

4 December 2025

Office of the Coordinator General
1 William Street, Brisbane Qld 4000
PO Box 15517, City East Qld 4002
E: rachel.ritchie@coordinatorgeneral.qld.gov.au

Attn: Rachel Ritchie, Senior Planner

Dear Rachel

AP2925/011 - Response to Information Request - SDA application for operational works for clearing of native vegetation (Eastern Outfall Pressure Main replacement project) in the Townsville State Development Area (TSDA)

AECOM Australia Pty Ltd (AECOM) writes on behalf of the applicant, Townsville City Council, to respond to a request for additional information from the Office of the Coordinator-General (OCG) for State Development Area (SDA) application AP2025/011 associated with the Eastern Outfall Pressure Main (EOPM) Replacement Project (the Project).

The SDA application was deemed properly made on 10 September 2025 and seeks approval for the following aspect of development in accordance with the Townsville SDA development scheme:

- SDA application for Operational Works for clearing of native vegetation over Lot 1 on SP313085 and within Ron McLean Drive.

The SDA application was referred to the Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (NRMMRRD) and Department of Transport and Main Roads (TMR) and a request for additional information was received on 8 October 2025.

Pursuant to Schedule 2, Part 2, Section 2.4(5) of the Townsville SDA Development Scheme, please refer to Table 1 below for the applicant's response to this request for additional information. All of the information requested by the OCG is provided within this submission.

This information request response should be considered in conjunction with the following supporting attachments:

- Attachment 1: Updated *Figure 5: Operational Work for clearing native vegetation within the TSDA*
- Attachment 2: Landscape Plans and Specification
- Digital files provided with email.

We trust this information addresses the OCG and NRMMRRD's concerns, and the review stage now ends. Should you have any queries regarding the above, please don't hesitate to contact the undersigned on 0432 632 567.

Yours faithfully



Alexandra Isgro
Principal Environmental Planner
alexandra.isgro@aecom.com

Mobile: +61 432 632 567

Table 1 SARA Information Request Response

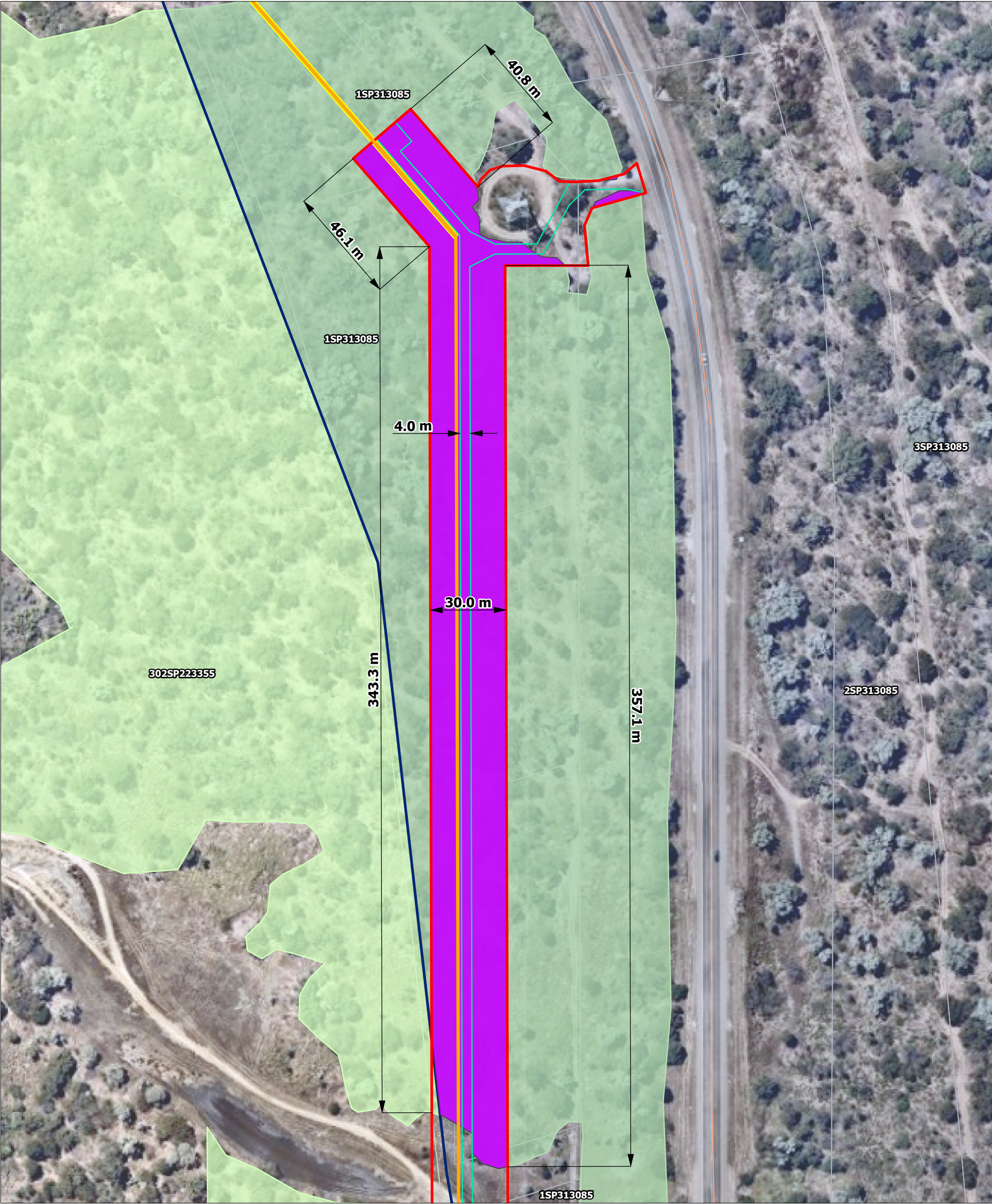
Item Number	SARA Issue	Applicant Response
1 – Vegetation Management: Site layout	The Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (NRMMRRD) has undertaken an assessment of the proposed vegetation clearing to determine if it meets the requirements under section 22A of the <i>Vegetation Management Act 1999</i>. Being in a coastal bioregion and subregion, the clearing in the proposed development must not: 1. occur in areas of vegetation that are less than 10 hectares; and 2. reduce the extent of vegetation to less than 10 hectares; and 3. occur in areas of vegetation less than 100 metres wide; and 4. reduce the width of vegetation to less than 100 metres; and 5. occur where the extent of vegetation on the subject lot(s) is reduced to, or less than, 30 per cent of the total area of the lot(s). Initial assessment of the application by the NRMMRRD has identified that the proposed development will result in the fragmentation of regional ecosystem (RE) 11.2.5. It will create an isolated area of RE 11.2.5 that is less than 10 hectares in the north-western extent of the clearing area. As such, the proposed development will not meet AO9.1, therefore the performance outcome will need to be met. The relevant performance outcome is PO9, which states that regional ecosystems on the subject land and any adjacent land retain sufficient vegetation to: 1. maintain ecological processes; and 2. ensure the regional ecosystem remains in the landscape despite threatening processes. The proponent is requested to: (1) provide details of the location and extent of remnant vegetation to be retained within the development footprint in the Townsville State Development Area and adjacent land (2) provide an analysis of how the remnant vegetation, with its altered extent and configuration, will maintain the ecological processes currently occurring (3) provide an analysis of how the remnant vegetation, with its altered extent and configuration, will remain the landscape despite threatening processes.	(1) <i>provide details of the location and extent of remnant vegetation to be retained within the development footprint in the Townsville State Development Area and adjacent land</i> Digital data for the following Project elements is provided with this response (attached to email) and will enable NRMMRRD to view the proposed pipeline and disturbance area in reference to nearby remnant vegetation: • Disturbance Area • Permanent Access Tracks • Replacement Pipeline Alignment • Underboring extents • Ground-truthed Regional Ecosystems • Temporary Clearing Areas (within TSDA) • Permanent Clearing Areas (within TSDA) • Total Clearing Area (with TSDA). This data is compatible with ESRI. An updated <i>Figure 5: Operational Work for clearing native vegetation within the TSDA</i> is provided in Attachment 1 of this letter. The updated figure now shows: • the EOPM Replacement pipeline alignment • approximate dimensions for the clearing areas • a table clarifying the extent of temporary vs permanent clearing impacts. The clearing proposed as part of this SDA application (clearing native vegetation within the Townsville SDA) is 17,674 m², of which only 2,837 m² will be permanent because of the 4 m wide permanent access track. The access track which will remain clear of vegetation permanently to allow for regular maintenance of scour, isolation and air valves. Temporary impacts are expected to equate to 14,837 m² and will be rehabilitated. (2) <i>provide an analysis of how the remnant vegetation, with its altered extent and configuration, will maintain the ecological processes currently occurring and</i> (3) <i>provide an analysis of how the remnant vegetation, with its altered extent and configuration, will remain the landscape despite threatening processes.</i> Since lodgement of the SDA application in early September 2025, AECOM has collaborated with Townsville City Council to develop a Landscape Plan and Specification for the Project that demonstrates a commitment to rehabilitating the impacted footprint. These plans and specification report are provided in Attachment 2 of this letter and consider the ground-truthed Regional Ecosystems for the area. As detailed in the Ecology Technical Report provided in Appendix F of the SDA application, the remnant vegetation within the Study Area has been divided into the following vegetation communities or types: a. Bare saltpans and / or areas of sparse forblands and / or tussock grasslands b. Closed forests and low closed forests dominated by mangroves c. Complex of open shrublands on strand and foredunes d. Open forests and low open forests in seasonally inundated swamps. Vegetation community (a) comprises a majority of the native vegetation in the disturbance area, with 3.38 ha of impacts proposed to this community within the Project Area. Impacts are considered predominantly temporary, as the open trenched pipeline will be backfilled and an extensive landscaping regime will be implemented by Townsville City Council. Permanent impacts to this community will be restricted to the proposed 4 m-wide permanent access track, however this width of clearing is not anticipated to change the overall ecological processes of this community, based on two critical points: • The proposed access track will be installed adjacent to existing and previously disturbed infrastructure corridors (state controlled road, power easements), and is only anticipated to be used intermittently after the construction phase. It is unlikely to cause impacts beyond that already existing in the locality. • The Project proposes the installation of an underground sewer pipeline within a tidal landscape, with short term trenching impacts during pipeline installation only. Levels will be restored to original profiles following pipeline installation. The Project will not affect the tidal influence in the Project Area, which is an important component supporting the vegetation communities in the area.

Item Number	SARA Issue	Applicant Response
		Further commentary on this matter is provided in Section 7.1.1.3 of the Planning Report. Vegetation communities (b) and (c) will be avoided with no clearing proposed, as these sections of the pipeline will be entirely under-bored and therefore any impacts are considered temporary and indirect only. No impacts are therefore proposed to the ecological processes of these communities. Vegetation community (d) comprises a minority of the native vegetation in the disturbance area, with 2.09 ha of impacts proposed to this community within the Project Area. Within this, a 4 m-wide corridor of permanent impacts are proposed to this community associated with the permanent access tracks. Remaining impacts in this community are temporary only, as landscaping efforts will ensure native revegetation. In addition to impacts to the individual communities considered above, as a whole, the interconnected and interdependent ecological processes of all the communities are expected to remain in the landscape despite the altered extent and configuration based on the following: • The altered extent and configuration is expected to be predominantly temporary, with permanent impacts only proposed to the 4 m-wide access track area. • The primary infrastructure for the Project comprises an open trenched pipeline which will be backfilled and reinstated to pre-existing levels, under-bored pipeline in areas of sensitive ecological values (tidal shrubland and mangroves), and a permanent access track. The under-bored pipeline areas have been strategically designed after initial ecological assessment to maximise avoidance of impacts to important tidal vegetation and potential habitat to threatened species. • Considering existing infrastructure on a landscape scale (particularly the adjacent state controlled road and power easements) and that the Project is a replacement of an existing EOPM located to the east, the Project is not anticipated to exacerbate impacts to ecological processes beyond existing levels. • Townsville City Council have developed detailed Landscaping Plans and Specifications to reinstate temporary impact areas of grassland, forbland and woody vegetation to preclearing conditions (refer to Attachment 2).
2 – Vegetation Management: Temporary use area	The planning report (page 16) has identified a 30m construction corridor for laydown areas and access tracks, with a 4m wide permanent access track along the eastern side is proposed. However, 'Figure 5 Operational Work for clearing native vegetation within the TSDA' situates the permanent access tracks in the centre of the clearing footprint. NRMRRD also note that in correspondence with the proponent on 17 September 2025 for the relevant purpose determination it was stated that "Only the area where the permanent access track is proposed will remain uncleared for the future of the project. The remaining areas within the 30m corridor will be rehabilitated by reinstating the topsoil over the pipeline to pre-existing levels to allow for the natural regeneration of native grasslands and forblands. Natural regeneration will be monitored, and additional management measures will be considered if natural regeneration is unsuccessful." NRMRRD is concerned that the application lacks a clear delineation of the various locations designated as permanent clearing areas, particularly concerning the Eastern Outfall Pressure Main (EOPM) Replacement and the associated access track. Additionally, the boundaries of temporary use areas are not explicitly defined, which raises uncertainty about the overall project layout. There is a need for clarification regarding the rehabilitation plans for these temporary use areas. Specifically, it is vital to understand whether the rehabilitation efforts will include returning the vegetation to its pre-clearing state. This would entail allowing for the natural regeneration of trees. Should the project restrict tree regeneration and instead allow only grasslands and forblands to develop, the area would effectively be reclassified from a temporary use area to a permanent area for infrastructure. This change in classification would occur because the vegetation would no longer represent the species composition expected for RE 11.2.5.	(1) <i>provide shapefiles delineating the proposed location of the EOPM replacement, permanent access track, and the temporary use areas</i> Digital data for the following Project elements is provided with this response (attached to email) and will enable NRMRRD to view the proposed pipeline and disturbance areas: • Disturbance Area • Permanent Access Tracks • Replacement Pipeline Alignment • Underboring extents • Ground-truthed Regional Ecosystems • Temporary Clearing Areas (within TSDA) • Permanent Clearing Areas (within TSDA) • Total Clearing Area (with TSDA). This data is compatible with ESRI. (2) <i>provide clarification regarding the rehabilitation plans for the temporary use areas, specifically, if it involves ensuring vegetation returns to its pre-clearing remnant status</i> (3) <i>if the intent is to rehabilitate the area to preclear extent, an Environmental Clearing Management Plan (ECMP) will need to be provided.</i> As noted above, detailed Landscape Plans and Specifications have been developed for the Project to promote the re-establishment of vegetation to pre-clearing conditions. These plans and specifications are provided in Attachment 2 of this letter and consider the ground-truthed Regional Ecosystems for the area. The proposed clearing areas will be landscaped with a combination of the following treatments (align with ground-truthed RE extents): • Landscape Revegetation Mix 1 (LR01) which comprises grass species (containerised or seeded treatment area option). • Landscape Revegetation Mix 2 (LR02) which comprises tree, shrub and grass species (containerised or seeded treatment area option).

Item Number	SARA Issue	Applicant Response
	The proponent is requested to: (1) provide shapefiles delineating the proposed location of the EOPM replacement, permanent access track, and the temporary use areas (2) provide clarification regarding the rehabilitation plans for the temporary use areas, specifically, if it involves ensuring vegetation returns to its pre-clearing remnant status (3) if the intent is to rehabilitate the area to preclear extent, an Environmental Clearing Management Plan (ECMP) will need to be provided. Appendix 11: Rehabilitation in the Guide to State Development Assessment Provisions State code 16: Native vegetation clearing (Public safety, relevant infrastructure activities or Integrated Planning Act approval), March 2023 provides further guidance on what is required in an ECMP. This document can be sourced from – https://www.qld.gov.au/__data/assets/pdf_file/0028/374536/sdap-guide-state-code-16-public-safety.pdf.	The areas within 3 metres offset of the pipeline centreline will be landscaped with Landscape Revegetation Mix 1 (LR01) to avoid future damage to the pipeline from tree roots. The proposed landscaping and associated management will promote regeneration of woody vegetation, forbland and grassland areas (associated with REs 11.2.25, 11.1.1, 11.1.2) to pre-clearing levels (excluding permanent access track). Consequently, these areas are not anticipated to have permanent impacts to native vegetation. There is no intent to prepare an <i>Environmental Clearing Management Plan (ECMP)</i> for the Project as the level of detail provided in the Landscape Plans and Specifications (Attachment 2) are considered necessary to demonstrate Townsville City Council (and it's contractors) are committed, and contractually required, to adequately rehabilitate, maintain and monitor the proposed landscaping regime. The Landscape Plans and Specifications will form part of the contract with the Project's Construction Contractor. Additionally, Project works will be undertaken in accordance with the Preliminary CEMP provided in Appendix K of the SDA Application. A final CEMP will be prepared and implemented by the chosen Construction Contractor and will include clear guidance on areas to be cleared and retained, methods for clearing, the role of the spotter-catcher and other relevant environmental protection matters. A Weed and Pest Management Plan will be developed and included in the final CEMP, which will include the control of terrestrial and aquatic weeds and pests. As noted in Section 6.2.1.6 of the Planning Report, a significant residual impact assessment has been completed for the Project for impacts to essential habitat. This assessment concluded that a significant residual impact is unlikely, as the Project will not result in a greater than 10% permanent reduction in the extent of essential habitat mapped on site. Offsets are not expected to be required for the Project.
3 – Land resource assessment: Acid sulfate management	Pursuant to the SDA wide assessment criteria in Part 2.5 of the Townsville SDA Development Scheme, an assessment of an SDA application is required to consider the impact on acid sulfate soils (ASS). NRMRRD note that strong ASS will be disturbed as part of the project and will need to be appropriately identified and managed. While it is noted that an ASS technical briefing note has been prepared for the Construction Contractor, NRMRRD consider that the level of risk from disturbance of ASS by the project requires a full and proper investigation of ASS in accordance with Table 6.1 of the National Acid Sulfate Soil Guidance. Given the level of potential ASS risk on the site, it is not considered appropriate to defer additional testing and ASS management planning to the construction manager as part of the Construction Environmental Management Plan. Based on findings from the ASS investigation, a competent and concise ASS management plan should be developed to both determine the most appropriate management, along with prescriptive processes relating to ASS management, treatment, and verification. NRMRRD note that existing private ASS work may be available along the sewer alignment. Suggest contacting the Townsville Port Authority and request access to sites associated with Port Access Road development and Sun Aquaculture site remediation. It is noted that the disturbance of ASS relevant to this application are those resulting from clearing of native vegetation. However, it is highlighted that similar information may be required by NRMRRD for the construction of the pipeline through the approval process under the Planning Act. The proponent is requested to: (1) Provide an ASS investigation identifying the presence, depth and strength of actual ASS and potential ASS sediments along the pipeline alignment as a result of the clearing of native vegetation. The investigation should: a. Involve investigation sites along the proposed alignment with a site frequency of at least 1 site every 50 linear	This matter has been discussed by the Project team (Townsville City Council as Project Owner and AECOM as Design Consultant), and it appears to be an early and unusual request at this point in the assessment process. The requirement for an ASSMP is typically a condition of approval and is usually submitted to the regulator for consideration before construction commences. Townsville City Council has every intention of preparing and implementing an ASSMP, and this will occur following the engagement of a Construction Contractor, planned for early-mid 2026 once statutory approvals have been obtained. On-site treatment of ASS for the EOPM Replacement Project will be the responsibility of the Construction Contractor and will be a contractual requirement for construction of the Project. The Contractor will be responsible for collecting the data required to inform construction risk and management. The Contractor will then need to determine their preferred approach for stockpile management, treatment, and on-site reuse and/or off-site disposal. Typically, the development of the ASSMP is best carried out by the construction contractor who are best placed to consider the efficient means of ASS management with their detailed construction planning. The development of the plan at this stage of the Project risks additional effort by the constructor once engaged if they require changes to work within their efficient construction practices. Overall, an expensive undertaking that would result in a waste of public funds. It is also noted that SARA (and associated technical agencies) have not requested any additional ASS information within their Information Request for the EOPM DA in accordance with the <i>Planning Act 2016</i>. They are satisfied with the ASS Management Considerations report (AECOM 2025) submitted with the DA (see Appendix J). The ASS Management Considerations Report provides a summary of obligations for the assessment and management of ASS, surface water and groundwater during all phases of construction, and mitigation of adverse effects on sensitive environmental values during the planning and delivery of this Project. Appropriate management and mitigation measures have been incorporated into the design, including horizontal directional drilling and nominated laydown areas. Refer to Appendix J for further details. This matter has been raised with the OCG (who raised with NRMRRD) and email correspondence received from Rachel Ritchie (OCG Senior Planner) on 7 November 2025 advised that NRMRRD accept the position above, but note sufficient conditions will be added to the SDA approval to manage ASS issues.

Item Number	SARA Issue	Applicant Response
	metres for open trenching, with a particular focus on sites in the lowest-lying marine plain areas b. Involve depth of sampling in accordance with section 6.5 of the National Acid Sulfate Soil Guidance. (2) Based on the findings in (1), provide an ASS Management Plan to both determine the most appropriate management, along with prescriptive processes relating to ASS management, treatment, and verification. NRMRRD recommends that an ASS Management Plan be developed in accordance with the Queensland Acid Sulfate Soil Technical Manual – Soil Management Guidelines V5.1, with particular attention given to the following sections; a. Section 6.8 – Trenching Considerations – particularly notations about managing groundwater and staging excavation works to limit the amount of trenching and disturbance to 50 m at a given time. b. Section 7.0 Neutralisation of acid sulfate soils c. Section 7.2 Verification testing to ensure ASS are fully treated d. Section 7.4 Treatment pads.	

Attachment 1: Updated *Figure 5: Operational Work for clearing native vegetation within the TSDA*



EOPM Replacement Project - SDA Development Application – Operational Work
(Clearing of Native Vegetation)

Figure 5: Operational Work for clearing native vegetation within the TSDA

Legend

- Pipeline Alignment
- Disturbance Area
- Under-boring
- Permanent access tracks
- Lot parcels
- Roads
- Townsville SDA
- Ground-truthed Regional Ecosystem 11.2.5

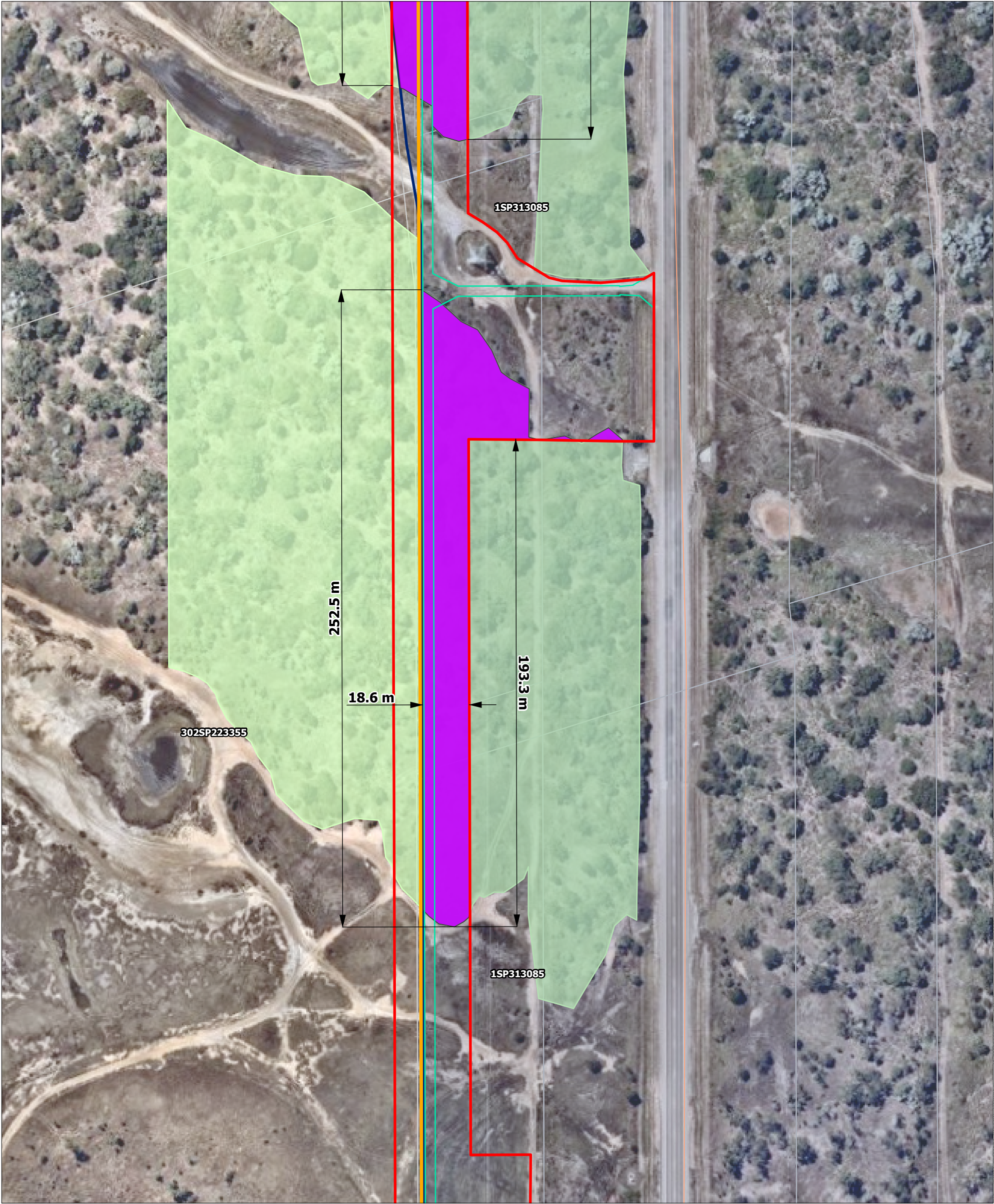
Intersecting Disturbance Area
Total Clearing Native Vegetation
(17,674m²)

Vegetation Clearance (m ²)	
Temporary Impact	Permanent Impact
14,837	2,837



A separate Development Approval for Clearing Native Vegetation is being sought for the Project's proposed vegetation clearing outside the TSDA in accordance with the Planning Act 2016. Only the vegetation clearing that is proposed within the TSDA area forms part of this Development Application

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EOPM Replacement Project - SDA Development Application – Operational Work
(Clearing of Native Vegetation)

Figure 5: Operational Work for clearing native vegetation within the TSDA

Legend

- Pipeline Alignment
- Disturbance Area
- Under-boring
- Permanent access tracks
- Lot parcels
- Roads
- Townsville SDA
- Ground-truthed Regional Ecosystem 11.2.5

Intersecting Disturbance Area
Total Clearing Native Vegetation
(17,674m²)

Vegetation Clearance (m²)	
Temporary Impact	Permanent Impact
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Attachment 2: Landscape Plans and Specification

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LANDSCAPE NOTES

1. REFER CIVIL ENGINEER DRAWING SERIES FOR DESCRIPTION ON PIPE-RELATED INFRASTRUCTURE
2. ALL PLANS AND DETAILS ARE TO BE READ IN CONJUNCTION WITH THE LEGEND, SCHEDULES AND NOTES PROVIDED WITHIN THE LANDSCAPE PACKAGE.
3. ALL PLANS AND DETAILS ARE TO BE READ IN CONJUNCTION WITH RELEVANT ENGINEERING AND ENVIRONMENTAL DESIGN DOCUMENTATION PACKAGES.
4. LANDSCAPE WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH TOWNSVILLE CITY COUNCIL STANDARDS.
5. ALL EXISTING AND RETAINED ELEMENTS ARE SHOWN INDICATIVELY ONLY. THE LOCATION OF THESE ELEMENTS ARE BASED ON SURVEY INFORMATION SUPPLIED BY THE CLIENT, ALL WORKS ARE TO BE SETOUT AND CONFIRMED ONSITE PRIOR TO CONSTRUCTION WORKS.
6. ALL UNDERGROUND SERVICES ARE TO BE CONFIRMED BY CONTRACTOR TO ENSURE INFRASTRUCTURE IS NOT DAMAGED OR INTERRUPTED BY WORKS. THE CONTRACTOR IS TO LIAISE WITH SERVICE PROVIDERS TO GAIN ALL APPROVALS/ PERMITS.
7. POTENTIAL SERVICES CONFLICTS, PROTECTION AND / OR RELOCATION WITH INITIAL WORKS SHALL BE DETERMINED PRIOR TO CONSTRUCTION USING CURRENT "DIAL BEFORE YOU DIG" INFORMATION, POT-HOLING AND CONSULTATION WITH RELEVANT SERVICES AUTHORITIES.

VEGETATION PROTECTION NOTES

1. ALL EXISTING TREES AND LANDSCAPE WORKS TO BE RETAINED ARE TO BE PROTECTED FROM IMPACT DURING CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH AS4970-2009 PROTECTION OF TREES ON DEVELOPMENT SITES.
2. EXISTING VEGETATION THAT FALLS WITHIN SIGHTLINES, WILL BE ASSESSED ON SITE AND MAINTAINED AS REQUIRED.
3. ANY TREE PROTECTION FENCING TO BE INSTALLED IS TO BE INSTALLED AS PER AS4970-2009.
4. ALL WORKS TO BE UNDERTAKEN ADJACENT TO EXISTING VEGETATION IS TO BE CARRIED OUT IN ACCORDANCE WITH AS4970-2009 REQUIREMENTS. ALL EXCAVATION WORKS WITHIN THE TPZ (TREE PROTECTION ZONES) ARE TO BE DONE BY APPROVED HAND OR VACUUM METHODS. NO STOCKPILING OR STORAGE OF MATERIALS (INCLUDING EQUIPMENT) IS ALLOWED IN TPZ.
5. WEED MANAGEMENT IS TO BE IN ACCORDANCE WITH TOWNSVILLE CITY COUNCIL STANDARDS AND GUIDELINES.
6. EXTENT OF CLEARING FOR SITE ACCESS AND CONSTRUCTION ACTIVITIES TO BE CONFIRMED BY LANDSCAPE SUPERINTENDENT IN RELATION TO EXISTING VEGETATION AND HABITAT FOOTPRINTS BEING RETAINED AND PROTECTED. WORKS BEYOND THE LANDSCAPE TREATMENTS SHOWN ON PLANS TO BE CONFIRMED AND MITIGATED WHERE POSSIBLE.

LANDSCAPE EROSION CONTROL MEASURES

1. FOR ALL LANDSCAPE EARTHWORKS, STABILISATION AND SURFACE PREPARATION GUIDANCE, REFER TO TOWNSVILLE CITY COUNCIL STANDARDS AND GUIDELINES.
2. ALL OTHER EROSION AND SEDIMENT CONTROL MEASURES TO BE IN ACCORDANCE WITH CONSTRUCTION EROSION AND SEDIMENT CONTROL PLAN (ESCP).

EXTENT OF LANDSCAPING

1. THE EXTENT OF LANDSCAPING HAS BEEN DEFINED BY THE ADOPTED LIMITS FOR DISTURBANCE OF THE CORRIDOR AND OTHER AREAS FOR GENERAL ACCESS AND LAYDOWN.
2. THE CONTRACTOR SHALL MINIMISE DISTURBANCE WHERE POSSIBLE
3. SHOULD AN AREA NOMINATED FOR LANDSCAPING IN THESE PLANS NOT BE DISTURBED BY THE CONSTRUCTION WORKS, THE CONTRACTOR IS NOT REQUIRED TO REVEGETATE THE CONTRACTOR SHALL SURVEY THE EXTENTS OF THE DISTURBANCE AND REVEGETATION AREA AND CONFIRM WITH THE SUPERINTENDENT PRIOR TO COMMENCEMENT.

LANDSCAPE LEGEND



LR01

LANDSCAPE REVEGETATION MIX 1 (LR01) – GENERAL AREAS – GRASS SPECIES – CONTAINERISED OR SEEDED TREATMENT AREA: WITHIN 3M OFFSET OF PIPE CENTRELINE

- AMELIORATE SUBSOIL – INCORPORATE AMELIORANT’S AT RATES AS PER THE SPECIFICATION
- ROUGHENING – 50mm DEEP (APPROX.)
- TOPSOIL – 75mm DEEP AMELIORATED TOPSOIL (MINIMUM)
- FERTILISER – INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION
- PLANTING – REFER TO PLANTING SCHEDULE
- FIBRE – 4500kg/ha (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED
- FINISHED FIBRE DEPTH – 5mm (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED
- EXTENT – AS SHOWN ON DRAWING WITHIN 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS



LR02

LANDSCAPE REVEGETATION MIX 2 (LR02) – OPEN FOREST AREAS – TREE, SHRUB AND GRASS SPECIES – CONTAINERISED OR SEEDED TREATMENT AREA: OUTSIDE 3M OFFSET OF PIPE CENTRELINE

- AMELIORATE SUBSOIL – INCORPORATE AMELIORANT’S AT RATES AS PER THE SPECIFICATION
- ROUGHENING – 50mm DEEP (APPROX.)
- TOPSOIL – 75mm DEEP AMELIORATED TOPSOIL (MINIMUM)
- FERTILISER – INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION
- FIBRE – 4500kg/ha (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED
- FINISHED FIBRE DEPTH – 5mm (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED
- PLANTING – REFER TO PLANTING SCHEDULE
- EXTENT – AS SHOWN ON DRAWING OUTSIDE 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS

NOTE:

1. THE TYPE OF LANDSCAPE TREATMENT (SEEDED OR CONTAINERIZED) IS TO BE DETERMINED PENDING DEVELOPMENT APPROVAL (DA). DETAILED REVEGETATION REQUIREMENTS WILL FORM PART OF THE APPROVED DA DOCUMENTATION.

GENERAL LEGEND



EXTENT OF WORKS



PROPOSED SEWAGE PRESSURE MAIN



EXISTING ELECTRICAL SERVICE (OVERHEAD)



EXISTING SEWER RISING MAIN



EASEMENT EXTENTS



FENCELINE



EXISTING TREES



PROPOSED ACCESS TRACK

LAST MODIFIED BY / DATE 12:04 AM

REVISIONS

This drawing is confidential and shall only be used for the purposes of this project.				
A	RW	01.12.25	ISSUED FOR CONSTRUCTION	
No.	BY	DATE	DESCRIPTION	APPD

Scale

THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM QUALITY ASSURANCE SYSTEM TO ISO 9001			
DESIGNED	R WHITE	CHECKED	E CASTILLO
DRAWN	R WHITE	CHECKED	E CASTILLO
APPROVED	E CASTILLO	DATE	01.12.25

AECOM

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



EASTERN OUTFALL PRESSURE MAIN REPLACEMENT

LANDSCAPE LEGEND AND NOTES

Status	CONSTRUCTION	Org No.	60691504-36	Rev.	A
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PLANTING SCHEDULE OPTION 1 - CONTAINERISED

LANDSCAPE REVEGETATION MIX 1 (LR01) - GENERAL AREAS - GRASS SPECIES - CONTAINERISED TREATMENT AREA: WITHIN 3M OFFSET OF PIPE							
AREA (m ²)						=	35260
CODE	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	DENSITY (per m2)	MATURE HEIGHT (m)	MATURE SPREAD	QTY
GRASS SPECIES							
ALL sem	<i>Alloteropsis semialata</i>	Black Seed Grass	tubestock	3	1.5	0.5	8815
BOT bla	<i>Bothriochloa bladhii</i>	Forest Bluegrass	tubestock		1.5	0.5	8815
BOT ewa	<i>Bothriochloa ewartiana</i>	Desert Bluegrass	tubestock		0.8	0.5	8815
DIC ser	<i>Dichanthium sericeum</i>	Queensland Bluegrass	tubestock		1	0.5	8815
DIG bro	<i>Digitaria brownii</i>	Cotton Panic Grass	tubestock		1	0.3	8815
HET con	<i>Hetropogon contortus</i>	Black Speargrass	tubestock		1.5	1.5	8815
IMP cyl	<i>Imperata cylindrica</i>	Cogon Grass	tubestock		1.5	0.5	8815
PAN dec	<i>Panicum decompositum</i>	Native Millet	tubestock		1.5	0.5	8815
SAR plu	<i>Sarga plumosum</i>	Plume Sorghum	tubestock		2	1	8815
SET sur	<i>Setaria surgens</i>	Pigeon Grass	tubestock		0.5	1	8815
SPO vir	<i>Sporobolus virginicus</i>	Seashore Dropseed	tubestock		0.5	1	8815
THE tri	<i>Themeda triandra</i>	Kangaroo Grass	tubestock		1.5	0.5	8815
TOTAL						=	105780

LANDSCAPE REVEGETATION MIX 2 (LR02) - OPEN FOREST AREAS - TREE, SHRUB AND GRASS SPECIES - CONTAINERISED TREATMENT AREA: OUTSIDE 3M OFFSET OF PIPE							
AREA (m ²)						=	17877
CODE	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	DENSITY (per m2)	MATURE HEIGHT (m)	MATURE SPREAD (m)	QTY
TREE SPECIES							
ACA cra	<i>Acacia crassicaarpa</i>	Northern Wattle	tubestock	0.02	20	10	20
ACA fla	<i>Acacia flavescens</i>	Red Wattle	tubestock		20	10	20
ALP exc	<i>Alphitonia excelsa</i>	Red Ash	tubestock		20	10	20
CAS cun	<i>Casuarina</i>	River Oak	tubestock		30	10	20
COR cla	<i>Corymbia clarksoniana</i>	Grey Bloodwood	tubestock		20	12	20
COR dal	<i>Corymbia dallachiana</i>	Dallachy's Gum	tubestock		20	10	20
COR tes	<i>Corymbia tessellaris</i>	Moreton Bay Ash	tubestock		30	15	20
CUP ana	<i>Cupaniopsis</i>	Tuckeroo	tubestock		15	10	20
EUC cre	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark	tubestock		30	10	20
EUC pla	<i>Eucalyptus platyphylla</i>	Poplar Gum	tubestock		20	12	20
EUC ter	<i>Eucalyptus tereticomis</i>	Forest Red Gum	tubestock		30	15	20
EXO lat	<i>Exocarpos latifolius</i>	Broad Leaved Ballart	tubestock		8	5	20
MEL dea	<i>Melaleuca dealbata</i>	Blue Paperbark	tubestock		10	6	20
MEL leu	<i>Melaleuca leucadendra</i>	Weeping Paperbark	tubestock		15	8	20
MEL ner	<i>Melaleuca nervosa</i>	Fibrebark	tubestock		8	5	20
MEL vir	<i>Melaleuca viridiflora</i>	Broad-Leaved Paperbark	tubestock		10	6	20
PLA car	<i>Planchonia careya</i>	Cocky Apple	tubestock	10	6	20	
SEN sur	<i>Senna surattensis</i>	Glossy Shower	tubestock	5	4	20	
TOTAL						=	358

SHRUB SPECIES							
ACA hol	<i>Acacia holsericea</i>	Soapbush Wattle	tubestock	0.05	8	4	179
ACA lep	<i>Acacia leptostachya</i>	Townsville Wattle	tubestock		6	4	179
ACA ora	<i>Acacia oraria</i>	Coastal Wattle	tubestock		6	4	179
ACA sim	<i>Acacia simsii</i>	Heathlands Wattle	tubestock		4	3	179
DOD vis	<i>Dodonaea viscosa</i>	Native Hops	tubestock		6	4	179
TOTAL						=	894

GRASS SPECIES							
ALL sem	<i>Alloteropsis semialata</i>	Black Seed Grass	tubestock	3	1.5	0.5	4125
BOT bla	<i>Bothriochloa bladhii</i>	Forest Bluegrass	tubestock		1.5	0.5	4125
BOT ewa	<i>Bothriochloa ewartiana</i>	Desert Bluegrass	tubestock		0.8	0.5	4125
CYM ref	<i>Cymbopogon refractus</i>	Barbed Wire Grass	tubestock		1.2	0.6	4125
DIC ser	<i>Dichanthium sericeum</i>	Queensland Bluegrass	tubestock		1	0.5	4125
DIG bro	<i>Digitaria brownii</i>	Cotton Panic Grass	tubestock		1	0.3	4125
HET con	<i>Hetropogon contortus</i>	Black Speargrass	tubestock		1.5	1.5	4125
IMP cyl	<i>Imperata cylindrica</i>	Cogon Grass	tubestock		1.5	0.5	4125
PAN dec	<i>Panicum decompositum</i>	Native Millet	tubestock		1.5	0.5	4125
SAR plu	<i>Sarga plumosum</i>	Plume Sorghum	tubestock		2	1	4125
SET sur	<i>Setaria surgens</i>	Pigeon Grass	tubestock		0.5	1	4125
SPO vir	<i>Sporobolus virginicus</i>	Seashore Dropseed	tubestock		0.5	1	4125
THE tri	<i>Themeda triandra</i>	Kangaroo Grass	tubestock		1.5	0.5	4125
TOTAL						=	53631

PLANTING SCHEDULE OPTION 2 - SEEDED

LANDSCAPE REVEGETATION MIX 1 (LR01) - GENERAL AREAS - GRASS SPECIES - SEEDED TREATMENT AREA: WITHIN 3M OFFSET OF PIPE - ENVIROSTRAW			
AREA (m ²)		=	35260
CODE	BOTANICAL NAME	COMMON NAME	MINIMUM APPLICATION
TREE SPECIES			
ACA cra	<i>Acacia crassicaarpa</i>	Northern Wattle	3
ACA fla	<i>Acacia flavescens</i>	Red Wattle	3
ALP exc	<i>Alphitonia excelsa</i>	Red Ash	3
CAS cun	<i>Casuarina</i>	River Oak	3
COR cla	<i>Corymbia clarksoniana</i>	Grey Bloodwood	3
COR dal	<i>Corymbia dallachiana</i>	Dallachy's Gum	3
COR tes	<i>Corymbia tessellaris</i>	Moreton Bay Ash	3
CUP ana	<i>Cupaniopsis</i>	Tuckeroo	3
EUC cre	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark	3
EUC pla	<i>Eucalyptus platyphylla</i>	Poplar Gum	3
EUC ter	<i>Eucalytpus tereticomis</i>	Forest Red Gum	3
EXO lat	<i>Exocarpos latifolius</i>	Broad Leaved Ballart	3
MEL dea	<i>Melaleuca dealbata</i>	Blue Paperbark	3
MEL leu	<i>Melaleuca leucadendra</i>	Weeping Paperbark	3
MEL ner	<i>Melaleuca nervosa</i>	Fibrebark	2
MEL vir	<i>Melaleuca viridoflora</i>	Broad-Leaved Paperbark	2
PLA car	<i>Planchonia careya</i>	Cocky Apple	2
SEN sur	<i>Senna surattensis</i>	Glossy Shower	2
TOTAL MINIMUM RATE		=	50
COVER CROP SPECIES			
Apr - Aug	50% Annual Rye and 50% Annual Millet		10g/ha
Sep - Mar	100% Annual Millet		

LANDSCAPE REVEGETATION MIX 2 (LR02) - OPEN FOREST AREAS - TREE, SHRUB AND GRASS SPECIES - SEEDED TREATMENT AREA: OUTSIDE 3M OFFSET OF PIPE - ENVIROSTRAW			
AREA (m ²)		=	17877
CODE	BOTANICAL NAME	COMMON NAME	MINIMUM APPLICATION
TREE SPECIES			
ACA cra	<i>Acacia crassicaarpa</i>	Northern Wattle	0.25
ACA fla	<i>Acacia flavescens</i>	Red Wattle	0.25
ALP exc	<i>Alphitonia excelsa</i>	Red Ash	0.25
CAS cun	<i>Casuarina</i>	River Oak	0.25
COR cla	<i>Corymbia clarksoniana</i>	Grey Bloodwood	0.25
COR dal	<i>Corymbia dallachiana</i>	Dallachy's Gum	0.25
COR tes	<i>Corymbia tessellaris</i>	Moreton Bay Ash	0.25
CUP ana	<i>Cupaniopsis</i>	Tuckeroo	0.25
EUC cre	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark	0.25
EUC pla	<i>Eucalyptus platyphylla</i>	Poplar Gum	0.25
EUC ter	<i>Eucalytpus tereticomis</i>	Forest Red Gum	0.25
EXO lat	<i>Exocarpos latifolius</i>	Broad Leaved Ballart	0.25
MEL dea	<i>Melaleuca dealbata</i>	Blue Paperbark	0.25
MEL leu	<i>Melaleuca leucadendra</i>	Weeping Paperbark	0.25
MEL ner	<i>Melaleuca nervosa</i>	Fibrebark	0.25
MEL vir	<i>Melaleuca viridoflora</i>	Broad-Leaved Paperbark	0.25
PLA car	<i>Planchonia careya</i>	Cocky Apple	0.25
SEN sur	<i>Senna surattensis</i>	Glossy Shower	0.25
SHRUBS AND GROUNDCOVERS			
ACA hol	<i>Acacia holsericea</i>	Soapbush Wattle	2
ACA lep	<i>Acacia leptostachya</i>	Townsville Wattle	2
ACA ora	<i>Acacia oraria</i>	Coastal Wattle	2
ACA sim	<i>Acacia simsii</i>	Heathlands Wattle	3
DOD vis	<i>Dodonaea viscosa</i>	Native Hops	3
ALL sem	<i>Alloteropsis semialata</i>	Black Seed Grass	2
BOT bla	<i>Bothriochloa bladhii</i>	Forest Bluegrass	2
BOT ewa	<i>Bothriochloa ewartiana</i>	Desert Bluegrass	2
CYM ref	<i>Cymbopogon refractus</i>	Barbed Wire Grass	2
DIC ser	<i>Dichanthium sericeum</i>	Queensland Bluegrass	2
DIG bro	<i>Digitaria brownii</i>	Cotton Panic Grass	3
HET con	<i>Hetropogon contortus</i>	Black Speargrass	3
IMP cyl	<i>Imperata cylindrica</i>	Cogon Grass	3
PAN dec	<i>Panicum decompositum</i>	Native Millet	3
SAR plu	<i>Sarga plumosum</i>	Plume Sorghum	3
SET sur	<i>Setaria surgens</i>	Pigeon Grass	3
SPO vir	<i>Sporobolus virginicus</i>	Seashore Dropseed	3
THE tri	<i>Themeda triandra</i>	Kangaroo Grass	3
TOTAL MINIMUM RATE		=	50
COVER CROP SPECIES			
Apr - Aug	50% Annual Rye and 50% Annual Millet		10g/ha
Sep - Mar	100% Annual Millet		

NOTES:

1. SETOUT OF SPECIES IS INTENDED TO MIMIC THE NATURAL ENVIRONMENT. GROUP AND SCATTER INDIVIDUAL AND GROUPINGS OF SPECIES TO ENSURE A RANDOM PATTERN. VARY THE SIZE OF MASSES TO ADJACENT GROUPS. SOME SHOULD BE LONG AND NARROW, SOME SHORT AND WIDE, AND SOME CURVED, BUT ALL SHOULD HAVE AN ORGANIC, RATHER THAN GEOMETRIC SHAPE.
2. WHERE THE PLANTING MIX CONTAINS BOTH LARGE AND SMALL SPECIES, UNLESS OTHERWISE DIRECTED, LOCATE OR BIAS THE USE OF SMALLER SPECIES TOWARDS THE PERIMETER OF THE BED, PAYING PARTICULAR ATTENTION TO PLANTING OFFSETS SO AS TO PROVIDE ADEQUATE SPACE SUCH THAT SPECIES DO NOT ENCR OACH UPON PATHS OR ROADWAYS.

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DRAWN	R WHITE	CHECKED	E CASTILLO
APPROVED	E CASTILLO	DATE	01.12.25



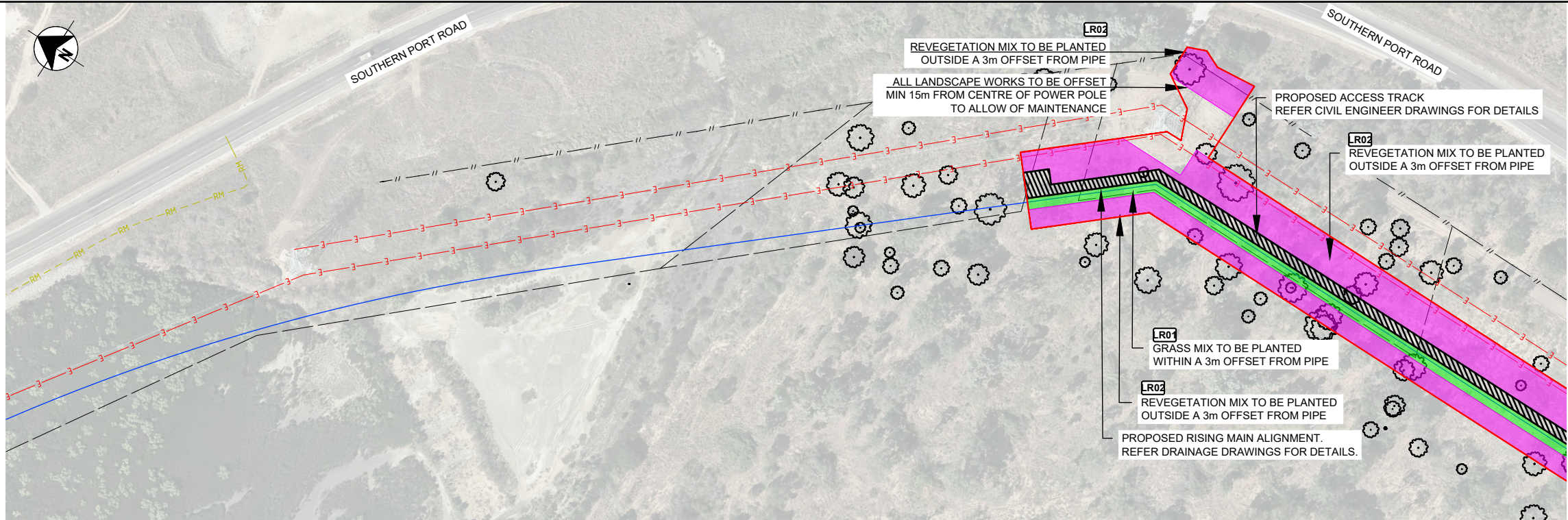
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EASTERN OUTFALL PRESSURE MAIN REPLACEMENT

PLANTING SCHEDULES

Status	CONSTRUCTION	Org No.	60691504-37	Rev.	A
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PLAN

LANDSCAPE LEGEND



LR01

LANDSCAPE REVEGETATION MIX 1 (LR01) - GENERAL AREAS - GRASS SPECIES - CONTAINERISED OR SEEDED TREATMENT AREA: WITHIN 3M OFFSET OF PIPE CENTRELINE

- AMELIORATE SUBSOIL - INCORPORATE AMELIORANT'S AT RATES AS PER THE SPECIFICATION
- ROUGHENING - 50mm DEEP (APPROX.)
- TOPSOIL - 75mm DEEP AMELIORATED TOPSOIL (MINIMUM)
- FERTILISER - INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION
- PLANTING - REFER TO PLANTING SCHEDULE
- FIBRE - 4500kg/ha (MINIMUM) - RELEVANT ONLY IF SEEDING IS PREFERRED
- FINISHED FIBRE DEPTH - 5mm (MINIMUM) - RELEVANT ONLY IF SEEDING IS PREFERRED
- EXTENT - AS SHOWN ON DRAWING WITHIN 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS



LR02

LANDSCAPE REVEGETATION MIX 2 (LR02) - OPEN FOREST AREAS - TREE, SHRUB AND GRASS SPECIES - CONTAINERISED OR SEEDED TREATMENT AREA: OUTSIDE 3M OFFSET OF PIPE CENTRELINE

- AMELIORATE SUBSOIL - INCORPORATE AMELIORANT'S AT RATES AS PER THE SPECIFICATION
- ROUGHENING - 50mm DEEP (APPROX.)
- TOPSOIL - 75mm DEEP AMELIORATED TOPSOIL (MINIMUM)
- FERTILISER - INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION
- FIBRE - 4500kg/ha (MINIMUM) - RELEVANT ONLY IF SEEDING IS PREFERRED
- FINISHED FIBRE DEPTH - 5mm (MINIMUM) - RELEVANT ONLY IF SEEDING IS PREFERRED
- PLANTING - REFER TO PLANTING SCHEDULE
- EXTENT - AS SHOWN ON DRAWING OUTSIDE 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS

GENERAL LEGEND



EXTENT OF WORKS



PROPOSED SEWAGE PRESSURE MAIN



EXISTING ELECTRICAL SERVICE (OVERHEAD)



EXISTING SEWER RISING MAIN



EASEMENT EXTENTS



FENCELINE



EXISTING TREES



PROPOSED ACCESS TRACK

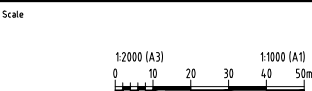
NOTES

- REFER 60691504-36 FOR LANDSCAPE NOTES AND LEGEND.

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APPROVED	E CASTILLO	DATE	01.12.25

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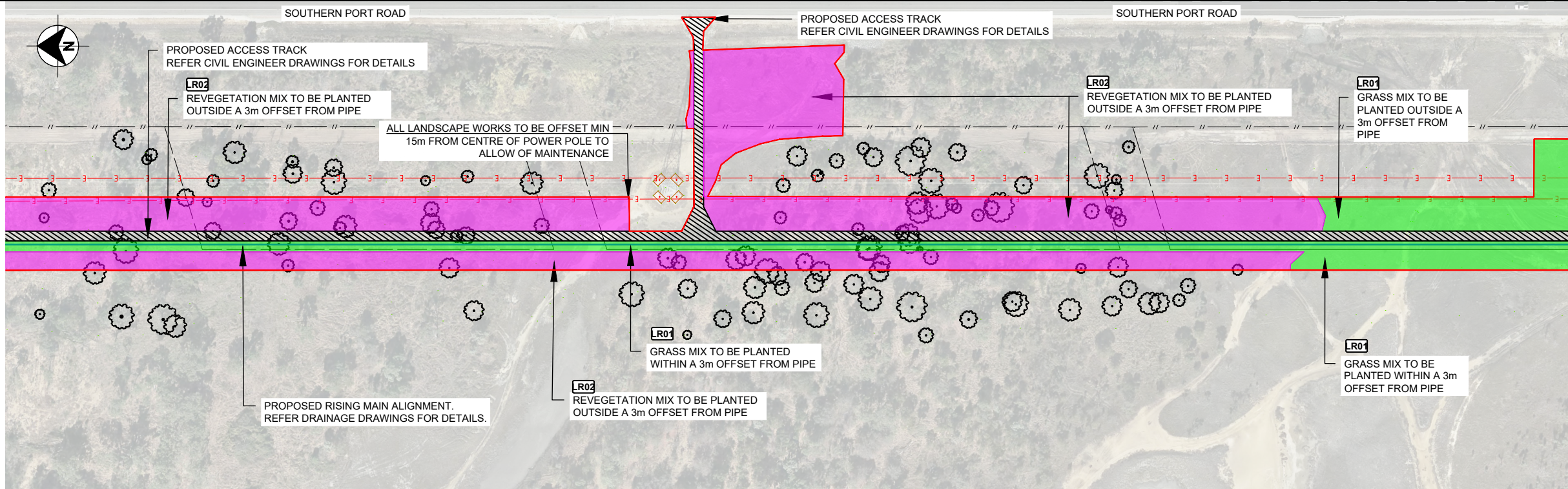
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EASTERN OUTFALL PRESSURE MAIN REPLACEMENT

LANDSCAPE PLANS
SHEET 01 OF 04

Status	CONSTRUCTION	Org No.	60691504-38	Rev.	A
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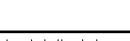
NOTES

- REFER 60691504-36 FOR GENERAL NOTES AND LEGEND.

LANDSCAPE LEGEND

	L.R01	LANDSCAPE REVEGETATION MIX 1 (LR01) – GENERAL AREAS – GRASS SPECIES – CONTAINERISED OR SEEDED TREATMENT AREA: WITHIN 3M OFFSET OF PIPE CENTRELINE	• AMELIORATE SUBSOIL – INCORPORATE AMELIORANT’S AT RATES AS PER THE SPECIFICATION • ROUGHENING – 50mm DEEP (APPROX.) • TOPSOIL – 75mm DEEP AMELIORATED TOPSOIL (MINIMUM) • FERTILISER – INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION • PLANTING – REFER TO PLANTING SCHEDULE • FIBRE – 4500kg/ha (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED • FINISHED FIBRE DEPTH – 5mm (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED • EXTENT – AS SHOWN ON DRAWING WITHIN 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS
	L.R02	LANDSCAPE REVEGETATION MIX 2 (LR02) – OPEN FOREST AREAS – TREE, SHRUB AND GRASS SPECIES – CONTAINERISED OR SEEDED TREATMENT AREA: OUTSIDE 3M OFFSET OF PIPE CENTRELINE	• AMELIORATE SUBSOIL – INCORPORATE AMELIORANT’S AT RATES AS PER THE SPECIFICATION • ROUGHENING – 50mm DEEP (APPROX.) • TOPSOIL – 75mm DEEP AMELIORATED TOPSOIL (MINIMUM) • FERTILISER – INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION • FIBRE – 4500kg/ha (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED • FINISHED FIBRE DEPTH – 5mm (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED • PLANTING – REFER TO PLANTING SCHEDULE • EXTENT – AS SHOWN ON DRAWING OUTSIDE 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS

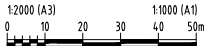
GENERAL LEGEND

	EXTENT OF WORKS
	PROPOSED SEWAGE PRESSURE MAIN
	EXISTING ELECTRICAL SERVICE (OVERHEAD)
	EXISTING SEWER RISING MAIN
	EASEMENT EXTENTS
	FENCELINE
	EXISTING TREES
	PROPOSED ACCESS TRACK

FOR CONSTRUCTION

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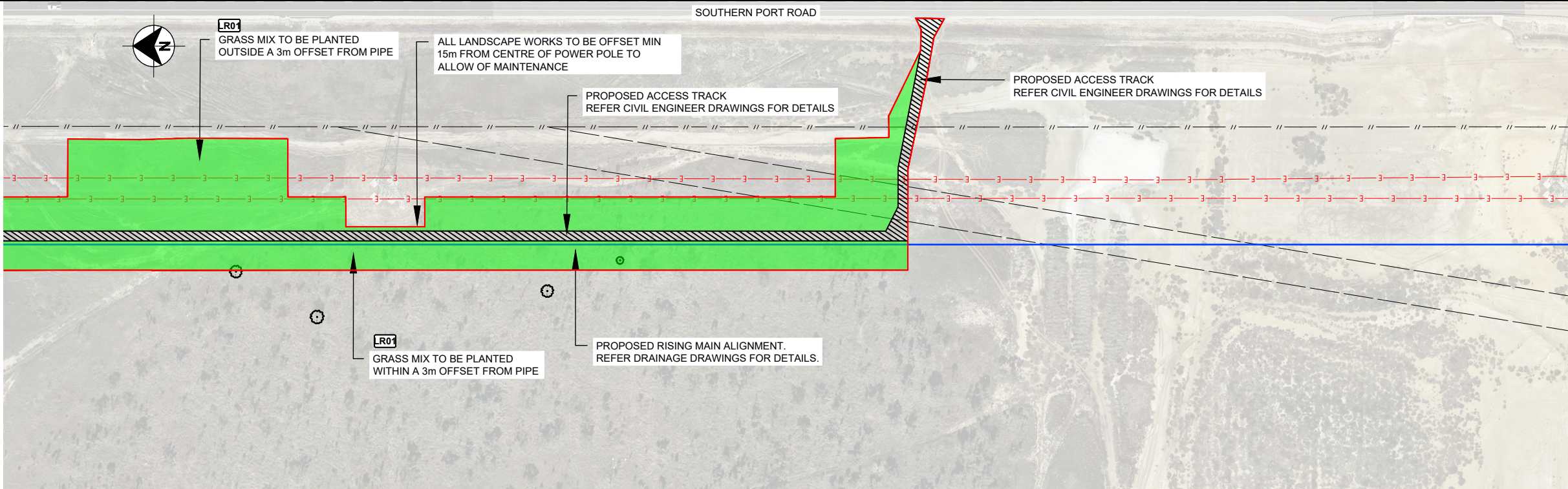
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LANDSCAPE PLANS SHEET 02 OF 04		
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Org No.	60691504-39	



PLAN

LANDSCAPE LEGEND

	LANDSCAPE REVEGETATION MIX 1 (LR01) - GENERAL AREAS - GRASS SPECIES - CONTAINERISED OR SEEDED TREATMENT AREA: WITHIN 3M OFFSET OF PIPE CENTRELINE
	• AMELIORATE SUBSOIL - INCORPORATE AMELIORANT'S AT RATES AS PER THE SPECIFICATION • ROUGHENING - 50mm DEEP (APPROX.) • TOPSOIL - 75mm DEEP AMELIORATED TOPSOIL (MINIMUM) • FERTILISER - INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION • PLANTING - REFER TO PLANTING SCHEDULE • FIBRE - 4500kg/ha (MINIMUM) - RELEVANT ONLY IF SEEDING IS PREFERRED • FINISHED FIBRE DEPTH - 5mm (MINIMUM) - RELEVANT ONLY IF SEEDING IS PREFERRED • EXTENT - AS SHOWN ON DRAWING WITHIN 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS
	LANDSCAPE REVEGETATION MIX 2 (LR02) - OPEN FOREST AREAS - TREE, SHRUB AND GRASS SPECIES - CONTAINERISED OR SEEDED TREATMENT AREA: OUTSIDE 3M OFFSET OF PIPE CENTRELINE
	• AMELIORATE SUBSOIL - INCORPORATE AMELIORANT'S AT RATES AS PER THE SPECIFICATION • ROUGHENING - 50mm DEEP (APPROX.) • TOPSOIL - 75mm DEEP AMELIORATED TOPSOIL (MINIMUM) • FERTILISER - INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION • FIBRE - 4500kg/ha (MINIMUM) - RELEVANT ONLY IF SEEDING IS PREFERRED • FINISHED FIBRE DEPTH - 5mm (MINIMUM) - RELEVANT ONLY IF SEEDING IS PREFERRED • PLANTING - REFER TO PLANTING SCHEDULE • EXTENT - AS SHOWN ON DRAWING OUTSIDE 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS

GENERAL LEGEND

	EXTENT OF WORKS
	PROPOSED SEWAGE PRESSURE MAIN
	EXISTING ELECTRICAL SERVICE (OVERHEAD)
	EXISTING SEWER RISING MAIN
	EASEMENT EXTENTS
	FENCELINE
	EXISTING TREES
	PROPOSED ACCESS TRACK

NOTES

- REFER 60691504-36 FOR GENERAL NOTES AND LEGEND.

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No.	BY	DATE	DESCRIPTION	APPD

Scale



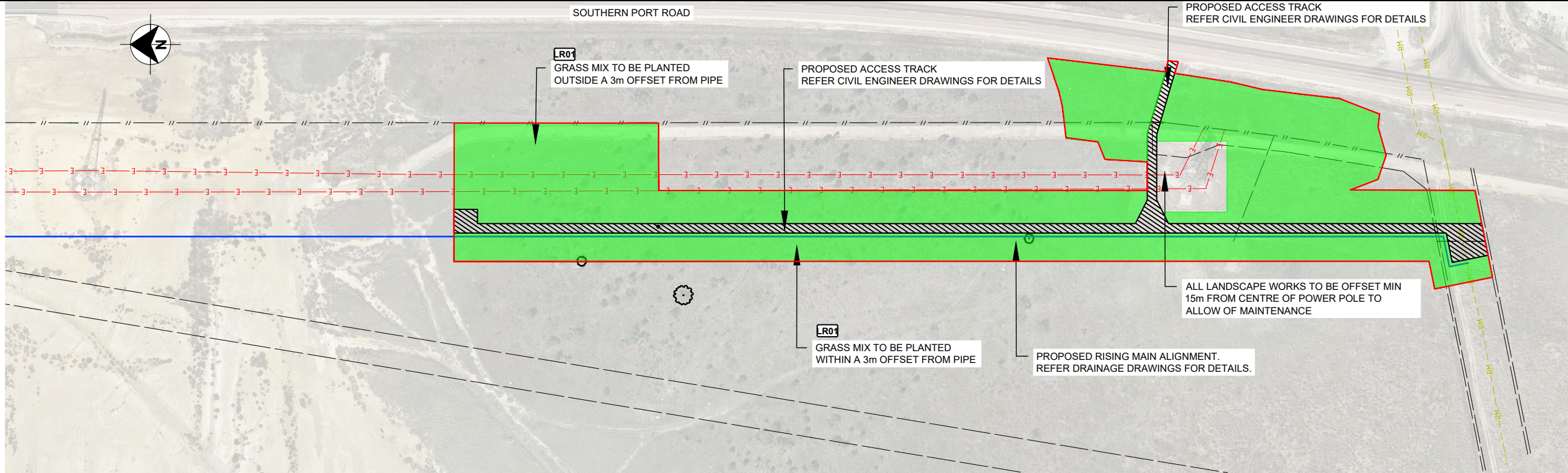
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EASTERN OUTFALL PRESSURE MAIN REPLACEMENT		
LANDSCAPE PLANS SHEET 03 OF 04		
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PLAN

LANDSCAPE LEGEND

	LANDSCAPE REVEGETATION MIX 1 (LR01) – GENERAL AREAS – GRASS SPECIES – CONTAINERISED OR SEEDED TREATMENT AREA: WITHIN 3M OFFSET OF PIPE CENTRELINE
	• AMELIORATE SUBSOIL – INCORPORATE AMELIORANT’S AT RATES AS PER THE SPECIFICATION • ROUGHENING – 50mm DEEP (APPROX.) • TOPSOIL – 75mm DEEP AMELIORATED TOPSOIL (MINIMUM) • FERTILISER – INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION • PLANTING – REFER TO PLANTING SCHEDULE • FIBRE – 4500kg/ha (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED • FINISHED FIBRE DEPTH – 5mm (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED • EXTENT – AS SHOWN ON DRAWING WITHIN 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS
	LANDSCAPE REVEGETATION MIX 2 (LR02) – OPEN FOREST AREAS – TREE, SHRUB AND GRASS SPECIES – CONTAINERISED OR SEEDED TREATMENT AREA: OUTSIDE 3M OFFSET OF PIPE CENTRELINE
	• AMELIORATE SUBSOIL – INCORPORATE AMELIORANT’S AT RATES AS PER THE SPECIFICATION • ROUGHENING – 50mm DEEP (APPROX.) • TOPSOIL – 75mm DEEP AMELIORATED TOPSOIL (MINIMUM) • FERTILISER – INCORPORATE FERTILISER AT RATES AS PER THE SPECIFICATION • FIBRE – 4500kg/ha (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED • FINISHED FIBRE DEPTH – 5mm (MINIMUM) – RELEVANT ONLY IF SEEDING IS PREFERRED • PLANTING – REFER TO PLANTING SCHEDULE • EXTENT – AS SHOWN ON DRAWING OUTSIDE 3M OF PIPE CENTERLINE AND WITHIN THE RELEVANT REGIONAL ECOSYSTEM EXTENTS

GENERAL LEGEND

	EXTENT OF WORKS
	PROPOSED SEWAGE PRESSURE MAIN
	EXISTING ELECTRICAL SERVICE (OVERHEAD)
	EXISTING SEWER RISING MAIN
	EASEMENT EXTENTS
	FENCELINE
	EXISTING TREES
	PROPOSED ACCESS TRACK

NOTES

- REFER 60691504-40 FOR GENERAL NOTES AND LEGEND.

FOR CONSTRUCTION

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EASTERN OUTFALL PRESSURE MAIN REPLACEMENT

LANDSCAPE PLANS
SHEET 04 OF 04

Status	CONSTRUCTION	Org No.	60691504-41	Rev.	A
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Landscape and Revegetation Specification

Eastern Outfall Pressure Main (EOPM) Replacement Project

04-Dec-2025

Eastern Outfall Pressure Main (EOPM) Replacement Project
Spec No. 60691504-TS-LA-REV 0

Specification No.: 60691504-TS-LA-REV 0

Client: Townsville City Council

ABN: 44 7419 920 72

Ref 60691504
Date 04-Dec-2025
Originator Reilly White
Checker/s Enrique Castillo
Verifier/s Enrique Castillo

Revision History

Rev	Revision Date	Details	Approved	
			Name/Position	Signature
0	04-Dec-2025	For submission	Paul Lemcke Technical Director - Water Infrastructure	

Professional Registration

This document includes professional services that require approval from a registered professional.

Registration Scheme	Discipline / Area of Practice	Name of Registered Professional*	Signature	Registration No.	Date
AILA	Landscape Architecture	Enrique Castillo		6066	01/12/2025

* The registered professional must be the originator of this work or have provided direct supervision to the originator.

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1.0 Introduction

1.1 General

This landscape performance specification has been prepared for Townsville City Council (Council) for the Eastern Outfall Pressure Main (EOPM) Replacement Project (the Project). This specification applies to the construction of landscape and revegetation treatments within the extent of works of the Project.

1.2 Project Description

The Project will replace the existing EOPM sewer pipeline that predominantly services Townsville's eastern suburbs. The existing pipeline runs from South Townsville, across the Ross River to the Cleveland Bay Purification Plant (CBPP) and forms a crucial part of the existing Townsville sewerage network. The Project is critical public utility infrastructure that will service continued residential expansion and urban consolidation within the 'Eastern' and 'Western' sewer systems in Townsville.

1.3 Table of Abbreviations

A list of terms, abbreviations and acronyms referred to throughout this report are included in Table 1 below:

Table 1 Acronyms

Terms, Abbreviations & Acronyms	Meaning
AS	Australia Standard
AS/NZS	Australian Standard / New Zealand Standard
CEMP	Construction Contractor's Construction Environmental Management Plan
Clearance	Measurement from the outer edge of a design component, road element to the perimeter of the vegetation's mature canopy.
TMR	Department of Transport and Main Roads
EOPM	Eastern Outfall Pressure Main
ISO	International Organization for Standardization
ITC	Inspection Test Checks
ITP	Inspection Test Plans
MRS	Main Roads Specification
MRTS	Main Roads Technical Specification
PDF	Portable Document Format
PUP	Public Utility Provider
QA	Quality Assurance
RE	Regional Ecosystem types (vegetation)
RPEQ	Registered Professional Engineer of Queensland
Setback	Measurement from outer edge of a design component, road element or object to the centre of the vegetation's trunk
SiD	Safety in Design
Council	Townsville City Council

1.4 Relevant Reference Material and Standards

The following documentation and guidelines were utilised in the preparation of this specification.

Table 2 Reference Material and Standards

Reference	Title
AS 2303	Tree Stock for Landscape Use
AS 4419	Soils for landscaping and garden use
AS 4454	Compost, soil conditioners and mulches

1.5 Design Intent and Summary of Revegetation Treatments

The Project seeks to address optimum revegetation outcomes from a local and state perspective. The key design approach is to create a resilient landscape through the selection of a hardy and robust plant palette which has the ability to be drought tolerant and low maintenance. Plant species' selection and location is to respect the landscape character of the local context and its surrounds. The landscape approach ensures diversity around the planting design through a varied local plant palette of species selected for broad, flat areas.

In areas subject to tidal inundation, particular attention is given to the selection of salt-tolerant and water-resilient species that can thrive under fluctuating saline conditions. These species are chosen based on their proven adaptability to intertidal zones, ensuring long-term viability and ecological function. The planting strategy incorporates hydrological modelling and site-specific tidal data to inform species placement, promoting stability, erosion control, and habitat value. This approach supports the creation of a robust coastal and riparian edge that can withstand periodic flooding, saline intrusion, and other dynamic environmental factors associated with tidal systems.

Two planting mixes have been proposed within the extents. These include:

Landscape Revegetation Mix 1 (LR01) - General Areas - Grass Species - Treatment Area: within 3m offset of pipe

The LR01 mix consists of a diverse combination of trees, shrubs, and groundcovers selected for their ability to thrive in wet soils and tolerate tidal inundation. All species align with the local Regional Ecosystems (REs) to ensure ecological compatibility and resilience. This mix will be planted starting 3 meters from the pipeline's centreline to avoid interference with underground services and will extend to replace existing vegetation where necessary.

Landscape Revegetation Mix 2 (LR02) - Open Forest Areas - Tree, Shrub And Grass Species - Treatment Area: Outside 3m Offset Of Pipe

The LR02 mix is composed exclusively of groundcover species suited to the site's soil conditions and designed for areas where trees and shrubs are not required. This mix will be installed directly over the pipeline and within ecosystems where existing vegetation does not necessitate taller plantings. Its purpose is to stabilize soil, maintain ecological integrity, and provide low-maintenance coverage without compromising infrastructure. Revegetation is to be undertaken progressively as areas become available. Priority should be made to revegetate areas where existing vegetation has been disturbed.

1.5.1 Landform

Civil earthworks have been completed and subgrade has been compacted to reduce runoff and scour potential. The following should be applied to each landscape treatment area:

- LR01 & LR02 – Generally flat areas (shallower than 1:4 grade) will require the following:

Item	Responsibility
Cultivate subsoil/subgrade	Revegetation Contractor
Incorporation of organics (stockpiled mulch with ameliorants)	Revegetation Contractor
Topsoil placement/reinstatement	Revegetation Contractor
Proposed revegetation treatments – Containerised Planting	Revegetation Contractor

1.5.2 Revegetation

Revegetation will be undertaken through the application of containerised planting, with the below tables outlining plant species to be utilised.

The following should be undertaken:

- Weed management is to be undertaken prior to revegetation to treat any listed or undesirable weed species. The Contractor shall outline proposed weed management techniques to be undertaken, noting the sensitivity of the Project Site.
- Contact plant providers to ascertain the availability of species well in advance of commencement of rehabilitation.
- Rehabilitation planting works are to be scheduled during the dry season to maximise establishment success and reduce stress on young plants. As the project aligns with the wet season, sufficient time will be allowed for the wet season to conclude and for natural regrowth to occur where possible, supporting the resilience and integration of new plantings into the existing landscape.

1.5.3 Topsoil

1.5.3.1 Definitions

General: For the purposes of this section the definitions given below apply.

Bad ground: Ground unsuitable for the purposes of the works, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground which is or becomes soft, wet or unstable.

Ameliorated site topsoil: Soil excavated from the site which contains organic matter, supports plant life, conforms generally to the fine to medium texture classification to AS 4419 (loam, silt, clay loam) and meets the minimum amelioration requirements, to be confirmed prior installation and use. Soil must also be free from:

Stones > 25 mm diameter.

Clay lumps > 75 mm diameter.

Weeds and tree roots.

Sticks and rubbish.

Material toxic to plants.

Natural soil: A soil that has been dug from the landscape and is presented for use with no more than minor amendment. This soil could be topsoil, subsoil, or a mixture of both and have a bulk density > 0.7 kg/L.

Organic soil: A general purpose soil (normally an amended natural soil or soil blend) that has:

Bulk density: > 0.6 kg/L.

Organic matter: 15 % to 25 % by mass.

1.5.3.2 Soil Testing and Amelioration

The contractor shall include when tendering the works to undertake soil testing in accordance with AS4419-2003 to all site topsoil for use. For the purposes of tendering the works, contractors should include a Provisional Sum to supply and install topsoil ameliorants by suitable Contractor. In the absence of soil testing results, maximum application rates should be used for each of the below (extracted from DTMR MRTS16 Appendix):

Table 3 Topsoil amelioration rates

Ameliorant	Topsoil – Max. rate
Agricultural lime – CaCO ₃	10kg/m ³
Agricultural dolomite – CaMg (CO ₃) ₂	10kg/m ³
Agricultural gypsum – CaSO ₄ .2H ₂ O	10kg/m ³
Organic soil conditioner – by volume of topsoil	0.2 m ³ /m ³

The Revegetation contractor should allow for undertaking follow-up soil tests to the amended topsoil within 8-12 weeks following completion of the works to confirm soil complies with AS4419, Table 1.

1.5.4 Seeding and EnviroMulch

Seeded revegetation shall be carried out using an approved hydroseeding or broadcast method to ensure uniform coverage and successful establishment. Enviromulch shall be incorporated as a binding agent to stabilize the seed and soil surface, reduce erosion, and improve moisture retention. The application shall achieve a minimum fibre rate of 4,500 kg/ha with a fibre depth of 5 mm across all treated areas. All materials and methods must comply with relevant environmental and project standards, and the contractor shall ensure proper curing and maintenance until vegetation is established.

1.5.5 Plaing Topsoil

1.5.5.1 Cultivation

Cultivate the ground surface in preparation for placing topsoil by ripping to the depth nominated within the landscape plans, to loosen the compacted ground. Do not disturb services or tree roots; if necessary, cultivate these areas by hand. Trim after cultivation to shapes and levels such that the required depth of topsoil can be placed to the specified finished surface levels.

1.5.5.2 Herbicide

After cultivation and before placing topsoil treat the area to be topsoiled with an approved herbicide.

1.5.5.3 Placing

Place topsoil from the site stockpiles to the depths as required. Spread and grade evenly.

1.5.5.4 Surplus

Unless otherwise directed, dispose of surplus topsoil remaining on site by spreading evenly over the areas already placed.

1.5.5.5 Compaction

Lightly compact topsoil so that the finished surface is smooth, free from lumps of soil, at the required level, ready for cultivation and planting.

1.5.5.6 Finishing

Finish topsoil flush with adjacent surfaces. Feather edges into adjoining undisturbed ground.

1.5.6 Regional Ecosystem (RE) mapping

Refer to plant schedules below. Vegetation Communities identified on site based on Regional Ecosystem (RE) Mapping include the following:

- 11.1.1 – Tussock Grassland
- 11.1.2 – Open Succulent Shrubland
- 11.1.4 – Mangrove low open forest and/or woodland on marine clay plains
- 11.2.2 HVR – Low Woodland
- 11.2.5 – Woodland.

1.5.7 Planting Treatments

Containerised planting is proposed in areas subject to tidal inundation to support faster vegetation establishment and improve resilience against environmental stressors such as scour and saline intrusion. This method is particularly suited to locations within low lying areas throughout the Project alignment, where the risk of erosion and water movement is elevated. The use of full native tubes strikes a balance between cost efficiency and rapid establishment, ensuring plants have sufficient root development to withstand tidal fluctuations.

1.5.7.1 Landscape Revegetation Mix 1 (LR01) – General Areas – Grass Species –Treatment Area: Within 3m Offset of Pipe

Full native tube grasses will be planted within 3 m of the pipe centreline alignment and provide a suitable ground cover treatment once established. Limited to grasses only, this will ensure no conflicts with the proposed sewer pipeline.

LANDSCAPE REVEGETATION MIX 1 (LR01) - GENERAL AREAS - GRASS SPECIES - TREATMENT AREA: WITHIN 3M OFFSET OF PIPE							
CODE	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	DENSITY (per m2)	MATURE HEIGHT (m)	MATURE SPREAD (m)	QTY
GRASS SPECIES							
ALL sem	<i>Alloteropsis semialata</i>	Black Seed Grass	Tubestock	4	1.5	0.5	
BOT bla	<i>Bothriochloa bladhii</i>	Forest Bluegrass			1.5	0.5	
BOT ewa	<i>Bothriochloa ewartiana</i>	Desert Bluegrass			0.8	0.5	
DIC ser	<i>Dichanthium sericeum</i>	Queensland Bluegrass			1	0.5	
DIG bro	<i>Digitaria brownii</i>	Cotton Panic Grass			1	0.3	
HET con	<i>Hetropogon contortus</i>	Black Speargrass			1.5	1.5	
IMP cyl	<i>Imperata cylindrica</i>	Cogon Grass			1.5	0.5	
PAN dec	<i>Panicum decompositum</i>	Native Millet			1.5	0.5	
SAR plu	<i>Sarga plumosum</i>	Plume Sorghum			2	1	
SET sur	<i>Setaria surgens</i>	Pigeon Grass			0.5	1	
SPO vir	<i>Sporobolus virginicus</i>	Seashore Dropseed			0.5	1	
THE tri	<i>Themeda triandra</i>	Kangaroo Grass			1.5	0.5	

1.5.7.2 Landscape Revegetation Mix 1 (LR01) – Open Forest Areas – Tree, Shrub and Grass Species – Treatment Area: Outside 3m Offset of Pipe

Species in this mix have been chosen for their ability to cope with both wet and dry conditions and where the Project alignment will be exposed to tidal inundation in the wet season. This includes both grass, shrub and tree species to assist with stabilising the corridor.

LANDSCAPE REVEGETATION MIX 2 (LR02) - OPEN FOREST AREAS - TREE, SHRUB AND GRASS SPECIES - TREATMENT AREA: OUTSIDE 3M OFFSET OF PIPE							
CODE	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	DENSITY (per m2)	MATURE HEIGHT (m)	MATURE SPREAD (m)	QTY
TREE SPECIES							
ACA cra	Acacia crassicarpa	Northern Wattle	Tubestock	2	20	10	
ACA fla	Acacia flavescens	Red Wattle			20	10	
ALP exc	Alphitonia excelsa	Red Ash			20	10	
CAS cun	Casuarina cunninghamiana	River Oak			30	10	
COR cla	Corymbia clarksoniana	Grey Bloodwood			20	12	
COR dal	Corymbia dallachiana	Dallachy's Gum			20	10	
COR tes	Corymbia tessellaris	Moreton Bay Ash			30	15	
CUP ana	Cupaniopsis anacardioides	Tuckeroo			15	10	
EUC cre	Eucalyptus crebra	Narrow-leaved Ironbark			30	10	
EUC pla	Eucalyptus platyphylla	Poplar Gum			20	12	
EUC ter	Eucalyptus tereticomis	Forest Red Gum			30	15	
EXO lat	Exocarpos latifolius	Broad Leaved Ballart			8	5	
MEL dea	Melaleuca dealbata	Blue Paperbark			10	6	
MEL leu	Melaleuca leucadendra	Weeping Paperbark			15	8	
MEL ner	Melaleuca nervosa	Fibrebark			8	5	
MEL vir	Melaleuca viridiflora	Broad-Leaved Paperbark			10	6	
PLA car	Planchonia careya	Cocky Apple			10	6	
SEN sur	Senna surattensis	Glossy Shower			5	4	
SHRUB SPECIES							
ACA hol	Acacia holsericea	Soapbush Wattle	Tubestock	3	8	4	
ACA lep	Acacia leptostachya	Townsville Wattle			6	4	
ACA ora	Acacia oraria	Coastal Wattle			6	4	
ACA sim	Acacia simsii	Heathlands Wattle			4	3	
DOD vis	Dodonaea viscosa	Native Hops			6	4	
GRASS SPECIES							
ALL sem	Alloteropsis semialata	Black Seed Grass	Tubestock	4	1.5	0.5	
BOT bla	Bothriochloa bladhii	Forest Bluegrass			1.5	0.5	
BOT ewa	Bothriochloa ewartiana	Desert Bluegrass			0.8	0.5	
CYM ref	Cymbopogon refractus	Barbed Wire Grass			1.2	0.6	
DIC ser	Dichanthium sericeum	Queensland Bluegrass			1	0.5	
DIG bro	Digitaria brownii	Cotton Panic Grass			1	0.3	
HET con	Hetropogon contortus	Black Speargrass			1.5	1.5	
IMP cyl	Imperata cylindrica	Cogon Grass			1.5	0.5	
PAN dec	Panicum decompositum	Native Millet			1.5	0.5	
SAR plu	Sarga plumosum	Plume Sorghum			2	1	
SET sur	Setaria surgens	Pigeon Grass			0.5	1	
SPO vir	Sporobolus virginicus	Seashore Dropseed			0.5	1	
THE tri	Themeda triandra	Kangaroo Grass			1.5	0.5	

1.5.8 Mulch

1.5.8.1 General:

Provide mulch which is free of deleterious and extraneous matter such as soil, weeds and sticks. Mulch materials should be spread evenly throughout the whole planting bed; shrubs and groundcovers, to a depth no less than 100 mm.

Standard: To AS 4454.

Mulch is to be certified as weed free by supplier. Certification and sample to be provided prior to installation for approval by the landscape architect.

Organic mulches: Free of stones.

Site mulches: Double tub-ground mulch.

1.5.8.2 Placing mulch

General: Place mulch to the required depth, clear of plant stems. Spread and roll mulch so that after settling it is smooth and evenly graded between design surface levels sloped towards the base of plant stems, and not closer to the stem than 50 mm. Mulch all trees located within grass areas with a mulch ring to base of tree, as indicated within the landscape documentation. Ensure trunk is clear of mulch.

In mass planted areas: Place after the preparation of the planting bed but before planting and other work.

1.5.8.3 Warranty

Prior to installing mulch, provide a warranty to the Superintendent that the material has been tested in accordance with Appendix K of AS 4454 – Method for Determination of Nitrogen Drawdown Index, and shall not have a nitrogen draw down effect on the planted areas to which it is placed.

1.5.9 Tree Guards

1.5.9.1 Type:

'Mallee Flute'. Dimensions 600 mm x 200 mm sides (Product code TSCOR6020)

1.5.9.2 Fixing

Fixed using 11x38 mm rectangular hardwood stake.

1.5.9.3 Supplier

Arboregreen (or approved equivalent by Superintendent).

1.5.10 Establishment and maintenance

1.5.10.1 General

Maintain and establish the contact area during the required period as noted in the Contract.

1.5.10.2 Plant Establishment and Maintenance

The Plant Establishment Period is the time subsequent to Practical Completion during which the Contractor has specific responsibilities for the maintenance and establishment of the plant material.

At the end of the Plant Establishment Period, all plant material shall be in good health and have grown at a rate deemed acceptable by the Landscape Superintendent. Plants shall be capable of independent growth.

1.5.10.3 During Establishment and Maintenance Period

During the Plant Establishment and/or Maintenance Period, the Contractor will be required to replace plants deemed by the Superintendent or Superintendent's Representative to be stressed or deteriorating. Replacement plants will be of the same species and of an equivalent size to that of the specified plant size in the contract after the stipulated establishment growth period has occurred. Replacement costs will be at the contractor's expense.

1.5.10.4 Completion of Establishment and Maintenance Period

At the end of the Plant Establishment and/or Maintenance Period, the Contractor will be required to replace plants deemed by the Superintendent to have shown insignificant signs of growth. Replacement plants will be of the same species and of an equivalent size to that of the specified plant size in the contract after the stipulated establishment growth period has occurred. Replacement costs will be at the contractor's expense.

1.5.10.5 Planting

Ensure the general appearance and presentation of the landscape and the quality of plant material at the date of practical completion is maintained for the full planting establishment period.

Existing plant material: Maintain existing planting and grass within the landscape contract area as specified for the corresponding classifications of new planting.

Replacements: Replace failed, dead and/or damaged plants at maximum 3-week intervals as necessary throughout the full plant establishment period.

1.5.10.6 Fertilising

Soil tests: Take samples from planting beds and conduct tests.

Fertilising: Base the fertilisation program on the soil testing results. Generally apply an all-purpose fertiliser of N:P:K (nitrogen:phosphorus:potassium) 10:4:6 at recommended rates. Alternatively apply 12 month slow release fertiliser (such as Nutricote) at the manufacturer's recommended rate.

1.5.10.7 Insect and disease control

Responsibility for insect and disease control: Contractor

Period for treatment: Until the problem has been eliminated.

Chemical spray: Apply within working hours in low wind conditions.

1.5.11 Watering

1.5.11.1 Establishment

Water quality:

- pH between 5.5 and 7.5.
- Total soluble salts less than 1000 mg/litre.
- No substances that would be toxic to plant growth.

Watering program: As per DTMR's Standard watering rate applications for BFM Hydromulch and tubestock plant as per MRTS16 minimum watering schedule and watering rates of Table 9.1.1.1(a) and Table 9.1.1.1(b).

Water restrictions: Coordinate the water supply and confirm the watering regime against State and Territory legislation and restrictions at the time.

2.0 Preliminaries

2.1 Extent of Work

The work to be performed under this Contract comprises the provision of materials, plant and labour and the performance of all operations of whatever kind necessary for the complete and proper construction of the Works associated with the Project as indicated in this specification and associated landscape and revegetation drawings.

Works under the Contract (WuC) are for construction of landscape and revegetation works, as defined, and include but are not limited to:

- Notification of all appropriate property owners adjoining the Works in accordance with the Principal's Communication protocol, access protocol and in association with the relevant Communications Manager.
- Setting out the works.
- Site establishment and de-establishment
- Completion of the works to the specified requirements
- Submission of detailed methodologies, work method statements, contingency plans, inspection test plans (ITP) and inspection test checks (ITC) for all WuC.
- Services location, potholing, and survey pickup of existing services within the construction area and confirm adequate clearances between the existing services and the proposed works.
- Dilapidation survey pre and post construction.
- Disposal offsite of excess excavated material (if required).
- Management of land holders and their assets including access tracks
- Final restoration of ground surfaces and final site clean-up
- Final survey and preparation of handover documentation.

2.2 Storage on site

Storage of plant, equipment, and laydown areas for materials on site shall be subject to approval by the Superintendent.

The Contractor shall prepare and maintain a site plan for the site showing locations and outlines of revegetation area, laydown/storage area, materials stockpile, site offices and temporary access routes within the construction area and submit to the Superintendent for approval. The Contractor will update and resubmit the site plan to the Superintendent as the site conditions change.

2.3 Disposal of surplus excavated material

Any surplus excavated material is to be disposed of by the Contractor at locations agreed with Townsville City Council and the Superintendent.

2.4 Construction standard of work

Where applicable, all construction works shall be carried out in accordance with the latest version of the Technical Specification, Drawings and the applicable Australian Standards and Codes.

Use referenced documents which are the editions, with amendments, current 3 months before the closing date for tenders, except where other editions or amendments are required by statutory authorities.

The Contractor is fully responsible for choosing the appropriate plant, equipment and work methods for the purpose and environment for which they are to be used. The Contractor shall be fully responsible for the construction and supervision of the works and ensure acceptable work practices are used.

2.5 Protection of the environment

2.5.1 General requirements

The Contractor shall prepare a Construction Environmental Management Plan (CEMP) to cover all site construction works and submit to the Superintendent for approval.

The Contractor's CEMP shall comply with the following documents provided by the Principal:

- Cultural Heritage Management Agreement (CHMA) between Townsville City Council and the Bindal People #2.

The Contractor is to fully inform themselves with all requirements detailed in the Project's environmental and planning reporting and conditions of approval. Should the Contractor wish to depart from these requirements, they shall be required to undertake all associated environmental approvals required for the departure.

The Contractor must:

- obtain, keep current and comply with the requirements of any environmental licenses, permits or authorities required under legislative requirements in relation to WuC;
 - identify all potential sources of and take all reasonable care to minimise waste and prevent pollution;
 - undertake a safety and environmental risk assessment for the WUC and provide these to the Superintendent;
 - report all incidents of environmental contamination or disturbance to the Superintendent within 12 hours of the occurrence of such an event;
 - instruct all personnel in relevant environmental procedures prior to any WUC being undertaken by those personnel;
 - nominate a competent employee to act as an environmental officer for the Contract;
 - exercise due diligence in all activities carried out on behalf of the Principal;
 - take all other reasonable steps to prevent the occurrence of any environmental damage or pollution, including noise pollution, as a result of the carrying out of the WUC;
 - undertake, and ensure that its personnel undertake the Principal's environmental induction training prior to the commencement of WUC if directed to do so by the Superintendent;
 - rectify and make good at its own cost any loss or damage caused as a result of the Contractor's failure to comply with its obligations under this clause; and
 - In the event of any inconsistency, ambiguity, discrepancy or conflict between any of the standards or obligations of the Contractor or its personnel, promptly notify the Superintendent of the inconsistency, ambiguity, discrepancy or conflict, and, unless otherwise directed by the Superintendent, adopt the higher or more onerous standard or obligation.
 - unless directed otherwise by the Superintendent, monitor and review the Contractor's CEMP:
 - at weekly intervals during the carrying out of the WuC;
 - at monthly intervals during the first quarter of the defect liability period; and
 - at quarterly intervals until the issuing of a final certificate;
1. reviews the overall environmental management process;
 2. provides recommendations in relation to the need for any further monitoring;
 3. provides recommendations in relation to any changes to the environmental management process;
 - a. provide a copy of any document produced or obtained by the Contractor in connection with this subclause to the Principal or Superintendent on request.

The Contractor's CEMP must:

1. at a minimum, be consistent with the Contract and demonstrate how the Contractor will comply with its obligations.
2. where relevant, address:
 - a. management of stockpiles;
 - b. water management;
 - c. revegetation;
 - d. erosion and sediment control plan;
 - e. acid sulphate soils;
 - f. waste management;
 - g. air and noise quality management; and
 - h. applying for, gaining and maintaining all approvals, permits and licenses required under the Contract.

2.5.2 Dust suppression

It is the responsibility of the Contractor to ensure dust suppression is controlled over the whole route of the works in accordance with the CEMP and to the satisfaction of the Superintendent.

The following measures, where applicable, are to be conducted to minimise this risk to the environment:

- Spraying of earthwork formations and roads with water or other suitable liquids approved by the Superintendent.
- Removal of mud from the wheels and bodies of equipment before it enters public roads or other sealed pavements.
- Establishment of suitable cover crop or provision of other covering over topsoil stockpiles.
- Erection of dust screens around and/or spraying of stockpiles with suitable stabilising agents.
- Stopping dust generating activities which cannot be adequately controlled by water or other means.
- Transportation of materials which are suitably covered and loaded in a manner that will prevent dropping of materials.
- Maintaining dust control equipment so that this equipment is available when required, including periods of dust generating activities or high wind speed.

2.5.3 Diverting water (including “dewatering”)

The Contractor shall do all work necessary to divert any water interfering with the progress of the works, keep the excavations free from water while the works are in progress, and prevent any damage to the works by water due to floods or other causes. The Contractor shall provide, where considered necessary by the Superintendent, sand traps on the discharge line of any drainage pump to prevent the deposit of material in channels and stormwater drains.

Where water is diverted from the site it shall be confined to existing drainage paths and away from adjacent private property.

All costs associated with the above shall be included as part of the Contractors Lump Sum price.

2.5.4 Flora and Fauna

The Contractor shall make every practicable effort to prevent the spread of weeds.

The Contractor must make the appropriate notifications and acquire the appropriate permits or approvals prior to clearing vegetation. Native flora shall only be cleared by the Contractor if necessary for the works, and, if a permit/license is in place, shall take place under the requirements set by the permit/license.

Before any land clearing commences, and if requested by the Superintendent, the contractor shall arrange for a vegetation and fauna survey to be conducted at the site. Prior to commencement of land clearing, records of the survey report shall be provided to the Superintendent.

The Contractor shall minimise disturbance and injury of native fauna. If any native fauna is injured the Contractor must notify the Superintendent and lodge an incident report. All injured native wildlife shall be taken to a vet or carer.

Costs incurred for relocating any wildlife or treatment by a professional are to be incurred by the Contractor.

2.6 Water

2.6.1 Sources

The Contractor is responsible for supplying its own construction water and potable water (if required), including all associated costs for supply, treatment and management.

2.7 Restoration

2.7.1 General

All surfaces shall be restored in such a manner that they conform generally with the levels, grades, and type of surface material existing before the work was commenced. Restored surfaces shall be maintained in such a way as to avoid any hazard or inconvenience.

The Contractor shall, from time to time, as required, provide, and place any pavement material, topsoil and other material that may be necessary to make good any subsidence and shall ensure that the restored surfaces are maintained throughout the duration of the Contract in conformity with the level of the adjoining surfaces to allow the safe and convenient passage of traffic.

All restoration work shall be to the satisfaction of the Superintendent. Initial cleaning up shall be carried out as soon as work is complete, and restoration shall be completed (excluding maintenance) within 28 days after each area of work is complete.

The Contractor will be responsible for maintaining all erosion and sediment control devices and repair any erosion or remove any sediment build up within the works corridor for a 3-month period following Practical Completion of the works.

2.7.2 Land Generally

For general land areas of the site, the top 75 mm of backfilling shall be carried out with topsoil material approved by the Superintendent as equivalent to that removed. Where, in the opinion of the Superintendent, the organic content of the backfill material is not equivalent to that removed, then an imported topsoil to the approval of the Superintendent shall be used for backfill.

2.7.3 As-Constructed Documents

As-constructed drawings shall include submission of an updated vegetation and planting plan.

All As-Constructed plans and documents shall include details of any variations or approved amendments made during the contract and include site directions, service locations, variations, hidden works and the like. Further to this where an as-built condition requires a drawing to be amended then all related drawings influenced by this amendment shall be similarly amended.

Once completed, a draft copy of the As-constructed drawings shall be submitted to the Superintendent for approval. The Contractor shall provide one electronic copy of each drawing in PDF format for this purpose. Any changes shall be duly executed and resubmitted for approval.

Once approved, the as-constructed drawings prepared pursuant to the requirements of this Contract, shall be clearly marked "As-Constructed drawing" and signed by the Contractor adjacent to the title block. These shall be delivered to the Superintendent in both PDF and AutoCAD 2016 format.

Should it be found subsequent to the issue of the Certificate of Practical Completion that the Contractor has failed to amend all or some of the drawings as required above, then the Superintendent at his discretion may proceed to have the necessary amendments carried out without further reference to the Contractor. All costs associated with obtaining information and carrying out these amendments will be deducted from any monies otherwise owing to the Contractor under the terms of this Contract.

2.7.4 Maintenance and call out during Defects Liability Period

The Contractor shall inspect, monitor, and maintain the works throughout the Defects Liability Period. All damage, subsidence or deterioration of the revegetated areas shall be made good to the satisfaction of the Superintendent, including but not limited to:

- Sediment and erosion control
- Tubestock mortality
- Weed identification and management
- Any subsidence or depressions
- Any erosion, undermining or scouring of Ross River / Creek crossing embankments and water course / water way crossings
- The Contractor shall respond to call outs during the Defects Liability Period.

2.8 Weeds and Seed Protection and Vehicle Wash Downs

The Contractor shall make provisions to ensure that weeds are not introduced or transferred across private properties as part of the Contractor's CEMP. The Contractor shall provide construction vehicle wash down facilities, along with inspection regimes to prevent weed contamination.

Washdown locations shall not be located within 200 m of a watercourse/waterway in accordance with the environmental reports and plans and such facility locations will be required to be confirmed on site by the Contractor at the time of construction.

All declared weed plants within the Project area shall be treated in accordance with the CEMP.

The Contractor shall use clean-down procedures shall be in accordance with the Queensland Department of Primary Industries requirements.

https://www.daf.qld.gov.au/__data/assets/pdf_file/0011/58178/cleandown-procedures.pdf

2.9 Access by Council

During replanting efforts, the Contractor shall ensure that access to Project corridor is maintained and available for Council operations and maintenance staff.

Access to the site will be required for Council (or Council's representatives) in order for various construction management tasks to be undertaken, such as, quality assurance and verifications inspections, responding to RFI's and other requirements.