL DATUM	MGA		R.L.	17.520
VERTICAL DATUM	AHD			

PROJECT: STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR

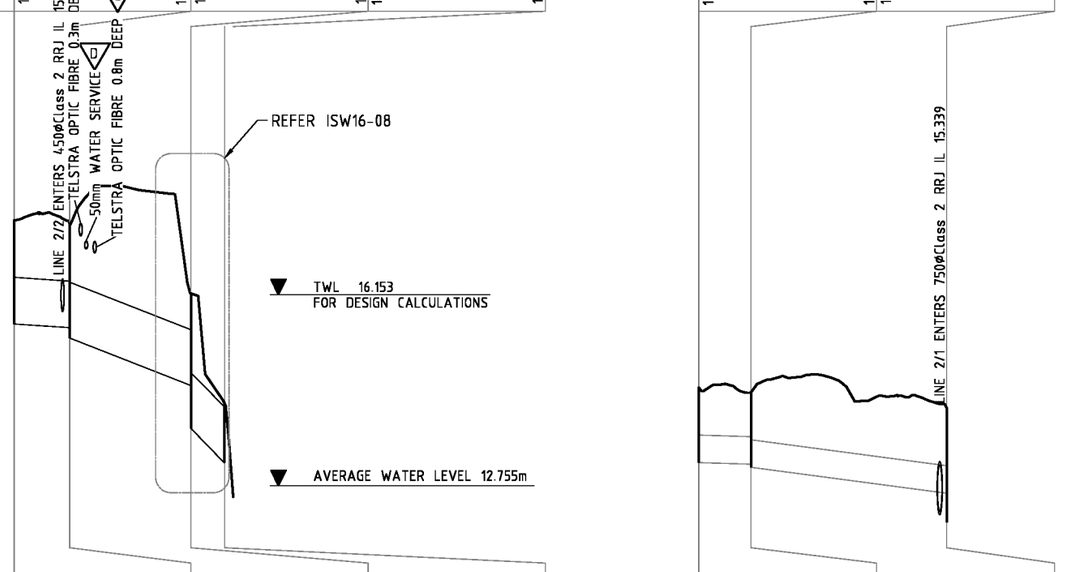
PLAN TITLE: ROADWORKS AND STORMWATER DRAINAGE PLAN

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-06
ISSUE: 1

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_06-1.dwg

	1/1	2/1	3/1	4/1
PIT TYPE	2x LLG-2400-2.5%XF	2x LLG-2400-2.5%XF	1200 DIA. CONC. MANHOLE	PRE-CAST HEADWALL WITH FLOOD GATE
GRATE/LID	SAG	SAG	GG 1%	
PIT SIZE	2 x 2400	2 x 2400	1200	
20% AEP FLOW (LIT/SEC)	770		979	979
VELOCITY (m/s)	1.74		1.54	1.54
HGL LEVEL (m)	16.891	16.475	16.298	16.243 / 15.911
DIAMETER (mm) CLASS	750Ø Class 2 RRJ		900Ø Class 2 RRJ	900Ø Class 2 RRJ
SLOPE/GRADE	0.66% 1:150.69		3.90% 1:25.66	10.27% 1:9.74
DEPTH (m)	1.689	1.695	1.865	1.794 / 2.202 / 0.861
INVERT LEVEL (m)	15.399	15.339	15.169	14.398 / 13.696 / 13.139
TOP OF PIT LEVEL	17.088	17.034	16.153	14.000
FINAL SURFACE LEVEL	17.088	17.034	15.898	14.115
ROAD CHAINAGE				
CHAINAGE	0.000	9.042	19.787	28.828 / 5.437 / 34.265

	1/2	2/2	2/1
PIT TYPE	KLG-3600-2.5%XF	KLG-3600-2.5%XF	2x LLG-2400-2.5%XF
GRATE/LID	SAG	SAG	GRADE
PIT SIZE	3600	3600	2400
20% AEP FLOW (LIT/SEC)			
VELOCITY (m/s)			
HGL LEVEL (m)	17.324	17.288	16.995 / 16.101
DIAMETER (mm) CLASS	EXISTING 450Ø Class 2 RRJ		
SLOPE/GRADE	0.32% 1:316.19		1.33% 1:75.45
DEPTH (m)	1.224	1.176	1.226 / 1.395
INVERT LEVEL (m)	16.139	16.112	16.062 / 15.639
TOP OF PIT LEVEL	17.363	17.288	17.034
FINAL SURFACE LEVEL	17.363	17.288	17.034
ROAD CHAINAGE			
CHAINAGE	0.000	8.537	31.916 / 40.453



DATUM RL 11.00

RL 14.00

LEGEND

LLG	LIP IN LINE GULLY
KLG	KERB IN LINE GULLY
2400 #	LENGTH OF LINTEL
BK	BARRIER KERB
RTK	ROLL TOP KERB
M/H	MANHOLE
JP	JUNCTION PIT
GIP	GRATED INLET PIT
FIP	FIELD INLET PIT
HW	HEADWALL
S.R.C.P.	STEEL REINFORCED CONCRETE PIPE
F.R.C.P.	FIBRE REINFORCED CONCRETE PIPE
R.R.J.	RUBBER RING JOINT
D.I.	DUCTILE IRON
C.I.	CAST IRON
CONC	CONCRETE

REFER TO TWEED SHIRE COUNCIL STANDARD DRAWING NUMBER S.D. 104 & 105

LONGITUDINAL SECTION

SCALE 1:500 (A1) HORIZONTAL
SCALE 1:50 (A1) VERTICAL

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:500, A3 SHEET 1:1000
0 5 10 20 30 40 50 m
SCALE: A1 SHEET 1:50, A3 SHEET 1:100
0 0.5 1 2 3 4 5 m
USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

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DESIGN ENGINEER [redacted] DATE 08.08.22

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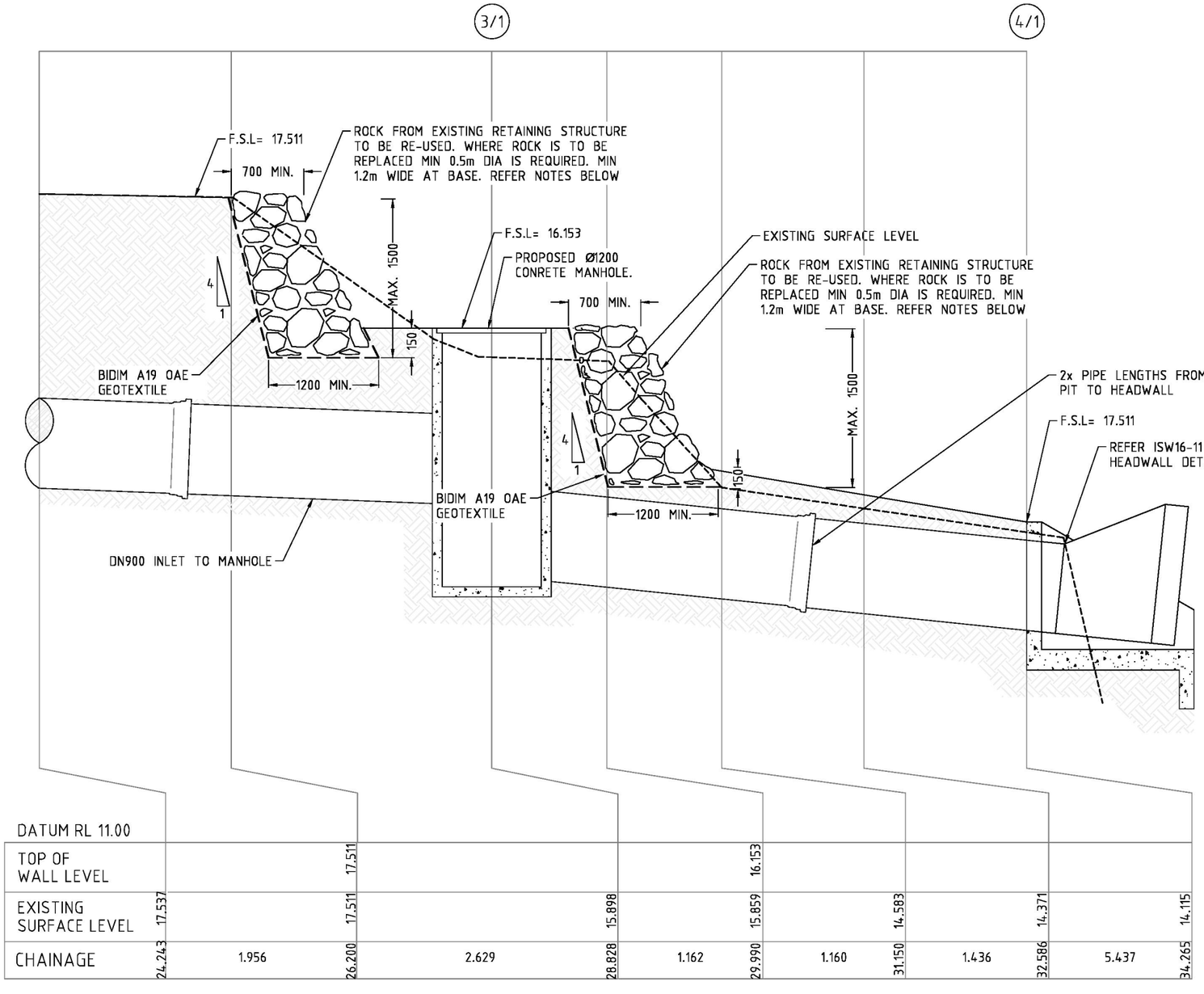
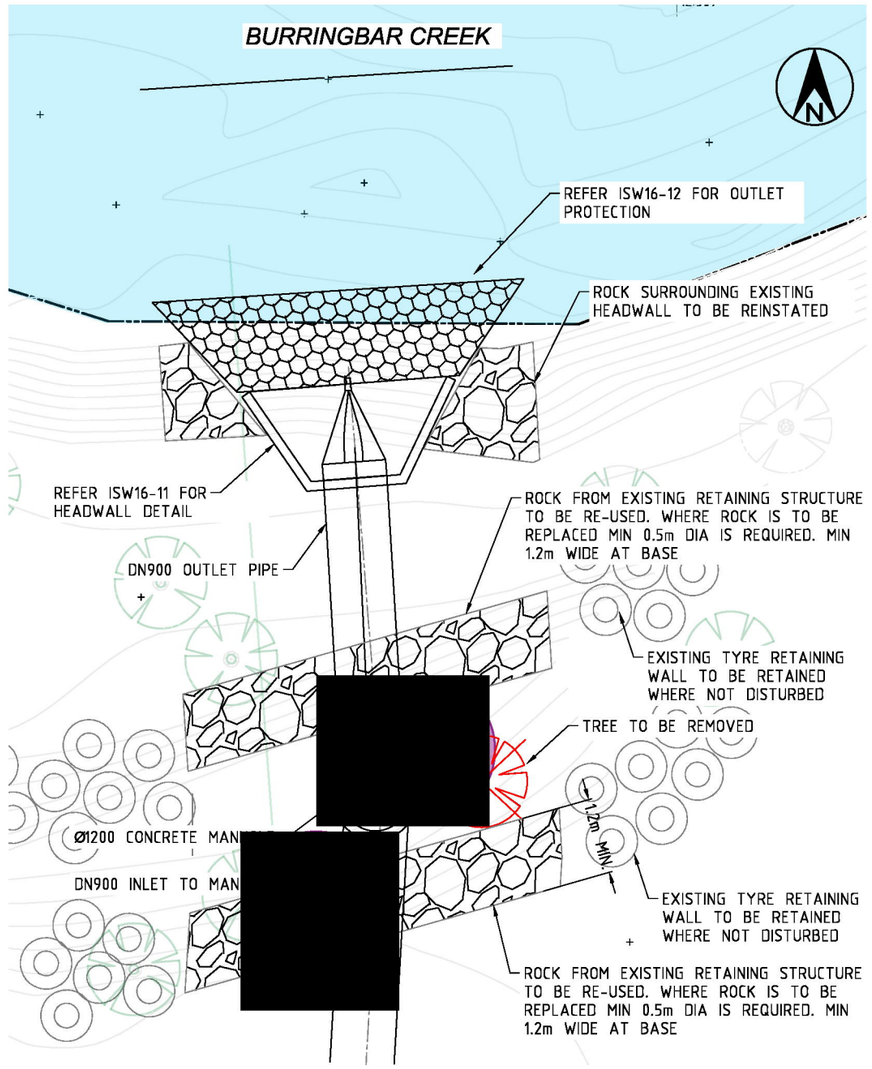
HORIZONTAL DATUM		MGA	NORTHING	6854097.175
VERTICAL DATUM		AHD	R.L.	17.520

PROJECT: STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR
PLAN TITLE: STORMWATER DRAINAGE LONGITUDINAL SECTIONS

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-07
ISSUE: 1

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_07-1.dwg





RETAINING STRUCTURE - LONGSECTION

SCALE 1:25 (A1) HORIZONTAL
SCALE 1:25 (A1) VERTICAL

NOTES:
1. ROCK SHALL CONSIST OF SOUND STONE AND SHALL HAVE A MINIMUM DIMENSION OF 0.5m.
2. ROCK SHALL BE PLACED IN COURSES WITH THE BOTTOM ROCKS FIRMLY BEDDING IN TRENCH
3. ROCK SHALL BE PLACED SO AS TO FORM IRREGULAR JOINTS AND ALL ROCKS SHALL FIRMLY INTERLOCK WITH SMALLER ROCKS WEDGED TIGHTLY INTO POSITION SUCH THAT NO SINGLE ROCK MAT BE DISLODGED AND NO LARGE VOIDS REMAIN BETWEEN ROCKS.

PLAN VIEW

SCALE 1:50

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:500, A3 SHEET 1:1000
0 5 10 20 30 40 50 m
SCALE: A1 SHEET 1:50, A3 SHEET 1:100
0 0.5 1 2 3 4 5 m

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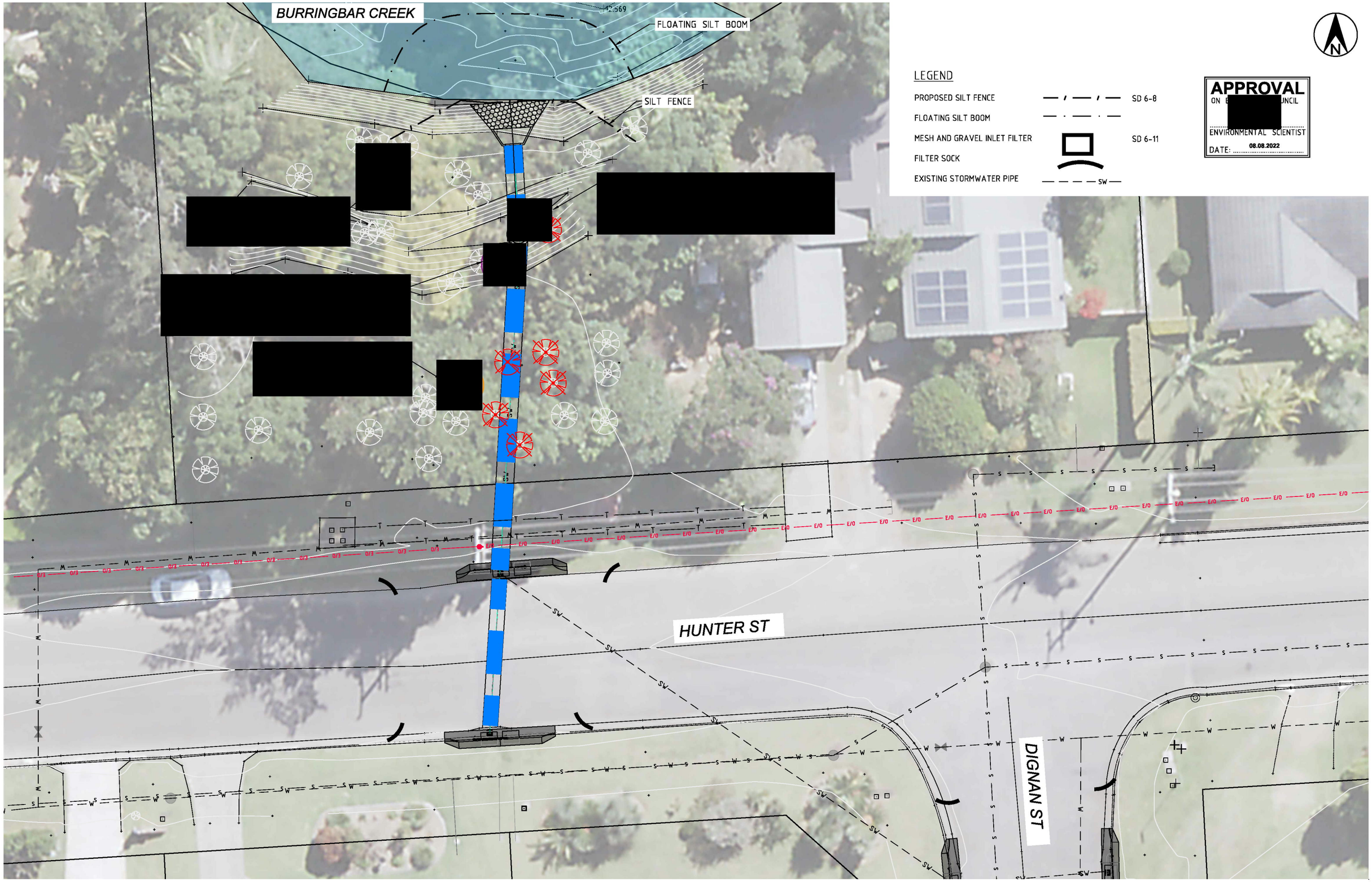
VERTICAL DATUM		AHD	R.L.	17.520

PROJECT: **STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR**

PLAN TITLE: **STORMWATER DRAINAGE GABION WALL CREEK BANK RESTORATION DETAIL**

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-08
ISSUE: 1

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_08-1.dwg



ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:100, A3 SHEET 1:200
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ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_09-1.dwg

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TWEED SHIRE COUNCIL

[redacted]

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VERTICAL DATUM		AHD	R.L.	17.520

PROJECT:
STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR

PLAN TITLE:
EROSION AND SEDIMENT CONTROL PLAN

ROAD SEGMENT:	10
JOB NUMBER:	A4757
PROJECT NUMBER:	ISW16
DRAWING NUMBER	ISSUE
ISW16-09	1

EROSION AND SEDIMENT CONTROL PLANS

PRINCIPLES AND STANDARD SITE CONTROL MEASURES

MINIMISE EXTENT AND DURATION OF DISTURBANCE
- CONSTRUCTION WORKS TO BE MANAGED SUCH THAT AREAS OUTSIDE SCOPE OF WORKS REMAIN UNDISTURBED WHERE POSSIBLE.
- MINIMISE EXTENT OF DISTURBANCE WITHIN CONSTRUCTION SITE AT ANY ONE TIME BY STAGING THE WORKS (EG. EXCAVATE TRENCH IN SECTIONS, MOVING ON TO NEW SECTIONS FOLLOWING COMPLETION OF PREVIOUS STAGE).
- MINIMISE DISTURBANCE OF VEGETATION ALONG THE ROAD VERGE WITH SPECIAL EMPHASIS ON MANAGEMENT OF CONSTRUCTION ACTIVITIES ADJACENT TO WATERCOURSES (E.G. MAINTAIN GRASSY BUFFER WHERE POSSIBLE).

CONTROL STORMWATER FLOWS ONTO, THROUGH AND FROM THE SITE
- SEPARATE 'CLEAN' RUN-ON WATER FROM 'DIRTY' (E.G. TURBID) CONSTRUCTION AREA RUNOFF.

USE EROSION CONTROL MEASURES TO PREVENT ON-SITE DAMAGE
- THE INSTALLATION OF ALL EROSION AND SEDIMENT CONTROLS TO OCCUR IMMEDIATELY POST CLEARING AND STRIPPING.
- SITE STOCKPILES OF SOIL MATERIAL IN LOW-HAZARD AREAS CLEAR OF WATERCOURSES. ADDITIONAL PROTECTION TO BE AFFORDED WITH TEMPORARY VEGETATION, DIVERSION BANKS AND SEDIMENT CONTROL MEASURES, IF REQUIRED. SEED STOCKPILES WITH ANNUAL GRASS IF THEY ARE TO BE STORED LONGER THAN 10 DAYS.

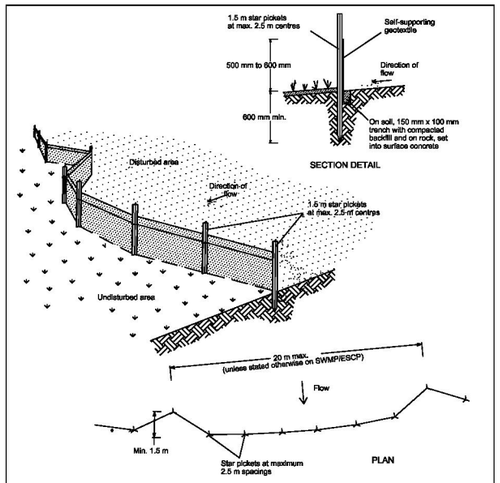
USE SEDIMENT CONTROL MEASURES TO PREVENT OFF-SITE DAMAGE
- THE INSTALLATION OF ALL EROSION AND SEDIMENT CONTROLS TO OCCUR IMMEDIATELY POST CLEARING AND STRIPPING.
- CONSTRUCT CONTROL MEASURES AS CLOSE TO THE POTENTIAL SOURCE OF SEDIMENT AS POSSIBLE.
- CONTROL THE DEPOSITION OF MUD AND SOIL MATERIAL ONTO LOCAL ROADS.

STABILISE DISTURBED AREAS QUICKLY
- ALL STABILISATION AND REINSTATEMENT WORKS ADJACENT TO NEW CONSTRUCTION SHALL BE CARRIED OUT AS SOON AS POSSIBLE AFTER COMPLETION OF CONSTRUCTION WORKS.
- ALL DISTURBED VERGES AND FILL BATTERS TO BE STABILISED BY REVEGETATING WITH APPROPRIATE SPECIES (E.G. ANNUAL GRASS SEED SUCH AS ANNUAL RYEGRASSS OR JAPANESE MILLET, OR TURF) AS SOON AS PRACTICAL AFTER REINSTATEMENT.
- ENSURE THE SUCCESS OF THE LATER REVEGETATION PROGRAM BY UTILISING A GOOD TOPSOIL MANAGEMENT PROGRAM
- CONTROL DUST THROUGH PROGRESSIVE REVEGETATION TECHNIQUES, WATER TANKERS ETC.

INSPECT AND MAINTAIN CONTROL MEASURES
- ENSURE THE PROGRESSIVE AND CONTINUAL IMPLEMENTATION AND MAINTENANCE OF TEMPORARY EROSION AND SEDIMENT CONTROLS (E.G. SEDIMENT FENCES, DIVERSION BANKS, DIVERSION DRAINS, SEDIMENT TRAPS).
- INITIATE A PROGRAM TO ENSURE REGULAR MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES. SEDIMENT CLEANED FROM STRUCTURES (E.G. SCRAPE AWAY ACCUMULATED SEDIMENT UPSTREAM OF CHECK DAMS AND REPLACE/REPAIR AS NECESSARY) TO MAINTAIN FUNCTIONALITY.
- ADDITIONAL INSPECTIONS WILL BE CONDUCTED DURING AND/OR IMMEDIATELY FOLLOWING SIGNIFICANT RAINFALL EVENTS TO MONITOR THE FUNCTIONING OF CONTROLS.
- ALL EROSION AND SEDIMENT CONTROLS TO BE MAINTAINED IN PLACE UNTIL ALL WORKS ARE COMPLETED AND DISTURBED AREAS HAVE STABILISED.

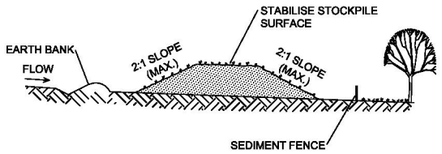
NOTES:
1. MONITOR THE 7 DAY RAIN FORCAST TO DETERMINE THE TIMING OF WORKS AND 24 HOUR FORCAST FOR PREPARATION OF EROSION AND SEDIMENT CONTROL (ESC) MEASURES
2. LIMIT AREAS OF DISTURBANCE AT ANY ONE TIME WHERE POSSIBLE AND IDENTIFY VEGETATION NO GO AREAS.
3. ENSURE THAT GUTTERS, PATHWAYS, ROADS ARE SWEPT CLEAN PRIOR TO RAIN OR BEFORE THE END OF THE DAYS SHIFT. HARD SURFACES CLEAN OF SOILWILL REDUCE THE NEED FOR CONTROLS AND ELIMINATE POTENTIAL TRIP HAZARDS TO PEDESTRIANS AND ROAD HAZARDS TO DRIVERS.
4. STOCKPILES, IF ANY, WILL BE MANAGED AS PER SD4-1
5. INSTALL FILTER SOCKS / SILT SOCKS WITHIN CONCENTRATED FLOW PATHS.
6. INSTALL MESH AND GRAVEL INLET FILTERS SD6-11 AS REQUIRED
7. PROGRESSIVELY INSTALL AND REMOVE CONTROLS AS WORK PROGRESSES ALONG THE ALIGNMENT.

APPROVAL
ON BEHA[redacted]CIL
.....
ENVIRONMENTAL SCIENTIST
DATE: 08.08.22



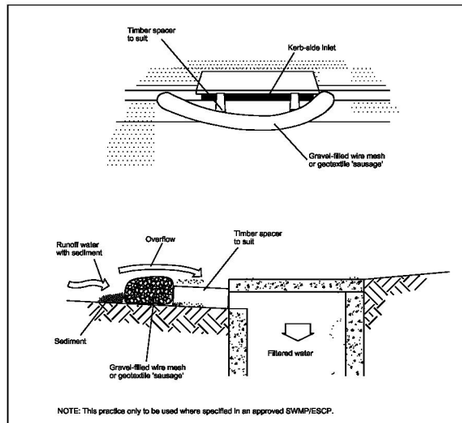
Construction Notes
1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE SD 6-8



Construction Notes
1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

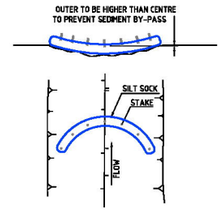
STOCKPILES SD 4-1



NOTE: This practice only to be used where specified in an approved SWMP/ESCP.

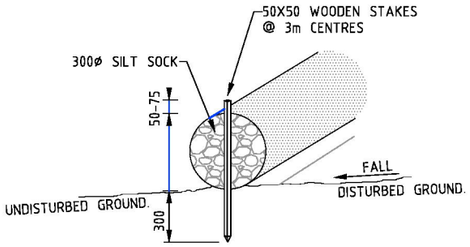
Construction Notes
1. Install filters to kerb inlets only at sag points.
2. Fabricate a sleeve made from geotextile or wire mesh longer than the length of the inlet pit and fill it with 25 mm to 50 mm gravel.
3. Form an elliptical cross-section about 150 mm high x 400 mm wide.
4. Place the filter at the opening leaving at least a 100-mm space between it and the kerb inlet. Maintain the opening with spacer blocks.
5. Form a seal with the kerb to prevent sediment bypassing the filter.
6. Sandbags filled with gravel can substitute for the mesh or geotextile providing they are placed so that they firmly abut each other and sediment-laden waters cannot pass between.

MESH AND GRAVEL INLET FILTER SD 6-11



SEDIMENT CONTROL FOR OPEN CHANNELS
N.T.S.

SILT SOCK FOR OPEN CHANNELS



SILT SOCK DETAIL
N.T.S.

Filter sock sediment trap

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

DESIGN UNIT
COUNCIL OFFICES
TUMBULGUM ROAD,
MURWILLUMBAH NSW 2484.
PHONE 02 66702400
FAX 02 66727513
WEBSITE www.tweed.nsw.gov.au
TWEED SHIRE COUNCIL

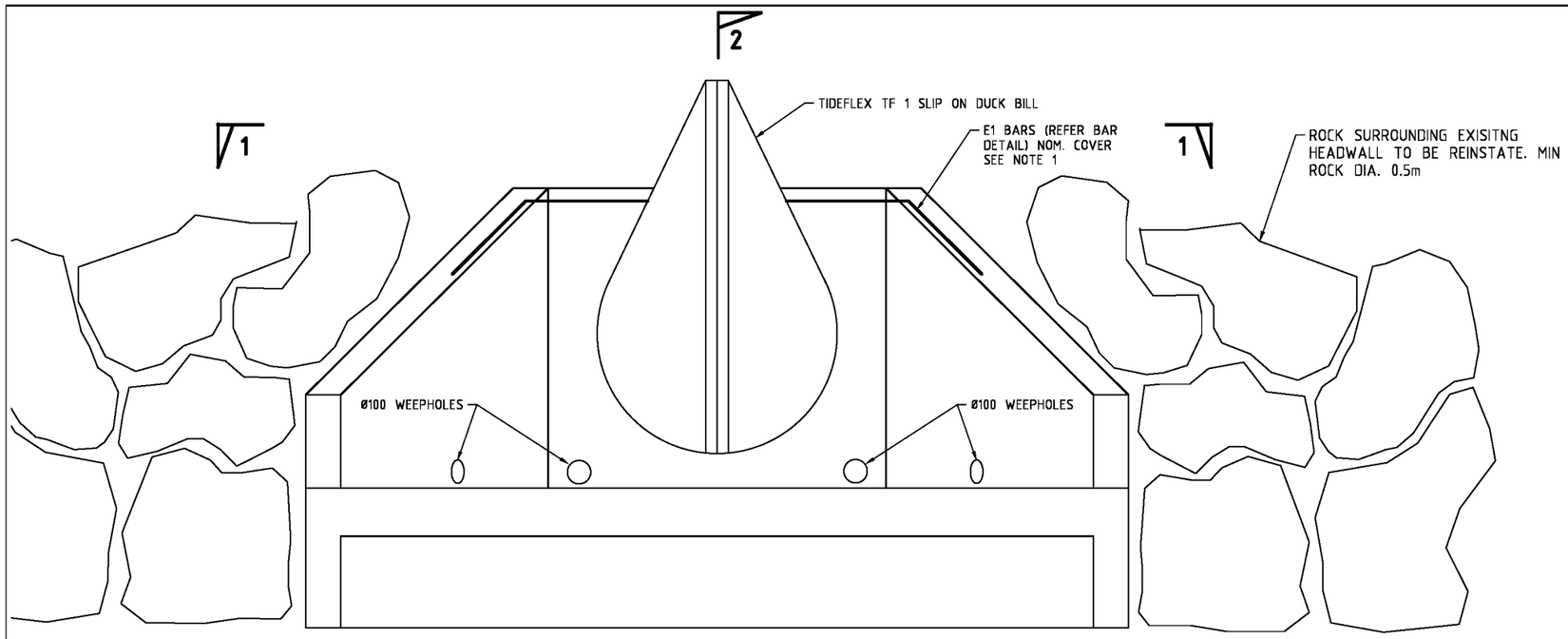
DESIGNED	WB	21.02.22		
DRAWN	JH	28.03.22	COORDS ADOPTED	PM 106541
CHECKED	WB	??.??.22	EASTING	546762.944
HORIZONTAL DATUM		MGA	NORTHING	6854097.175
VERTICAL DATUM		AHD	R.L.	17.520

PROJECT: STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR

PLAN TITLE: EROSION AND SEDIMENT CONTROL PLAN - DETAILS

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-10
ISSUE: 1

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_10-1.dwg



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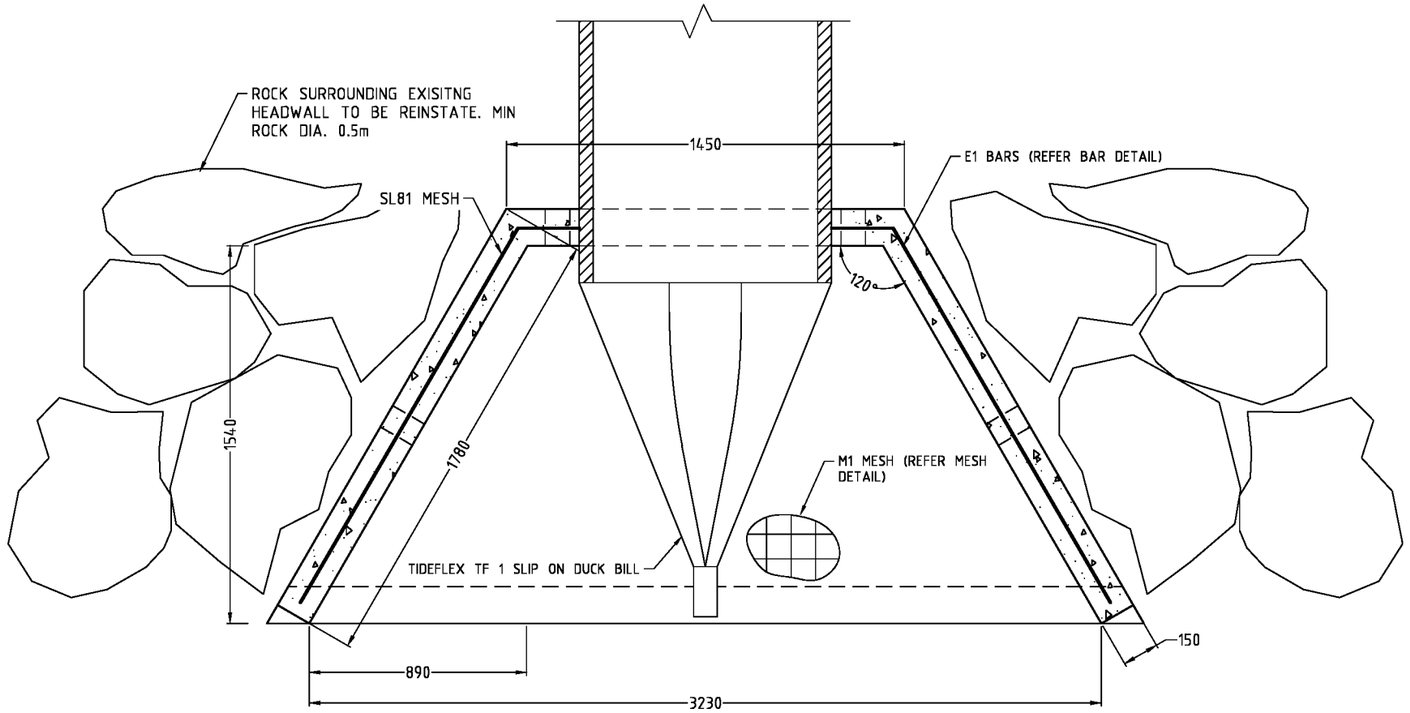
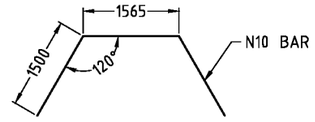
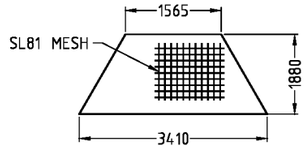


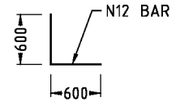
SECTION 1-1



E1 BAR DETAIL



M1 MESH DETAIL



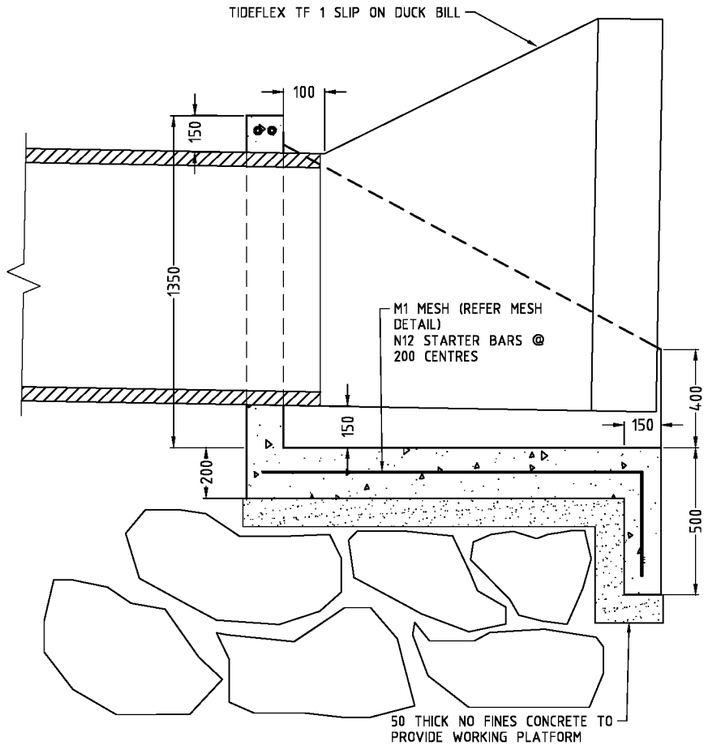
STARTER BAR DETAIL

NOTES:

1. CONCRETE STRENGTH GRADES ARE FOR EXPOSURE CLASSIFICATION B1. CONCRETE STRENGTH GRADE N32 MINIMUM COVER TO REINFORCEMENT IS 40mm.
2. WEEPHOLES ARE TO BE PROVIDED AT 1800 CENTRES (MAXIMUM) AT OUTLET ONLY.
3. ALL STEEL BARS TO BE GRADE D500N TO AS4671.
4. MESH: LAPS SHALL BE MADE SO THAT THE OUTERMOST WIRES OF ONE FABRIC OVERLAP TO TWO OUTERMOST WIRES OF THE SHEET BEING LAPPED.

REFERENCED DOCUMENTS:

AS4671 STEEL REINFORCING MATERIALS
AS3600 CONCRETE STRUCTURES
SPECIFICATION R11 - STORMWATER DRAINAGE
SPECIFICATION B80 - CONCRETE WORKS FOR BRIDGES



SECTION 2-2

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:10, A3 SHEET 1:20
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USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

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EMAIL tsc@tweed.nsw.gov.au
WEBSITE www.tweed.nsw.gov.au
TWEED SHIRE COUNCIL

DESIGN ENGINEER [redacted] DATE 08.08.22

DESIGNED	WB			
DRAWN	JH	28.03.22	COORDS ADOPTED	PM 106541
CHECKED	WB	??.??.22	EASTING	546762.944
HORIZONTAL DATUM	MGA		NORTHING	6854097.175
VERTICAL DATUM	AHD		R.L.	17.520

PROJECT: STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR

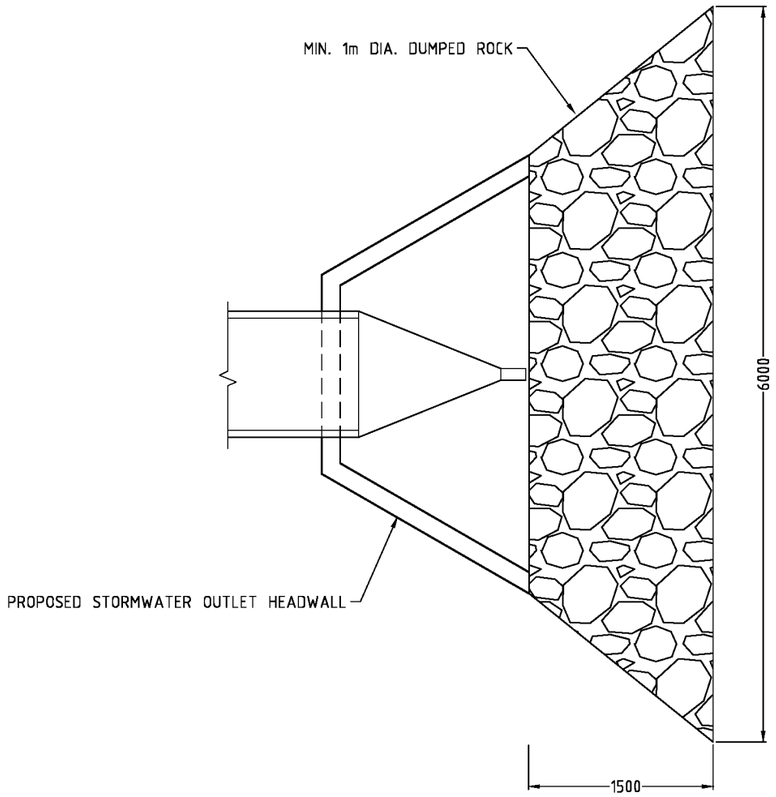
PLAN TITLE: HEADWALL DETAIL

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-11
ISSUE: 1

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_11-1_12-1_13-1_14-1.dwg

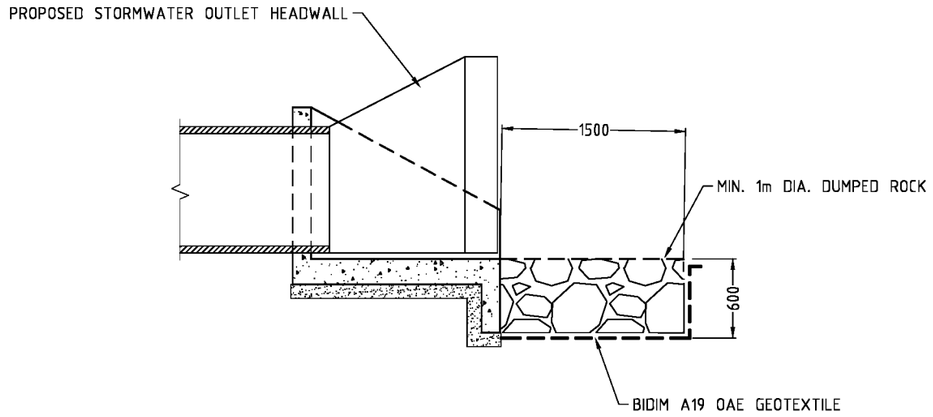
ROCK PROTECTION NOTES

1. ROCK TO BE PLACED ON A19 BIDIM OAE
2. SELECTED ROCKS TO BE DURABLE AND RESISTANT TO WEATHERING, AND SHOULD BE PROPORTIONED SO THAT NEITHER THE BREADTH NOR THE THICKNESS OF A SINGLE ROCK IS LESS THAN ONE-THIRD ITS LENGTH.
3. ROCKS SHOULD BE PLACED IN STABLE POSITIONS WITH SEVERAL POINT CONTACTS, GENERALLY BALANCED REARWARD.
4. ROCKS SHOULD FORM AN INTERLOCKING MASS WHEN COMPLETED WITH NO INDIVIDUAL ROCKS FREE TO MOVE
5. ROCK SHALL LIE WITHIN RANGE OF Ø800 TO Ø1200 WITH 50% GREATER THAN Ø1000 AND AT LEAST 50% MORE THAN SPECIFIED MASS (1760kg)



TYPICAL STORMWATER OUTLET PLAN

SCALE: NTS



TYPICAL STORMWATER OUTLET SECTION

SCALE: NTS

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:10, A3 SHEET 1:20
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USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

DESIGN UNIT
COUNCIL OFFICES
TUMBULGUM ROAD,
MURWILLUMBAH NSW 2484.
PHONE 02 66702400
EMAIL tsc@tweed.nsw.gov.au
WEBSITE www.tweed.nsw.gov.au
TWEED SHIRE COUNCIL

DESIGN ENGINEER [redacted] DATE 08.08.22

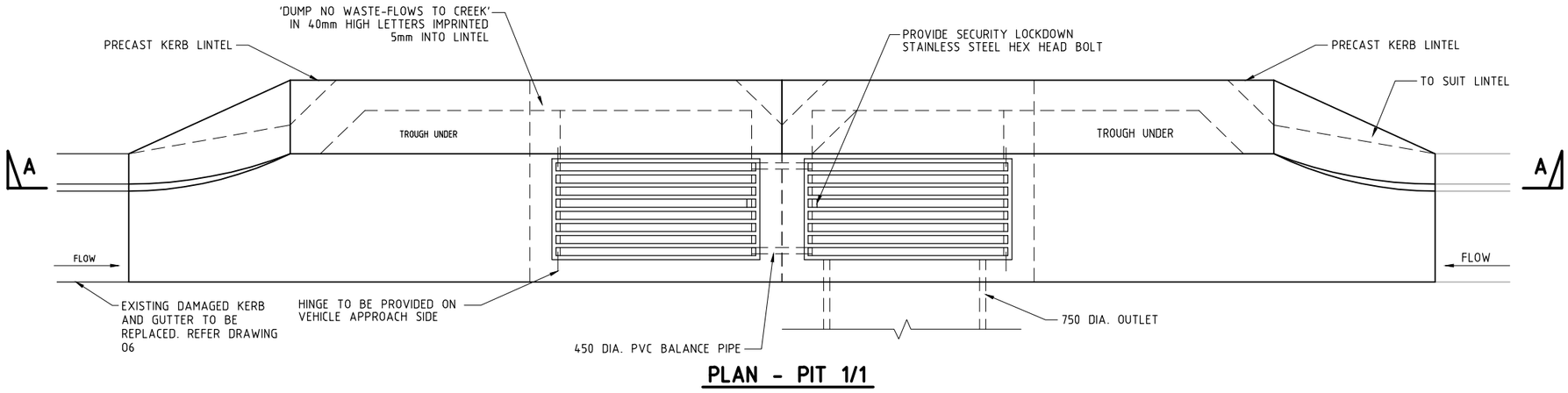
DESIGNED	WB			
DRAWN	JH	28.03.22	COORDS ADOPTED	PM 106541
CHECKED	WB	??.??.22	EASTING	546762.944
HORIZONTAL DATUM		MGA	NORTHING	6854097.175
VERTICAL DATUM		AHD	R.L.	17.520

PROJECT:
STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR

PLAN TITLE:
OUTLET PROTECTION LAYOUT

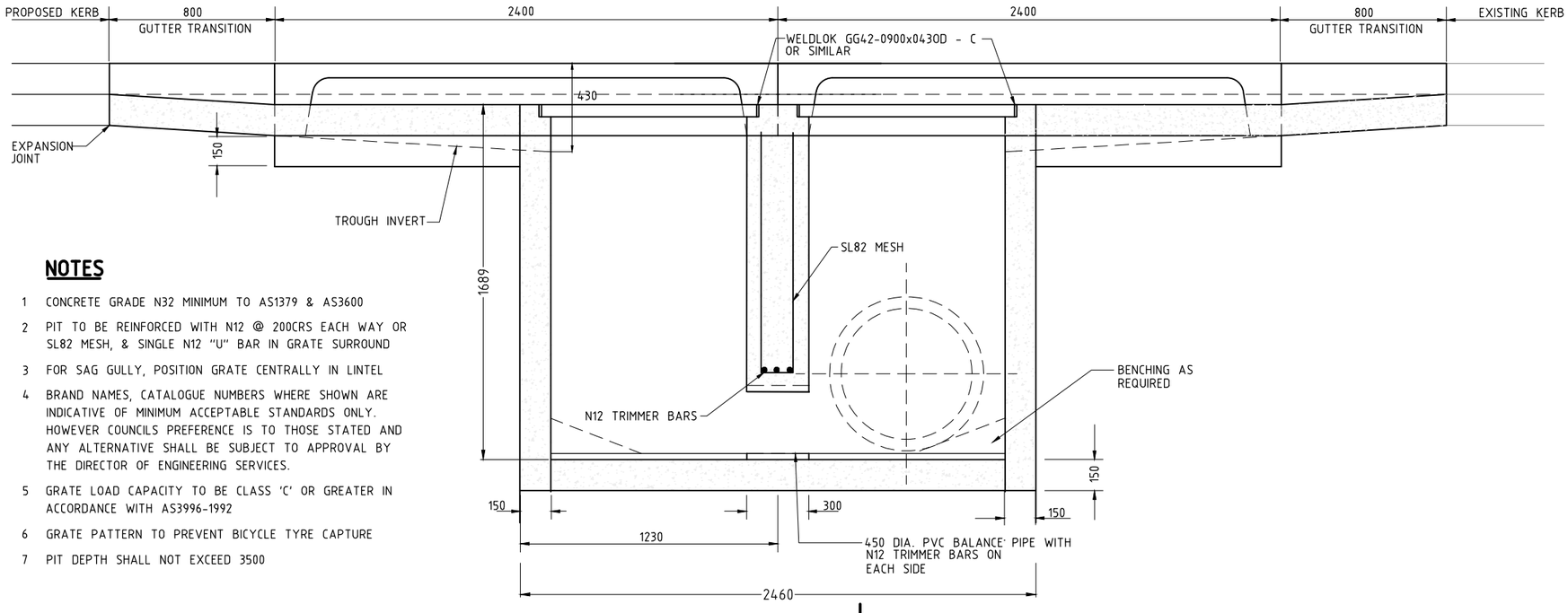
ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-12
ISSUE: 1

ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_11-1_12-1_13-1_14-1.dwg



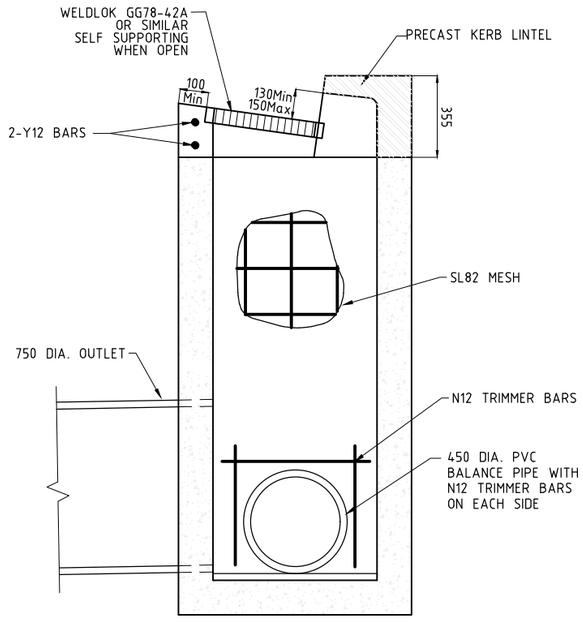
PLAN - PIT 1/1

B



B

SECTIONAL ELEVATION A-A



SECTIONAL ELEVATION B-B

NOTES

1. CONCRETE GRADE N32 MINIMUM TO AS1379 & AS3600
2. PIT TO BE REINFORCED WITH N12 @ 200CRS EACH WAY OR SL82 MESH, & SINGLE N12 "U" BAR IN GRATE SURROUND
3. FOR SAG GULLY, POSITION GRATE CENTRALLY IN LINTEL
4. BRAND NAMES, CATALOGUE NUMBERS WHERE SHOWN ARE INDICATIVE OF MINIMUM ACCEPTABLE STANDARDS ONLY. HOWEVER COUNCILS PREFERENCE IS TO THOSE STATED AND ANY ALTERNATIVE SHALL BE SUBJECT TO APPROVAL BY THE DIRECTOR OF ENGINEERING SERVICES.
5. GRATE LOAD CAPACITY TO BE CLASS 'C' OR GREATER IN ACCORDANCE WITH AS3996-1992
6. GRATE PATTERN TO PREVENT BICYCLE TYRE CAPTURE
7. PIT DEPTH SHALL NOT EXCEED 3500

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:10, A3 SHEET 1:20
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USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

DESIGN UNIT
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EMAIL tsc@tweed.nsw.gov.au
WEBSITE www.tweed.nsw.gov.au

TWEED SHIRE COUNCIL

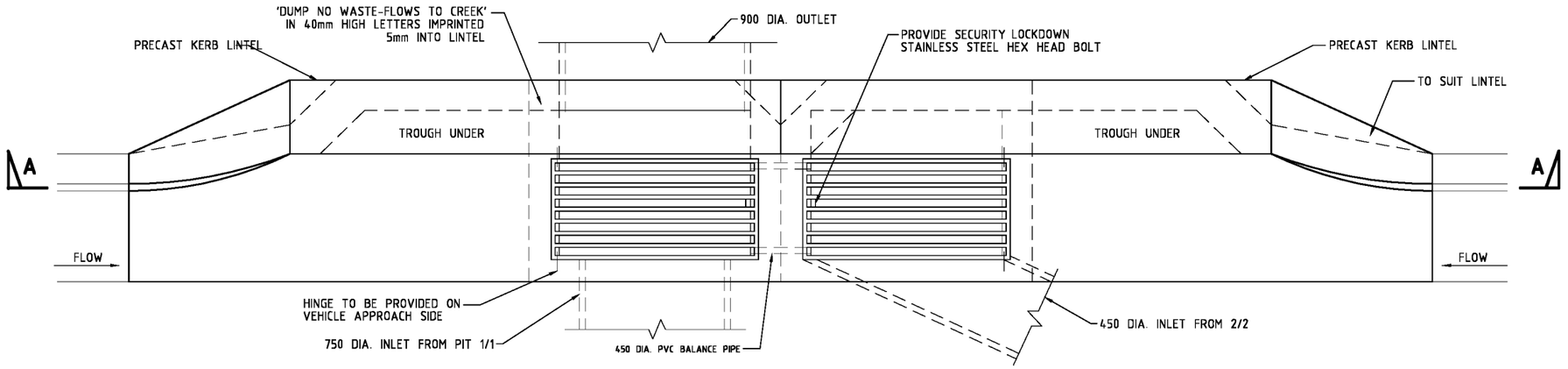
DESIGN ENGINEER		DATE 08.08.22		
DESIGNED	WB	21.02.22		
DRAWN	JH	28.03.22	COORDS ADOPTED	PM 106541
CHECKED	WB	??.??.22	EASTING	546762.944
HORIZONTAL DATUM		MGA	NORTHING	6854097.175
VERTICAL DATUM		AHD	R.L.	17.520

PROJECT:
STORMWATER DRAINAGE - UPGRADE
HUNTER STREET, BURRINGBAR

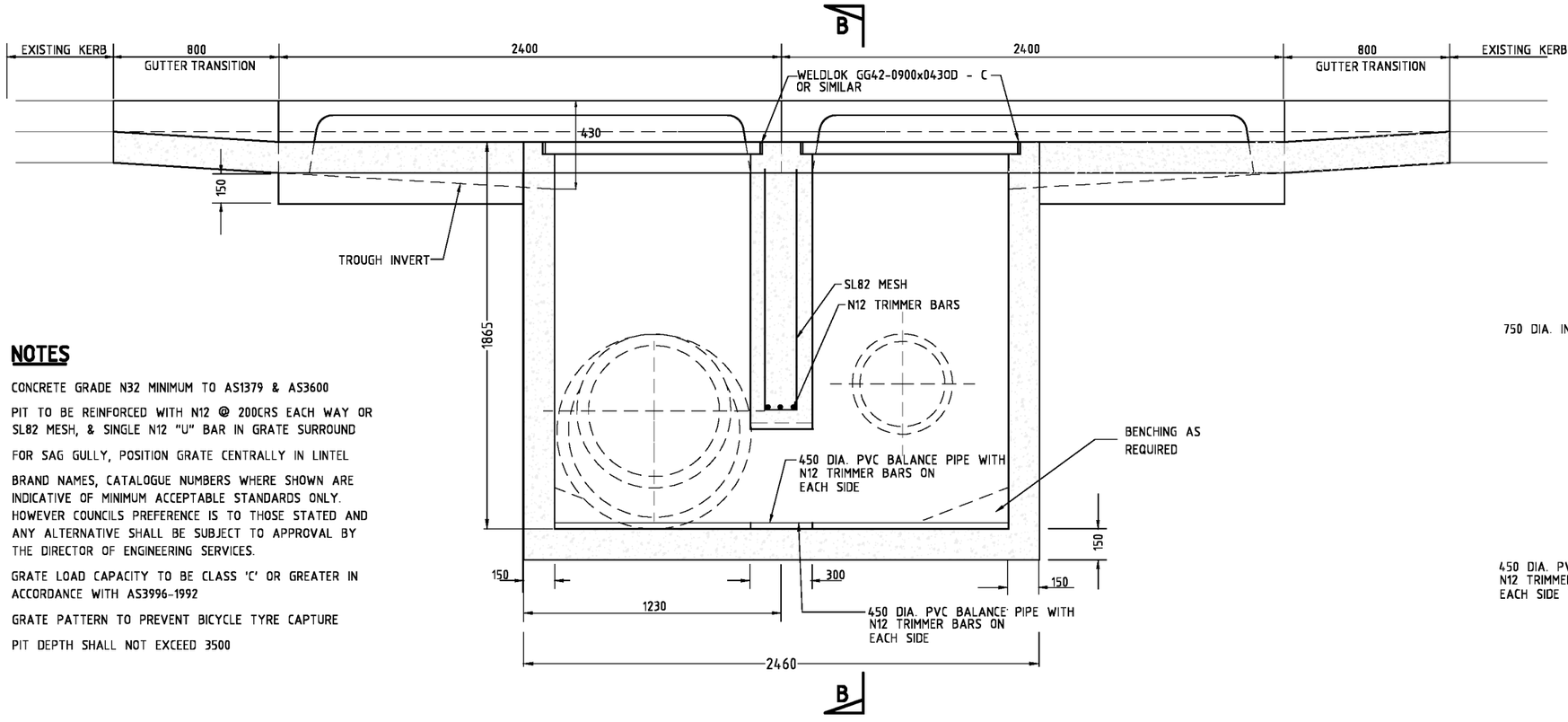
PLAN TITLE:
DOUBLE GRATED GULLY PIT
KERB INLET 1/1

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-13
ISSUE: 1

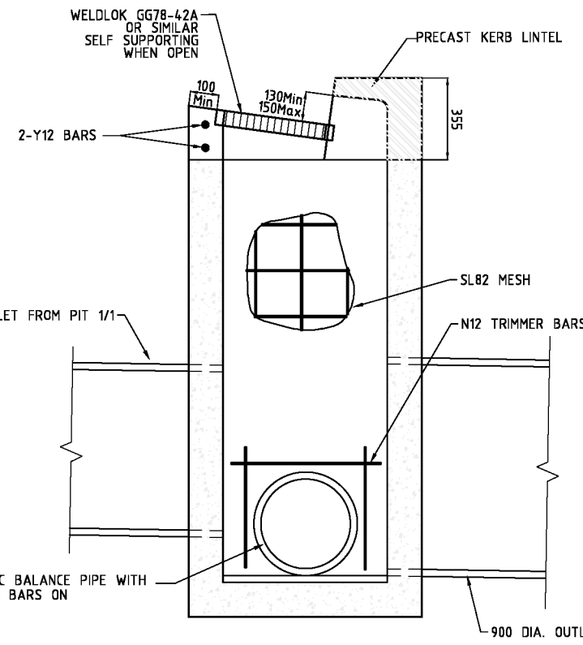
ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_11-1_12-1_13-1_14-1.dwg



PLAN - PIT 2/1



SECTIONAL ELEVATION A-A



SECTIONAL ELEVATION B-B

NOTES

1. CONCRETE GRADE N32 MINIMUM TO AS1379 & AS3600
2. PIT TO BE REINFORCED WITH N12 @ 200CRS EACH WAY OR SL82 MESH, & SINGLE N12 "U" BAR IN GRATE SURROUND
3. FOR SAG GULLY, POSITION GRATE CENTRALLY IN LINTEL
4. BRAND NAMES, CATALOGUE NUMBERS WHERE SHOWN ARE INDICATIVE OF MINIMUM ACCEPTABLE STANDARDS ONLY. HOWEVER COUNCILS PREFERENCE IS TO THOSE STATED AND ANY ALTERNATIVE SHALL BE SUBJECT TO APPROVAL BY THE DIRECTOR OF ENGINEERING SERVICES.
5. GRATE LOAD CAPACITY TO BE CLASS 'C' OR GREATER IN ACCORDANCE WITH AS3996-1992
6. GRATE PATTERN TO PREVENT BICYCLE TYRE CAPTURE
7. PIT DEPTH SHALL NOT EXCEED 3500

ISSUE	AMENDMENT DETAILS	DRAWN	CHECK	DATE
1	CONSTRUCTION ISSUE	JH	JM	08.08.22

SCALE: A1 SHEET 1:10, A3 SHEET 1:20
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USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

DESIGN UNIT
COUNCIL OFFICES
TUMBULGUM ROAD,
MURWILLUMBAH NSW 2484.
PHONE 02 66702400
EMAIL tsc@tweed.nsw.gov.au
WEBSITE www.tweed.nsw.gov.au
TWEED SHIRE COUNCIL

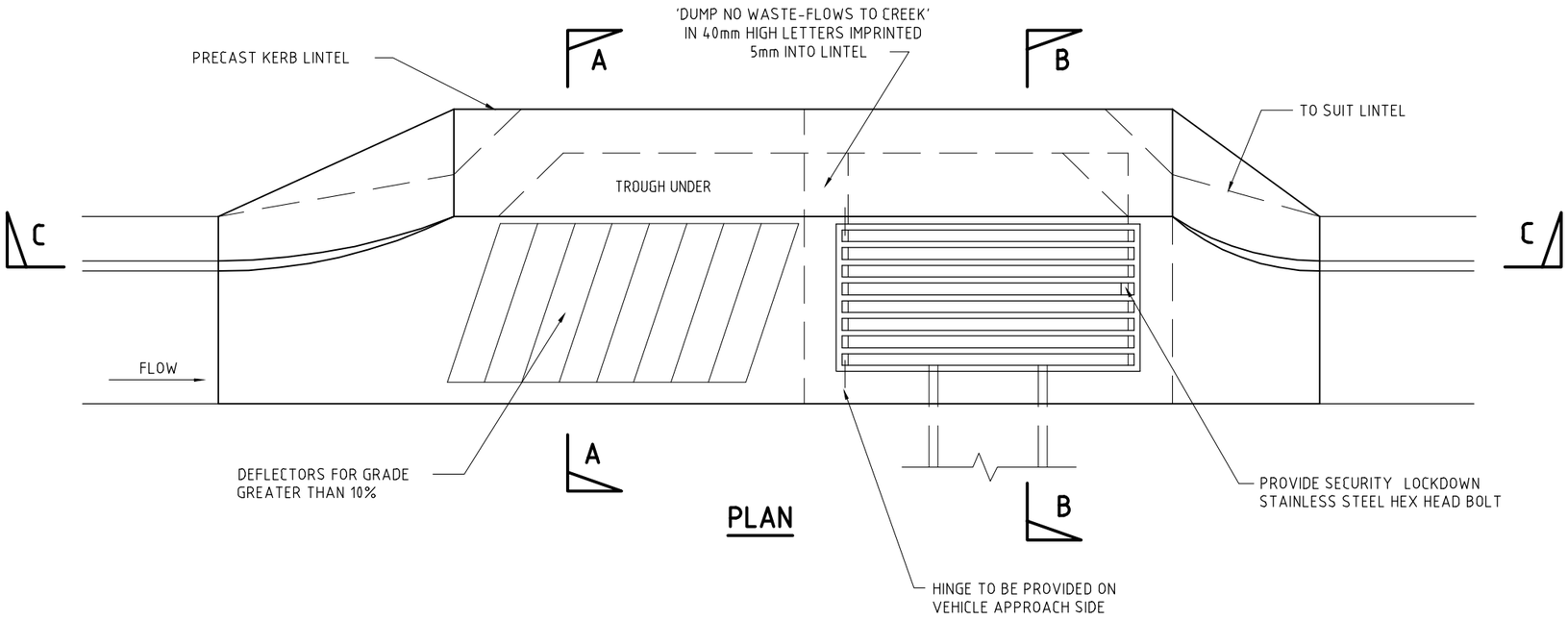
DESIGN ENGINEER ... [redacted]				ATE 08.08.22	
DESIGNED	WB				
DRAWN	JH	28.03.22	COORDS ADOPTED	PM 106541	
CHECKED	WB	??.??.22	EASTING	546762.944	
HORIZONTAL DATUM		MGA	NORTHING	6854097.175	
VERTICAL DATUM		AHD	R.L.	17.520	

PROJECT: STORMWATER DRAINAGE - UPGRADE HUNTER STREET, BURRINGBAR

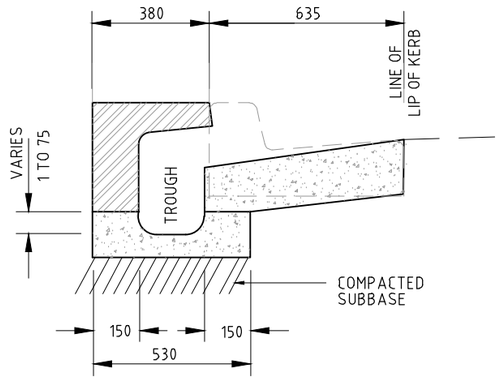
PLAN TITLE: DOUBLE GRATED GULLY PIT KERB INLET 2/1

ROAD SEGMENT: 10
JOB NUMBER: A4757
PROJECT NUMBER: ISW16
DRAWING NUMBER: ISW16-14
ISSUE: 1

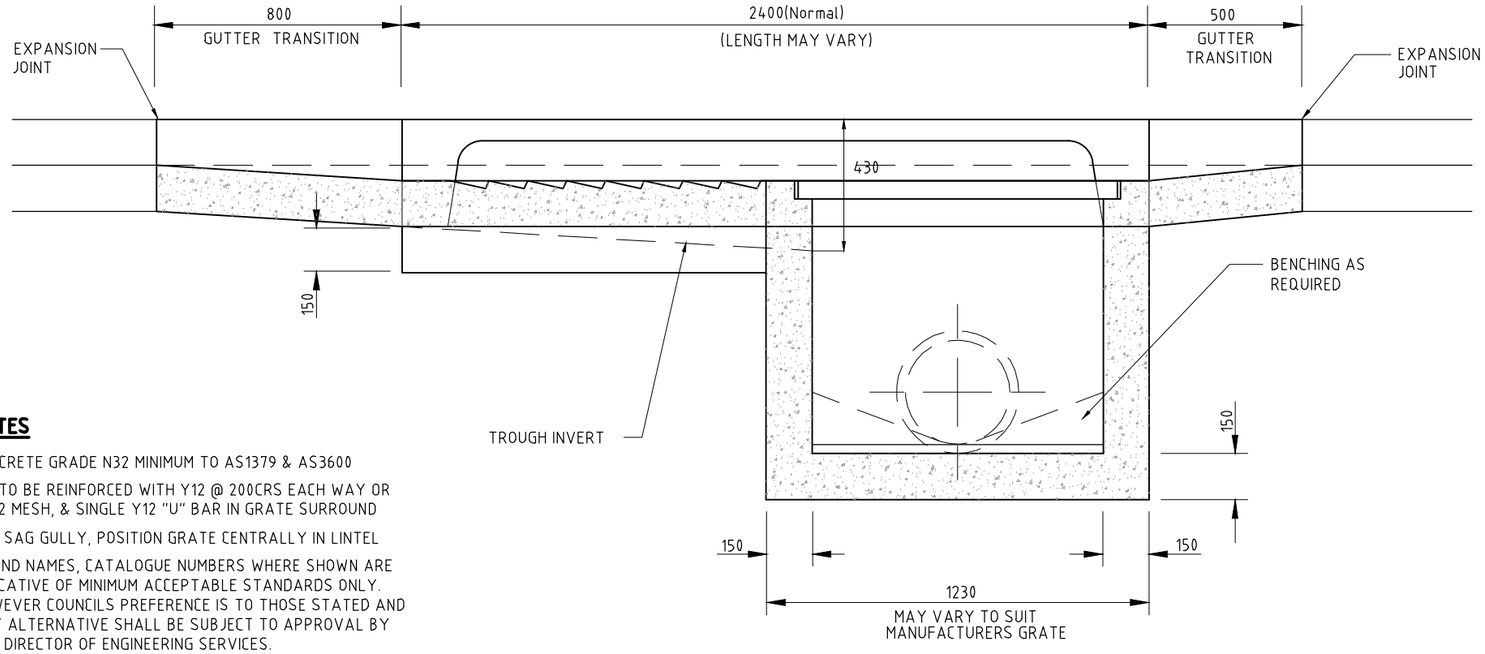
ACAD FILE No: G:_AAA DESIGN PROJECTS\ISW\ISW16_Hunter St Burringbar Drainage\Drawings\B_CONSTRUCTION DRAWINGS\ISW16_11-1_12-1_13-1_14-1.dwg



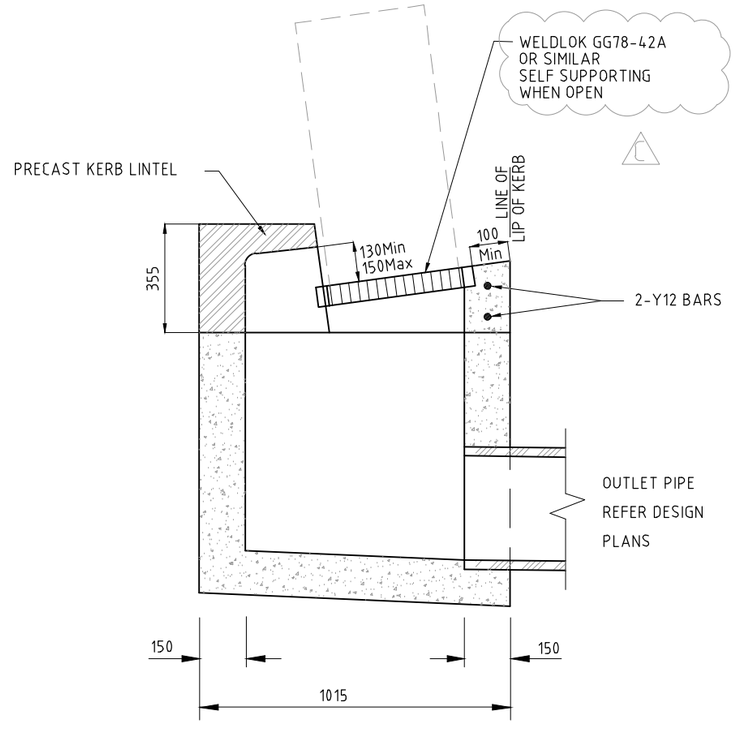
PLAN



SECTION A-A



SECTIONAL ELEVATION C-C



SECTION B-B

NOTES

1. CONCRETE GRADE N32 MINIMUM TO AS1379 & AS3600
2. PIT TO BE REINFORCED WITH Y12 @ 200CRS EACH WAY OR SL82 MESH, & SINGLE Y12 "U" BAR IN GRATE SURROUND
3. FOR SAG GULLY, POSITION GRATE CENTRALLY IN LINTEL
4. BRAND NAMES, CATALOGUE NUMBERS WHERE SHOWN ARE INDICATIVE OF MINIMUM ACCEPTABLE STANDARDS ONLY. HOWEVER COUNCILS PREFERENCE IS TO THOSE STATED AND ANY ALTERNATIVE SHALL BE SUBJECT TO APPROVAL BY THE DIRECTOR OF ENGINEERING SERVICES.
5. GRATE LOAD CAPACITY TO BE CLASS 'C' OR GREATER IN ACCORDANCE WITH AS3996-1992
6. GRATE PATTERN TO PREVENT BICYCLE TYRE CAPTURE
7. PIT DEPTH SHALL NOT EXCEED 3500

SCALE 1:10 0 0.1 0.2 0.4 0.6 0.8 1.0 m

ISSUE	AMENDMENT DETAILS	INITIALS	DATE
C	NOTATION ON GRATE TYPE	G.P.C.	08.2008
B	DRAWINGS ADOPTED FOR ISSUE TO PUBLIC	R.A.E.	5.2004
A	RE-ISSUED	R.A.E.	4.2004

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WEBSITE www.tweed.nsw.gov.au

DESIGN ENGINEER				DATE	5.2004
DESIGN MANAGER				DATE	5.2004
DESIGNED	R.A.E.	2.2004	DESIGN NO.		
DRAWN	R.A.E.	2.2004	SURVEY NO.		
CHECKED	W.B.	2.2004	REDUCTION RATIO		
HORIZONTAL DATUM		ISG	COORDS ADOPTED	PM E N	
VERTICAL DATUM		AHD			

PROJECT: STORMWATER STANDARDS

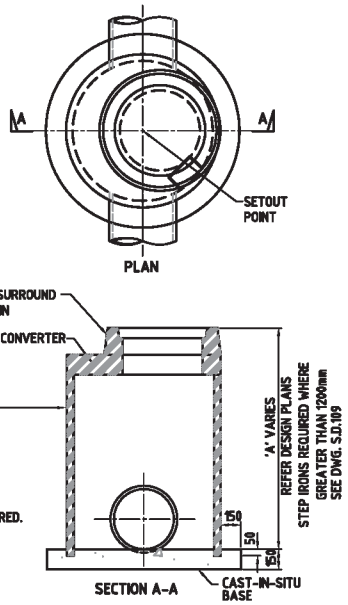
DRAWING NUMBER: S.D.104

PLAN TITLE: STANDARD GULLY PIT - BARRIER KERB

SHEET 1 OF 1 SHEETS

ISSUE A B C

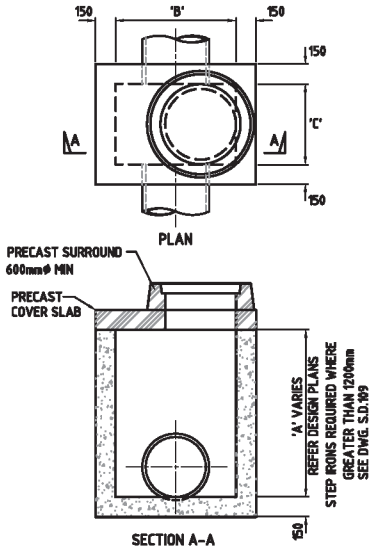
ACAD FILE No G:\TSC STANDARD DRAWINGS\S.D.DRAWINGS\100STORMWATER\S.D.104.DWG



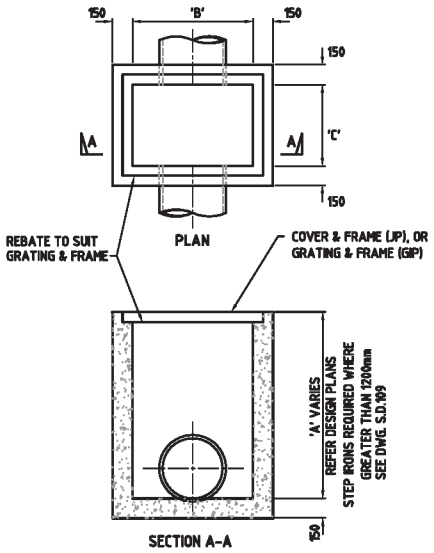
PIT Dia.	PIPE Dia.
1050	UP TO 750ϕ
1200	UP TO 900ϕ
1800	UP TO 1350ϕ

NOTE: FOR PIPES GREATER THAN 1350ϕ, SQUARE OR RECTANGULAR MANHOLE REQUIRED.

CIRCULAR STORMWATER MANHOLE
NTS



RECTANGULAR STORMWATER MANHOLE
NTS

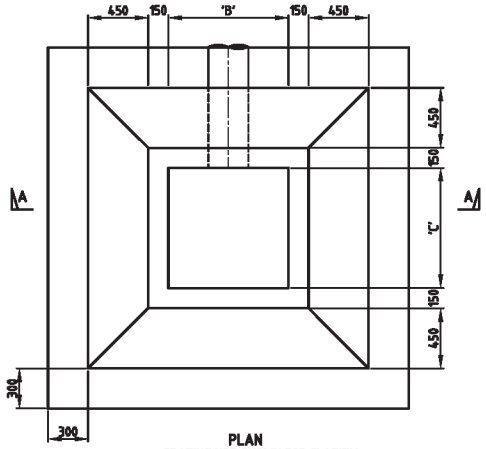


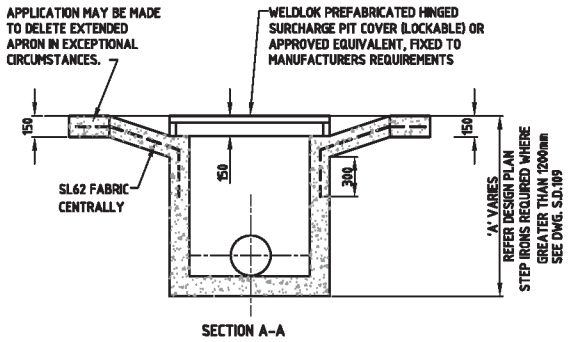
JUNCTION PIT(JP)/GRATED INLET PIT(GIP)
NTS

MINIMUM PIT DIMENSIONS

DEPTH 'A'	MIN. SIZE	DIM. 'B'	DIM. 'C'
600mm OR LESS	600mm × 600mm	600mm	600mm
OVER 600mm	900mm × 600mm	PIPE ϕ PLUS 300mm	PIPE ϕ PLUS 300mm

NOTES
1. FOR DIMENSIONS 'A' , 'B' & 'C', PIPE SIZE & CONFIGURATION & INVERT LEVELS, REFER TO DESIGN PLANS.
2. CLASS OF LID/COVER/GRATE TO BE IN ACCORDANCE WITH AS3996, EXCEPT THAT CLASS 'A' COVERS WILL NOT BE ACCEPTED
3. CONCRETE GRADE TO BE N32 TO AS3600
4. SIDE WALLS OF PITS DEEPER THAN 1500 TO BE REINFORCED WITH ONE LAYER OF SL82 PLACED CENTRALLY AND RETURNED 300 INTO PIT BASE.
5. CAST INSITU PIT DEPTH IS NOT TO EXCEED 3500.





FIELD INLET PIT- SURCHARGE PIT COVER
NTS

F

ISSUE	AMENDMENT DETAILS	INITIALS	DATE
F	TITLE SURCHARGE PIT AMENDED	G.P.C.	01.2010
E	STEP IRON REQUIRED AT 1200mm	G.P.C.	5.2009
D	PIT & PIPE DIA. TABLE ADDED	N.R.	5.2009
C	FIELD INLET TYPE 1 DELETED, GENERALLY UPGRADED	R.A.E.	10.2004
B	DRAWINGS ADOPTED FOR ISSUE TO PUBLIC	R.A.E.	5.2004
A	RE-ISSUED	R.A.E.	4.2004

TWEED SHIRE COUNCIL
DESIGN UNIT
COUNCIL OFFICES
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WEBSITE www.tweed.nsw.gov.au

DESIGN ENGINEER			DATE	5.2004
CHECKING ENGINEER			DATE	5.2004
DESIGNED	R.A.E.	5.2004	DESIGN NO.	
DRAWN	R.A.E.	5.2004	SURVEY NO.	
CHECKED	W.D.	5.2004		
HORIZONTAL DATUM			REDUCTION RATIO	PM E N
VERTICAL DATUM				

PROJECT: STORMWATER STANDARDS

DRAWING NUMBER: S.D.106

PLAN TITLE: MANHOLES, FIELD INLET PITS & GRATED INLET/ JUNCTION PIT DETAILS

SHEET 1 OF 1 SHEETS

ISSUE A B C D E F

0mm 10mm 20mm 30mm 40mm 50mm 100mm 150mm 200mm 250mm

ACAD FILE No G:\TSC STANDARD DRAWINGS\S.D.DRAWINGS\100STORMWATER\S.D.106_REV_F_JANUARY_2010.DWG

Appendix B EPBC Act Matters of National Environmental Significance

Table B1 Matters of National Environmental Significance and their relevancy to the proposed activity

Matter of National Environmental Significance	Relevancy to the proposed activity
World Heritage Properties	None.
National Heritage Places	None.
Wetlands of International Significance (RAMSAR Sites)	None.
Great Barrier Reef Marine Park	None.
Commonwealth Marine Areas	None.
Listed Threatened Ecological Communities	Five identified: • Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community • Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland • Littoral Rainforest and Coastal Vine Thickets of Eastern Australia • Lowland Rainforest of Subtropical Australia • Subtropical and Temperate Coastal Saltmarsh These vegetation communities are not mapped as being present at the site. The proposed works have been designed to avoid as much vegetation clearing as possible. No TECs will be impacted upon.
Listed Threatened Species	116 identified. The proposed disturbance footprint has a threatened flora species present, [redacted]
Listed Migratory Species	62 identified. All species are marine species (birds, cetaceans, sharks and turtles) or terrestrial or wetland birds. These species are highly mobile and the disturbance footprint represents a small area relative to their home ranges. Furthermore, the extent and condition of suitable habitat available for these species which would be altered as a result of the proposal is negligible. Accordingly, these species are not expected to be significantly impacted upon.

Additional matters protected under the EPBC Act identified in the EPBC Protected Matters report are summarised and the relevancy of these matters to the proposal are discussed in Table B2.

Table B2 Additional matters protected under the EPBC Act and relevancy to the proposed activity

Additional matter protected under the EPBC Act	Relevancy to the proposed activity
Commonwealth Lands	7 identified: • Commonwealth Land – Australian Telecommunications Commission (11247) NSW • Commonwealth Land – Australian Telecommunications Commission (14482) NSW • Commonwealth Land – Australian Telecommunications Commission (11265) NSW • Commonwealth Land – Australian Telecommunications Commission (11244) NSW • Commonwealth Land – Australian Telecommunications Corporation (11245) NSW • Commonwealth Land – (14475), NSW • Commonwealth Land – (14476), NSW The subject site is not with these Commonwealth Lands and the proposed works would not impact these areas.
Commonwealth Heritage Places	None.
Listed Marine Species	91 identified. Given the small proposed disturbance footprint of the proposal, the nature of the proposed activity, and the distance the subject site is from the marine environment, marine species are unlikely to be impacted upon.
Whales and Other Cetaceans	12 identified. Given the small proposed disturbance footprint of the proposal, the native of the proposed activity, and the distance the subject site is from the marine environment, whales and other cetaceans are unlikely to be impacted upon.
Critical Habitats	None.
Commonwealth Reserves Terrestrial	None.
Australian Marine Parks	None.
Habitat Critical to the Survival of Marine Turtles	None.

Additional matter protected under the EPBC Act	Relevancy to the proposed activity
State and Territory Reserves	9 identified: • Billinudgel Nature Reserve, NSW • Cape Byron Marine Park, NSW • Cudgera Creek Nature Reserve, NSW • Inner Pocket Nature Reserve, NSW • Jinangong Nature Reserve, NSW • Marshalls Creek Nature Reserve, NSW • Mooball National Park, NSW • Mount Jerusalem National Park, NSW • Wooyung Nature Reserve, NSW The subject site is sufficiently removed from the listed state and territory reserves and therefore the proposed works will not impact upon them.
Regional Forest Agreements	One identified. North East NSW RFA applies over the broader study area; however, none of the reserves included in the RFA occur within the study area.
Nationally Important Wetlands	1 identified: • Billinudgel Nature Reserve, NSW The subject site is sufficiently removed from the listed nationally important wetland and therefore the proposed works will not impact upon them.
EPBC Act Referrals	10 identified. The referrals listed have all completed or post-approval assessment statuses and are all unrelated to the proposed disturbance footprint and proposal.
Key Ecological Features (Marine)	None.
Biologically Important Areas	5 identified. The 5 species listed are all marine species. Given the proposal location is sufficiently removed from the marine environment the 5 species identified will not be impacted by the proposal.
Bioregional Assessments	None.
Geological and Bioregional Assessments	None.

Based on the assessment provided in Table B1 and B2 above, matters protected under the EPBC Act are unlikely to be significantly impacted upon by the proposal and the proposal does not require referral to the Commonwealth Minister of the Environment.

Appendix C Preliminary flora and fauna assessment

TWEED
SHIRE COUNCIL

Appendix C: Preliminary Flora and Fauna Assessment

Version	Title	Date
1.0	Preliminary Flora and Fauna Assessment) – Hunter Street Stormwater Pipe Upgrade, Burringbar	13/2/2023

Contents

Introduction

The flora and fauna assessment included a review of the project brief, survey plans, and environmental planning legislation to consider the likely impacts of the proposed activity on native flora and fauna.

Reviews of Tweed Shire Council Weave GIS information including relevant environmental layers were carried out along with searches of State and Commonwealth ecological databases, followed by site visits to assess the potential impacts of the development.

For the purposes of this assessment, the following terms of reference are used:

- Disturbance footprint – refers to the direct footprint subject to development, including any disturbance associated with ancillary works (e.g. temporary access tracks or stockpile sites).
- Study area – the study area includes the disturbance footprint and any additional lands approximately 50 m either side of the disturbance footprint that could be affected directly or indirectly from the proposal. The objective of the assessment would ensure that impacts beyond the direct disturbance footprint are also considered where relevant.
- Subject site – refers to the parcel/s of land on which the development is proposed.
- Broader study area – lands within 10 km of the local study area and includes the BioNet Atlas of NSW Wildlife and Commonwealth Protected Matters database search areas.
- Bioregion – as classified by the Interim Biogeographic Regionalisation for Australia (IBRA) v 6 mapping (Thackway and Cresswell 1995). A bioregion is an area of common climate, geology, landform, native vegetation and species information. This project is located within the South East Queensland bioregion and Burringbar-Conondale sub-region.

Direct and indirect impacts are defined in accordance with OEH (2018) as follows:

- Direct impacts are those that directly affect the habitat of species and ecological communities and of individuals using the study area. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat.
- Indirect impacts occur when project-related activities affect species or ecological communities in a manner other than direct loss within the subject site. Indirect impacts may sterilise or reduce the habitability of adjacent or connected habitats. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, reduction in viability of adjacent habitat due to edge effects, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, noise, light spill, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas.

Assessment aims

The principal aim of the assessment was to determine the potential impact of the proposed activity on significant flora, fauna and ecological communities using the following legislation and planning and management policies:

- NSW *Environmental Planning and Assessment Act 1979* (EP&A Act)
- NSW *Biodiversity Conservation Act 2016* (BC Act)
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Fisheries Management Act 1994* (FM Act)
- Tweed Coast Comprehensive Koala Plan of Management
- Threatened species recovery plans.

Specifically, the aims of the study were to:

- identify vegetation communities, flora and fauna species, and habitats within the study area
- undertake field and desktop assessments to identify the likelihood of conservation significant species and communities occurring within the study area
- assess the conservation status of the site
- identify impacts associated with the proposal pursuant to section 7.3 of the BC Act, if required
- determine whether there is a need to conduct a Species Impact Statement or make a referral to the Commonwealth Department of Agriculture, Water and the Environment (DAWE)
- provide recommendations to minimise impacts on conservation significant species and biodiversity generally.

Desktop assessment methodology

The desktop assessment involved a review of the following information:

- BioNet Atlas of NSW Wildlife database to identify any known records of significant flora and fauna species
- DAWE EPBC Act Protected Matters online database to identify any Matters of National Environmental Significance
- NSW EES and Department of Primary Industries registers of critical habitat (also referred to as Areas of Outstanding Biodiversity Value under the BC Act)
- NSW EES regional and subregional fauna corridor and key habitat mapping
- NSW and Commonwealth lists of Key Threatening Processes
- NSW EES threatened species website for existing Recovery Plans and Threat Abatement Plans
- Atlas of Living Australia wildlife records
- Tweed Coast Comprehensive Koala Plan of Management (TSC, 2014)
- Koala habitat mapping (TSC Weave GIS)
- Tweed Shire Council vegetation mapping (OEH 2012) to identify the potential presence of any Endangered Ecological Community (EEC) or Threatened Ecological Communities (TECs) listed under the BC Act or EPBC Act, respectively
- Tweed Shire Roadside Vegetation Management Plan (Tweed RVMP) (Bushland Restoration Services Pty Ltd & Landmark Ecological Services Pty Ltd, 2013)
- Tweed Shire Council GIS layers such as the contour mapping, slope and soils
- Past fauna survey and assessment reports for the area.

Database searches were undertaken using a 10 km radius of the subject site.

Desktop assessment results

Table C.1: Desktop assessment results

Attributes	Comments
Vegetation communities	The Tweed Shire Council vegetation mapping identifies two vegetation communities as occurring within the disturbance footprint: substantially cleared of vegetation (veg code: 1099) and not assessed (veg code: 998). Kingston et al (2004) describes the substantially cleared of native vegetation community as forming approximately half of the area of the Shire which includes areas cleared for agriculture, recreation facilities, roads and urban development. Vegetated areas occurring in this community type are generally dominated by exotic grass species. If native vegetation is present it is very sparse and highly disturbed. The not assessed vegetation community has not been described by Kingstone et al (2004). These communities throughout the shire were unable to be identified due to poor imagery or lack of access. Other vegetation communities within the study area include: • Camphor laurel dominant closed to open forest. **Camphor laurel dominant closed to open forest** This community is described as being dominated by Camphor laurel (*Cinnamomum camphora*) and often occurs as pure, even-aged stands or where disturbance has been extensive in other vegetation types some emergent or remnants of this type may remain. Other species, such as Brush box (*Lophostemon confertus*), may occur within this type having established at the same time as the Camphor laurel. Thus type occurs on more fertile soils especially those of volcanic origin and in areas of high soil moisture, typically colonising areas that may have previously supported rainforest or wet sclerophyll forest that had been cleared for agriculture. (Kingston, 2004). Refer to Figure C.1 below.
Threatened ecological communities	None of the vegetation communities identified above are analogous with any threatened ecological communities listed under the BC Act or EPBC Act.
Threatened flora records	A search of threatened flora species on the BioNet Atlas of NSW Wildlife and Commonwealth Matters of National Significance databases was undertaken based on a 10 km buffer of the subject site. A total of 63 threatened flora species were short-listed from these searches. Of these

Attributes	Comments
	63 short-listed threatened flora species, a likelihood of occurrence assessment concluded 5 were likely to occur within the study area: • marblewood (*Acacia bakeri*) – listed as vulnerable under BC Act • brush cassia (*Cassia marksiana*) – listed as endangered under BC Act • fine-leaved tuckeroo (*Lepiderema pulchella*) – listed as vulnerable under BC Act • red lilly pilly (*Syzygium hodgkinsoniae*) – listed as vulnerable under BC Act and EPBC Act • durobby (*Syzygium moorei*) – listed as vulnerable under BC Act and EPBC Act
Corridor mapping	The subject site is mapped as not being within a regional or sub-regional corridor. Nearby regional and sub-regional corridors are present to the north of the subject site.
Osprey nests	None present within the disturbance footprint. The nearest mapped [redacted]
Flying-fox camp	[redacted]
Marine vegetation	No marine vegetation occurs within the proposed disturbance footprint.
Koala habitat	Small, isolated patches of koala habitat are mapped throughout the broader study area, however none within the subject site. The closest patches being associated with the brush box open forest on hill sin Mooball (~630 m north-east of the disturbance footprint). The most recent koala records within the broader study area are from 1986.

Threatened fauna	A search of threatened fauna species on the BioNet Atlas of NSW Wildlife and Commonwealth Matters of National Significance databases was undertaken based on a 10 km buffer of the subject site. A total of 114 threatened fauna species and 3 populations were short-listed from these searches (marine and pelagic species were immediately dismissed on account of the absence of such habitat in the study area). Of these 114 short-listed threatened fauna species, 7 species were considered likely to occur in the study area including:
	• one bird:
	  ○ white-throated needletail (*Hirundapus caudacutus*) – listed as vulnerable under EPBC Act
	• one fish:
	  ○ southern purple spotted gudgeon (*Mogurnda adspersa*) – listed as endangered under FM Act – see Figure C.2.
	• five mammals (all bats):
	  ○ southern myotis (*Myotis macropus*) – listed as vulnerable under BC Act

Attributes	Comments
	○ eastern tube-nosed bat (*Nyctimene robinsoni*) – listed as vulnerable under BC Act ○ eastern long-eared bat (*Nyctophilus bifax)* – listed as vulnerable under BC Act ○ northern free-tailed bat (*Ozimops lumsdenae*) – listed as vulnerable under BC Act ○ grey-headed flying-fox (*Pteropus poliocephalus*) – listed as vulnerable under BC Act and EPBC Act None of the short-listed populations (grey nurse shark, koala, and spotted-tail quoll) were considered likely to occur within the study area.

The results of the desktop assessment are summarised in Table C.1 as follows:

Figure C.1: Tweed Shire Council vegetation mapping, proposed disturbance footprint alignment in pink.

Figure C.2: [redacted] mapping (purple line); proposed disturbance footprint alignment in pink

Field assessment methodology

A preliminary diurnal field assessment was undertaken on 26 May 2022. The field assessment involved traverses over the disturbance footprint to validate the results of the desktop study and assess the potential impacts of the development in the study area. In summary, this involved carrying out searches for the following:

- Characterisation of vegetation communities within the development footprint.
- Identification of retained vegetation which may be impacted upon by root damage from construction works.
- Potential fauna habitat likely to be affected by the proposal such as burrows, hollow-bearing trees, flowering trees, nests, and other general signs of fauna activity such scats, tracks, and traces.
- The impact of disturbance on fauna movement and bushland linkages.
- Potential sources of erosion and sediment loss.
- Receiving waterways and the potential impacts on these aquatic habitats.

Field assessment results

Flora

The vegetation within the immediate subject site and disturbance footprint is a mix of native and exotic trees that have regenerated over time. Historically the site was cleared of vegetation prior to housing development. The shrub layer is dominated by exotic species and the groundcover is predominantly exotic garden escapee species. The vegetation patch is bordered by Hunter Street road reserve in the south, residential houses in the east and west and Burringbar Creek in the north. The vegetation patch is approximately 0.1 ha in size and is generally disconnected from other naturally occurring native vegetation on the southern side of Burringbar Creek. There is some linear riparian vegetation present on the northern side of Burringbar Creek.

The native species that are present are representative of the early regrowth rainforest vegetation community (veg code: 1002). Kingston et al (2004) describes this vegetation community as occurring with a mixture of early stage rainforest regeneration and some sclerophyll species often on soils of high fertility where rainforest or wet sclerophyll open forest to woodland types may have previously occurred. This community is the result of prior disturbance events, usually clearing and, in time may regenerate rainforest composition and structure.

A register of trees [redacted] within the proposed disturbance footprint is provided in Table C.2. Figure C.3 shows the proposed works with the tree species identified within the disturbance footprint.

Table C.2. Register of trees adjacent the disturbance footprint

Tree ID	Common name	Species name	BC Act	EPBC Act	DBH range (cm)	Works within TPZ (yes/no)	Disturbance >10% of Tree Protection Zone (yes/no)
1	Guioa	*Guioa semiglauca*			36.1	No	No
2	Red ash	*Alphitonia excelsa*			21.2	Yes	Yes To be removed
3	Foambark	*Jagera pseudorhus*			15.9	Yes	Yes To be removed
4	Guioa	*Guioa semiglauca*			6.3	Yes	Yes To be removed
5	Guioa	*Guioa semiglauca*			29.4	Yes	Yes To be removed
6	Macaranga	*Macaranga tanarius*			20.6	No	No
7	Jacaranda	**Jacaranda mimosifolia*			Not measured	Yes	Yes To be removed
9	Sandpaper fig	*Ficus coronata*			17	No	No
10	Bangalow palm	*Archontophoenix cunninghamiana*			12	No	No
13	Guioa	*Guioa semiglauca*			43	Yes	Yes To be removed
14	Alexander palm	**Archontophoenix alexandrae*			Not measured	Yes	Yes To be removed
16	Umbrella tree	**Schefflera actinophylla*			Not measured	No	No

* Denotes exotic/non-endemic species; black shaded cells = threatened species; V = vulnerable species listing under the legislation

Figure C.3: Proposed stormwater pipe upgrade works with tree species numbered.

Early rainforest regeneration

The vegetation community present within the subject site differed to that of the OEH (2012) mapping. The subject site was historically cleared, presumably for cattle grazing prior to becoming a residential housing development area. The vegetation community present was representative of the early regrowth rainforest vegetation community (veg code: 1002).

Kingston et al (2004) describes this vegetation community as occurring with a mixture of early stage rainforest regeneration and some sclerophyll species often on soils of high fertility where rainforest or wet sclerophyll open forest to woodland types may have previously occurred. They are the result of a prior disturbance event, usually clearing and, in time may regenerate rainforest composition and structure. Species that are typical of this type include macaranga (*Macaranga tanarius*), cheese tree (*Glochidion ferdinandi*), umbrella cheese tree (*Glochidion sumatranum*), red ash (*Alphitonia excelsa*), guioa (*Guioa semiglauca*), foambark (*Jagera pseudorhus*), red kamala (*Mallotus philippensis*), bleeding heart (*Homalanthus populifolius*), brown kurrajong (*Commersonia bartramia*), brush box (*Lophostemon confertus*), white nettle (*Pipturus argenteus*), blackwood wattle (*Acacia melanoxylon*), hickory wattle (*Acacia aulacocarpa*), sandpaper fig (*Ficus coronata*), hard quandong (*Elaeocarpus obovatus*), wild tobacco (*Solanum mauritianum*) and rough-leaved elm (*Aphananthe philippinensis*).

Field surveys identified the upper stratum within the disturbance footprint was dominated by guioa, red ash, foambark, macaranga and jacaranda. This stratum was approximately 10–15 m in height and had a canopy cover of 60–70 %. The mid-stratum was dominated by umbrella tree, sandpaper fig and guioa and incorporated the 4–8 m height range with a cover of 10%. The ground and smaller shrub cover was dominated by invasive exotic and garden escapee species such as small-leaved privet (*Ligustrum sinense*), trad (*Tradescantia fluminensis*), syngonium (*Syngonium podophyllum*) and blue ginger (*Dichorisandra thrysiflora*) with native graceful grass (*Ottochloa gracillima*) also commonly occurring. This stratum occupied the <1–2 m height range and had a cover of 70%.

Of the 63 short-listed threatened flora species, a likelihood of occurrence assessment concluded 5 were likely to occur within the study area:

- marblewood (*Acacia bakeri*
- brush cassia (*Cassia marksiana*)
- fine-leaved tuckeroo (*Lepiderema pulchella*
- red lilly pilly (*Syzygium hodgkinsoniae*)
- durobby (*Syzygium moorei*)

These species are known to occur in riverine and rainforest habitat environments. Field surveys [redacted] footprint [redacted] of these [redacted]

Overall, the vegetation within the disturbance footprint is reflective of the historic clearing and garden area of the private property. No vegetation communities present within the study area are considered to be consistent with any TECs listed under the NSW BC Act or the EPBC Act and [redacted] proposed disturbance footprint.

Fauna

Fauna habitat within the disturbance footprint was found to be limited on account of the area being highly disturbed and overgrown with exotic garden escapee groundcovers and shrubs. However, in the broader context, Burringbar Creek has regenerating vegetation and disconnected pockets of bushland are also present on hills within the broader area. Diurnal field investigations did not record any threatened species at the site.

An assessment of specific habitat attributes within the study area is provided in Table C.3 below.

Table C.3: Fauna habitat attributes associated with the subject site

Fauna habitat attributes	Comments
Rock features including cracks, sheets, shelters, outcrops	Rock revetment and stormwater outlet rock protection are present within the subject site.
Autumn - winter - early spring flowering eucalypts	None observed within the study area. Present within the broader study area.
Summer flowering eucalypts	None observed within the study area. Present within the broader study area.
Acacia shrubs-trees	Yes – [redacted] is present within the broader study area.
Other flowering and fruiting resources	Present within the study area are native and exotic species which provide blossom and fruit resources. Gardens of residential houses within the broader study area also provide flowering and fruiting resources.

Fauna habitat attributes	Comments
Allocasuarina resources for Glossy Black Cockatoos	None observed within the study area.
Koala feed trees	None observed within the study area. Present within the broader study area.
Open grassy patches	Cleared mowed grassland (e.g. suburban yards) and grazing paddocks are present within the study area. Given the intensive maintenance regime and consistent grazing for these areas, they provide limited habitat value in terms of shelter or nesting habitat, even for open land species.
Cracks, crevices, and other roosting sites (man- made or otherwise) for insectivorous bats	The surrounding residential houses provide potential micro-bat roosting habitat in the form of roof cavities. Native vegetation along Burringbar Creek provides tree roosting opportunities for micro-bats.
Ephemeral water bodies	None observed within the study area.
Permanent water bodies	Burringbar Creek is adjacent the subject site.
Drainage lines and/or soaks and/or man-made water bodies	None observed within the study area.
Understorey cover for ground dwelling mammals	Predominantly exotic shrubs and groundcover vegetation within the subject site offer cover to ground dwelling mammals such as rodents. However, this resource of native species understorey was generally scarce within the study area.
Fallen fine and coarse vegetative litter	Some leaf litter is provided within the subject site, however, this resource was generally scarce within the study area on account of the regular mowing regime within the residential properties.
Hollows in live and dead trees	None observed within the study area.
Marine vegetation	None observed within the study area.
Riparian vegetation	Observed along Burringbar Creek, however is generally a thin strip of vegetation with a mix of native and exotic species regenerating from being historically cleared.
Flying-fox camps	[redacted]

Fauna habitat attributes	Comments
Osprey and/or other raptor nests	[redacted]
Exposed coastal fore dunes and beaches	None present.
Oceanic habitats	None present.
Areas of Outstanding Biodiversity Value pursuant to NSW legislation	[redacted]

Impact assessment

Flora

The proposed stormwater pipe upgrade has been designed to avoid mature vegetation and threatened species where possible. Despite these efforts, the size of the established native trees within the disturbance footprint of the stormwater pipe alignment has necessitated some works within the Tree Protection Zones (TPZ) of existing trees (refer to Table C.2 and Figure C3) and are required to be cleared.

Based on the location and size of the trees, the distance of the stems from the proposed ground disturbance and the required area that is needed for machinery to undertake the works, it is estimated that 5 native trees and 2 exotic trees will be required to be removed (refer to Figure C.3 for tree numbers). Impacted trees include: 3 mature guioa (tree numbers 4, 5 and 13), one red ash (tree number 2), one foambark (tree number 3), one exotic jacaranda (tree number 7) and one exotic Alexander palm (tree number 14).

Post-works the subject site will receive dense creek mat-rush (*Lomandra hystrix*) planting to the disturbed areas within the private property and on the banks of Burringbar Creek and will be maintained to ensure successful revegetation for 3 years. Planting of trees and shrubs is not recommended in this area as it will be directly above the stormwater infrastructure and will possibly require to be cleared to undertake future maintenance of the infrastructure. To offset the 7 trees that will be removed, 30 native pioneer rainforest species will be planted downstream of the subject site on Council owned property adjacent to Burringbar Creek at 6 Clarkes Road, Mooball – Lots A and B DP6624. This revegetation will be maintained for 5 years to ensure revegetation success.

The methodologies proposed and design of the upgrade has avoided and minimised impacts to existing trees where possible. Tree protection measures for trees outside of the disturbance footprint during construction are required to ensure compaction to TPZs caused by machinery is avoided or minimised and accidental damage to trunks and limbs does not occur.

Fauna

As previously discussed, the habitat values within the disturbance footprint are limited on account of the absence of quality native vegetation communities. The proposed works will require the direct removal of 7 existing trees and any groundcovers and shrubs within the pipe upgrade alignment.

As previously stated, the likelihood of occurrence (LOC) assessment concluded that 7 threatened fauna species were likely to occur in the study area, including:

- one bird:
  - white-throated needletail (*Hirundapus caudacutus*) – Vulnerable (EPBC Act)
- one fish:
  - southern purple spotted gudgeon (*Mogurnda adspersa*) – Endangered (FM Act)
- five mammals (all bats):
  - southern myotis (*Myotis macropus*) – Vulnerable (BC Act)
  - eastern tube-nosed bat (*Nyctimene robinsoni*) – Vulnerable (BC Act)
  - eastern long-eared bat (*Nyctophilus bifax)* – Vulnerable (BC Act)
  - northern free-tailed bat (*Ozimops lumsdenae*) – Vulnerable (BC Act)
  - grey-headed flying-fox (*Pteropus poliocephalus*) – Vulnerable (BC Act and EPBC Act)

The bird and bat species are highly mobile and their interactions with the ecological resources within the study area are expected to be limited to flyovers or occasional foraging. It is considered unlikely that impacts to these species will occur.

White-throated needletail is an aerial forager generally feeding on insects above the terrestrial landscape. It breeds in Asia and so its interaction with the site would be limited to a fly-over and aerial foraging.

[redacted]

It is expected that the proposed works would proceed without any significant direct or indirect impact upon fauna species breeding or foraging habitat. Given the disturbed nature and the limited habitat features of the disturbance footprint, none of the species considered likely to occur within the study area are expected to rely upon the habitat contained within the footprint of direct disturbance. Accordingly, it is anticipated that there would be no impact upon threatened fauna as a result of the proposed activity.

Requirement for Part 7 (BC Act) Assessments

Section 7.8 of the *Biodiversity Conservation Act 2016* (BC Act) outlines the biodiversity assessment requirements for Part 5 activities under the EP&A Act and notes a Part 5 activity is to be regarded as having a significant effect on the environment if it is likely to significantly affect a threatened species. Section 7.3 of the BC Act outlines the test for determining whether an activity is likely to result in a significant impact on threatened species or ecological communities (test of significance).

The Threatened Species Test of Significance Guidelines – The Assessment of Significance (OEH, 2018) explain that a species does not have to be considered as part of the assessment of significance if adequate surveys or studies have been carried out that clearly show that the species:

- does not occur in the study area
- will not use on-site habitats on occasion
- will not be influenced by off-site impacts of the proposal.

Otherwise all species likely to occur in the study area (based on general species distribution information), and known to use that type of habitat, should be considered in the rationale that determines the list of threatened species, populations and ecological communities for the assessment of significance (OEH, 2018).

With the above in mind, species considered to warrant further consideration pursuant to Section 7 of the BC Act are those that have a high likelihood of occurrence within and adjacent the study area and could be either directly or indirectly impacted by the proposal. That is, these species are considered likely to interact with those habitats directly and or indirectly impacted by the development proposed. For example, species with specific lifecycle requirements such as hollow dependent species that may be impacted through loss of hollow bearing trees would be included within the Section 7.3 assessment. In contrast, those species which have broad home ranges and do not have specific habitat elements within the study area, may not be considered further.

Based on the discussion provided above, further consideration by way of test of significance pursuant to Part 7 of the BC Act [redacted] The summary of

potential impacts on threatened species and test of significance requirements are identified in Table C.4. The test of significance for each species are in Attachment 1.

Table C4: Summary of potential impacts on threatened species and requirement for test of significance

Threatened flora/fauna species / ecological communities (identified as groups 4 or 5 species / communities)	Potential Impacts	Requirement for a Test of Significance under the EP&A Act (✓)
[redacted]		

Threatened flora/fauna species / ecological communities (identified as groups 4 or 5 species / communities)	Potential Impacts	Requirement for a Test of Significance under the EP&A Act (✓)
[redacted]		

In summary, the assessment determined that the proposed works at the site could

[redacted]

Requirement for EPBC Act threatened species

Under the EPBC Act an action will require approval from the minister if the action has, will have or is likely to have, a significant impact on a matter of national environmental significance (NES). An assessment must be undertaken on any matter of NES to determine whether the proposed action will be significantly impacted.

Generally, repairing and maintaining existing distribution infrastructure for utilities, water and sewage would not normally be expected to have a significant impact on a matter of NES, unless there is a substantial expansion or modification of these utilities. However, this should not be taken to be conclusive and an action should be assessed against the significant impact criteria.

Action assessment

An action is defined broadly in the EPBC Act and includes a project, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things.

Action considerations	Action assessment
1. *Are there any matters of national environmental significance located in the area of the proposed action?*	[redacted]
2. *Considering the proposed action at its broadest scope, is there potential for impacts on matters of national environmental significance?*	

Action considerations	Action assessment
3. *Are there any proposed measures to avoid or reduce impacts on matters of national environmental significance?*	[redacted]
4. *Are any impacts of the proposed action on matters of national environmental significance likely to be significant impacts?*	

The assessment has determined that the proposed activity is unlikely to result in a significant impact upon threatened species, populations or communities and that the activity does not require referral to the Commonwealth DAWE for assessment under the EPBC Act.

Flora and fauna assessment conclusion

In summary, this preliminary flora and fauna assessment suggests that the conservation values of the disturbance footprint are low given the presence of weed incursion and lack of native species diversity in all strata. The proposed works are unlikely to impact upon threatened flora and fauna and their habitats.

The assessment has determined that the proposed activity is unlikely to result in a significant impact upon threatened species, populations or communities and that the

activity does not require referral to the Commonwealth DAWE for assessment under the EPBC Act.

Environmental safeguards to mitigate impacts on the receiving environment are proposed within Section 10 of the REF.

Attachment 1: Tests of significance

Significant impact assessment pursuant to Section 7.3 of the Biodiversity Conservation Act

It has been proposed to upgrade the stormwater pipe at Hunter Street, Burringbar. Rock protection will be required to be removed and replaced at the outlet of the stormwater pipe. The stretch of [redacted]

[redacted]

Table 1: [redacted] ToS

Test of Significance criteria	Response
Is the proposed development or activity likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction?	[redacted]

Test of Significance criteria	Response
Is the proposed development or activity likely to have an adverse effect on the extent of an endangered ecological community or critically endangered ecological community such that its local occurrence is likely to be placed at risk of extinction?	[redacted]
Is the proposed development or activity likely to adversely modify the composition of the endangered ecological community or critically endangered ecological community such that its local occurrence is likely placed at risk?	
In relation to the habitat of a threatened species or ecological community: *i. What is the extent of habitat removed or modified as a result of the proposed development or activity*?	
ii. Is an area of habitat likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity?	
iii. Is an area of habitat to be removed, modified, fragmented or isolated important to the long-term survival of the species or ecological community in the locality?	
Would the proposed development or activity likely have an adverse	

Test of Significance criteria	Response
effect on any declared area of outstanding biodiversity value (either directly or indirectly)?	[redacted]
Is the proposed development or activity part of a key threatening process or is it likely to increase the impact of a key threatening process?	
Conclusion	

Table 2: [redacted] ToS

Test of Significance criteria	Response
Is the proposed development or activity likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction?	[redacted]
Is the proposed development or activity likely to have an adverse effect on the extent of an endangered ecological community or critically endangered ecological community such that its local occurrence is likely to be placed at risk of extinction?	
Is the proposed development or activity likely to adversely modify the composition of the endangered ecological community or critically endangered ecological community such that its local occurrence is likely placed at risk?	
In relation to the habitat of a threatened species or ecological community: *iv. What is the extent of habitat removed or modified as a result of the proposed development or activity*?	

Test of Significance criteria		Response
v.	*Is an area of habitat likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity*?	[redacted]
vi.	*Is an area of habitat to be removed, modified, fragmented or isolated important to the long-term survival of the species or ecological community in the locality?*	
Would the proposed development or activity likely have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)?		
Is the proposed development or activity part of a key threatening process or is it likely to increase the impact of a key threatening process?		
Conclusion		

Table 3: [redacted] ToS

Test of Significance criteria	Response
Is the proposed development or activity likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction?	[redacted]
Is the proposed development or activity likely to have an adverse effect on the extent of an endangered ecological community or critically endangered ecological community such that its local occurrence is likely to be placed at risk of extinction?	
Is the proposed development or activity likely to adversely modify the composition of the endangered ecological community or critically endangered ecological community such that its local occurrence is likely placed at risk?	
In relation to the habitat of a threatened species or ecological community: *vii. What is the extent of habitat removed or modified as a result of the proposed development or activity*?	

Test of Significance criteria		Response
viii.	*Is an area of habitat likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity*?	[redacted]
ix.	*Is an area of habitat to be removed, modified, fragmented or isolated important to the long-term survival of the species or ecological community in the locality?*	
Would the proposed development or activity likely have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)?		
Is the proposed development or activity part of a key threatening process or is it likely to increase the impact of a key threatening process?		

Test of Significance criteria	Response
Conclusion	[redacted]

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Appendix D Preliminary Aboriginal Cultural Heritage Assessment (PACHA)

TWEED SHIRE COUNCIL

Preliminary Aboriginal Cultural Heritage Assessment (PACHA)

ISW16 – Hunter Street Stormwater Pipe Upgrade, Burringbar

February 2023

Version	Title	Date
1.0	Preliminary Aboriginal Cultural Heritage Assessment (PACHA) – Hunter Street Stormwater Pipe Upgrade, Burringbar	13/2/2023

Contents

Definitions

AAC:	**Aboriginal Advisory Committee**
ACH:	**Aboriginal cultural heritage**
ACHA:	**Aboriginal Cultural Heritage Assessment**
ACHAR:	**Aboriginal Cultural Heritage Assessment Report**
ACHMP:	**Tweed Shire Aboriginal Cultural Heritage Management Plan 2017**
AHIP:	**Aboriginal Heritage Impact Permit** The statutory instrument that OEH issues under section 90 of the NPW Act to manage harm or potential harm to Aboriginal objects and places.
AHIMS:	**Aboriginal Heritage Management Information System** AHIMS is a part of OEH and maintain the NSW records database of Aboriginal objects/sites, declared Aboriginal Places and archaeological reports submitted either voluntarily or as part of compliance-related submissions.
Disturbed land:	Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable. Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks. Refer also to Clause 58 of the NPW Reg.
Due Diligence code:	Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECC&W, 2010)
EIS:	**Environmental Impact Statement**
PACHA:	**Preliminary Aboriginal Cultural Heritage Assessment** Process to assess whether Aboriginal objects will or are likely to be harmed, and whether further investigation and impact assessment is required. Determines whether an ACHA is required and, subsequently, whether an AHIP is required.
DPE:	**Department of Planning and Environment, NSW Government**
EP&A Act:	**Environmental Planning and Assessment Act, 1979**
NPW Act:	**National Parks and Wildlife Act, 1974**
NPW Reg:	**National Parks and Wildlife Regulation, 2019**
OEH:	**Office of Environment and Heritage, NSW Government**
Study area:	For the purpose of this PACHA, the study area is the spatial extent in which the proposed works could potentially directly and indirectly impacts on the ACH values of the site. For this particular assessment, the study area is defined as the lands and waters within 200 m of the subject site.
TBLALC:	**Tweed Byron Local Aboriginal Land Council**
TSC:	**Tweed Shire Council**

1.0 Introduction

The aim of this Preliminary Aboriginal Cultural Heritage Assessment (PACHA) is to ensure Council infrastructure projects minimise the risk of harm to Aboriginal places and objects of cultural heritage significance.

The objective is to identify those projects with a significant risk of harm to Aboriginal cultural heritage (ACH) and those projects for which the risk is low.

Those projects determined to have a high risk of harm to ACH require a more detailed assessment in the form of an Aboriginal Cultural Heritage Assessment Report (ACHAR) and potentially an Aboriginal Heritage Impact Permit (AHIP).

Those determined to have a low risk of harm to ACH may proceed with caution without an ACHAR or AHIP.

The PACHA is suitable for incorporation into TSC environmental planning assessments for works deemed:

- permissible with consent
- permissible without consent
- exempt activities under the EP&A Act, with the exception of projects requiring an Environmental Impact Statement (EIS) for which the assessment requirements are directed by the Secretary's Environmental Assessment Requirements (SEARs).

2.0 Planning considerations under the NPW Act/Reg

The following clauses were considered to determine whether any of the exemptions or defences identified under the NPW Act/Reg apply.

Planning consideration	Response
Are the works exempt under s87A of the NPW Act (e.g. specified emergency or conservation activities)	☐ Yes ☒ No
Are the works exempt under s87B of the NPW Act (e.g. traditional Aboriginal cultural activities)	☐ Yes ☒ No
Is the activity a low impact one for which there is a defence under Clause 58 of the NPW Reg? (e.g. maintenance of existing infrastructure on disturbed land; 'disturbed land' is defined in the definitions section) **N.B.** If yes, there is still a responsibility to not harm or desecrate an object that a person knows is an Aboriginal object; stop works procedures still apply to any unexpected finds.	☒ Yes ☐ No

3.0 Scope of work

The following questions were addressed to clarify the type and scale of works proposed.

Scope/scale of works	Response
Is the work trivial or negligible? (e.g. picking up and replacing a small stone artefact, breaking a small Aboriginal object below the surface when you are gardening, crushing a small Aboriginal object when you walk on or off a track, picnicking, camping or other similar recreational activities)	☐ Yes ☒ No
Will the works involve ground disturbance?	☒ Yes ☐ No
What is the scale of excavation works? (refer to ACHMP page 105 for definitions of minimal, moderate and major)	☐ Minimal ☒ Moderate ☐ Major
Will the works impact upon any known or suspected culturally modified trees? (e.g. scar trees)	[redacted]

4.0 Assessment methodology

The following desktop and site assessments were performed and used to determine the level of community consultation required, if any.

Assessment type	Response
Desktop assessment	☒ Review ACHMP mapping GIS layer ☒ Search AHIMS database Review site cards relevant to the study area: ☐ Y ☒ N/A ☒ Search NSW Heritage database for Aboriginal Places ☒ Review topographic GIS layers (e.g. contours) Review previous ACHARs relevant to the study area: ☐ Y ☒ N/A
Site assessment	☒ Walkover by TSC Environmental Scientist

5.0 Desktop results

The results of the desktop assessment are detailed below.

Desktop resource reviewed	Response
Does an Aboriginal Place (as declared under the NPW Act) apply to the study area?	[redacted]
What ACHMP mapping designations apply to the study area? (refer to TSC GIS layer under Planning Strategies and Policies)	[redacted]
Are there any registered AHIMS site records identified within the study area?	[redacted]
What ACH values apply or potentially apply to the study area? (refer to site cards, previous ACHARs and ACHMP mapping attribute data)	[redacted]
Do any of the following landscape features apply to the study area?	☐ Ridgelines ☐ Coastal headland ☐ Sand dunes ☐ Rock shelters (within 20 m) ☒ Waterways (within 200 m) ☐ Other (specify) _____

Desktop resource reviewed	Response
Are the works proposed on disturbed land? ('disturbed land' is defined in the definitions section)	☒ Yes ☐ No
Is the site in proximity to the Holocene high stand shore line? (refer to contours and AHD 1.5 m for indication)	☐ Yes ☒ No

6.0 Site inspection findings

The results of the site inspection are detailed below.

Site inspection conditions/findings	Response
How was the ground surface visibility?	☐ Good ☒ Moderate ☐ Poor
Were any Aboriginal objects/values identified during the site assessment?	[redacted]
Were any potential ACH objects/values identified/recorded during the site visit? (e.g. artefacts, scar trees, midden material, burials, grinding grooves, charcoal deposits) Note: attach photos to plates section where appropriate – seek permission from the TBLALC for potentially sensitive matters.	[redacted]
What evidence of previous ground disturbance was observed within the proposed works area?	☒ Built road ☐ Fence construction ☐ Imported fill ☒ Construction of buildings/structures ☒ Construction/installation of utilities ☒ Earthworks/reformed land ☐ Other (please specify) _____ _____

7.0 Consultation outcomes

The desktop assessments and site inspections which indicate potential for harm, or a high degree of uncertainty regarding potential for harm, to ACH are required to seek further information and expertise through consultation with community members/cultural heritage experts.

Consultation outcomes	Response
Do the results of the desktop assessment and site inspection indicate potential for harm, or a high degree of uncertainty regarding potential for harm?	☐ Yes (stakeholder consultation is required, see below) ☒ No (specify why and then proceed to Section 8) Justification: Considerable earthworks was required to construct the existing stormwater infrastructure and Hunter and Dignan street road reserves. The proposed earthworks are located within the same alignment as the existing stormwater infrastructure. Given the extent of earthworks previously undertaken at the site, the likelihood of encountering ACH objects is considered low.
Stakeholders consulted	[redacted]
Did any stakeholders request additional site inspections?	☐ Yes ☐ No ☒ N/A
Did representatives request to have site monitors present during construction?	☐ Yes ☐ No ☒ N/A
Did representatives recommend an Archaeologist inspect the site?	☐ Yes ☐ No ☒ N/A
Did representatives recommend an ACHAR be prepared and an AHIP be applied for?	☐ Yes ☐ No ☒ N/A

Consultation outcomes	Response
Did representatives request any project-specific mitigation measures?	☐ Yes (list recommendations) _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ ☐ No ☒ N/A

8.0 Recommendations and conclusion

Recommendations and conclusion	Response
Does a desktop and site assessment confirm that there are Aboriginal objects or that they are likely?	[redacted]
Does consultation confirm that there are Aboriginal objects or that they are likely?	
Can harm to Aboriginal places and objects be avoided?	
Are site monitors required during construction?	

Recommendations and conclusion	Response
Is an ACHAR and AHIP required?	☐ Yes. Engage a consultant Archaeologist to undertake ACHA and, if deemed necessary, apply for an AHIP. Refer to OEH Guidelines. ☒ No. The project is to proceed with caution. If any potential Aboriginal objects are found, work is to stop and the stop works procedure provided in the ACHMP – Appendix 7 is to be applied. N.B. If human remains are found, work is to stop, the site secured and the NSW Police notified. All staff and contractors on site are to be notified that it is an offence under the Coroners Act to interfere with the materials/remains.

9.0 Figures and plates

Figure 1. Aerial photograph showing study area (pink polygons).

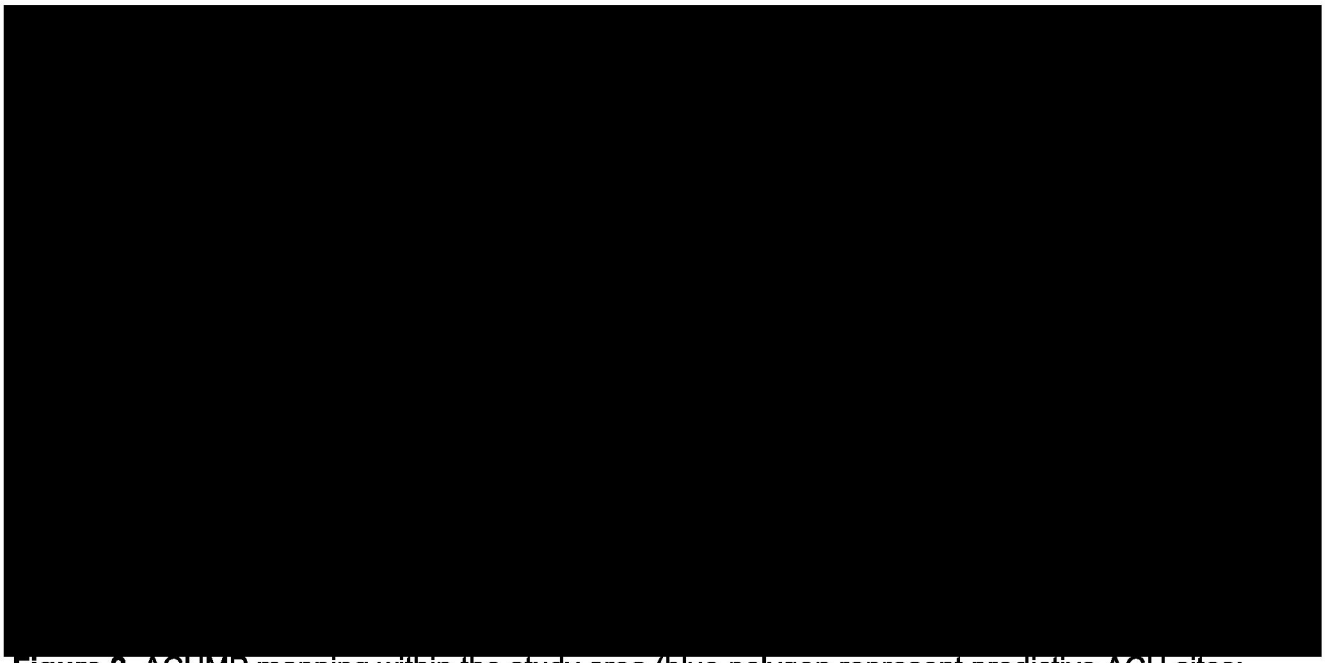

Figure 2. ACHMP mapping within the study area (blue polygon represent predictive ACH sites; yellow polygons represent known ACH sites).

Appendix A – ACHMP Stop works procedure

7. Stop Work Procedure

It is an offence to harm an Aboriginal object or place under the NPW Act. Immediate Stop Work procedures are to be implemented when an activity or works reveal any Aboriginal object or remains so as to avoid harm (see definition of harm in Section 7). The following outlines the Stop Work Procedures:

Inadvertent discovery of an object

On discovery of any surface or buried sub-surface cultural material (other than human remains, which is addressed following) the following actions should occur as soon as practicable:

- All work should cease at the location and if necessary, an appropriately qualified Aboriginal sites officer or experienced archaeologist, with expertise in Aboriginal cultural heritage is to be notified, if not already present at the location. The area is to be made safe and cordoned off to prevent access and to protect the object. Construction workers and operational personnel will comply with the instructions of the qualified Aboriginal Sites Officer and/or experienced cultural professional (archaeologist).
- The TBLALC and OEH North East Region Planning Unit are to be notified.
- An Aboriginal cultural heritage assessment of the object and surrounding locality is to be undertaken. A written report of the archaeologist's findings and recommendations is to be provided to registered Aboriginal parties and the OEH for their consideration.
- No further works or development may be undertaken at the location until the required investigations have been completed and permits or approvals obtained as required by the NPW Act and receipt of written authorisation by the OEH North East Region Planning Unit. Upon further advice, construction may be able to continue at an agreed distance away from the site.
- Aboriginal cultural heritage objects are to be registered to the AHIMS.

Inadvertent discovery of a burial or human remains

Burials or human remains are controlled by the following legislation:

- Coroners Act 2009 (NSW)
- Crimes Act 1900 (NSW) and Federal Crimes Act 1914
- National Parks and Wildlife Act 1974 (NSW) covers Aboriginal human remains
- Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, 2010 by OEH

Should human remains be found during the activity or works, the following procedure should be followed. On discovery of the remains the following actions should occur as soon as practicable:

- All work should cease at the location. The Police must be notified, and all personnel and contractors on site should be advised that it is an offence under the Coroners Act to interfere with the material/remains.
- If necessary, an appropriately qualified Aboriginal or experienced archaeologist, with expertise in Aboriginal cultural heritage is to be notified, if not already present at the location. The area is to be cordoned off to access and to protect the remains. Construction workers and operational personnel will comply with the instructions of the qualified Aboriginal sites officer or archaeologist.
- The TBLALC and the OEH North East Region Planning Unit are to be notified.
- No further works or development may be undertaken until the required investigations have been completed and permits or approvals obtained where required in accordance with the NPW Act. Upon further advice, construction may be able to continue at an agreed distance away from the site.
- Burial remains are to be registered to the AHIMS if found to be Aboriginal cultural remains.

Note: A Stop Work Order or Interim Protection Order may also be directed by the Chief Executive under S91AA of the NPW Act.

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TWEED SHIRE COUNCIL

Preliminary Aboriginal Cultural Heritage Assessment (PACHA)

ISW16 – [redacted]

6 Clarkes Road, Mooball

February 2023

Version	Title	Date
1.0	Preliminary Aboriginal Cultural Heritage Assessment (PACHA) – Threatened species translocation site, 6 Clarkes Road, Mooball	13/2/2023

Contents

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ACH:	**Aboriginal cultural heritage**
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PACHA:	**Preliminary Aboriginal Cultural Heritage Assessment** Process to assess whether Aboriginal objects will or are likely to be harmed, and whether further investigation and impact assessment is required. Determines whether an ACHA is required and, subsequently, whether an AHIP is required.
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EP&A Act:	**Environmental Planning and Assessment Act, 1979**
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NPW Reg:	**National Parks and Wildlife Regulation, 2019**
OEH:	**Office of Environment and Heritage, NSW Government**
Study area:	For the purpose of this PACHA, the study area is the spatial extent in which the proposed works could potentially directly and indirectly impacts on the ACH values of the site. For this particular assessment, the study area is defined as the lands and waters within 200 m of the subject site.
TBLALC:	**Tweed Byron Local Aboriginal Land Council**
TSC:	**Tweed Shire Council**

1.0 Introduction

The aim of this Preliminary Aboriginal Cultural Heritage Assessment (PACHA) is to ensure Council infrastructure projects minimise the risk of harm to Aboriginal places and objects of cultural heritage significance.

The objective is to identify those projects with a significant risk of harm to Aboriginal cultural heritage (ACH) and those projects for which the risk is low.

Those projects determined to have a high risk of harm to ACH require a more detailed assessment in the form of an Aboriginal Cultural Heritage Assessment Report (ACHAR) and potentially an Aboriginal Heritage Impact Permit (AHIP).

Those determined to have a low risk of harm to ACH may proceed with caution without an ACHAR or AHIP.

The PACHA is suitable for incorporation into TSC environmental planning assessments for works deemed:

- permissible with consent
- permissible without consent
- exempt activities under the EP&A Act, with the exception of projects requiring an Environmental Impact Statement (EIS) for which the assessment requirements are directed by the Secretary's Environmental Assessment Requirements (SEARs).

2.0 Planning considerations under the NPW Act/Reg

The following clauses were considered to determine whether any of the exemptions or defences identified under the NPW Act/Reg apply.

Planning consideration	Response
Are the works exempt under s87A of the NPW Act (e.g. specified emergency or conservation activities)	☐ Yes ☒ No
Are the works exempt under s87B of the NPW Act (e.g. traditional Aboriginal cultural activities)	☐ Yes ☒ No
Is the activity a low impact one for which there is a defence under Clause 58 of the NPW Reg? (e.g. maintenance of existing infrastructure on disturbed land; 'disturbed land' is defined in the definitions section) **N.B.** If yes, there is still a responsibility to not harm or desecrate an object that a person knows is an Aboriginal object; stop works procedures still apply to any unexpected finds.	☒ Yes ☐ No

3.0 Scope of work

The following questions were addressed to clarify the type and scale of works proposed.

Scope/scale of works	Response
Is the work trivial or negligible? (e.g. picking up and replacing a small stone artefact, breaking a small Aboriginal object below the surface when you are gardening, crushing a small Aboriginal object when you walk on or off a track, picnicking, camping or other similar recreational activities)	☐ Yes ☒ No
Will the works involve ground disturbance?	☒ Yes ☐ No
What is the scale of excavation works? (refer to ACHMP page 105 for definitions of minimal, moderate and major)	☒ Minimal ☐ Moderate ☐ Major
Will the works impact upon any known or suspected culturally modified trees? (e.g. scar trees)	[redacted]

4.0 Assessment methodology

The following desktop and site assessments were performed and used to determine the level of community consultation required, if any.

Assessment type	Response
Desktop assessment	☒ Review ACHMP mapping GIS layer ☒ Search AHIMS database Review site cards relevant to the study area: ☐ Y ☒ N/A ☒ Search NSW Heritage database for Aboriginal Places ☒ Review topographic GIS layers (e.g. contours) Review previous ACHARs relevant to the study area: ☐ Y ☒ N/A
Site assessment	☒ Walkover by TSC Environmental Scientist

5.0 Desktop results

The results of the desktop assessment are detailed below.

Desktop resource reviewed	Response
Does an Aboriginal Place (as declared under the NPW Act) apply to the study area?	[redacted]
What ACHMP mapping designations apply to the study area? (refer to TSC GIS layer under Planning Strategies and Policies)	[redacted]
Are there any registered AHIMS site records identified within the study area?	[redacted]
What ACH values apply or potentially apply to the study area? (refer to site cards, previous ACHARs and ACHMP mapping attribute data)	[redacted]
Do any of the following landscape features apply to the study area?	☐ Ridgelines ☐ Coastal headland ☐ Sand dunes ☐ Rock shelters (within 20 m) ☒ Waterways (within 200 m) ☐ Other (specify) _____

Desktop resource reviewed	Response
Are the works proposed on disturbed land? ('disturbed land' is defined in the definitions section)	☒ Yes ☐ No
Is the site in proximity to the Holocene high stand shore line? (refer to contours and AHD 1.5 m for indication)	☐ Yes ☒ No

6.0 Site inspection findings

The results of the site inspection are detailed below.

Site inspection conditions/findings	Response
How was the ground surface visibility?	☐ Good ☒ Moderate ☐ Poor
Were any Aboriginal objects/values identified during the site assessment?	[redacted]
Were any potential ACH objects/values identified/recorded during the site visit? (e.g. artefacts, scar trees, midden material, burials, grinding grooves, charcoal deposits) Note: attach photos to plates section where appropriate – seek permission from the TBLALC for potentially sensitive matters.	
What evidence of previous ground disturbance was observed within the proposed works area?	☐ Built road ☐ Fence construction ☐ Imported fill ☐ Construction of buildings/structures ☐ Construction/installation of utilities ☐ Earthworks/reformed land ☒ Other (please specify) Demolition of house, fences, infrastructure and outbuildings

7.0 Consultation outcomes

The desktop assessments and site inspections which indicate potential for harm, or a high degree of uncertainty regarding potential for harm, to ACH are required to seek further information and expertise through consultation with community members/cultural heritage experts.

Consultation outcomes	Response
Do the results of the desktop assessment and site inspection indicate potential for harm, or a high degree of uncertainty regarding potential for harm?	[redacted]
Stakeholders consulted	[redacted]
Did any stakeholders request additional site inspections?	☐ Yes ☐ No ☒ N/A
Did representatives request to have site monitors present during construction?	☐ Yes ☐ No ☒ N/A
Did representatives recommend an Archaeologist inspect the site?	☐ Yes ☐ No ☒ N/A
Did representatives recommend an ACHAR be prepared and an AHIP be applied for?	☐ Yes ☐ No ☒ N/A

Consultation outcomes	Response
Did representatives request any project-specific mitigation measures?	☐ Yes (list recommendations) _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ ☐ No ☒ N/A

8.0 Recommendations and conclusion

Recommendations and conclusion	Response
Does a desktop and site assessment confirm that there are Aboriginal objects or that they are likely?	[redacted]
Does consultation confirm that there are Aboriginal objects or that they are likely?	
Can harm to Aboriginal places and objects be avoided?	
Are site monitors required during construction?	

Recommendations and conclusion	Response
Is an ACHAR and AHIP required?	☐ Yes. Engage a consultant Archaeologist to undertake ACHA and, if deemed necessary, apply for an AHIP. Refer to OEH Guidelines. ☒ No. The project is to proceed with caution. If any potential Aboriginal objects are found, work is to stop and the stop works procedure provided in the ACHMP – Appendix 7 is to be applied. N.B. If human remains are found, work is to stop, the site secured and the NSW Police notified. All staff and contractors on site are to be notified that it is an offence under the Coroners Act to interfere with the materials/remains.

9.0 Figures and plates

Figure 1. Aerial photograph showing study area (pink polygons)

Figure 2. ACHMP mapping within the study area (blue polygon represent predictive ACH sites; yellow polygons represent known ACH sites)

Appendix A – ACHMP Stop works procedure

7. Stop Work Procedure

It is an offence to harm an Aboriginal object or place under the NPW Act. Immediate Stop Work procedures are to be implemented when an activity or works reveal any Aboriginal object or remains so as to avoid harm (see definition of harm in Section 7). The following outlines the Stop Work Procedures:

Inadvertent discovery of an object

On discovery of any surface or buried sub-surface cultural material (other than human remains, which is addressed following) the following actions should occur as soon as practicable:

- All work should cease at the location and if necessary, an appropriately qualified Aboriginal sites officer or experienced archaeologist, with expertise in Aboriginal cultural heritage is to be notified, if not already present at the location. The area is to be made safe and cordoned off to prevent access and to protect the object. Construction workers and operational personnel will comply with the instructions of the qualified Aboriginal Sites Officer and/or experienced cultural professional (archaeologist).
- The TBLALC and OEH North East Region Planning Unit are to be notified.
- An Aboriginal cultural heritage assessment of the object and surrounding locality is to be undertaken. A written report of the archaeologist's findings and recommendations is to be provided to registered Aboriginal parties and the OEH for their consideration.
- No further works or development may be undertaken at the location until the required investigations have been completed and permits or approvals obtained as required by the NPW Act and receipt of written authorisation by the OEH North East Region Planning Unit. Upon further advice, construction may be able to continue at an agreed distance away from the site.
- Aboriginal cultural heritage objects are to be registered to the AHIMS.

Inadvertent discovery of a burial or human remains

Burials or human remains are controlled by the following legislation:

- Coroners Act 2009 (NSW)
- Crimes Act 1900 (NSW) and Federal Crimes Act 1914
- National Parks and Wildlife Act 1974 (NSW) covers Aboriginal human remains
- Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, 2010 by OEH

Should human remains be found during the activity or works, the following procedure should be followed. On discovery of the remains the following actions should occur as soon as practicable:

- All work should cease at the location. The Police must be notified, and all personnel and contractors on site should be advised that it is an offence under the Coroners Act to interfere with the material/remains.
- If necessary, an appropriately qualified Aboriginal or experienced archaeologist, with expertise in Aboriginal cultural heritage is to be notified, if not already present at the location. The area is to be cordoned off to access and to protect the remains. Construction workers and operational personnel will comply with the instructions of the qualified Aboriginal sites officer or archaeologist.
- The TBLALC and the OEH North East Region Planning Unit are to be notified.
- No further works or development may be undertaken until the required investigations have been completed and permits or approvals obtained where required in accordance with the NPW Act. Upon further advice, construction may be able to continue at an agreed distance away from the site.
- Burial remains are to be registered to the AHIMS if found to be Aboriginal cultural remains.

Note: A Stop Work Order or Interim Protection Order may also be directed by the Chief Executive under S91AA of the NPW Act.

Contact and connect

02 6670 2400

tweed.nsw.gov.au
tsc@tweed.nsw.gov.au
PO Box 819 Murwillumbah NSW 2486

Appendix E Waste Management Plan

TWEED SHIRE COUNCIL

ISW16 – Hunter Street Stormwater Pipe Upgrade – Burringbar

Waste Management Plan

February 2023 Revision 1.0

Version history

Version	Title	Date
1.0	Waste Management Plan – ISW16 Hunter Street Stormwater Pipe Upgrade, Burringbar	13/2/2023

Contents

Introduction

The following pre-classification of waste streams to be generated during the construction of the proposed road rehabilitation works and associated stormwater pipe installation are based on the following:

- review of the preliminary site contamination investigation
- communication with Council Design Unit Engineering and Drafting personnel
- waste classification of waste streams in accordance with the NSW Waste Classification Guidelines and relevant current NSW EPA resource recovery exemptions
- review of the Stott's Creek Resource Recovery Centre 2022/2023 commercial fees and charges.

Waste streams and associated disposal options are presented in Table 1 below.

Red imported fire ants (*Solenopsis invicta*) biosecurity

Occasionally TSC import soil/waste, equipment and plants to use on projects. Importation of materials and equipment into NSW, from or through Queensland red imported fire ant biosecurity zones, must be accompanied by a certificate. Materials and equipment include: hay, straw bales, turf, agricultural and earth moving equipment, organic mulch including manure, soil and potted plants. Types of certificates required are presented in Table 2 below.

Table 1: Waste streams and associated disposal options

Waste stream	Likely sources within the subject site	Pre-classification	Re-use / Disposal options without license	Disposal cost (Stott's waste facility)/tonne
Concrete	Discarded stormwater pipes, kerb and channel, driveways, discarded slurry, concrete off-cuts, culverts.	General solid waste (non-putrescible) - Building and demolition waste	• Re-use within the subject site • Re-use on private property (less than 200 tonnes) • Dispose	$52.00
Asphalt/bitumen	Sources of asphalt/bitumen from road profiling works or reclaimed asphalt pavement or RAP	General solid waste (non-putrescible)	Potential Resource Recovery Order and Exemption as Reclaimed Asphalt Pavement (2014) for road base and sub base, applied as a surface layer on road shoulders and unsealed roads, and use as an engineering fill. Alternatively, the asphalt/bitumen would qualify for the Resource Recovery Order and Exemption as Excavated Public Road Material (2014), where material can only be reused for road making purposes within the road reserve. There are mandatory reporting requirements for RREs. Dispose to licensed landfill.	$241.00

Waste stream	Likely sources within the subject site	Pre-classification	Re-use / Disposal options without license	Disposal cost (Stott's waste facility)/tonne
Excavated soil material (imported soil)	Excavated material from trenching works: • is naturally occurring rock and soil • contains at least 98% (by weight) natural material • does not meet the VENM definition	Excavated Natural Material (ENM)	• Re-use within the project • Re-use as ENM in accordance with resource recovery exemption (e.g. ENM, 2014) • Dispose to licensed landfill validation testing	$241.00
Excavated soil material (imported soil within road reserve e.g. road base)	Excavated material from trenching works: • being rock, soil, sand, bitumen, reclaimed asphalt pavement, gravel, slag from iron and steel manufacturing, fly and bottom ash, concrete, brick, ceramics and materials that hold a resource recovery order for use in road making activities • that have been excavated during the construction and maintenance of council and RMS public roads and public road infrastructure facilities	Excavated Public Road Material (EPRM)	• Re-use within the project • Re-use as EPRM in accordance with resource recovery exemption (e.g. EPRM, 2014) • Dispose to licensed landfill no validation testing	$241.00

Waste stream	Likely sources within the subject site	Pre-classification	Re-use / Disposal options without license	Disposal cost (Stott's waste facility)/tonne
Excavated native soil	Excavated material from trenching works (natural material in situ): • that are not contaminated with manufactured or process residues as a result of industrial, commercial, mining or agricultural • does not contain sulphidic ores or soils	• Material is identified as Virgin Excavated Natural Material (VENM)	• Re-use on council land or private property subject to approval • Dispose to licensed landfill	$150.00
General construction waste	Discarded pipe fittings, offcuts, geofabric material, sediment fencing etc	General solid waste (non-putrescible) - Building and demolition waste	• Re-use within the subject site • Re-use on private property (less than 200 tonnes) • Dispose to licensed landfill	$241.00
General rubbish litter	Food scraps, paper, cardboard, plastics etc	General solid waste (putrescible and non-putrescible)	Dispose	$241.00

Waste stream	Likely sources within the subject site	Pre-classification	Re-use / Disposal options without license	Disposal cost (Stott's waste facility)/tonne
Vegetation	Removal of roadside turf or grass, other groundcover vegetation within alignment, and shrubs/limbs of trees	• General solid waste (non-putrescible) - garden waste • Raw mulch exemption 2016	• Re-use within the project • Re-use within the local road network • Dispose to a licensed landfill as green waste	$107.00 (trunks or stumps under 30 cm)
Tyres	Car, 4WD, truck, large (super single)	• Tyres	• Dispose to a licensed landfill	Cost each: Car $8.10 4WD $14.00 Truck $32.70 Large $81.70

NB Disposal costs are current at the time of publication. Disposal costs need to be confirmed at the time of construction.

Note the following conditions applicable to Table 1:

Re-use on private property (soil material and concrete):

- Land holder may require development consent for filling.
- Section 143 forms required to be completed.

Re-use on private property (Asphalt/bitumen)

- The reclaimed asphalt pavement can only be applied to land for road related activities including road construction or road maintenance activities, being:
    a) use as a road base and sub base
    b) applied as a surface layer on road shoulders and unsealed roads
    c) use as an engineering fill material.
- The reclaimed asphalt pavement can only be used as an alternative raw material in the manufacture of asphalt.
- Other conditions apply to the processor and consumer. If private property application of asphalt is proposed by the project consult with the TSC Project Manager for additional requirements

Building and demolition waste

Building and demolition waste means unsegregated material (other than material containing asbestos waste or liquid waste) that results from:

- the demolition, erection, construction, refurbishment or alteration of buildings other than
    - chemical works
    - mineral processing works
    - container reconditioning works
    - waste treatment facilities
- the construction, replacement, repair or alteration of infrastructure development such as roads, tunnels, sewage, water, electricity, telecommunications and airports

and includes materials such as:

- bricks, concrete, paper, plastics, glass and metal
- timber, including unsegregated timber, that may contain timber treated with chemicals such as copper chrome arsenate (CCA), high temperature creosote (HTC), pigmented emulsified creosote (PEC) and light organic solvent preservative (LOSP)

but does not include excavated soil (for example, soil excavated to level off a site prior to construction or to enable foundations to be laid or infrastructure to be constructed).

Table 2: Red imported fire ant biosecurity requirements for imported waste

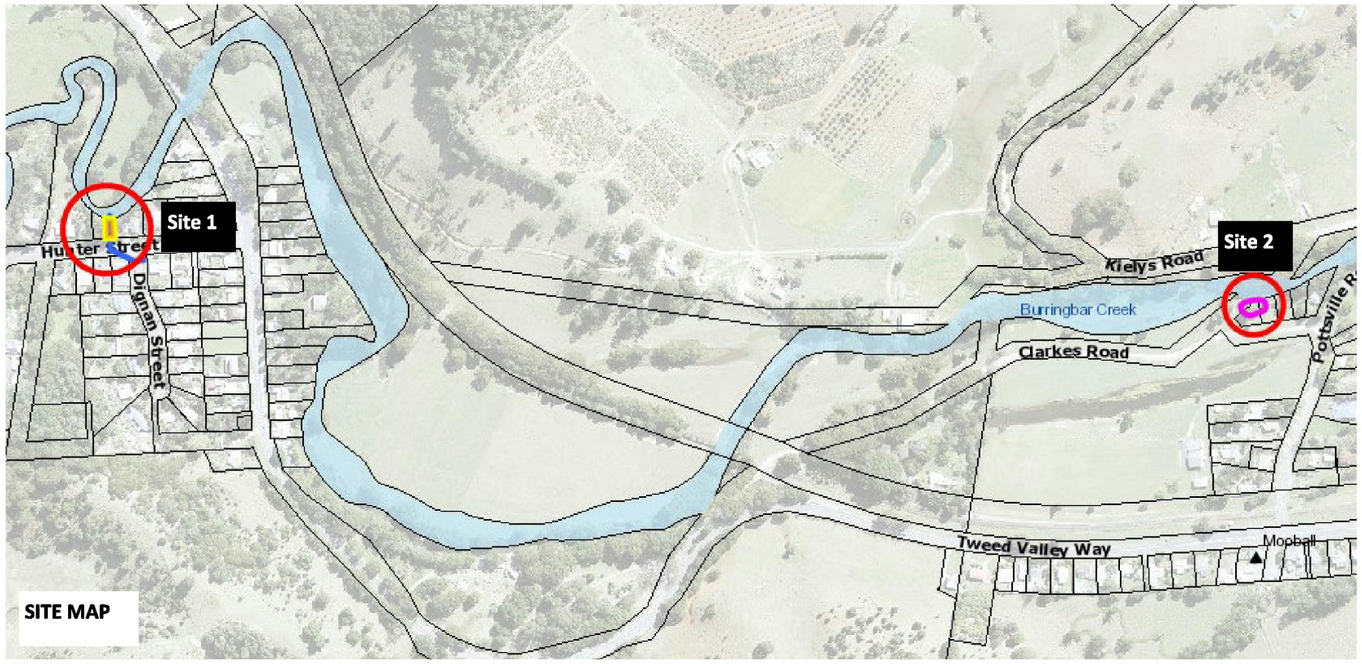
Certificate required	Hay	Turf	Soil	Organic mulch	Potted plants	Agricultural and earth moving equipment
Plant Health Certificate	✓	✓	✓	✓	✓	✓
Plant Health Assurance Certificate					✓	
HACCP Biosecurity Certificate ECCPRIFA03					✓	
HACCP Biosecurity Certificate ECCPRIFA21			✓	✓		

Contact and connect

02 6670 2400

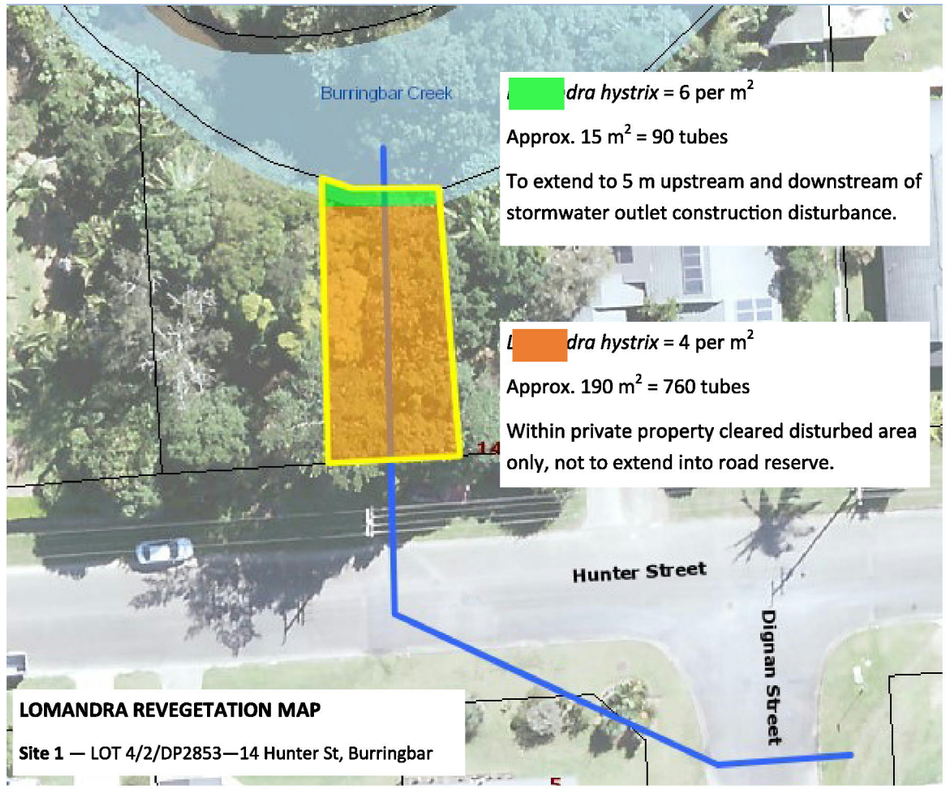
tweed.nsw.gov.au
tsc@tweed.nsw.gov.au
PO Box 819 Murwillumbah NSW 2486

Appendix F Vegetation Management Plan



SITE MAP

[redacted]



dra hystrix = 6 per m^2

Approx. 15 m^2 = 90 tubes

To extend to 5 m upstream and downstream of stormwater outlet construction disturbance.

dra hystrix = 4 per m^2

Approx. 190 m^2 = 760 tubes

Within private property cleared disturbed area only, not to extend into road reserve.

LOMANDRA REVEGETATION MAP

Site 1 — LOT 4/2/DP2853—14 Hunter St, Burringbar

APPROVAL
ON BEHALF OF COUNCIL
[redacted]
ENVIRONMENTAL SCIENTIST
DATE: **10.1.2023**

[redacted]

Site 2 — LOT A & B DP6624—6 Clarkes Rd, Mooball

PLAN TITLE:

VEGETATION MANAGEMENT PLAN

DESIGN UNIT
COUNCIL OFFICES
TUMBULGUM ROAD,
MURWILLUMBAH NSW 2484.
PHONE 02 66702400
EMAIL tsc@tweed.nsw.gov.au
WEBSITE www.tweed.nsw.gov.au
TWEED SHIRE COUNCIL

PROJECT: ISW16 – HUNTER ST, BURRINGBAR - THREATENED SPECIES TRANSLOCATION AND OFFSET PLANTING

TWEED SHIRE

[redacted]

[redacted]

Revegetation and offset planting (tubestock planting)

This method is to be applied to areas that have been disturbed from construction or are offset plantings as a result of loss of native species during construction. The two site areas are expected to benefit from the introduction of groundcover tubestock (Site 1) in order to assist in stabilising the bank and to reduce erosion. Site 2 is expected to benefit from native tree revegetation by increasing the diversity of flora using pioneer species, creating shade and will encourage natural regeneration of native species. Site 2 will also be receiving translocated threatened species, it is expected that the additional pioneer species revegetation will assist the threatened species to establish and succeed. A total of 880 plants will be planted. A 3 year maintenance period is required for Site 1. A 5 year maintenance period is required for Site 2.

Specifications and KPIs for revegetation areas

1. 90 *Lomandra hystrix* tubestock are to be planted in Site 1 on the Burringbar Creek bank, 5m upstream and downstream of the stormwater outlet pipe, at 2m wide at a density of 6 plants per 1 m^2. Green shaded area on map.
2. 760 *Lomandra hystrix* tubestock are to be planted in Site 1, in the remaining cleared disturbed areas at a density of 4 plants per 1 m^2. Orange shaded area on map.
3. 30 additional tubestock (as per the species list table), are to be planted into the Site 2. Tubestock can be placed within the general identified area (pink polygon), and can replace exotic species that are likely to be removed in the future or can be placed on the edges of existing vegetated patch.
4. Due to the likelihood of flooding at the 2 sites, no mulch or other weed suppression materials are required for the revegetation species.
5. Targeted weed control would be performed throughout the revegetation areas intermittently over the course of the 5 year maintenance period to encourage regeneration of native species and to ensure the success of the revegetation through suppression of weed competition.
6. At the Clarkes Rd, Mooball site, exotic mature species within the identified vegetation patch (pink polygon) are to be controlled over the 5 year maintenance period.
7. The following key performance indicators (KPIs) apply:

   (a) Tubestock survival of greater than 90% is required. Any more than a 10% loss requires supplementary planting.

   (b) Throughout and by the end of the 3 year maintenance period for Site 1 and 5 year maintenance period for Site 2, weed cover in the revegetation areas will be less than 5%.

Red imported fire ant biosecurity

Contractors are to supply the necessary certificates for any materials and equipment that are from or have passed through a Queensland biosecurity zone. This includes earth moving equipment, potted plants, mulch, top soil etc.

Certificates may include Plant Health Certificate, Plant Health Assurance Certificate or a Biosecurity Certificate. Further information can be found here.

Species list	Number	Site
Lomandra hystrix	850	Site 1
Guoia semiglauca	5	Site 2
Jagera pseudorhus	5	Site 2
Alphitonia excelsa	5	Site 2
Macaranga tanarius	5	Site 2
Ficus coronata	5	Site 2
Archontophoenix cunninghamiana	5	Site 2
Total	**880**	[redacted]

APPROVAL
C[redacted]UNCIL
EN[redacted]IENTIST
DATE: 10.1.2023

PLAN TITLE:

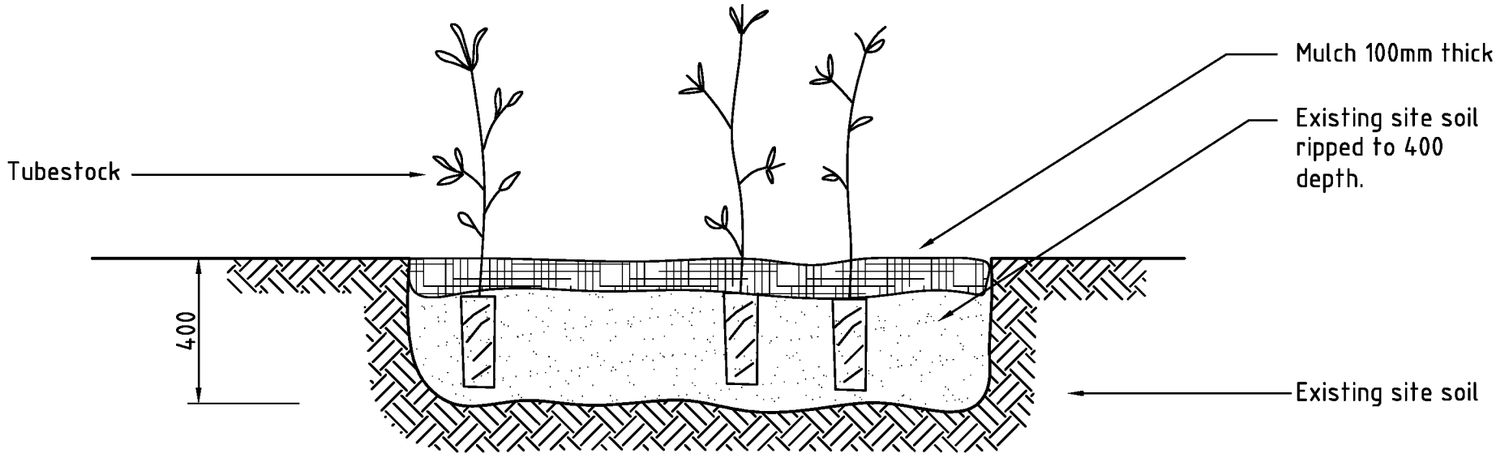
VEGETATION MANAGEMENT PLAN

DESIGN UNIT
COUNCIL OFFICES
TUMBULGUM ROAD,
MURWILLUMBAH NSW 2484.
PHONE 02 66702400
EMAIL tsc@tweed.nsw.gov.au
WEBSITE www.tweed.nsw.gov.au
TWEED SHIRE COUNCIL

PROJECT: ISW16 – HUNTER ST, BURRINGBAR - THREATENED SPECIES TRANSLOCATION AND OFFSET PLANTING

TWEED SHIRE

PLANTING DETAIL



CROSS SECTION

Scale 1:20

LANDSCAPE NOTES

- Rip existing site soil to a depth of 400mm in areas to be planted.
- Remove any builders debris such as broken bricks, concrete etc.
- Prepare planting areas as above, mulch to a minimum depth of 100mm.
- Do not heap mulch overly high in the bed, rather prepare final soil levels to a level below existing site levels and then place mulch to level with surrounds. This will allow any natural surface runoff to infiltrate the planted area, particularly in exposed perimeter planting areas.
- Supply and install all species as tubestock in areas as indicated on plan.
- Deep water new plantings twice during the first week with a minimum of 10 litres of water per plant.

ISSUE	AMENDMENT DETAILS	INITIALS	DATE
B	DRAWINGS ADOPTED FOR ISSUE TO PUBLIC	R.A.E.	5.2004
A	RE-ISSUED	R.A.E.	4.2004

TWEED SHIRE COUNCIL
PLANNING AND DESIGN UNIT
COUNCIL OFFICES
TUMBULGUM ROAD,
MURWILLUMBAH,
NEW SOUTH WALES, 2484
PHONE MURWILLUMBAH 02 66720400
FAX MURWILLUMBAH 02 66727513
EMAIL lmunro@tweed.nsw.gov.au

DESIGN ENGINEER [redacted]		DATE	2.2004
PLANNING & DESIGN		DATE	2.2004
DESIGNED	R.A.E.	2.2004	DESIGN NO.
DRAWN	R.A.E.	2.2004	SURVEY NO.
CHECKED	W.B.	2.2004	PROGRAM NO.
HORIZONTAL DATUM			REDUCTION RATIO
VERTICAL DATUM			

PROJECT: LANDSCAPING STANDARDS

PLAN TITLE: STANDARD REVEGETATION DETAIL

DRAWING NUMBER: S.D.702

SHEET 1 OF 1 SHEETS

ISSUE A B

0 10 20 30 40 50 100 150 200 250

NOTE: FULL SIZE ON ORIGINAL.

ACAD FILE No G:\TSC STANDARD DRAWINGS\S.D.DRAWINGS\700LANDSCAPING\S.D.702

Appendix G Fisheries Permit

Department of Primary Industries (Fisheries)
Department of Regional NSW

OUR REF: PN23/86

9 March 2023

The General Manager
Tweed Shire Council
PO Box 816
MURWILLUMBAH NSW 2484
Via email: [redacted]

Attention: [redacted]

[redacted]

Re: Permit # PN23/86 for dredging and reclamation works associated with stormwater upgrade works within Burringbar Creek, Crown Land adj Lot 14/2 DP 2853, Hunter Street, Burringbar, Tweed Shire Council LGA

I refer to your application dated 20 February 2023 for a permit under Part 7 of the *Fisheries Management Act 1994* (FM Act). DPI Fisheries, a division within the Department of Primary Industries, assesses applications for dredging and reclamation works, harm marine vegetation and obstruction of fish passage in accordance with Part 7 of the FM Act and the *Policy and Guidelines for Fish Habitat Conservation and Management (2013 Update).*

An invoice has been prepared and sent to Council for the statutory minimum initial assessment fee of $358. The quality of the application enabled the assessment to be undertaken without additional charges being required.

DPI Fisheries has considered the test of significance provided in *Review of Environmental Factors document title* for the proposed works and work methods outlined in correspondence and documentation received 20 February 2023. The Department has determined that the proposed works are not likely to significantly affect aquatic threatened species, populations or ecological communities listed under Federal and State legislation (EPBC Act, BC Act, and FM Act) or their habitats, and consequently the proposed works do not require a referral to the Commonwealth or a licence to harm.

Please find enclosed a permit under Part 7 of the FM Act for dredging and reclamation works associated with stormwater upgrade works within Burringbar Creek, Crown Land adj Lot 14/2 DP 2853, Hunter Street, Burringbar, Tweed Shire Council LGA.

Please note that the attached permit providing authorisation under the FM Act to undertake dredging and reclamation (s200) does not provide authorisation under any other Act or planning instrument. It is Council's responsibility to ensure they possess all appropriate approvals and land owners consent before works occur. This may include, but is not restricted to, development consent under the *Environmental Planning & Assessment Act 1979* and *Biodiversity Conservation Act 2016* in relation to impacts on terrestrial species and threatened species not covered by the *Fisheries Management Act 1994*; land owners consent and/or licences under the *Crown Land Management Act 2016*; and controlled activity approvals under the *Water Management Act 2000*.

Please carefully read and note the conditions included in the permit. **If you agree that all the conditions are reasonable, appropriate and achievable, you must sign and date the attached sheet (Acceptance of Conditions) and return it to the Contact Officer as soon as possible.** **If you believe that you cannot comply with all the conditions then you must not commence work.** Instead, you should contact the Contact Officer listed on the first page of the permit so that your concerns can be considered.

If you intend to have the work undertaken by a contractor, please ensure that the contractor receives a full copy of the permit and understands the importance of abiding by the conditions. As the permit holder and proponent of the works, Council is responsible for ensuring that all conditions are fully adhered to. **Breaching a condition of a permit can incur an on-the-spot fine of up to $500 or up to $11,000 through the local court pursuant to clause 225 of the *Fisheries Management (General) Regulation 2019*.**

The extent of work is to be restricted to that outlined in the application and plans submitted to DPI Fisheries. **If for any reason, other works are required, or the works need to be extended to other areas, you must seek specific approval beforehand.** DPI Fisheries will require justification for these variations and may charge additional assessment fees as outlined in the permit application. Similarly, **please note the expiry date on the permit**. If the works are not completed by the expiry date you will need to obtain an extension. **Requests to renew a permit before the expiry date will not incur a fee. Requests to renew a permit that has expired within the last 3 months will incur a $179 fee. Permits that have expired more than 3 months previously will need to be reapplied for.**

DPI Fisheries places particular importance upon the need to minimise the harm to the natural environment both at the worksite and downstream waters. We expect implementation of Best Management Practice with respect to erosion and sediment control and aquatic vegetation management. This includes:

- Work scheduling (e.g. installation of protective measures before earthworks commence, suspension of works during rain etc.);
- Deployment of protective measures (e.g. silt curtains, site drainage, separation of "clean" and "dirty" water, silt stop fencing, check dams, sediment traps etc.); and
- Constant maintenance of protective measures (e.g. replacing torn silt-stop fencing, replacing silt-stop fencing which has fallen down or been knocked over, removing accumulated sediment etc.).

Please refer to the publication Landcom (2004), *Managing Urban Stormwater: Soils and Construction* (4th Edition), commonly referred to as "The Blue Book" for guidance (www.environment.nsw.gov.au/research-and-publications/managing-urban-stormwater-soils-and-construction-volume-1-4th-editon).

DPI Fisheries highlight that the State Environmental Planning Policy (Transport and Infrastructure) 2021 requires that exempt developments, complying developments and emergency works are carried out in accordance with all applicable requirements of The Blue Book.

In addition to complying with the conditions of the permit, DPI Fisheries recommends that laminated copies of the permit be included on the site security signage and/or other high visibility areas of the works compound.

If you have any queries, please contact me or [redacted]

Yours sincerely

[redacted]

[redacted]
Senior Fisheries Manager, Coastal Systems (North Coast)
Aboriginal Fishing and Marine and Coastal Environments, Primary Industries NSW
Authorised delegate of the Minister for Primary Industries

Cc: fisheries.compliance@dpi.nsw.gov.au

Permit under Part 7 of the

FISHERIES MANAGEMENT ACT 1994

Permit	Permit Number	**PN23/86**
	Expiry Date	Unless cancelled or suspended sooner, this permit or updated variations shall remain in force until **1 April 2024**
Permit Holder:	Tweed Shire Council PO Box 816 MURWILLUMBAH NSW 2484 **Responsible Officer:** [redacted]	
Permit Area:	Within Burringbar Creek, Crown Land adj Lot 4 DP 2853, Hunter Street, Burringbar, Tweed Shire Council LGA **(Refer to Attachment 1)**	
Permit Activity:	Dredging and reclamation works, specifically, the replacement of an existing stormwater pipe outlet headwall and installation of rock mattress scour protection in front of the outlet associated with stormwater upgrade works as proposed in your application 20 February 2023. **(Refer to Attachment 2)**	
Departmental Contact Officer:	[redacted] Senior Fisheries Manager, Coastal Systems (North Coast) 1243 Bruxner Hwy WOLLONGBAR NSW 2477 [redacted]	

This permit is subject to the following conditions:

ADMINISTRATIVE CONDITIONS

1. The attached **Acceptance of Conditions** form must be completed and returned to ahp.central@dpi.nsw.gov.au before any works authorised by this permit commence.
   Reason – To remove any doubt that the Permit Holder understands and accepts the Conditions before work commences.
2. The attached **Commence Works Notification** form must be completed and sent to ahp.central@dpi.nsw.gov.au **and** fisheries.compliance@dpi.nsw.gov.au at least three (3) days BEFORE the commencement of works authorised by this permit.
   Reason - To ensure that local DPI Fisheries staff are aware that works authorised by this permit are about to commence.

3. The attached **Post Works Notification** form, including clearly labelled site photographs of the completed works, must be completed and sent to ahp.central@dpi.nsw.gov.au, fisheries.compliance@dpi.nsw.gov.au within 21 days of completion of works at the site.
Reason - To provide an opportunity for local DPI Fisheries staff to inspect the site to ensure that riparian restoration works have been adequately completed consistent with the authority of this permit.

4. The permit holder must ensure that all works authorised by this permit are restricted to the permit area and are undertaken in a manner consistent with those described in the application made to DPI Fisheries dated 20 February 2023. In particular, all the actions and recommendations outlined in Tweed Shire Council the REF document titled *ISW16 – Hunter Street Stormwater Pipe Upgrade, Burringbar* dated February 2023 are to be followed. Other works which have not been described, excepting those activities required by this permit, are not to be undertaken.
Reason – This permit has been granted following an assessment of the potential impacts of the described works upon the aquatic and neighbouring environments. Other works, which were not described in the application have not been assessed and may have significant adverse impacts.

5. This permit (or a true copy), a copy of the determined Part V Assessment, CEMP and other approvals such as landholder's consent must be carried by the permit holder or sub-contractor operating on-site at all times during work activity in the permit area.
Reason – A DPI Fisheries Compliance Officer may wish to check compliance of works with imposed conditions.

SEDIMENT AND EROSION CONTROL PLAN

6. Erosion and sediment mitigation devices are to be erected in a manner consistent with the currently accepted Best Management Practice (i.e. Landcom [2004], *Managing Urban Stormwater: Soils and Construction* [4th Edition]) to prevent the entry of sediment into the waterway, or mobilisation of sediment within the waterway, **prior to** any earthworks being undertaken. **These erosion and sediment devices are to be maintained in good working order for the whole duration of the works and subsequently until the worksite has been stabilised and the risk of erosion and sediment movement from the site is minimal.**
Reason – To ensure that sediment generated by the exposure of soil is not transported into the main water body.

DEWATERING PLAN

7. Dewatering at the worksite is to be undertaken consistent with accepted Best Management Practice (i.e. Landcom [2004], *Managing Urban Stormwater: Soils and Construction* [4th Edition]). In addition, mitigation controls such as a sediment fence between the sump water release outlet and the waterway are to be employed to ensure that downstream water quality is not adversely affected.
Reason – Minimise turbidity impacts from the site on downstream waters.

WORK IN WATERS

8. Machinery is not to enter or work from the waterway unless in accordance with works proposed in your application for the permit and the requirements of this permit.
Reason – To ensure minimal risk of water pollution from oil or petroleum products and to minimise disturbance to the streambed substrate.

9. Only clean rock is to be used in construction of works authorised by this permit.
Reason – To avoid fines, clay and other sediment un-necessarily entering the waterway and potentially impacting on aquatic habitats.

10. Prior to use near the waterway, machinery is to be appropriately cleaned, degreased and serviced. Emergency Spill Kits appropriate for containing and cleaning up petroleum and solvent product spills within waterways are to be available on site at all times during works.
Reason – To reduce the threat of an unintended pollution incident impacting upon the aquatic environment.

TIMING OF WORKS FOR LOW FLOWS

11. Works are to be undertaken during low flows in Burringbar Creek and when Bureau of Meteorology forecast for the Northern Rivers district forecast region (available at: www.bom.gov.au/nsw/forecasts/map.shtml) indicates several days of clear, dry weather.
Reason – Timing the works for appropriate conditions can reduce delays and minimise impacts on the aquatic environments.

AVOIDING MOVING OR HARMING SNAGS, RIPARIAN AND AQUATIC VEGETATION

12. When working near aquatic vegetation[1] (phragmites and other aquatic vegetation) on water land[2], these areas are to be identified and appropriately delineated as "No Go" areas (with the aim of avoiding harm to these areas). Harm to aquatic including removing or moving vegetation on water land outside the permit area approved under the authority of this permit is not permitted. Such removal, harm or movement caused to aquatic vegetation is to be documented and reported to the contact officer who may direct that the removed, harmed or damaged aquatic vegetation on water land be restored.
Reason – To ensure that impacts on aquatic habitats and the riparian zone are minimised.

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[1] "***Aquatic vegetation***" is defined in the *Fisheries Management (General) Regulation* 2019 as 'native vegetation that inhabits freshwater but does not include noxious weeds within the meaning of the *Noxious Weeds Act 1993*.'

[2] "***Water land***" is defined in the *Fisheries Management Act 1994* and means land submerged by water:

a) whether permanently or intermittently, or
b) whether forming an artificial or natural body of water,

and includes wetlands and any other land prescribed by the regulations.

Wetlands include marshes, mangroves, swamps, or other areas that form a shallow body of water when inundated intermittently or permanently with fresh, brackish or salt water, and where the inundation determines the type and productivity of the soils and the plant and animal communities.

13. Material storage and stockpiling is not to be undertaken on water land, riparian or aquatic vegetation. Stockpiling must be undertaken in a manner to avoid harm to these types of vegetation or water land. Stockpiles should also be located away from adjacent water land. Stockpiles and dewatering areas should be appropriately controlled by sediment fencing or other materials prescribed in the "Blue Book" (i.e. Landcom 2004, *Managing Urban Stormwater: Soils and Construction* [4th Edition]) to ensure sediments do not enter the waterway.
Reason – To ensure that impacts on aquatic habitats and the riparian zone are minimised. "Degradation of native riparian vegetation along NSW water courses" is listed as a Key Threatening Process under the provisions of the Fisheries Management Act 1994.

14. No snags[3] outside of the works area described in the permit application are to be removed, realigned or relocated without first obtaining the authority of the Senior Fisheries Manager, Coastal Systems.
Reason – "Removal of large woody debris from NSW rivers and streams" is listed as a Key Threatening Process under the provisions of the Fisheries Management Act 1994. This approval has been granted on the basis that snags are not to be removed.

15. On completion of the works, the worksite is to be rehabilitated and stabilised including:
- Removal of surplus construction materials and temporary structures (other than silt fences and other erosion and sediment control devices) installed during the course of the works.
- Undertaking plantings of *Lomandra sp.* within all temporarily disturbed areas of works within the riparian zone. Replanting within temporarily disturbed areas should consist of at least six (6) *Lomandra sp.* tubestock per square metre.
- Appropriate maintenance of erosion and sediment control devices until the vegetation has successfully established and the site has stabilised.
Reason – To ensure that habitats are restored as quickly as possible, public safety is not compromised, aesthetic values are not degraded and sediment inputs into the waterway are reduced.

FISH KILL CONTINGENCY

16. A visual inspection of the waterway for dead or distressed fish (indicated by fish gasping at the water surface, fish crowding in pools or at the creek's banks) is to be undertaken twice daily during the works. **Observations of dead or distressed fish are to be immediately reported to the Contact Officer by the Permit Holder.** In such a case all works are to cease until the issue is rectified and approval is given to proceed. If requested, the Permit Holder is to commit resources to the satisfaction of the Contact Officer for an effective fish rescue, if in the view of that officer, a fish kill event is imminent and likely to occur within or adjacent to the works area due to conditions associated with weather, water quality and other parameters.
Reason – DPI Fisheries needs to be aware of fish kills so that it can assess the cause and mitigate further incidents in consultation with relevant authorities. They are also potentially contentious incidents from the public perspective. Work practices may need to be modified to reduce the impacts upon the aquatic environment.

[3] "***Snags***" is a term used to describe **large woody debris** from trees and shrubs, including whole fallen trees, broken branches and exposed roots that have fallen or washed into a waterway and are now wholly or partially submerged by water. Snags also includes submerged large rocks (of greater than 500 mm in two dimensions).

IMPORTANT NOTE:

INCONSISTENCY BETWEEN DOCUMENTS

In the event of any inconsistency between the conditions of this approval and:
- the drawings / documents referred to above, the conditions of this approval prevail to the extent of the inconsistency;
- any Government publication referred in this permit, the most recent document, shall prevail to the extent of the inconsistency; and
- the proponent's mitigation measures outlined in the application, the conditions of this approval prevail to the extent of the inconsistency.

STOP WORK ORDERS

A Fisheries Officer or other appropriate delegate who has reasonable cause to suspect that the conditions of this permit have not been complied with, **may order the work to stop immediately**. The order may be given to the permit holder or any person who informs the officer that they are acting in any capacity on behalf of the permit holder. Any damage caused to the habitat outside the specified permit area, or the carrying out of works not in accordance with the conditions specified in this permit and/or the application and that were accepted by the permit holder, could result in a breach of the *Fisheries Management Act 1994* or *Regulations*, and penalties of up to $220,000 may apply. Orders may also be made requiring work to rectify any damage caused by unauthorised works. Failure to abide by permit conditions may incur a $500 on-the-spot fine per breach pursuant to clause 225 of the *Fisheries Management (General) Regulations 2019*.

Authorised:

Senior Fisheries Manager, Coastal Systems (North Coast)
Authorised delegate of the Minister for Primary Industries

9 March 2023

Attachment 1

Figure 1: Plan showing location of works as described within the *Permit Area* section above.

Attachment 2

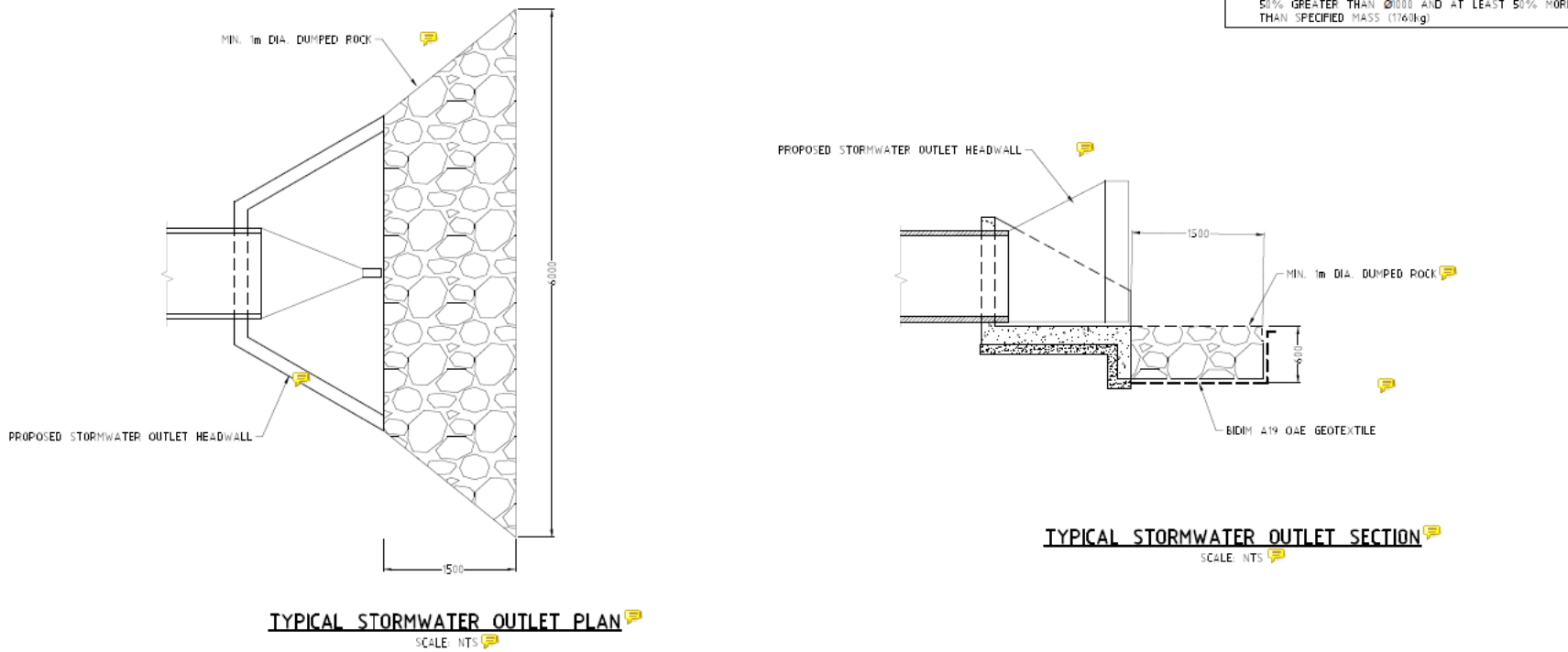

Figure 1: Plan showing design of stormwater outlet and rock scour protection as described within the *Permit Activity* section above.

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