Review of Environmental Factors

Mullumbimby Trunk Water Main

Prepared for Byron Shire Council
By Planit Consulting Pty Ltd

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Executive Summary

This Review of Environmental Factors (REF) has been prepared to consider potential environmental effects for the proposed emergency water trunk main extension to be undertaken by Byron Shire Council (BSC) to service the Mullumbimby area.

The general locality of the works is Mullumbimby, with the eastern extent of the works linking into the coastal suburb of Brunswick Heads.

Mullumbimby and Brunswick Heads are situated on the Far North Coast of NSW within the BSC Local Government Area.

The primary objective of the proposal is to ensure that the emergency trunk main has the capacity to service the 2046 planning horizon network demands for Mullumbimby's reticulated water supply.

The secondary objective of the proposal is to minimise all environmental impacts associated with the works.

Development consent is not required for the proposed water reticulation system in accordance with Division 24 (water supply systems) and clause 2.159 (1) of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&ISEPP). The proposal becomes an 'activity' for the purposes of Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This environmental assessment has been prepared in accordance with Clause 171 of the *Environmental Planning and Assessment Regulation 2021* (the Regulations) and indicates that the activity is not likely to present significant risk to environmental, cultural, and human values.

During the construction phase potential short term impacts will occur affecting private property, local traffic, and the local noise environment. Appropriate traffic management control will ensure minimal disruption to traffic movements, and private property access and noise impacts will be managed through ongoing consultation with affected landowners.

The design alignment has been selected to minimise impacts on native vegetation. The methodology also includes bridge crossing of waterways to avoid direct instream impacts and minimise potential impacts to water quality. The activity crosses areas mapped as being prone to acid sulfate soils (ASS) and the works will require preparation of an acid sulfate soil management plan to support construction activities.

The works traverse in places land and waters owned and managed by Crown Lands. Bundjalung of Byron Bay Corporation (Arakwal) hold Native Title rights and interests in these lands and waters pursuant to Federal Court determination NCD2019/001. BSC will need to ensure compliance with the requirements of the *Crown Lands Management Act 2016* (NSW) and the *Native Title Act 1994* (Cth).

The following ancillary approvals are required prior to undertaking the works:

- The activity will be strapped to the Azalea Street bridge over Mullumbimby Creek within the Habitat Protection Zone of the Cape Byron Marine Park (CBMP); prior to undertaking works a permit is required in accordance with Section 1.16 of the *Marine Estate Management (Management Rules) Regulation 1999*.
- Licenses from Crown Lands authorising construction of the works will be required where the activity occurs on, under or over lands or waters owned by Crown Lands.
- BSC will have to satisfy itself prior to commencement of the works that the requirements of the *Crown Lands Management Act 2016* (NSW) and the *Native Title Act 1994* (Cth) have been satisfied.
- Prior to undertaking works within the road reserves of Mullumbimby Road (regional classified road), BSC shall gain concurrence from TfNSW under Section 138 of the *Roads Act 1993*.
- The activity requires placement of water mains within the rail corridor and application and approval through UGL Regional Linx Pty Ltd to address works within the Country Regional Network (CRN) rail corridor including:

- As outlined in the TfNSW Standard Service Installations within the Rail Corridor applications for the installation of non-rail infrastructure services on the rail corridor shall be made through the Rail Corridor Management Group (RCMG) TfNSW. Subject to meeting all engineering and configuration requirements and reaching a satisfactory agreement, the RCMG then advises the applicant whether approval is granted to proceed with the installation of the service. Site work within or near the rail corridor shall not be undertaken unless written permission is received from TfNSW via the RCMG.
- In accordance with the Rail Safety National Law National Regulations 2012, all external parties must apply for a Rail Access and Works for permission to perform works within or in the vicinity of rail infrastructure.

A construction environmental management plan (CEMP) is required to be prepared prior to undertaking construction and is to include all safeguards outlined under this REF.

The following consultation and notification are also required for the activity:

- The works traverse in places land and waters owned and managed by Crown Lands. Bundjalung of Byron Bay Corporation (Arakwal) hold Native Title rights and interests in these lands and waters pursuant to Federal Court determination NCD2019/001. BSC will need to ensure compliance with the requirements of the *Crown Lands Management Act 2016* (NSW) and the *Native Title Act 1994* (Cth);
- Notification of all receivers within 100 m of the works (letterbox drop or equivalent) including the anticipated duration of such works at least two weeks prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/ updates associated with the proposed works;
- Any private property adjustments (e.g. fencing or driveways) required to enable the works will be negotiated with the affected landholders prior to undertaking the works;
- The activity will occur across the Cape Byron Marine Park (CBMP) and the provisions under the *Marine Estate Management Act 2014* (MEM Act) are relevant. Notification is required in accordance with Section 56 of the MEM Act. CBMP were contacted in November 2022 regarding the Activity and have requested a copy of the REF prior to providing further advice or approvals on the Activity under section 56(3) of the MEM Act; and
- Traffic delay notifications will be issued by BSC at least two weeks prior to commencement of works. Notification will be made via BSC website, media notification and portable variable messages sign (VMS) located along the applicable public road network.

The activity has a capital investment value of $5.5 million and does not require approval/permits listed under Clause 171 4 (b) of the *Environmental Planning and Assessment Regulation 2021*. BSC is therefore required to publish the REF on the BSC Website.

Overall, no significant impacts are anticipated, and a variety of safeguards have been developed to avoid and/ or minimise potential negative impacts. Together with the identified mitigation methods under this report, these safeguards will ensure appropriate environmental outcomes are achieved when undertaking the proposed activity.

1 Introduction

This REF has been prepared by Planit Consulting Pty Ltd on behalf of BSC to consider potential environmental effects of the proposed emergency water trunk main extension to be undertaken by BSC to service the Mullumbimby area.

The extent of emergency water trunk main extension works proposed includes:

- Area of works:
  - New dedicated DN400 HDPE water main within the road reserve of Tandy's Lane between Pacific Highway and Gulgan Road
  - New dedicated DN400 HDPE water main within the road reserve from Mullumbimby Road to Azalea Street Reservoirs
  - Installation of Booster Pump Station and Bypass at Azalea Street reservoir site
  - Minor water main upgrades at Left Bank Road/Tristran Road intersection including DN150 water main and sluice valves

- Additional work areas of interest:
  - The proposed trunk water main alignment includes two creek crossings, Mullumbimby Creek at Azalea Street and Saltwater Creek at Myokum Street. The water main pipe will be strapped to the Azalea Street bridge over Mullumbimby Creek and also strapped to a new pipe bridge over Saltwater Creek.
  - Construction (underboring) of the water main through the Byron Shire Council office site and library carpark in Station Street, Mullumbimby.
  - Construction (underboring) of the water main across the existing railway corridor and APA electrical mains.
  - Construction (underboring) of the water main along Jubilee Avenue.
  - Construction (trenching) of the water main adjacent to residential and commercial premises.
  - Construction of the water main across Lot 392 DP724577 (Crown Land), Lot 187 DP 728514 (Crown Land) and Mullumbimby Creek (Crown Waterway) subject to a Native Title Claim NCD2019/001 - Bundjalung People of Byron Bay #3.

- Construction specifications:
  - 1350mm deep trench (approx. 600-800mm wide).
  - 135mm trench base lining (crusher dust).
  - 400mm (DN400) HDPE pipe.
  - 800mm soil cover over water main pipe.

The environmental assessment and determination of the proposal has been undertaken in accordance with Part 5 of the EP&A Act. For this proposal, BSC is both a public authority proponent (EP&A Act s5.3) and the determining authority (EP&A Act s. 5.1). The REF has been prepared in accordance with Clause 171 of the Regulations.

Documentation supporting this REF includes:

- Appendix A - Engineering Designs
- Appendix B - Mullumbimby Trunk Water Main Assessment and Options Report
- Appendix C – Biodiversity Assessment Report
- Appendix D – Environmental Searches

1.1 Project Location and Context

The general locality of the activity area is Mullumbimby with the eastern extent of the activity linking into the coastal suburb of Brunswick Heads.

Mullumbimby and Brunswick Heads are situated on the Far North Coast of NSW within the Byron Shire Local Government Area.

The proposed works are primarily located within public road reserves including the Gulgan Road, Tandys Lane, Mullumbimby Road, King Street, Ann Street, Station Street, Stuart Street, Fern Street, Myokum Street, Jubilee Avenue, Azalea Street, Reservoir Road and Left Bank Road. The proposed water reticulation systems also traverse land outside the public road corridor including Lot 23 DP 1002810 and Lot 2 DP 1121508 (rail corridor), Lot 2 DP 1227659 (BSC Operational Land), Lot 392 DP724577 (Crown Land), Lot 187 DP 728514 (Crown Land), Lot 1 DP 342369 (BSC Operational Land),

The eastern extent of the proposed works along Tandy's Lane adjoins rural residential properties located between Gulgan Road and the Pacific Highway. The works also occur within the township of Mullumbimby adjoining low rise residential properties. Lot 1 DP 342369 (BSC Operational Land) features the existing water reservoirs.

The proposed emergency water trunk main extension alignment traverses land that is mapped as being flood prone under the Byron Shire Council online mapping and North Byron Floodplain Risk Management Study and Plan (refer to Figure 1-1). This generally relates to areas of the activity alignment within the Mullumbimby township between Mullumbimby Road and Azalea Street.

The activity traverses Mullumbimby Creek and Saltwater Creek. Mullumbimby Creek is mapped key fish habitat under the *Fisheries Management Act 1994* (FM Act). The activity area does not traverse any areas mapped Coastal Wetlands or Littoral Rainforest under the State Environmental Planning Policy (Resilience and Hazards) 2021. Mullumbimby Creek within the alignment of the activity also forms part of the Cape Byron Marine Park (CBMP).

Topographic levels vary across the activity area. The proposed alignment along Tandys Lane is undulating with a variation in levels between approximately 10m AHD and 30m AHD. The areas of the activity alignment within the Mullumbimby township between Mullumbimby Road and Azalea Street is relatively flat with a range in levels of approximately 2m AHD and 4m AHD. The section of the proposed emergency water trunk main extension alignment from the Azalea Street Reservoir to the Mullumbimby Creek has a variation in levels of 50m AHD (Reservoir site) and 2m AHD.

Review of NSW eSPADE online mapping identifies that activity area intercepts the Billinudgel and Mullumbimby soil landscapes. The Billinudgel soil landscapes occurs within the Tandys Lane area and elevated section of the proposed alignment between the Azalea Street Reservoir and Mullumbimby Creek with remaining areas of the activity mapped Mullumbimby soil landscape. The limitations of the Billinudgel soil landscapes includes hard setting, shallow, stony and erodible soils of low fertility. Steep slopes and localised mass movement. The limitation of the Mullumbimby soil landscape includes flood hazard, localised seasonal waterlogging and moderately erodible soil materials with high shrink-swell. The ePlanning Spatial Viewer identifies that the activity area is mapped as being prone to acid sulfate soil (refer to Figure 1-2).

Review of BSC online mapping identifies that there are no cattle dip sites or registered contaminated land within the activity alignment. The EPA contaminated lands register identifies no registered contamination sites within the activity area. The nearest registered site is a former dip site located adjacent to Tandys Lane within Lot 1 DP449630 (refer to Figure 1-3).

The activity alignment includes areas of vegetation mapped high environmental value under BSC online mapping (refer to Figure 1-4 and Figure 1-5). Review of the Byron Shire Council online mapping confirms the site is free of any Koala Habitat mapped under the Byron Coast Comprehensive Koala Plan of Management. Sections of the activity area is mapped as being bush fire prone land (refer to Figure 1-6). The alignment has been carefully designed to minimise vegetation impacts.

The activity is located within the Bundjalung People of Byron Bay Native Title NDC2019/001 Determination Area. Review of the Native Title register and Native Title Vision identifies that Native Title rights and interests continue on the three Crown Land parcels and Mullumbimby Creek (refer to Figure 1-7).

The works are located within the boundary of the Tweed Byron Local Aboriginal Land Council.

Search of the AHIMS database identified no Aboriginal sites/objects recorded within the alignment of the activity.

Searches of the NSW State Heritage Inventory Register, Australian Heritage database and LEP Maps confirm that the site does not include items of State or National heritage significance. The activity area traverses the LEP mapped heritage conservation area (refer to Figure 1-8).

Figure 1-1 Flood mapping

(Source: BSC Online mapping, 2024)

Figure 1-2 ASS mapping

(Source: NSW ePlanning spatial viewer, 2024)

Figure 1-3 Cattle Dip Site mapping (former dip site marked red)

(Source: BSC Online mapping, 2024)

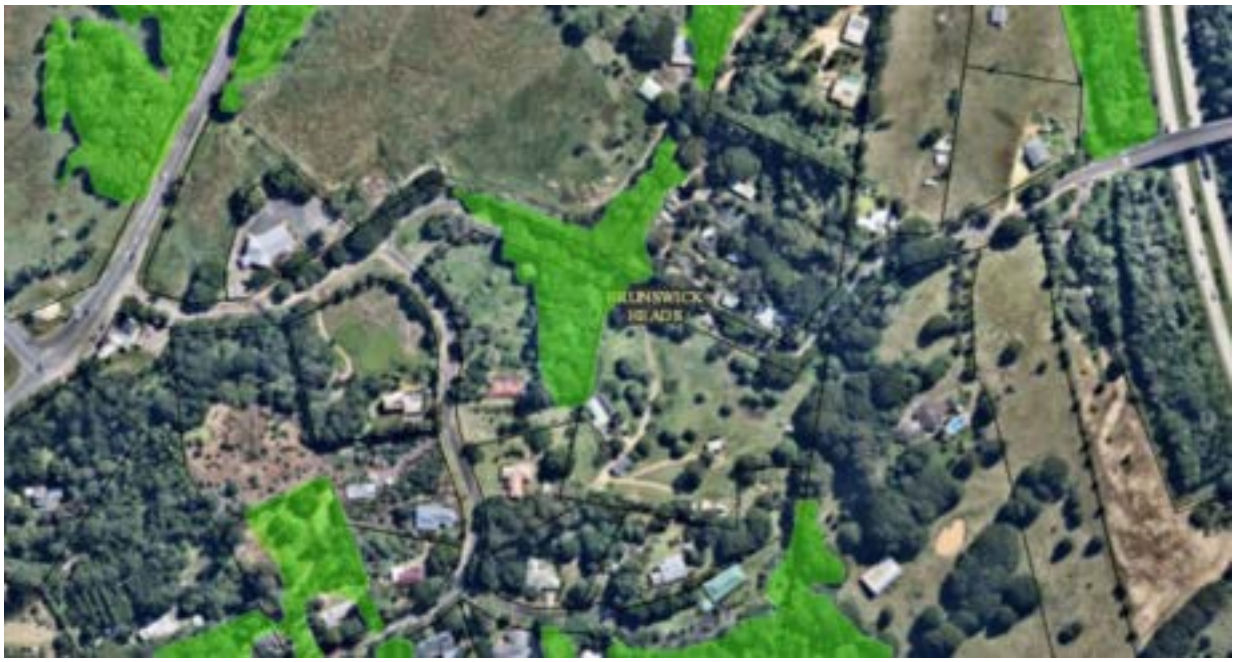

Figure 1-4 BSC vegetation community mapping

(Source: BSC Online mapping, 2024)

Figure 1-5 BSC vegetation community mapping

(Source: BSC Online mapping, 2024)

Figure 1-6 Bushfire Prone Land mapping

(Source: NSW ePlanning spatial viewer, 2024)

Figure 1-7 NCD2019/001 Bundjalung People of Byron Bay #3 (claim area light brown)

(Source: NSW Minview, 2024)

Figure 1-8 Heritage Mapping

(Source: NSW ePlanning spatial viewer, 2024)

1.2 Project Need, Objectives and Options

Planit Consulting prepared a Mullumbimby Trunk Water Main Assessment in March of 2022 focusing on the hydraulic capacity analysis of the water main network and Mullumbimby Trunk Water Supply Options Report in May 2022 focusing on the preferred alignment of the trunk main through the Mullumbimby township.

Mullumbimby Trunk Water Main Assessment and Mullumbimby Trunk Water Supply Options Report is provided at Appendix B.

As identified within the Mullumbimby Trunk Water Main Assessment, the existing water mains to Azalea Street Reservoir from the Rous County Council main through Tandy's Lane/Gulgan Road from the Rous County Council main at Pacific Highway have insufficient capacity to cater for the 2046 planning horizon network demands without water supply from the Wilsons Creek Water Treatment Plant.

Matters impacting the 2046 planning horizon includes catering for future population growth, Mullumbimby Water Treatment Plant supply interruptions due to heavy rain and flow on turbidity impacts, resilience during drought conditions, flood impacts, and fire water supply, all of which will pose an increase on the network demand within the area. Subsequently, Planit has been requested by BSC to maintain the existing DN250 PVC trunk water main in Mullumbimby Road. The hydraulic modelling identified that 300mm mains are required between the Azalea Street reservoir and the 375mm Rous County Council trunk main located at the Pacific Highway.

Hydraulic modelling simulations indicated that theoretically there would still be a loss in storage of the Azalea Street reservoir from approximately 70% to 55%, however once the section of DN250 PVC main is replaced with a minimum internal diameter of 300mm pipework, the Azalea Street reservoirs are able to be refilled during a peak day event in 2046. To ensure the proposed mains had sufficient capacity a HDPE100 DN400 SDR11 PN16 (internal diameter 326mm) was agreed with Council as this provides improved construction outcomes from underboring.

The hydraulic modelling also investigated the servicing of the Left Bank reservoir from the Azalea Street Reservoir rather than the Wilsons Creek Water Treatment Plant. The hydraulic modelling identified that a booster pump station would be required be installed at the Azalea Street reservoir site and that provided there was water storage in the Azalea Street reservoir the Left Bank reservoir could fill during a peak day event in 2046.

The primary objective of the proposal is to ensure that the emergency trunk main has the capacity to service the 2046 planning horizon network demands for Mullumbimby's reticulated water supply.

The secondary objective of the activity is to minimise all environmental impacts associated with the activity.

2 Proposed Activity

2.1 Scope of Works

The extent of the emergency water trunk main extension works proposed includes:

- Area of works:
  - New dedicated DN400 HDPE water main within the road reserve of Tandy's Lane between Pacific Highway and Gulgan Road
  - New dedicated DN400 HDPE water main within the road reserve from Mullumbimby Road to Azalea Street Reservoirs
  - Installation of Booster Pump Station and Bypass at Azalea Street reservoir site
  - Minor water main upgrades at Left Bank Road/Tristran Road intersection including DN150 water main and sluice valves

- Additional work areas of interest:
  - The proposed trunk water main alignment includes two creek crossings, Mullumbimby Creek at Azalea Street and Saltwater Creek at Myokum Street. The water main pipe will be strapped to the Azalea Street bridge over Mullumbimby Creek and also strapped to a new pipe bridge over Saltwater Creek.
  - Construction (underboring) of the water main through the Byron Shire Council office site and library carpark in Station Street, Mullumbimby.
  - Construction (underboring) of the water main across the existing railway corridor and APA electrical mains.
  - Construction (underboring) of the water main along Jubilee Avenue.
  - Construction (trenching) of the water main adjacent to residential and commercial premises.
  - Construction of the water main across Lot 392 DP724577 (Crown Land), Lot 187 DP 728514 (Crown Land) and Mullumbimby Creek (Crown Waterway) subject to a Native Title Claim NCD2019/001 - Bundjalung People of Byron Bay #3.

- Construction specifications:
  - 1350mm deep trench (approx. 600-800mm wide).
  - 135mm trench base lining (crusher dust).
  - 400mm (DN400) HDPE pipe.
  - 800mm soil cover over water main pipe.

The proposed emergency water trunk main extension alignment is illustrated in Figure 2-1 to Figure 2-4. The complete engineering plans are provided in Appendix A. An overview of the scope of works required for the activity is presented in Table 2-1.

Table 2-1 - Scope of Works

Stage	Details / Requirements
Preconstruction	• Consultation with adjoining and affected landowners • BSC to satisfy itself prior to commencement of the works that the requirements of the *Crown Lands Management Act 2016 (NSW)* and the *Native Title Act 1994 (Cth)* have been satisfied. • Gain ancillary approvals from Marine Parks and TfNSW • Completion of Detailed Construction Plans • Preparation of Construction Environmental Management Plan (CEMP), incorporating recommendations from this REF

Stage	Details / Requirements
	• Install traffic management controls along affected section of the public road • Install sediment and erosion controls • Establish temporary fencing and exclusions zone fencing • Flag specific trees to be protected and avoided • Establishment of ancillary sites including satellite site compounds and stockpile areas • Publish REF on BSC Website
Construction	• Maintain access to private properties during construction • Construction of a new dedicated DN400 HDPE main along Tandy Lane between Pacific Highway and Gulgan Road • Construction of a new dedicated DN400 HDPE main from Mullumbimby Road to Azalea Street Reservoirs • Installation of Booster Pump Station and Bypass at Azalea Street reservoir site including minor stormwater adjustments • Minor water main upgrades at Left Bank Road/Tristran Road intersection • Adjust and reinstate private property access and fencing as required. • Trenching the water mains across the alignment other than: - Strapped to Azalea Street bridge over Mullumbimby Creek - Strapped to a new pipe bridge over Saltwater Creek. The bridge will comprise two concrete piles either side of the waterway connected by a steel beam to which the trunk water main pipe will be attached. - Underbore the railway corridor and Byron Shire Council office site and library carpark.
Disestablishment, Clean up and Offset Planting	• Reinstate road pavements, property access and fencing as required upon completion of works. • Replace topsoil to stabilise land surfaces that have been impacted as a result of the construction phase • Provide grass to all disturbed areas post earthworks as soon as possible • Remove traffic management controls • Site clean-up

2.2 Machinery and Equipment

Works will be undertaken using machinery such as:

- Tip Trucks;
- Excavators;
- Concrete mixing trucks;
- Track loader/Bobcat;
- Backhoe;
- Compaction equipment;
- Directional drilling/underboring equipment; and
- Traffic Control equipment (automated and manned), incl. signage, barriers, bollards.

2.3 Work Methodology

Construction activities would be guided by a CEMP to ensure work is carried out to specifications within the specified work area. Detailed work methodologies would be identified by the construction contractor. The staging of construction would be sequenced to complete construction within the minimum possible timeframe, while always maintaining traffic flow along Avenue Road.

The construction period for the activity is expected to take approximately twelve months pending weather conditions.

Construction working hours will be limited to the following:

- 7 am to 6 pm Monday to Friday;
- 8 am to 1 pm Saturdays; and
- No works would be undertaken on Sundays or Public Holidays.

Works may be undertaken outside these hours where:

- The delivery of materials is required outside these hours;
- It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm;
- Variation is approved in advance in writing by the Regulatory Authority; and
- Residents likely to be affected by the works are notified in writing of the timing and duration of these works at least 24 hours prior to the commencement of works (except for emergency work).

2.4 Ancillary Facilities

The proposed activity will require temporary ancillary facilities to support construction of the water supply infrastructure.

Small satellite compounds will be located within the road reserves or Council owned land/facilities. The satellite compounds will include laydown areas for equipment and materials, construction staff waste closet, excavated material stockpiling and vehicle parking. These satellite compounds will be temporary and relocated as the works areas progress along the alignment.

Larger temporary ancillary facilities may also be established with BSC managed land to support the activity construction.

The locations of the ancillary facilities will be subject to agreement between BSC and the appointed contractor and must meet the following key criteria:

- Within existing clear areas with no additional tree removal or clearing permitted.
- Not located within drainage lines or within 10m of a waterway.
- Located within Council owned land/facilities or Council managed road reserve.

Materials excavated for the emergency water trunk main extension installation will be managed in accordance with an ASS Management Plan and used to backfill trenching activities across the alignment.

Excess spoil to be disposed offsite from the proposed works will need to be classified pursuant to the EPA Waste Classification Guidelines. Relevant permits may need to be obtained for such waste in accordance with the POEO Act 1997 and the relevant guidelines.

2.5 Traffic Management

Where works occur next to live traffic a Traffic Control Plan (TCP) shall be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW. Licensed traffic controllers will assist with traffic control during construction.

Traffic delay notifications will be issued by BSC at least two weeks prior to commencement of works. Notification will be made via BSC website, media notification and potable variable messages sign (VMS) located along the applicable public road network.

2.6 ASS Management

The activity will require trenching and underboring within areas identified as being prone to ASS. An ASS management plan shall be prepared with consideration of the Acid Sulfate Soils Manual published by Acid Sulfate Soils Management Advisory Committee

2.7 Tree Removal

The alignment of the trunk water main has been carefully designed to avoid vegetation impacts and conflicts with existing services, such that the majority of the alignment is located within cleared verge areas of the road reserve. However, eight (8) trees will require removal, including seven (7) native species and one (1) exotic species including:

- Three (3) Weeping Bottlebrush (Melaleuca viminalis),
- One (1) Bangalow Palm (Archontophoenix cunninghamiana),
- One (1) Hoop Pine (Araucaria cunninghamii),
- One (1) Wheel of Fire (Stenocarpus sinuatus),
- One (1) Silky Oak (Grevillea robusta); and
- One (1) Golden Shower Tree (Cassia fistula).

The water main will be strapped to the bridge over Mullumbimby Creek alongside existing pipes, The new pipe bridge over Saltwater Creek will comprise two concrete piles either side of the waterway connected by a steel beam to which the trunk water main pipe will be attached. The bridge will require removal of weed species and one juvenile Hoop Pine (Araucaria cunninghamii). Consequently, the activity will not have a significant impact on waterways or riparian vegetation.

During construction phase there is also potential for tree trimming and additional minor tree removal to occur as a result of detailed design or to facilitate construction.

The following works may be undertaken to facilitate construction of the activity:

- Minor tree pruning undertaken with supervision of a qualified arborist ensuring the tree health is maintained;
- No tree removal permitted for trees of heritage value;
- Minor tree removal providing that prior to removal:
    - A qualified ecologist has assessed the impact of the tree removal within a biodiversity assessment to confirm the significance of the impact on biodiversity in accordance with a test of significance under the *Biodiversity Conservation Act 2016* and the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*.
    - The biodiversity assessment has confirmed that there will not be a significant impact on biodiversity under the *Biodiversity Conservation Act 2016* and the provisions of the Environment Protection and Biodiversity Conservation Act 1999 in regard to the additional tree loss and with consideration of the biodiversity impacts outlined within this REF
    - Tree loss is offset generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity.
    - The biodiversity assessment is signed off by BSC and appended to the REF forming part of the planning approval for the activity.

2.8 Ancillary Approvals

The following ancillary approvals must be gained prior to undertaking the activity:

- The activity will require placement of a watermain within the Habitat Protection Zone (Mullumbimby Creek) of the Cape Byron Marine Park (CBMP); prior to undertaking works a permit is required in accordance with Section 1.16 of the *Marine Estate Management (Management Rules) Regulation 1999.* Any additional safeguards issued by CBMP will also be incorporated into the activity.
- Licenses from Crown Lands authorising construction of the works will be required where the activity occurs on, under or over lands or waters owned by Crown Lands.
- BSC will have to satisfy itself prior to commencement of the works that the requirements of the *Crown Lands Management Act 2016 (NSW)* and the *Native Title Act 1994 (Cth)* have been satisfied.
- Mullumbimby Road is classified a Regional Road and BSC is the relevant delegated roads authority under the Roads Act 1993. BSC is required to consult with and gain concurrence of TfNSW prior to undertaking works in accordance with 138 (2) and (3) of the Roads Act 1993
- The activity requires placement of emergency water trunk main extension within the rail corridor and application and approval through UGL Regional Linx Pty Ltd to address works within the Country Regional Network (CRN) rail corridor including:
  - As outlined in the TfNSW Standard Service Installations within the Rail Corridor applications for the installation of non-rail infrastructure services on the rail corridor shall be made through the Rail Corridor Management Group (RCMG) TfNSW. Subject to meeting all engineering and configuration requirements and reaching a satisfactory agreement, the RCMG then advises the applicant whether approval is granted to proceed with the installation of the service. Site work within or near the rail corridor shall not be undertaken unless written permission is received from TfNSW via the RCMG.
  - In accordance with the Rail Safety National Law National Regulations 2012, all external parties must apply for a Rail Access and Works for permission to perform works within or in the vicinity of rail infrastructure.

Figure 2-1 Proposed emergency water trunk main extension – Line 01 Tandy's Lane

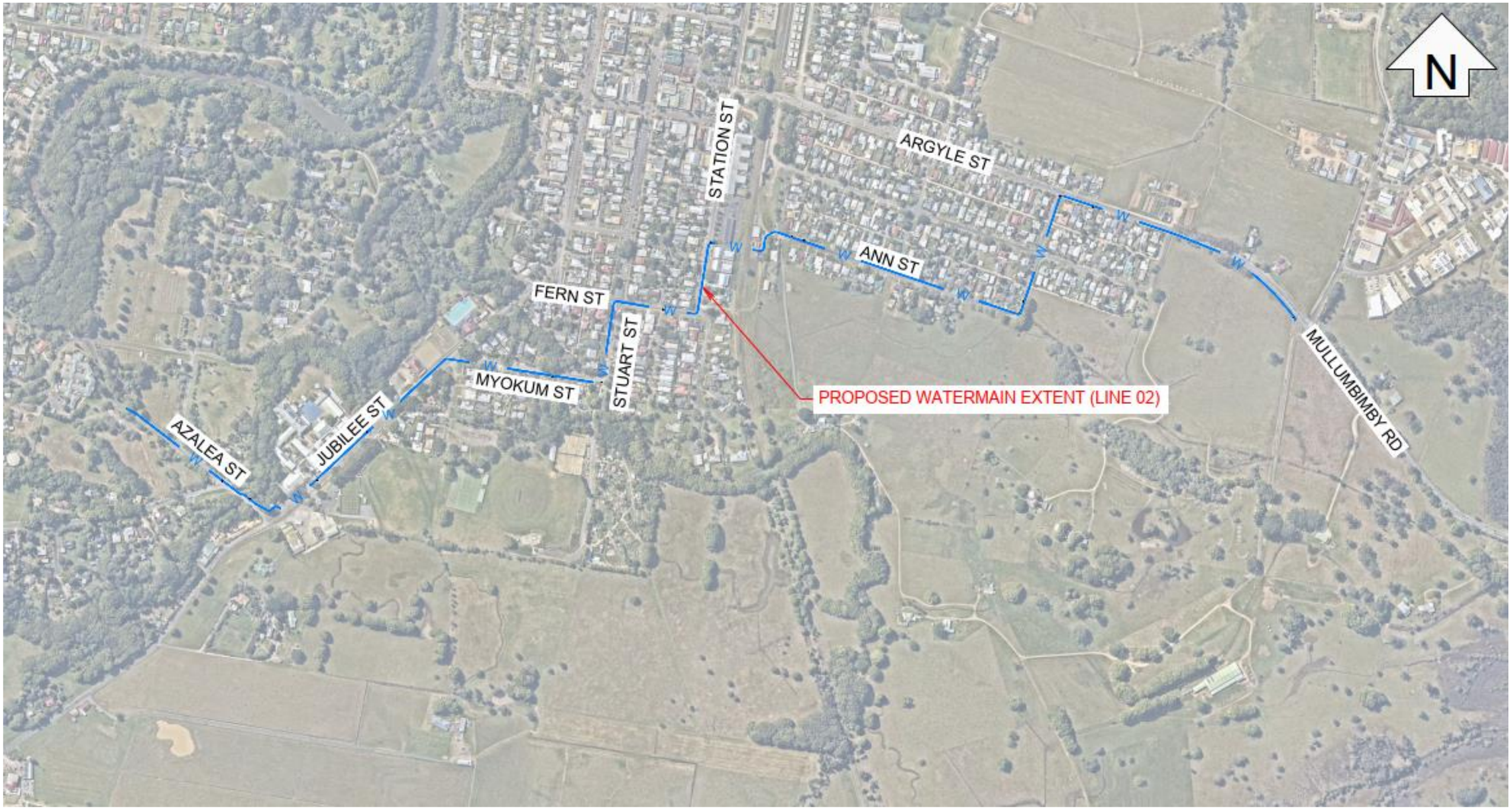

Figure 2-2 Proposed emergency water trunk main extension – Line 02 Mullumbimby

Figure 2-3 Proposed emergency water trunk main extension – Line 03 Reservoir

Figure 2-4 Proposed emergency water trunk main extension – Line 04 Left Bank Road

3 Existing Environment and Impact Assessment

3.1 Landform, Geology and Soils

3.1.1 Existing Environment

A range of different topographic levels are experienced along the activity alignment. The proposed alignment along Tandy's Lane is undulating with a variation in levels between approximately 10m AHD and 30m AHD. The areas of the activity alignment within the Mullumbimby township between Mullumbimby Road and Azalea Street is relatively flat with a range in levels of approximately 2m AHD and 4m AHD. The section of the proposed emergency water trunk main extension alignment from the Azalea Street Reservoir to the Mullumbimby Creek has a variation in levels of 50m AHD (Reservoir site) and 2m AHD.

Review of the NSW eSPADE Mapping database identifies that the activity intercepts the Billinudgel and Mullumbimby soil landscapes as outlined at Table 3-1.

Table 3-1 Soil landscapes from NSW eSPADE mapping

General location	Soil type	Soil limitations
Tandys Lane area and elevated section of the proposed alignment between the Azalea Street Reservoir and Mullumbimby Creek	**Billinudgel**	Billinudgel soil landscapes includes hardsetting, shallow, stony and erodible soils of low fertility. Steep slopes and localised mass movement.
The remaining areas of the activity	**Mullumbimby**	Mullumbimby soil landscape includes flood hazard, localised seasonal waterlogging and moderately erodible soil materials with high shrink-swell.

The ePlanning Spatial Viewer identifies that the activity area is mapped as being prone to acid sulfate soils Class 3 and 4.

3.1.2 Impact Assessment

Earthworks associated water main trenching, underboring, Booster Pump Station installation and reinstatement of land would result in minor change to the topography of the land. This change is not considered to create any significant negative impacts on existing topography.

There is risk however from erosion and sedimentation because of the ground disturbance. Given there are watercourses (Mullumbimby Creek and Saltwater Creek) that intersects the activity area, the proposed works therefore present a (manageable) risk to the watercourses from erosion and sedimentation, noting the construction methodology has been designed to minimise impacts to water quality of the key fish habitat waterway.

The water main pipe will be strapped to the Azalea Street bridge over Mullumbimby Creek and also strapped to a new pipe bridge over Saltwater Creek. The new pipe bridge over Saltwater Creek will comprise two concrete piles either side of the waterway connected by a steel beam to which the trunk water main pipe will be attached.

All disturbed areas will be backfilled, landscaped and/or sealed as appropriate following the installation of the water reticulation infrastructure.

The erection of the new Booster Pump Station will need to consider the specific subsoil conditions and appropriate foundations required for the structure. Geotechnical investigation is recommended to support the detailed design of the structure.

The following safeguards are recommended to prevent, minimise, and mitigate the potential impacts of the activity on Landform, Geology and Soils.

Does the activity involve the disturbance of large areas (e.g. >2ha) for earthworks?	Yes	☒	No	☐
Does the site have constraints for erosion and sedimentation controls such as steep gradients or narrow corridors?	Yes	☒	No	☐
Is the activity footprint in or nearby a highly sloping landform?	Yes	☒	No	☐
Are there any sensitive receiving environments that are in or nearby the likely activity footprint or that would likely receive stormwater discharge from the activity?	Yes	☒	No	☐

Landform, Geology and Soils - Recommended Safeguards:

- *Further geotechnical investigation is recommended to support erection of the new Booster Pump Station including consideration of specific subsoil conditions and appropriate foundations required for the structure.*
- *Site management will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book (4th Edition) on erosion and sediment control and Safe Work Australia 'Excavation Code of Practice (March 2015).*
- *Overburden will be placed in the form of a bund upslope of the site where necessary to reduce surface water entering the construction areas.*
- *All erosion and silt control devices will be visually inspected weekly and before forecast rain events to ensure effectiveness as well as after each rainfall event.*
- *Excavated areas will be stabilised as soon as possible.*

3.2 Contaminated Land and Acid Sulfate Soils

3.2.1 Existing Environment

A search of the NSW Environment Protection Authority's (EPA) Contaminated Lands Register was undertaken returning no results for the proposed activity area.

Review of BSC online mapping identifies that there are no cattle dip sites or registered contaminated land within the activity alignment. The nearest registered site is a former dip site located adjacent to Tandys Lane within Lot 1 DP449630.

Contamination database searches are provided at Appendix D.

The ePlanning Spatial Viewer identifies that the activity area is mapped as being prone to acid sulfate soils Class 3 and 4.

3.2.2 Impact Assessment

Considering the existing environment, exposure of contaminated soils is low. Any potential that contamination may be present, would be associated with surrounding agricultural practices and possible illegal dumping. If contaminated soils are to be present on site, the possibility of exposing and dispersing these soils could be a result of excavation activities and earthworks.

The works have potential for disturbance of acid sulfate soils to enable the emergency water trunk main extension construction requiring the preparation and implementation of an acid sulfate soil management plan (ASSMP). This is within the same locations as the watercourses (Mullumbimby Creek and Saltwater Creek) that intersects the activity area; therefore, implementation of the ASSMP is critical to the protection of water quality of the waterway.

The following safeguards are recommended to prevent any adverse impacts on the surrounding environment.

Is there any evidence within or nearby the likely footprint of potential contamination?	Yes	☒	No	☐
Are there any known occurrences of salinity or acid sulfate soils in the area?	Yes	☒	No	☐

Contaminated Land and Acid Sulfate Soils - Recommended Safeguards:

- *Works are to be managed in accordance with an Acid Sulfate Soils Management Plan, to manage risks associated with exposure of actual and/or potential acid sulfate material. The plan shall be prepared prior to construction with consideration of the Acid Sulfate Soils Manual published by Acid Sulfate Soils Management Advisory Committee.*
- *Spill kits maintained onsite during the construction period and employees trained how to use spill kits.*
- *CEMP is to contain suitable unexpected finds protocols and waste handling procedures for managing contaminated soils. This should include, as a minimum:*
  - *Works to proceed with caution and cease immediately if any potential source of contamination are encountered during development, then works should be halted until confirmation of the presence of contamination is undertaken. In instances where contamination is confirmed, remediation in accordance with a Council approved Remediation Action Plan would be required.*
  - *Excess spoil to be disposed offsite from the proposed works will need to be classified pursuant to the EPA Waste Classification Guidelines. Relevant permits may need to be obtained for such waste in accordance with the POEO Act 1997 and the relevant guidelines.*

3.3 Water Quality and Hydrology

3.3.1 Existing Environment

The proposed emergency water trunk main extension alignment traverses land that is mapped as being flood prone under the Byron Shire Council online mapping and North Byron Floodplain Risk Management Study and Plan (refer to Figure 1-1). This generally relates to areas of the activity alignment within the Mullumbimby township between Mullumbimby Road and Azalea Street.

The activity traverses Saltwater Creek and the Mullumbimby Creek both of which are mapped key fish habitat under the *Fisheries Management Act 1994* (FM Act).

The activity area does not traverse any areas mapped Coastal Wetlands under the State Environmental Planning Policy (Resilience and Hazards) 2021.

The Mullumbimby Creek section of the activity alignment forms part of the Cape Byron Marine Park (CBMP).

3.3.2 Impact Assessment

Construction activities can result in the following environmental outcomes including (but not limited to):

- Disturbance of acid sulfate soil resulting in sulphuric acid generation leaching into drainage lines and waterways.
- Dust propagation and sediment transportation to waterways.
- Accidental chemical spills such as fuels, oils, and solvents from use of plant and equipment on-site

These outcomes can impact the pH, electrical conductivity, turbidity, dissolved oxygen, and temperature of receiving water environments. Variations in water quality can negatively impact aquatic environments resulting in fish disease, kills, loss of food resource, reduced fish migration and recruitment potential and disturbance to water plant communities.

The water main will be strapped to the bridge over Mullumbimby Creek alongside existing pipes, and also strapped to a new pipe bridge over Saltwater Creek on the southern side of Myokum Street adjacent to the existing culvert. The new pipe bridge over Saltwater Creek will comprise two concrete piles either side of the waterway connected by a steel beam to which the trunk water main pipe will be attached. The bridge will require removal of weed species and one juvenile Hoop Pine (*Araucaria cunninghamii*). Consequently, the activity will not have a significant impact on waterways or riparian vegetation.

The implementation of the ASSMP will further address the potential of disturbed acid sulfate soil impacting the waterways during the works. With appropriate mitigation measures in place during construction, the activity is unlikely to present significant risk to waterways in the area.

The works will occur in flood prone land and construction of the water infrastructure will need to consider the probability of flood events when scheduling works.

As the proposed works traverse the CBMP associated with Mullumbimby Creek, permit approval under the *Marine Estate Management Act 2014* is required prior to works in that location.

Post construction, the water infrastructure would not have any potential to negatively impact water quality or flood behaviour.

Are the works located within, adjacent to or near a waterway or body of water?	Yes	☒	No	☐
Is the location known to flood or be prone to water logging?	Yes	☒	No	☐
Will the proposed works be undertaken on a bridge?	Yes	☒	No	☐
Are the works likely to require the extraction of water from a local water course?	Yes	☐	No	☒

Water Quality and Hydrology - Recommended Safeguards:

- *Best practice stormwater, groundwater and sediment and erosion control measures are to accompany the CEMP.*
- *All erosion and silt control devices will be visually inspected weekly and before forecast rain events to ensure effectiveness as well as after each rainfall event.*
- *Spill kits maintained onsite during the construction period and employees trained how to use spill kits.*
- *No dirty water may be released into drainage lines and/or waterways.*
- *Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways.*
- *Wash down, if undertaken at the site, must be undertaken in a designated and controlled (bunded and plastic lined) area within the site. Wash down shall use potable water and excess debris removed using hand tools. Wash down waste must be filtered before release.*
- *Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) is to be undertaken daily to identify any potential spills or deficient erosion and sediment controls. This will be undertaken where works are undertaken within 100m of the waterways.*
- *Contractors shall monitor weather forecasts daily and ensure that works are scheduled so that construction is not impacted by flooding where possible.*
- *BSC shall consult with Cape Byron Marine Parks prior to crossing Mullumbimby Creek and where required obtain approval under the Marine Estate Management Act 2014 and Section 1.16 of the Marine Estate Management (Management Rules) Regulation 1999.* Any additional safeguards issued by CBMP will also be incorporated into the activity.

3.4 Biodiversity

3.4.1 Existing Environment

A Biodiversity Assessment Report prepared for the activity (Appendix C) identifies six (6) vegetation communities within road reserve and Crown Land that will accommodate the proposed emergency water trunk main extension. These include:

1. Cleared and Modified
2. Planted Landscaping
3. Camphor Laurel
4. Riparian Vegetation
5. Coastal Cypress Pine
6. Rainforest + Camphor Laurel

The proposed emergency water trunk main extension predominately traverses 'Vegetation Community 1 - Cleared and Modified' areas in the road verge.

'Vegetation Community 5 – Coastal Cypress Pine' on Tandy's Lane is representative of 'Coastal Cypress Pine Forest in the NSW North Coast Bioregion' which is listed as 'Endangered' under Schedule 2, Part 2 of the *Biodiversity Conservation Act 2016* (BC Act).

'Vegetation Community 6 – Rainforest + Camphor Laurel' on Tandys Lane is representative of the EEC 'Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions'. This rainforest community is also representative of 'Lowland Rainforest of Subtropical Australia' which is listed as 'Critically Endangered' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Two (2) threatened flora species were observed on the site during the ecological survey. Four (4) planted specimens of Coolamon (*Syzygium moorei*) occur in the road verge of Tandy's Lane proximate to the highway overpass, one (1) planted specimen occurs at the far eastern end of the alignment on Tandy's Lane, and one (1) planted specimen occurs at the water reservoir in Mullumbimby. Coolamon is listed as 'Vulnerable' under the *Biodiversity Conservation Act 2016*. One (1) Macadamia Nut (*Macadamia integrifolia*) occurs at the eastern end of the alignment on Tandy's Lane and is listed as 'Vulnerable' under the *Environment Protection Biodiversity Conservation Act 1999*.

No species of threatened fauna was observed on the site during the survey, and a likelihood of occurrence assessment finds that potentially occurring threatened fauna is unlikely to occupy the site as it comprises predominately road reserve. Similarly, a habitat assessment finds that the habitat value within the site is low to negligible as it predominately comprises maintained verge areas within road reserve.

3.4.2 Impact Assessment

Since the proposed emergency water trunk main extension predominately traverses 'Vegetation Community 1 - Cleared and Modified' areas in the road verge, vegetation clearing will be minor.

Eight (8) trees including seven (7) native and one (1) exotic species will be impacted by the proposed alignment and require removal. The impacted trees comprise three (3) Weeping Bottlebrush (*Melaleuca viminalis*), one (1) Bangalow Palm (*Archontophoenix cunninghamiana*), one (1) Hoop Pine (*Araucaria cunninghamii*), one (1) Wheel of Fire (*Stenocarpus sinuatus*), one (1) Silky Oak (*Grevillea robusta*) and one (1) Golden Shower Tree (*Cassia fistula*). None of the impacted trees are threatened species.

The patch of 'Coastal Cypress Pine Forest in the NSW North Coast Bioregion' on Tandy's Lane, and the 'Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions' on Tandy's Lane and at the Mullumbimby water reservoir occur outside the proposed trunk water main footprint including the associated 4m wide construction buffer and therefore will not be adversely impacted.

The planted specimens of Coolamon (*Syzygium moorei*) on Tandy's Lane and at the Mullumbimby water reservoir, and the Macadamia Nut (*Macadamia integrifolia*) on Tandy's Lane, occur outside the

alignment of the emergency water trunk main extension and associated construction footprint and therefore they will not be directly impacted.

Two (2) Fig trees on Jubilee Avenue and one (1) Fig tree on Stuart Street contribute to streetscape character and will be retained and protected.

The water main is proposed to be strapped to bridges across the tributaries of Mullumbimby Creek and Saltwater Creek to avoid direct impact on the waterways.

The water main will be strapped to the bridge over Mullumbimby Creek alongside existing pipes.

A new pipe bridge is proposed across Saltwater Creek on the southern side of Myokum Street. No instream works are proposed for the new pipe bridge. The new pipe bridge over Saltwater Creek will comprise two concrete piles either side of the waterway connected by a steel beam to which the trunk water main pipe will be attached. The bridge will require removal of weed species and one juvenile Hoop Pine (*Araucaria cunninghamii*).

Consequently, the activity will not have a significant impact on waterways or riparian vegetation.

The proposed development will not impact on threatened species, communities, or populations under the *Biodiversity Conservation Act 2016*, nor will it impact on any matters of national environmental significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999*.

The emergency water trunk main extension is not located within nor will adversely impact an area of Outstanding Biodiversity Value. The emergency water trunk main extension alignment and associated construction buffer does not occur within Biodiversity Values (BV) mapped areas except for a negligible portion in the cleared road reserve of Left Bank Road.

To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity for the seven (7) impacted native trees. The compensatory planting should occur at a suitable BSC owned offset site.

The implementation of the following recommended safeguards will ensure that any adverse effect will be restricted to the minimal possible extent.

Have relevant database searches been carried out?	Yes	☒	No	☐
Did the database searches identify any endangered ecological communities, threatened flora and/or threatened or protected fauna within the vicinity of the proposed works?	Yes	☒	No	☐
Will the proposed works require the removal of any vegetation?	Yes	☒	No	☐
Will the proposed works affect any tree hollows or hollow logs?	Yes	☐	No	☒
Are there any known areas of critical habitat, coastal wetland or littoral rainforest area within the vicinity of the proposed works?	Yes	☐	No	☒
Will the proposed works provide any additional barriers to the movement of wildlife?	Yes	☐	No	☒
Will the proposed works disturb any natural waterways or aquatic habitat?	Yes	☐	No	☒
Will the proposed works disturb any crevices or other locations (such as on bridges and culverts) for potential bat habitat?	Yes	☐	No	☒
Will there be impact on any vegetation or land that is part of an offset or is protected under a condition of approval from a previous project?	Yes	☐	No	☒
Biodiversity - Recommended Safeguards: • *Works are to be undertaken in general accordance with the relevant provisions of AS4970-2009 Protection of Trees on Development Sites.* • *Measures are required to protect existing trees to be retained, including identified threatened species and Figs that contribute to streetscape character, by establishing adequate tree protection / no-go zones around the retained trees. Construction activities*				

are to be managed to restrict excavations, parking of machinery or stockpiling of materials from the tree protection zones, where practicable.

- *If any damage occurs to vegetation outside of the boundaries of the work site as a result of the implementation of the activity, the Construction Contractor will be notified and will establish strategies for mitigation of impacts and site restoration.*
- *WIRES are to be contacted on 1300 094 737 in the unlikely event that fauna become harmed during works.*
- *To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity for the seven (7) impacted native trees. The compensatory planting should occur at a suitable BSC owned offset site*

The following refinements may be undertaken to facilitate construction of the activity:

- Minor tree pruning undertaken with supervision of a qualified arborist ensuring the tree health is maintained;
- No tree removal permitted for trees of heritage value;
- Minor tree removal providing that prior to removal:
  - A qualified ecologist has assessed the impact of the tree removal within a biodiversity assessment to confirm the significance of the impact on biodiversity in accordance with a test of significance under the *Biodiversity Conservation Act 2016* and the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*.
  - The biodiversity assessment has confirmed that there will not be a significant impact on biodiversity under the *Biodiversity Conservation Act 2016* and the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* in regard to the additional tree loss and with consideration of the biodiversity impacts outlined within this REF
  - Tree loss is offset generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity.
  - The biodiversity assessment is signed off by BSC and appended to the REF forming part of the planning approval for the activity.

3.5 Aboriginal Cultural Heritage

3.5.1 Existing Environment

The activity is located within the cultural heritage land boundary of Tweed Byron Local Aboriginal Land Council. Searches of the AHIMS database identified no Aboriginal sites/objects recorded within the alignment of the activity. The AHIMS search is provided at Appendix D.

The NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' and Part 5 of the *National Parks and Wildlife Regulation 2019* defines disturbed land as 'land is disturbed if it has been the subject of human activity that has changed the land's surface, being changes that remain clear and observable'. The activity area traverses disturbed land associated with construction of public roads, railway corridor, water supply infrastructure and public hospitals (including site remediation). The activity alignment has been designed to minimise vegetation impacts, with only minor tree removal required including street trees and landscape plantings, therefore the activity will not impact any potential cultural scar trees.

Parts 1 and 2 of the Generic Due Diligence Process under the NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' has been completed at Table 3-2.

Table 3-2 Due Diligence Review – Part 1 and 2

Due Diligence Process Step	Comment
1. Will the activity disturb the ground surface or any culturally modified trees?	The activity will result in ground disturbance. To enable trenching of the emergency water trunk main extension and construction of the booster pump station. No tree removal is required for the activity.
2a. Are there any relevant confirmed site records or other associated landscape feature information on AHIMS? and/or	AHIMS search of the activity area found there are no registered sites within the activity area alignment. The activity area occurs within 200m of a waterway, however as identified previously the activity area is disturbed land.
2b. Are there any other sources of information of which a person is already aware?	Not that the REF author is aware of.
2c. Are there any landscape features that are likely to indicate presence of Aboriginal objects?	The activity area occurs within 200m of a waterway, however as identified previously the activity area is disturbed land.

3.5.2 Impact Assessment

Parts 3 - 5 of the Generic Due Diligence Process under the NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' has been completed at Table 3-3.

Table 3-3 Due Diligence Review – Part 3-5

Due Diligence Process Step	Comment
If after completing steps above and no information indicates site importance, it is reasonable to conclude that there are no known Aboriginal objects or a low probability of objects occurring in the area of the proposed activity, you can proceed with caution.	
3. Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?	AHIMS search of the project area found there are no sites occurring in the general area. The activity area alignment is considered disturbed land and prevent low risk to aboriginal cultural heritage objects or sites.
4. Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely? Note: This step only applies if your activity is on land that is not disturbed land or contains known Aboriginal objects.	Land associated with the activity area is consistent with the definition of disturbed land. The NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' defines disturbed land as 'land is disturbed if it has been the subject of human activity that has changed the land's surface, being changes that remain clear and observable'. The activity area traverses land disturbed from construction of public roads, railway corridor, water supply infrastructure and public hospitals (including site remediation).
5. Further investigation and impact assessment	Further inspection and impact assessment is not required.

The activity comprises disturbed land and does not include any registered Aboriginal cultural sites or objects. An Aboriginal Heritage Impact Permit (AHIP) in accordance with the NP&W Act 1974 is not required for the activity at this stage.

As per BSC usual work practices, Unexpected Finds and Stop Work Protocols will be in place and implemented during construction.

Would the works involve disturbance in any area that has not been subject to previous ground disturbances?	Yes	☐	No	☒

Has online AHIMS search been completed?	Yes	☒	No	☐
Is there likely potential for the proposed works to impact on any items of Aboriginal heritage?	Yes	☐	No	☒
Would the works impact on any features that may indicate any potential archaeological remains?	Yes	☐	No	☒

Aboriginal Heritage - Recommended Safeguards:

- *The CEMP is to include the BSC Aboriginal Cultural Heritage Unexpected Finds and Stop Work Protocols. This procedure will be in place and implemented during construction.*
- *Construction contractors are to ensure that all staff on site are aware of the requirement to preserve Aboriginal Cultural Heritage and requirements under the BSC Aboriginal Cultural Heritage Unexpected Finds and Stop Work Protocols under the CEMP.*

3.6 Historic Heritage

3.6.1 Existing Environment

Searches of the NSW State Heritage Inventory Register, Australian Heritage database and LEP Maps confirm that the activity area does not include items of State or National heritage significance.

The activity area traverses the LEP mapped heritage conservation area.

Heritage searches are provided at Appendix D.

3.6.2 Impact Assessment

A section of the proposed emergency water trunk main extension alignment is located within the Mullumbimby Heritage Conservation Area under Schedule 5, Part 2 of the Byron Local Environmental Plan (LEP) 2014. The Byron Shire Heritage Inventory (State Heritage Inventory No. 1260198) describes the heritage characteristics of the Mullumbimby township as including 'wide streets in which most are planted with shades trees, some in avenues'.

The alignment of the emergency water trunk main extension has been carefully designed to avoid vegetation impacts including rows of street trees. The eight (8) trees that require removal to facilitate the activity do not contribute to heritage character. However, two (2) Fig trees on Jubilee Avenue and one (1) Fig tree on Stuart Street contribute to heritage character and will be avoided and protected. These trees are identified in the attached Biodiversity Assessment Report (Appendix C). The activity will be underbored beneath these Fig trees rather than trenched to minimize root disturbance.

The following recommended safeguards have been provided to mitigate impacts upon heritage items within the area.

Have online heritage database searches been completed?	Yes	☒	No	☐
Are there any items of non-Aboriginal heritage or heritage conservation areas located within the vicinity of the proposed works?	Yes	☒	No	☐
Are there any items of potential non-Aboriginal heritage significance within the vicinity of the works?	Yes	☐	No	☒
Are works likely to occur in or near features that indicate potential archaeological remains?	Yes	☐	No	☒

Historic Heritage - Recommended Safeguards:

- *In the event of an unexpected find, works will not recommence until signed authority is received from the BSC and any necessary permits and/or approvals are obtained.*
- *The Construction Contractor is to ensure all staff on site are aware of the unexpected finds protocol contained in the CEMP.*

3.7 Noise and Vibration

3.7.1 Existing Environment

Existing background noise would typically include vehicle traffic noise and agricultural noises associated with farm machinery and livestock in rural areas and street noises associated with urban residential and commercial uses within the Mullumbimby township. Insect and livestock generated noise will also contribute to background noise during the night.

There are noise receivers adjacent to the activity area (<100m) including:

- Residential properties along Tandys Lane, Mullumbimby Road, King Street, Ann Street, Station Street, Fern Street, Stuart Street, Myokum Street, Jubilee Avenue, Azalea Street, Reservoir Road;
- Commercial receivers located along Jubilee Avenue; and
- Mullumbimby High School located along Jubilee Avenue;

3.7.2 Impact Assessment

Use of machinery, vehicles and work activity during the construction phase will have potential to generate short-term noise impacts on nearby sensitive receivers.

The construction of the water supply infrastructure will require the following prominent noise and vibration generating activities:

- Trenching for water main infrastructure using excavators
- Underboring for water main infrastructure using underbore directional drilling
- Pavement breaking or cutting.

The construction period for the activity is expected to take approximately twelve months pending weather conditions.

Construction working hours will be restricted to the normal daytime construction hours as specified by the EPA being:

- 7 am to 6 pm Monday to Friday;
- 8 am to 1 pm Saturdays; and
- No works will be undertaken on Sundays or Public Holidays.

Works may be undertaken outside these hours where:

- The delivery of materials is required outside these hours;
- It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm;
- Variation is approved in advance in writing by the Regulatory Authority; and
- Residents likely to be affected by the works are notified in writing of the timing and duration of these works at least 24 hours prior to the commencement of works (except for emergency work).

Use of plant and machinery, vehicles and works activity during the construction phase will have short-term noise impacts. Trucks and construction staff accessing the site will also be a source of intermittent noise throughout of the construction period.

All reasonable and feasible work practices will be implemented to reduce construction noise including, maintaining all construction equipment in good working order and operating equipment as per manufacturer's specifications.

EPA's Interim Construction Noise Guidelines recommendations for construction noise levels include:

- The noise management level (NML) for works during the recommended standard hours is background + 10 dB(A). Above this noise level the proponent needs to implement all feasible and reasonable work practices, as defined in the Guideline, to minimise noise impacts;
- For works outside the recommended standard hours, the NML is background + 5 dB(A); and
- The highly noise-affected level of LAeq 75 dB(A) represents the point above which there may be strong community reaction to noise and indicates a need to consider other feasible and reasonable ways to reduce noise, such as restricting the times of very noisy works to provide respite to affected residences.

The proposed works will be undertaken in close proximity (<100m) to various residential, commercial, and educational receivers and it is possible that the activity will result in a highly noise-affected level of LAeq 75 dB(A) at these locations.

Due the methodology of the works, the proposed plant and equipment being used for construction and proximity of the works to various sensitive receivers, safeguards are considered necessary to manage noise and vibration impacts including the provision of respite periods to address highly noise affected receivers (>/LAeq 75 dB(A)).

Underboring of the emergency water trunk main extension has potential to cause vibration within the local environment. There are dwellings and structures within 100m of all proposed underboring areas. Therefore, vibration may be experienced at receivers adjacent to the underboring works though it is unlikely that the proposed underboring will result in structural damage to buildings or structures. As a conservative measure, building dilapidation reports are recommended for any buildings or structures within 20m of the underboring alignments.

In terms of operation, no noise impacts are likely to occur during future use of the water infrastructure above the current acoustic impact.

The following recommended noise and vibration safeguards have been provided to mitigate impacts associated with the activity.

Are there any residential properties or other noise sensitive areas near the location of the proposed works that may be affected by the works (i.e. church, school, hospital)?	Yes	☒	No	☐
Are the proposed works going to be undertaken only during standard working hours?	Yes	☒	No	☐
Will the construction duration be greater than 3 weeks?	Yes	☒	No	☐
Is any explosive blasting required for the proposed works?	Yes	☐	No	☒
Will operation of the works alter the noise environment for sensitive receivers?	Yes	☐	No	☒
Will the works result in vibration being experienced by any surrounding properties or infrastructure (during either construction or operation)?	Yes	☐	No	☒

Noise and Vibration - Recommended Safeguards:

- *High noise generating activities within 100 m of sensitive residential, commercial and community buildings will not be carried out in continuous period that exceed three hours each, with a minimum respite period of one hour between each period.*
- *Notification of all receivers within 100 m of the works (letterbox drop or equivalent) including the anticipated duration of such works at least two weeks prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/ updates associated with the proposed works.*
- *Noise complaints will be recorded, including suitable identification/ description of the noise source (e.g. continual/ impulsive) and general location of the complaint. Any noise complaints will be investigated and actioned as required.*

- *Construction working hours will be restricted to the normal daytime construction hours as specified by the EPA being:*
  - *7 am to 6 pm Monday to Friday.*
  - *8 am to 1 pm Saturdays.*
  - *No works will be undertaken on Sundays or Public Holidays.*
- *Works may be undertaken outside these hours where:*
  - *The delivery of materials is required outside these hours.*
  - *It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm.*
  - *Variation is approved in advance in writing by the Regulatory Authority.*
  - *Residents likely to be affected by the works are notified in writing of the timing and duration of these works at least 24 hours prior to the commencement of works (except for emergency work).*
- *All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include:*
  - *All relevant project-specific and standard noise mitigation measures.*
  - *Permissible hours of work.*
  - *Any limitations on high noise generating activities.*
  - *Location of nearest sensitive receivers.*
  - *Designated loading/ unloading areas and procedures.*
  - *Escalation protocols for noise complaints.*
- It is recommended that building dilapidation reports are prepared for any buildings or structures within 20m of the underboring alignments addressing the pre and post development conditions of the buildings.

3.8 Air Quality

3.8.1 Existing Environment

No specific land uses within the immediate area are identified as generating significant emissions. Potential airborne particles within the locality are largely restricted to vehicle emissions, agricultural activities and bushfires in the broader landscape.

3.8.2 Impact Assessment

The activity may generate emissions through the operation of machinery, plant, and tools during construction. Of note, the works will require site disturbance (i.e. trenching and soil excavation, etc.).

These activities have potential to make materials airborne or enter the environment unless managed accordingly. Safeguards and mitigation measures are required to protect workers and nearby sensitive receivers from dust and other materials produced from the activity. Mitigation measures such as covering truck loads and wetting down stockpiled and exposed soil as necessary are to be employed and detailed under the Contractor's CEMP.

The following recommended air quality safeguards have been provided to mitigate impacts associated with the activity.

Are the proposed works likely to result in large areas (>2ha) of exposed soils?	Yes	☒	No	☐
Will there be any dust sensitive receivers located within the vicinity of the proposed works during the construction period?	Yes	☒	No	☐
Is there likely to be an emission to air during construction?	Yes	☒	No	☐

Air Quality - Recommended Safeguards:

- *Adjacent receivers are to be suitably notified and consulted with prior to the works occurring and kept updated throughout the duration of the activity.*
- *Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation.*
- *The Construction Contractor would observe local meteorological conditions and predicted forecasts daily and prepare site for extreme weather events (i.e., high winds).*
- *All disturbed areas would be stabilised as soon as practicable to prevent or minimise windblown dust.*
- *Disturbed surfaces and stockpiles would be wetted down or covered with geotextile fabric during high wind conditions to prevent significant dust generation, as required.*
- *All plant and machinery would be serviced at regular intervals to minimise exhaust emissions.*
- *Vehicles would be switched off when not in use.*

3.9 Traffic & Access

3.9.1 Existing Environment

The proposed water reticulation systems are primarily located within public road reserves including the Gulgan Road, Tandys Lane, Mullumbimby Road, King Street, Ann Street, Station Street, Fern Street, Stuart Street, Myokum Street, Azalea Street, Reservoir Road and Left Bank Road. All roads other than Mullumbimby Road are public roads (non-classified) and BSC are the relevant roads authority. Mullumbimby Road is classified a Regional Road and BSC is the relevant delegated roads authority under the *Roads Act 1993*.

3.9.2 Impact Assessment

The works would not require excessive vehicle movements. Traffic would be generated by the activity during construction through construction worker movements (light vehicles) and truck deliveries. The impact of additional traffic movements associated with the proposed construction activities would represent a small and temporary increase compared to existing traffic movements.

The proposed water reticulation works occur next to live traffic and traffic control would be required to ensure construction worker and public safety. The works may also require short term temporary closure of one lane of traffic to enable the trenching, underboring and delivery of materials for construction.

As the water mains are being constructed within the public road reserve, parking within the affected sections of the road will be temporarily restricted during the construction phase. It also anticipated that formal and informal pedestrian access within the road reserve will be temporarily impacted during the construction phase of the activity. The activity may also temporarily impact driveway access to properties during construction.

Mullumbimby Road is classified a Regional Classified Road and BSC is the relevant delegated roads authority under the *Roads Act 1993*. The activity requires construction of the emergency water trunk main extension within the road reserves of Mullumbimby Road and therefore requirements of Section 138 apply under the *Roads Act* 1993.

BSC is required to consult with and gain concurrence of TfNSW prior to undertaking works in accordance with 138 (2) and (3) of the *Roads Act 1993*. as outlined below:

S138 (2) A consent may not be given with respect to a classified road except with the concurrence of TfNSW.

S138 (3) If the applicant is a public authority, the roads authority and, in the case of a classified road, TfNSW must consult with the applicant before deciding whether or not to grant consent or concurrence.

Post construction, traffic movements would be consistent with existing levels as the proposed activity will not generate any additional operational traffic. Given the location of the works, current accessibility and the temporary nature of the construction period, no significant traffic impacts would result.

The following recommended traffic and access safeguards have been provided to mitigate impacts associated with the activity.

Are the proposed works likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during construction?	Yes	☒	No	☐
Are the proposed works likely to affect any other transport nodes or transport infrastructure (e.g. bus stops, bus routes) in the surrounding area? Result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?	Yes	☒	No	☐
Is the work likely to generate traffic to an extent that will significantly strain the capacity of the existing road system in a local government area?	Yes	☐	No	☒
Would the work involve more than minor excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	☒	No	☐

Traffic - Recommended Safeguards:

- *Where works occur next to live traffic a Traffic Control Plan (TCP) shall be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW. Licensed traffic controllers will assist with traffic control during the Project.*
- *Where possible, current traffic movements will be maintained during the works.*
- *Regard to public safety will be maintained at all times and appropriate signage will be erected and details will be confirmed by appropriate Council personnel responsible for site safety during the activity.*
- *Any traffic delay notifications will be issued by Council at least two weeks prior to commencement of works. Notification will be made via Council website and potable variable messages sign (VMS) located along the affected public road.*
- *BSC will regularly consult with affected properties along the activity alignment regarding potential property access impacts associated with the activity.*
- *Prior to undertaking works within the road reserves of Mullumbimby Road (regional classified road), BSC shall gain concurrence from TfNSW under Section 138 of the Roads Act 1993.*

3.10 Waste and Chemical Management

3.10.1 Existing Environment

The main types of waste currently associated with the site are mixed forms of general rubbish which has been left by road users within the road corridor.

3.10.2 Impact Assessment

The works will generate potential forms of waste from the construction phase including:

- Water main construction materials and construction of the water mains;
- General wastes and sewage from site compounds and offices;
- Spoil and other excavated materials; and
- Packaging materials from items delivered to site, such as pallets, crates, cartons, plastics and wrapping materials.

Some of these waste sources have potential to disperse into the surrounding environment, impacting soils, water, biodiversity, and agricultural activities within the surrounding lands. The proposed works would be undertaken to ensure minimal impacts are generated from waste material produced on site by ensuring that all waste products are appropriately collected and removed from site.

Spoil generated from trenching of the emergency water trunk main extension will be used to backfill the excavations. Similarly, any excavations required to locate the booster pump structure will be contoured within the site.

Excess spoil to be disposed offsite from the proposed works will need to be classified pursuant to the EPA Waste Classification Guidelines. Relevant permits may need to be obtained for such waste in accordance with the POEO Act 1997 and the relevant guidelines.

After the construction phase, it is not anticipated that additional waste would be generated from operation of the activity.

Are the proposed works likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)?	Yes	☐	No	☒
Are the proposed works likely to require a licence from OEH?	Yes	☐	No	☒

Waste and Chemical Management - Recommended Safeguards:

- *Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.*
- *Waste is to be temporarily stockpiled at the site, classified and transported to a Council waste handling facility.*
- *Where practical excavated road materials shall be stockpiled at a BSC approved site and used in other BSC projects in accordance with the excavated public road material order 2014 and applicable planning and waste legislation.*
- *Waste material with no reuse purpose shall be transported to a licensed waste facility in accordance with the provisions of the applicable planning and waste legislation.*
- *The contractor will provide waste disposal certificates to Council.*
- *Work to be undertaken in accordance with the Protection of the Environment Operations (Waste) Regulation 2014.*

3.11 Visual Amenity & Landscape

3.11.1 Existing Environment

The existing landscape character associated with the activity area consists of the following:

- Undulating rural land cleared for agricultural purposes and stands of native forest vegetation.
- Low density urban areas (residential and commercial) located on relatively flat land associated with the Mullumbimby township
- Undulating large allotment urban areas (residential and commercial) located on relatively flat land associated with the western extent of Mullumbimby township.

The visual landscape quality associated with the activity area is considered to be moderate with value at a local scale.

3.11.2 Impact Assessment

Visual impacts will be created for properties adjoining the site, as construction works will be visible in most sections of the activity alignment. Ancillary sites for stockpiles will also have temporary visual impacts on properties with views to the activity area. The construction phase would therefore result in minor temporary visual impacts.

The emergency water trunk main extension will be underground and not visible once construction is complete. The emergency water trunk main extension will be located within a heritage

conservation area mapped under the LEP 2014, however as the works are located underground the new infrastructure will not impact the values of the heritage conservation area.

The activity alignment has been designed to minimise vegetation impacts, with only minor tree removal required including several street trees and landscape plantings, therefore the activity will not result in adverse impact on visual amenity.

Above ground structures include the new booster pump station located at the existing Azalea Street reservoir. The new booster pump station is located between the reservoir and a stand of vegetation with no direct view to any residences, parks, or other buildings. The new above ground structure will not obstruct any significant views within the locality.

The visual landscape quality associated with the activity area during operation is considered to remain moderate with value at a local scale.

Are the proposed works over or near an important physical or cultural element or landscape? (Heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc.)?	Yes	☒	No	☐
Would the proposed works obstruct or intrude upon the character or views of a valued landscape or urban area? For example, locally significant topography, a rural landscape or a park, a river, lake or the ocean or a historic or distinctive townscape or landmark?	Yes	☐	No	☒
Would the proposal require the removal of mature trees or stands of vegetation, either native or introduced?	Yes	☒	No	☐
Would the proposal result in large areas of man-made material or clearing visible from the road or adjacent properties?	Yes	☐	No	☒
Would the proposal involve new noise walls or visible changes to existing noise walls?	Yes	☐	No	☒
Would the proposal involve substantial changes to the appearance of a bridge (including piers, girders, abutments, and parapets) that are visible from the road or residential areas?	Yes	☐	No	☒
If involving lighting, would the proposal create unwanted light spillage on residential properties at night (in construction or operation)?	Yes	☐	No	☒
Would any new structures or features being constructed, result in over shadowing to adjoining properties or areas?	Yes	☐	No	☒

Visual Amenity & Landscape - Recommended Safeguards:

- *Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day using waste collection bins.*
- *Upon completion of construction, work areas and waste stockpiles will be removed, and the activity area grassed / stabilised and cleared of all rubbish and materials.*

3.12 Socio-economic Considerations

There is no significant anticipated negative socio-economic impact associated with the activity. Short-term noise, amenity and traffic impacts will occur during construction works. These impacts are minor and temporary.

Works staff will need to wear PPE and undertake the works appropriately to ensure a safe work site and no negative impacts to the health of the public.

Private property access may be temporarily impacted due to emergency water trunk main extension trenching across driveways. BSC will consult with all potentially affected property owners and all driveways impacted by the works will be reinstated to existing conditions or better to ensure no negative impact on private access occurs after construction. The emergency water trunk main

extension construction within the public road reserve will temporarily restrict parking and pedestrian access during the construction phase.

Acquisition of land is not required to facilitate the proposed works. Easements may be created for the water infrastructure and the activity is not likely to have any long-term detrimental impact on adjoining properties.

Due to the extent of services located within and adjoining the activity area, all services will need to be clearly located prior to undertaking any excavation or underboring works. This is required to ensure that no essential services are damaged during the works and that any potential services interruptions are communicated to the relevant services authorities to enable flow on notifications to any affected services customers.

Matters impacting the 2046 planning horizon includes catering for future population growth, Mullumbimby Water Treatment Plant supply interruptions due to heavy rain and flow on turbidity impacts, resilience during drought conditions, flood impact interruptions, and fire water supply, all of which will pose an increase on the network demand within the area..

The activity will have a positive socioeconomic impact through the provision of an emergency water supply accommodating the 2046 planning horizon water network demands.

Are the proposed works likely to directly impact on local business?	Yes ☐	No ☒
Are the proposed works likely to require any property acquisition?	Yes ☐	No ☒
Are the proposed works likely to alter any access for properties (either temporarily or permanently)?	Yes ☒	No ☐
Are the proposed works likely to alter any on-street parking arrangements (either temporarily or permanently)?	Yes ☒	No ☐
Are the proposed works likely to change pedestrian movements or pedestrian access (either temporarily or permanently)?	Yes ☒	No ☐
Are the proposed works likely to impact on any items or places of social value to the community (either temporarily or permanently)?	Yes ☐	No ☒
Are the proposed works likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)?	Yes ☐	No ☒

Socio-economic Considerations - Recommended Safeguards:

- *Adjacent residents are to be suitably notified and consulted with prior to the works occurring and kept updated throughout the duration of the activity.*
- *Any private property adjustments (e.g. fencing or driveways) required to enable the works will be negotiated with the affected landholders prior to undertaking the works. All property access impacted by the works will be reinstated to existing conditions or better to ensure no negative impact on private access occurs after construction.*
- *Contractors/ workers would be mindful of the needs of the local community.*
- *In accordance with the Work Health and Safety Act 2011, workers would be provided with appropriate safety clothing and equipment. Supervisory staff and any visitors to the work area would also be required to wear protective clothing. Works personnel would be provided with or expected to have protective equipment and appropriate training.*
- *Prior to undertaking any excavation works all underground services will be clearly located. Any potential services interruptions shall be communicated to the relevant services authorities to enable flow on notifications to any affected services customers.*

3.13 Cumulative impacts

No other external projects are known to be proposed or occurring in the vicinity of the site shortly before, during or after the proposed activity.

Are other projects proposed to be undertaken at the same time within the vicinity of the proposal?	Yes ☐ No ☒
Are there considered to be significant cumulative impacts as a result of the works proposed?	Yes ☐ No ☒
Cumulative Impacts - Recommended Safeguards: • *N/A*	

3.14 Matters of National Environmental Significance (MNES)

The following matters in Table 3-4 are required to be considered under the EPBC Act when determining if the proposal should be referred to the Commonwealth Department of Environment and Energy for assessment.

Table 3-4 Review of MNES

Matters of NES	Significant Impact
Any impact on a World Heritage property?	Yes ☐ No ☒
The activity is not located on or within proximity to a World Heritage property.	
Any impact on a National Heritage place?	Yes ☐ No ☒
The activity is not located on or within proximity to a National Heritage Place.	
Any impact on a wetland of international importance?	Yes ☐ No ☒
The activity is not located on or within proximity to a wetland of international importance.	
Any impact on a listed threatened species or communities?	Yes ☐ No ☒
The activity will not have any significant long-term impacts on threatened species or communities.	
Any adverse impacts on listed migratory species?	Yes ☐ No ☒
The activity will not have any adverse impacts on listed migratory species.	
Does the proposal involve a nuclear action (including uranium mining)?	Yes ☐ No ☒
No nuclear action proposed.	
Any impact on a Commonwealth marine area?	Yes ☐ No ☒
The activity is not located on or within proximity to a Commonwealth marine area.	
Any impact on the Great Barrier Reef Marine Park?	Yes ☐ No ☒
The activity is not located on or within proximity to the Great Barrier Reef Marine Park.	
Any impact on water resources from coal seam gas development and large coal mining development?	Yes ☐ No ☒
No coal seam gas or coal mine is development proposed.	
Additionally, any significant impact (direct or indirect) on Commonwealth land?	Yes ☐ No ☒
No impact on Commonwealth land is proposed.	
Additionally, any significant impact (direct or indirect) on the environment generally as a result of a Commonwealth action?	Yes ☐ No ☒
No significant impact on the environment as a result of a Commonwealth action is proposed or likely.	

This REF has determined that the proposed activity does not require referral to the Commonwealth Department of Environment and Energy for assessment as will not have any significant impacts on matters of NES.

3.15 Clause 171 of the EP&A Regulation 2021

Clause 171 of the Regulations sets out 16 factors that need to be considered when assessing environmental impact under Part 5 of the EP&A Act. These factors are addressed in this report and are listed in Table 3-5.

Table 3-5 Review of Clause 171 Factors

Clause 171 Factors	Significant Impact
Any environmental impact on a community?	Yes ☐ No ☒
The proposal will have some short-term minor negative impacts associated with minor temporary impacts on traffic, parking, and pedestrian access. However, the activity will have a long-term positive impact on the community by the provision of a secure water supply to service the 2046 planning horizon. The short-term negative impacts can be managed through safeguards and mitigation measures.	
Any transformation of a locality?	Yes ☐ No ☒
The addition of the new booster pump station will result in new above ground development occurring in the locality however the new structures are screened (vegetation/landform) from public view and do not result in a transformation of the local area.	
Any environmental impact on the ecosystems of the locality?	Yes ☐ No ☒
Reference should be made to Section 3 of this REF. No detrimental environmental impact to ecosystems is likely to occur as part of the activity.	
Any impact on the aesthetic, recreational, scientific or other environmental quality or value of a locality?	Yes ☐ No ☒
The activity is unlikely to detrimentally impact on the aesthetic, recreational, scientific, or other environmental quality or value of the locality.	
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?	Yes ☐ No ☒
Reference should be made to Section 3 of this REF. No impact to items of anthropological, archaeological, architectural, cultural, historical, scientific or social significance are anticipated.	
Any impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016)?	Yes ☐ No ☒
The proposed activity will not have any adverse impacts on the habitat of protected animals.	
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	Yes ☐ No ☒
The proposed activity will not cause the endangering of any species of animal, plant or other form of life.	
Any long-term effects on the environment?	Yes ☐ No ☒
The proposal is not considered to have any long-term effects on the environment.	
Any degradation of the quality of the environment?	Yes ☐ No ☒
The proposed activity will not degrade the quality of the environment.	
Any risk to the safety of the environment?	Yes ☐ No ☒
Minor short-term risks are likely and can be managed through appropriate safe work practices. These procedures have been recommended under this REF.	
Any reduction in the range of beneficial uses of the environment?	Yes ☐ No ☒
No reduction in the range of beneficial uses of the environment will occur.	
Any pollution of the environment?	Yes ☐ No ☒
Suitable construction methods will ensure there is no pollution of the environment, and all waste will be disposed of correctly. These procedures have been recommended under this REF.	
Any environmental problems associated with the disposal of waste?	Yes ☐ No ☒
Any waste generated from the works will be categorised and disposed of in accordance with the relevant guidelines and all so as not to cause environmental problems.	
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	Yes ☐ No ☒
The proposal will not increase demands on resources.	

Any cumulative environmental effect with other existing or likely future activities?	Yes	☐	No	☒
No cumulative impacts have been identified.				
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	Yes	☐	No	☒
The activity is located within the coastal zone but will not contribute to coastal processes and coastal hazards.				

The factors listed under Clause 171 have been considered and all impacts associated are considered acceptable.

The Activity has a capital investment value of $5.5 million and does not require approval/permits listed under Clause 171 4 (b) of the Environmental Planning and Assessment Regulation 2021. BSC is therefore required to publish the REF on the BSC Website.

4 Statutory and Planning Considerations

4.1 Planning Approval Pathway

The activity involves construction and operation of the proposed emergency water trunk main extension to be undertaken by BSC to service the Mullumbimby area to address the 2046 planning horizon network demands.

Section 4.1 of the EP&A Act confirms that if an environmental planning instrument (EPI) provides that development may be carried out without the need for development consent, a person may carry the development out, in accordance with the EPI, on land to which the provision applies.

State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&ISEPP) aims to facilitate the effective delivery of infrastructure across NSW. Clause 2.159 (1) of T&I SEPP specifies that development for the purposes of water reticulation systems is permitted on any land without consent when undertaken by a public authority. BSC is a public authority who operate and own the public water reticulation system for the Byron Shire.

The proposed activity is defined as a ***water reticulation system*** under the definitions of T&I SEPP and the NSW Standard Instrument—Principal Local Environmental Plan (Standard Instrument).

Under clause 2.158 of T&I SEPP the following definition applies:

Water reticulation system means a building or place used for the transport of water**, including pipes**, tunnels, canals, **pumping stations**, related electricity infrastructure and dosing facilities.

The development scope of emergency trunk water mains and installation of Booster Pump Station is therefore consistent with the definition of water reticulation system as defined under clause 2.158 of T&I SEPP.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not constitute Designated Development, State Significant Development or State Significant Infrastructure in accordance *with* State Environmental Planning Policy (Resilience and Hazards) 2021 or *State Environmental Planning Policy (Planning Systems) 2021.*

The proposed works meet the definition of a water reticulation system and therefore can be undertaken without requiring development consent.

BSC is still required to undertake due diligence and environmental assessment before commencing the work to ensure it has given due consideration to any potential environmental impacts. This is the purpose of this REF.

4.2 Commonwealth Legislation

4.2.1 Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects matters of National Environmental Significance (NES), such as threatened species and ecological communities and migratory species (protected under international agreements), promotes ecologically sustainable development, conservation of biodiversity and heritage places and recognises the knowledge of Indigenous Australians. Any actions that will, or are likely to have, a significant impact on the matters of NES require referral and approval from the Australian Government Environment Minister. Significant impacts are defined by the Commonwealth for matters of NES.

As outlined in Table 3-4 the activity will not result in an impact on Matters of National Environmental Significance (MNES), therefore referral to the Commonwealth Department of Environment is not required.

4.2.2 Native Title Act 1993 (NT Act 1993)

The Native Title Act 1993 (NT Act) provides recognition and protection of native title on land across Australia. The NT Act establishes ways which future dealings affecting native title claim may be processed and establishes mechanisms for determining native title claims.

The works traverse in places land and waters owned and managed by Crown Lands. Bundjalung of Byron Bay Corporation (Arakwal) hold Native Title rights and interests in these lands and waters pursuant to Federal Court determination NCD2019/001. BSC will need to ensure compliance with the requirements of the *Crown Lands Management Act 2016* (NSW) and the *Native Title Act 1994* (Cth).

4.3 State Legislation

4.3.1 Environmental Planning and Assessment Act 1979 (EP&A Act)

The EP&A Act is the principal planning legislation for NSW and provides a framework for the overall environmental planning and assessment of proposals.

BSC is the proponent, and the works are assessed as 'development permissible without consent' under Part 5 of the EP&A Act. Accordingly, Council must satisfy Sections 5.5, 5.6 and 5.7 of the EP & A Act by examining, and considering to the fullest extent possible, all matters which are likely to affect the environment. This REF is intended to assist and ensure compliance with the EP&A Act including Sections 5.5, 5.6 and 5.7 and the requirements of clause 171 of the Regulations.

4.3.2 Biodiversity Conservation Act 2016

Section 7.8 of the *Biodiversity Conservation Act 2016* provides the environmental assessment requirements for activities being assessed under Part 5 of the *EP&A Act*. If a significant impact is likely, the Environmental Impact Statement is to be accompanied by a Species Impact Statement, or if the proponent so elects – a Biodiversity Development Assessment Report.

Two (2) endangered ecological communities and two (2) threatened flora species listed under the Biodiversity Conservation Act 2016 were recorded on the site. The alignment of the emergency trunk water main and associated 4m wide construction buffer has been designed to avoid these endangered ecological communities and threatened flora species. The proposed development will therefore not impact on threatened species, communities, or populations under the Biodiversity Conservation Act 2016

The emergency trunk water main is not located within nor will adversely impact an area of Outstanding Biodiversity Value. The emergency water trunk main extension alignment and associated construction buffer does not occur within Biodiversity Values (BV) mapped areas except for a negligible portion in the cleared road reserve of Left Bank Road.

Biodiversity Assessment has been prepared for the activity demonstrating the activity will not significantly impact biodiversity (refer to Appendix C).

4.3.3 Coastal Management Act 2016

The Coastal Management Act 2016 (CM Act) aims to manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural, and economic well-being of the people of the State. The CM Act defines the coastal zone and management objectives for coastal management areas and allows local Councils to prepare coastal management programs.

The activity is located within the coastal zone. The activity is proposed to be undertaken in accordance with the safeguards presented in the REF and in doing so does not present any risk to the coastal environment or cultural values within the coastal zone.

4.3.4 Contaminated Land Management Act 1997

Section 59 of the *Contamination Land Management Act 1997 (CLM Act)* requires the notification of contaminated sites. The NSW Environment Protection Authority's (EPA) Contaminated Lands Register does not list any sites within proximity to the works as contaminated sites.

A search of the NSW EPA Contaminated Lands Register and BSC online Cattle Dip mapping was searched returning no results for the proposed activity area alignment.

The nearest registered site is a former dip site located adjacent to Tandys Lane within Lot 1 DP449630. This area is outside the alignment of the activity, therefore further investigation and/or remediation of the dip.

The EPA will need to be notified if other sources of contamination that present a risk of harm to human health or the environment are identified as part of the proposed activity.

4.3.5 Conveyancing Act 1919

The proposed watermain will underbore Lot 2 DP 1227659 (BSC Operational Land) and BSC may elect to create an easement for the public asset under provisions of the Conveyancing Act 1919.

4.3.6 Crown Land Management Act 2016

The *Crown Land Management Act 2016* (CLM Act) regulates the ownership, use and management of Crown Land and requires environmental, social, cultural heritage and economic considerations to be taken into account in decision-making about Crown Land.

The works traverse in places land and waters owned and managed by Crown Lands. Bundjalung of Byron Bay Corporation (Arakwal) hold Native Title rights and interests in these lands and waters pursuant to Federal Court determination NCD2019/001. BSC will need to ensure compliance with the requirements of the *Crown Lands Management Act 2016* (NSW) and the *Native Title Act 1994* (Cth).

4.3.7 Forestry Act 2012

Section 60 of the Forestry Act 2012 requires that a permit be obtained for the use of a forestry area for non-forestry uses. The activity area does not form part of a state forest; therefore, no permit is required.

4.3.8 Fisheries Management Act 1994

The objectives of the *Fisheries Management Act* 1994 are to conserve, develop and share the fishery resources of the State for present and future generations. The water main is proposed to be strapped to bridges across the tributaries of Mullumbimby Creek and Saltwater Creek to avoid direct impact on the waterways.

A new pipe bridge is proposed across Saltwater Creek on the southern side of Myokum Road. No instream works are proposed for the new pipe bridge. The new pipe bridge over Saltwater Creek will comprise two concrete piles either side of the waterway connected by a steel beam to which the trunk water main pipe will be attached. The bridge will require removal of weed species and one juvenile Hoop Pine (*Araucaria cunninghamii*). Consequently, the activity will not have an adverse impact on waterways or riparian vegetation.

The implementation of the ASSMP will further address the potential of disturbed acid sulfate soil impacting the waterways during the works.

Mullumbimby Creek is mapped as a Key fish Habitat waterway under DPI Fisheries online spatial data and provisions of the *Fisheries Management Act 1994*.

As the works involve strapping the water main to the existing bridge across Mullumbimby Creek; no instream works are required, and the activity will not impact marine vegetation. Approval under Part 7 of the *Fisheries Management Act 1994* is therefore not required as the activity does not involve dredging/reclamation, blocking fish passage or harm to marine vegetation.

4.3.9 Heritage Act 1977

The *Heritage Act 1977* makes provision for the promotion and conservation of the state's heritage.

Searches of the NSW State Heritage Inventory Register, Australian Heritage database and LEP Maps confirm that the works are not across or located near items of State or Commonwealth listed heritage items.

The activity area traverses the LEP mapped heritage conservation area however given that the water main infrastructure is located underground the activity will not impact the significance of the heritage conservation area.

As outlined in section 3 of this REF the activity has been designed to retain trees of heritage value within the heritage conservation area.

4.3.10 Local Land Services Act 2013

The objectives of the *Local Land Services Act 2013* (LLS Act) include 'to ensure the proper management of natural resources in the social, economic and environmental interests of the State, consistently with the principles of ecologically sustainable development'.

The Act regulates the clearing of native vegetation; however, section 60(O)(b)(ii) excludes the need for consent under the *LLS Act where* the clearing is an activity carried out by a determining authority within the meaning of Part 5 of the *EP&A Act*.

The activity alignment has been designed to minimise vegetation impacts, with only minor tree removal required including several street trees and landscape plantings.

4.3.11 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NP&W Act) regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal objects and areas. The site is not located proximate to any national park, historic site, reserve, or places of Aboriginal cultural significance.

The main aim of the NP&W Act 1974 is to conserve the natural and cultural heritage of NSW and where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required.

Searches of the AHIMS database identified no Aboriginal sites/objects recorded within the alignment of the activity. The AHIMS search is provided at Appendix D.

The activity comprises disturbed land and does not include any registered Aboriginal cultural sites or objects. An Aboriginal Heritage Impact Permit (AHIP) in accordance with the NP&W Act 1974 is not required for the activity at this stage.

4.3.12 Protection of the Environment Operations Act 1997

The Protection *of the Environment Operations Act 1997* (POEO Act) is the key environmental protection and pollution statute. The Act is administered by the EPA and establishes a licensing regime for waste, air, water, and pollution. The following summarises key heads of consideration under the Act:

- The project contractor is required to notify EPA if a 'pollution incident' occurs during works, that is likely to impact upon the environment.
- The REF includes mitigations measures to minimise potential impacts that may result in pollution of waters
- The project contractor is required to manage waste in accordance with the Waste Avoidance and Resource Recovery Act 2001.

Section 143 of the Act requires waste to be transported to a place that can lawfully accept it. All waste generated from the works will need to be classified pursuant to the EPA Waste Classification Guidelines and relevant permits obtained for its disposal.

4.3.13 Water Management Act 2000

The main objective of the *Water Management Act 2000 (WM Act)* is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs. Section 91E of the Act establishes an approval regime for controlled activities within waterfront land.

Areas of the proposed water main alignment are considered waterfront land due to being located within 40m of waterways and therefore the project would be classified a controlled activity. Clause 41 of the *Water Management (General) Regulation 2018* provides an exemption for public authorities in relation to all controlled activities on waterfront land. Therefore, approval under the *WM Act* is not required.

Safeguards to protect waterfront land are proposed within this REF.

4.3.14 Roads Act 1993

Section 138 of the *Roads Act 1993* requires the approval from the relevant road's authority for the carrying out of works within a public road. Part 5(1) of Schedule 2 of the Roads Act 1993 also states that public authorities do not require consent for works on unclassified roads.

Mullumbimby Road is classified a Regional Road and BSC is the relevant delegated roads authority under the *Roads Act 1993*. The activity requires construction of a water main infrastructure within the road reserves of Mullumbimby Road and therefore requirements of Section 138 apply under the *Roads Act* 1993.

BSC is required to consult with and gain concurrence of TfNSW prior to undertaking works in accordance with 138 (2) and (3) of the *Roads Act 1993*. as outlined below:

S138 (2) A consent may not be given with respect to a classified road except with the concurrence of TfNSW.

S138 (3) If the applicant is a public authority, the roads authority and, in the case of a classified road, TfNSW must consult with the applicant before deciding whether or not to grant consent or concurrence.

4.3.15 Rural Fires Act 1997

The works are proposed upon land that is identified as being within a bushfire prone and bushfire prone buffer area. The works are not development for the purposes of Section 100B of the *Rural Fires Act 1997* and a bush fire safety authority is therefore not required.

4.3.16 Wilderness Act 1987

Proposals by statutory authorities affecting certain wilderness areas are required to be notified to the Minister and receive consent from the Minister under Section 15 of the Act. The proposal does not involve any activity in a declared wilderness area. Therefore, the Act does not apply to the proposal.

4.3.17 Local Government Act 1993

Under s191A of the *Local Government Act 1993* a council employee (or other person) authorised by a council may enter land to carry out water supply work, sewerage work or stormwater drainage work on or under the premises (being work that the Council is authorised by this or any other Act to carry out). In this regard, BSC does not require landowner consent to undertake any work required on private land.

Council does not require works within private land, regardless BSC does propose to notify potentially affected landholders prior to and throughout the construction period.

4.3.18 Waste Avoidance and Resource Recovery Act 2001 (WARR 2001)

The purpose of the WARR 2001 is to develop and support the implementation of regional and local programs to meet the outcomes of a State-wide strategy for waste avoidance and resource recovery. It also aims to 'minimise the consumption of natural resources and final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste'.

Waste generation and disposal reporting would be carried out during the construction and operation of the proposal. Procedures should be implemented to promote the objectives of the Act.

4.3.19 Marine Estate Management Act 2014 (MEM Act)

The *MEM Act* provides for the strategic and integrated management of the whole marine estate including marine waters, coasts, and estuaries. The activity area traverses Mullumbimby Creek that is mapped Habitat Protection Zone under the Cape Byron Marine Park (CBMP). The water main pipe will be strapped to the Azalea Street bridge over Mullumbimby Creek. The implementation of the ASSMP will further address the potential of disturbed acid sulfate soil impacting the waterway during the works.

The activity is proposed under Part 5 of the EPA Act and does not require an environmental impact statement (as defined under the EPA Act). The activity area traverses a mapped Habitat Protection Zone under the CBMP. Therefore, consideration of Section 55 (3) of the MEM Act applies to the determination of the activity by the public authority as outlined at Table 4-1.

Table 4-1 Section 55 (3) of the MEM

Section 55 (3) (a)	Comment
(i) if there are management rules for the marine park or aquatic reserve, the purposes of the zone within which the area concerned is situated as specified in those management rules, and (ii) the permissible uses of the area concerned under the regulations or the management rules, and (iii) if a management plan for the marine park or aquatic reserve has been made, the objectives of the marine park or aquatic reserve, and (iv) any relevant marine park or aquatic reserve notifications	The activity traverses the Habitat Protection Zone. The objects of the habitat protection zone are— (a) to provide a high level of protection for biological diversity, habitat, ecological processes, natural features and cultural features (both Aboriginal and non-Aboriginal) in the zone, and (b) where consistent with paragraph (a), to provide opportunities for recreational and commercial activities (including fishing), scientific research, educational activities and other activities, so long as they are ecologically sustainable and do not have a significant impact on any fish populations or on any other animals, plants or habitats. The CBMP Operational Plan outlines how the marine park will be managed to meet key the objectives of: - conservating marine biodiversity; - maintaining ecological processes; - providing opportunities for ecologically sustainable use; - supporting public appreciation, enjoyment and understanding of the marine park. The activity proposes to strap to the Azalea Street bridge over Mullumbimby Creek alongside existing pipes and therefore does not result in any direct impacts on the waterway channel or uses within the

Section 55 (3) (a)	Comment
	waterway. The activity occurs across the Habitat Protection Zone of the CBMP Safeguards presented within this REF will mitigate any potential construction impacts on the waterway. As the activity crosses the CBMP, prior to undertaking works a permit is required in accordance with Section 1.16 of the *Marine Estate Management (Management Rules) Regulation 1999* issued by CBMP. Any additional safeguards issued by CBMP will also be incorporated into the activity.

Under section 56(3) of the MEM Act 2014 a determining authority must not carry out, or grant an approval to carry out, an activity on land that is in the locality of a marine park or aquatic reserve in purported compliance with Part 5 of the EP&A Act unless:

> *(a) the determining authority has taken into consideration the purposes of marine parks or aquatic reserves, the regulations and any advice given to it by the relevant Ministers on the impact on the marine park or aquatic reserve of the carrying out of an activity in the locality, and*
> *(b) if the determining authority is of the opinion that the proposed activity is likely to have an effect on the plants or animals within the marine park or aquatic reserve or their habitat, the determining authority has consulted with the relevant Ministers.*

The activity traverses the CBMP and thus the provisions under the Act are relevant. CBMP have requested a copy of the REF prior to providing further advice on the activity under section 56(3) of the MEM Act 2014.

Clause 56 requires that the determining authority (for a Part 5 activity) takes into consideration certain matters under the *Marine Estate Management Act 2014* and Clause 9 of the Marine Estate Management Regulation 2017 as shown in Table 4-2.

Table 4-2 Clause 9 of the Marine Estate Management Regulation 2017

Assessment Criteria	Comment
(a) the objects of the Act (as specified in section 3 of the Act), The objects of this Act are as follows— (a) to provide for the management of the marine estate of New South Wales consistent with the principles of ecologically sustainable development in a manner that— (i) promotes a biologically diverse, healthy and productive marine estate, and (ii) facilitates— • economic opportunities for the people of New South Wales, including opportunities for regional communities, and • the cultural, social and recreational use of the marine estate, and • the maintenance of ecosystem integrity, and • the use of the marine estate for scientific research and education, (b) to promote the co-ordination of the exercise, by public authorities, of functions in relation to the marine estate,	The activity proposes to strap to the Azalea Street bridge over Mullumbimby Creek alongside existing pipes and therefore does not result in any direct impacts on the waterway channel or uses within the waterway. The activity will cross over the Habitat Protection Zone of the CBMP. Safeguards presented within this REF will mitigate any potential construction impacts on the waterway. As the activity will cross the CBMP a permit is required in accordance with Section 1.16 of the Marine Estate Management (Management Rules) Regulation 1999 issued by CBMP. Any additional safeguards issued by CBMP will also be incorporated into the activity. The activity presents no conflict with the objects of the Act.

Assessment Criteria	Comment
(c) to provide for the declaration and management of a comprehensive system of marine parks and aquatic reserves.	
(b) the purposes of marine parks and aquatic reserves (as specified in sections 22 and 33 of the Act respectively)	The activity proposes to strap to the Azalea Street bridge over Mullumbimby Creek alongside existing pipes and therefore does not result in any direct impacts on the waterway channel or uses within the waterway. A permit will be sought for the activity in accordance with Section 1.16 of the *Marine Estate Management (Management Rules) Regulation 1999* issued by CBMP. Any additional safeguards issued by CBMP will also be incorporated into the activity. The activity presents no conflict with the Marine Park purpose.
(c) the objects of the zone in which the activity is proposed Clause 1.8 of the Marine Estate Management (Management Rules) Regulation 1999 sets out the objectives for habitat protection zones in marine parks as: (a) to provide a high level of protection for biological diversity, habitat, ecological processes, natural features and cultural features (both Aboriginal and non-Aboriginal) in the zone, and (b) where consistent with paragraph (a), to provide opportunities for recreational and commercial activities (including fishing), scientific research, educational activities.	The activity proposes to strap to the Azalea Street bridge over Mullumbimby Creek alongside existing pipes and therefore does not result in any direct impacts on the waterway channel or uses within the waterway. The activity will occur across the Habitat Protection Zone of the CBMP. Safeguards presented within this REF will mitigate any potential construction impacts on the waterway. The works will be undertaken with the requirement of any permit issued under Section 1.16 of the *Marine Estate Management (Management Rules) Regulation 1999*. The activity is not considered to be in conflict with the objects of the habitat protection zone.
(d) the activities that are permissible in the zone in which the activity is proposed to be carried out	The proposed activity is not in conflict with any permissible activities allowed in the habitat protection zone.
(e) any operational plan for the marine park adopted by the Marine Parks Authority pursuant to section 25 (4) of the Marine Parks Act 1997 (before its repeal) that continues to have effect because of clause 5 of Schedule 2 to the Marine Estate Management Act 2014	The CBMP Operational Plan is the relevant plan for the site. The proposed activity is low impact and will not negatively impact the Marine Park environment, water quality and Marine habitats
(g) any threatened species or other protected flora or fauna under the Fisheries Management Act 1994, the National Parks and Wildlife Act 1974 or the Threatened Species Conservation Act 1995 that may be affected by the proposed activity	As detailed within this REF the proposed activity will not significantly impact biodiversity or the marine environment.
(h) the form of transport to be used to gain access to the zone in, on or from which the activity is proposed to be carried out, having regard to the adequacy of facilities for parking, mooring, and landing vehicles, vessels and aircraft, and for loading and unloading them	The activity proposes to strap to the Azalea Street bridge over Mullumbimby Creek alongside existing pipes and therefore does not result in any direct impacts on the waterway or uses within the waterway and will not require access from the Marine Park.

Assessment Criteria	Comment
(i) the type of equipment to be used in connection with the proposed activity,	The works methodology includes construction works and operation of the water main not within the waterway. The activity proposes to strap to the Azalea Street bridge over Mullumbimby Creek alongside existing pipes and therefore does not result in any direct impacts on the waterway channel or uses within the waterway.
(j) the arrangements that have been made for the prevention, mitigation and making good of any damage to the marine park or aquatic reserve arising from the proposed activity	This REF has considered all environmental impacts relevant to the activity and safeguards proposed to address any potential impacts are provided within this REF.
(k) such other requirements as the relevant Ministers consider appropriate to the proposed activity	To be confirmed

As *outlined* in Table 4-2, the activity will not negatively impact the Marine Park.

Section 1.16 of the Marine Estate Management (Management Rules) Regulation 1999 requires consent from Marine Parks (permit) in regard to activities that will harm, or attempt to harm animals, plants, and habitat (including soil, sand, shells or other material occurring naturally within the zone) in a habitat protection zone.

The activity proposes to strap the watermain to the Azalea Street bridge over Mullumbimby Creek alongside existing pipes and therefore does not result in any direct impacts on the waterway channel or uses within the waterway. Safeguards presented within this REF will mitigate any potential construction impacts on the waterway. During operation the water main presents no impact on the waterway.

As the activity will require works across the Mullumbimby Creek that is mapped as Habitat Protection Zone of the CBMP, prior to undertaking works a permit is required in accordance with Section 1.16 of the *Marine Estate Management (Management Rules) Regulation 1999* issued by CBMP. Any additional safeguards issued by CBMP will also be incorporated into the activity.

4.4 State Environmental Planning Policies under the EP&A Act

4.4.1 State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&ISEPP)

As discussed under Section 4.1 of this REF, development consent is not required for the proposed water reticulation system in accordance with Division 24 (water supply systems) and clause 2.159 (1) of T&I SEPP.

Part 2.2 of the T&ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by T&I SEPP (where applicable), is discussed in Section 5 of this REF.

4.4.2 Other Environmental Planning Instruments (EPIs)

Table 4-3 provides a review of other Environmental Planning Instruments (EPIs) made under the EP&A Act. Whilst not applicable, this review of EPIs has been undertaken to assist in confirming the suitability, likely impacts, and necessary environmental considerations for the proposed activity. This review has confirmed that the activity is consistent with the aims and objectives of the EPIs and EP&A Act.

Table 4-3 Review of Other EPIs

EPI	Section	Comment
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008	Subdivision 38 Subdivision	Clause 2.75 enables the subdivision of land for the purposes of excising from a lot land that is, or is intended to be, used for public purposes. The activity does not require subdivision of land or land acquisition.
State Environmental Planning Policy (Resilience and Hazards) 2021	Chapter 2 Coastal management	The proposed activity is located within the coastal zone but does not include areas mapped as Coastal Wetland or Littoral Rainforest. The activity is permitted without development consent and therefore precluded from requiring development consent. The provision of the chapter apply to development that requires development consent. Therefore, the provisions of the SEPP do not apply.
	Chapter 3 Hazardous and offensive development	The proposed activity is not defined as a "potentially hazardous industry" or "potentially offensive industry".
	Chapter 4 Remediation of land	The proposed works do not require remediation of land.
State Environmental Planning Policy (Biodiversity and Conservation) 2021	Chapter 4 Koala habitat protection 2021	The SEPP indicates when a Koala Plan of Management is required in regard to development that requires consent. As the activity is permitted without consent the provisions of the SEPP do not apply.
State Environmental Planning Policy (Planning Systems) 2021	Chapter 3 Aboriginal land	The Aboriginal Land SEPP only applies to land identified on the Land Application Map. The subject site is not identified on the Land Application Map.
	Schedule 1-7	The activity is not identified Regionally Significant Development, or State Significant Development
State Environmental Planning Policy (Precincts—Regional) 2021		The subject site is not located within a Regionally significant precinct.
Byron Shire Local Environmental Plan 2014		The activity area is zoned R5, RU1 RU2 R2, B4, W1 and SP2 under the LEP. The activity is precluded from requiring development consent pursuant to clause 2.159 (1) of T&I SEPP.

4.5 Summary of Ancillary Approvals

The following ancillary approvals are required prior to undertaking the works:

- The activity will be strapped to the Azalea Street bridge over Mullumbimby Creek within the Habitat Protection Zone of the Cape Byron Marine Park (CBMP); prior to undertaking works a permit is required in accordance with Section 1.16 of the *Marine Estate Management (Management Rules) Regulation 1999*.
- Licenses from Crown Lands authorising construction of the works will be required where the activity occurs on, under or over lands or waters owned by Crown Lands.
- BSC will have to satisfy itself prior to commencement of the works that the requirements of the *Crown Lands Management Act 2016* (NSW) and the *Native Title Act 1994* (Cth) have been satisfied.

- Prior to undertaking works within the road reserves of Mullumbimby Road (regional classified road), BSC shall gain concurrence from TfNSW under Section 138 of the *Roads Act 1993*.
- The activity requires placement of water mains within the rail corridor and application and approval through UGL Regional Linx Pty Ltd to address works within the Country Regional Network (CRN) rail corridor including:
  - As outlined in the TfNSW Standard Service Installations within the Rail Corridor applications for the installation of non-rail infrastructure services on the rail corridor shall be made through the Rail Corridor Management Group (RCMG) TfNSW. Subject to meeting all engineering and configuration requirements and reaching a satisfactory agreement, the RCMG then advises the applicant whether approval is granted to proceed with the installation of the service. Site work within or near the rail corridor shall not be undertaken unless written permission is received from TfNSW via the RCMG.
  - In accordance with the Rail Safety National Law National Regulations 2012, all external parties must apply for a Rail Access and Works for permission to perform works within or in the vicinity of rail infrastructure.

5 Consultation Requirements

5.1 Consultation Requirements under T&I SEPP

Part 2.2 Division 1 of the T&I SEPP requires public authorities to consult with Councils and other public authorities prior to the commencement of specified development. These requirements are summarised in Table 5-1.

Table 5-1 Consultation requirements checklist

T&I SEPP, Part 2.2, Division 1 Consultation				
Consultation with councils – development with impacts on council-related infrastructure or services				
Will the proposal have a substantial impact on stormwater management services provided by a council?	Yes	☐	No	☒
Is the proposal likely to generate traffic to an extent that will strain the capacity of the road system in a local government?	Yes	☐	No	☒
Will the proposal involve connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by a council?	Yes	☐	No	☒
Will the proposal involve connection to, and use of a substantial volume of water from, any part of a water supply system owned by a council?	Yes	☒	No	☐
Will the proposal involve the installation of a temporary structure on, or the enclosing of, a public place that is under a council's management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential?	Yes	☒	No	☐
Comment – The proposal is being pursued by BSC and relates to its own water supply network. Through construction, the proposed activity will include traffic control measures and structures that will guide vehicle movements around the works zones. This is unavoidable, however will be appropriately managed to ensure safe and convenient travel through and around the works zones.				
Will the proposal involve excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the *Roads Act 1993* (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath)?	Yes	☐	No	☒
Consultation with councils – development with impacts on local heritage				
Is the proposal likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential, and is development that this Policy provides may be carried out without consent?	Yes	☐	No	☒
Consultation with councils – development with impacts on flood liable land				
Is the proposed activity located on flood liable land and will change flood patterns other than to a minor extent?	Yes	☐	No	☒
Comment: The proposed activity is located on land identified as being susceptible to the 1 in 100yr flood. The works though are not considered to create a new barrier for floodwaters or likely to significantly change the flood patterns of the locality.				
Consultation with State Emergency Service – development with impacts on flood liable land				

Is the proposed activity permitted without consent under a **relevant provisions** and located on flood liable land?	Yes	☐	No	☒
Comment- The proposal does not relate to works permitted without consent under any listed relevant provision.				
Consultation with councils – development with impacts on certain land within the coastal zone				
Is the proposed development on land that is within a coastal vulnerability area and is inconsistent with a certified coastal management program that applies to that land?	Yes	☐	No	☒
Consultation with public authorities other than councils				
Is the development adjacent to land reserved under the National Parks and Wildlife Act 1974 or to land acquired under Part 11 of that Act—the Office of Environment and Heritage?	Yes	☐	No	☒
Is the development on land in Zone E1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone—the Office of Environment and Heritage?	Yes	☐	No	☒
development comprising a fixed or floating structure in or over navigable waters—Transport for NSW,	Yes	☐	No	☒
development that may increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map—the Director of the Observatory,	Yes	☐	No	☒
development on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument—the Secretary of the Commonwealth Department of Defence,	Yes	☐	No	☒
Is the development on land in a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 1961—the Mine Subsidence Board?	Yes	☐	No	☒

The activity does trigger any additional agency consultation under Part 2.2 Division 1 of T&ISEPP.

5.2 Consultation Requirements under CPP

The Byron Community Participation Plan does not prescribe a requirement for broad community consultation. For significant, controversial, or highly complex projects, the Council may notify and exhibit the REF before it is finalised and approved by Council.

Whilst the works are not considered to be significant, controversial, or complex, considering the length of the works and the number of landowners within the vicinity of works, Council may choose to notify landowners and businesses, in addition to those directly impacted by the works, to ensure awareness of the project and possible traffic delays.

5.3 Publication Requirements of Environmental Assessment

The work has a capital investment value of $5.5 million and does not require a permit under the *Fisheries Management Act 1994, Heritage Act 1977, National Parks and Wildlife Act 1974 and Protection of the Environment Operations Act 1997*.

Considering the matters above, the REF is required to be published in accordance with Clause 171(4)(a) of the EP&A Regulations on BSC Website.

5.4 Additional consultation and notification requirements

The following consultation and notification are required for the activity:

- The works traverse in places land and waters owned and managed by Crown Lands. Bundjalung of Byron Bay Corporation (Arakwal) hold Native Title rights and interests in these lands and waters pursuant to Federal Court determination NCD2019/001. BSC will need to ensure compliance with the requirements of the *Crown Lands Management Act 2016* (NSW) and the *Native Title Act 1994* (Cth).
- Notification of all receivers within 100 m of the works (letterbox drop or equivalent) including the anticipated duration of such works at least two weeks prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/ updates associated with the proposed works.
- Any private property adjustments (e.g. fencing or driveways) required to enable the works will be negotiated with the affected landholders prior to undertaking the works.
- The activity occurs over the CBMP (Mullumbimby Creek) and the provisions under the MEM Act are relevant. Notification is required in accordance with Section 56 of the MEM Act. CBMP were contacted in November 2022 regarding the activity and have requested a copy of the REF prior to providing further advice/approval on the activity under section 56(3) of the MEM Act.
- Traffic delay notifications will be issued by BSC at least two weeks prior to commencement of works. Notification will be made via BSC website, media notification and potable variable messages sign (VMS) located along the applicable Public Road.

6 Mitigation Measures

Environmental safeguards and management measures outlined in this REF will be recommended to be implemented during construction and operation of this proposal. The safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised at Table 6-1.

Table 6-1 Mitigation Measures

Safeguards/Mitigation Measures
1. General
• *A CEMP is to be prepared prior to any construction works commencing. The CEMP is to include the mitigation measures listed under this Table.* • *Small satellite compounds will be located within the road reserves or Council owned land/facilities. The satellite compounds will include laydown areas for equipment and materials, construction staff waste closet, excavated material stockpiling and vehicle parking. These satellite compounds will be temporary and relocated as the works areas progress along the alignment.* • *Larger temporary ancillary facilities may also be established with BSC managed land to support the activity construction.* • *The locations of the any ancillary facility will be subject to agreement between BSC and the appointed contractor and must meet the following key criteria:* - Within existing clear areas with no additional tree removal or clearing permitted. - Not located within drainage lines or within 10m of a waterway. - Located *within Council owned land/facilities or Council managed road reserve.* • *The activity will require works across the Mullumbimby Creek that is mapped as Habitat Protection Zone of the CBMP, prior to undertaking works a permit is required in accordance with Section 1.16 of the Marine Estate Management (Management Rules) Regulation 1999 issued by CBMP. Any additional safeguards issued by CBMP will also be incorporated into the activity.* • *Concurrence from TfNSW under Section 138 of the Roads Act 1993 is required prior to undertaking works in the alignment of Mullumbimby Road, classified a Regional Classified Road.* • *The activity requires placement of water mains within the rail corridor and application and approval through UGL Regional Linx Pty Ltd to address works within the Country* Regional Network (CRN) rail corridor including: - As outlined in the TfNSW Standard Service Installations within the Rail Corridor, applications for the installation of non-rail infrastructure services on the rail corridor shall be made through the Rail Corridor Management Group (RCMG) TfNSW. Subject to meeting all engineering and configuration requirements and reaching a satisfactory agreement, the RCMG then advises the applicant whether approval is granted to proceed

Safeguards/Mitigation Measures
with the installation of the service. Site work within or near the rail corridor shall not be undertaken unless written permission is received from TfNSW via the RCMG. - In accordance with the Rail Safety National Law National Regulations 2012, all external parties must apply for a Rail Access and Works for permission to perform works within or in the vicinity of rail infrastructure. • *The* proposed watermain will underbore Lot 2 DP 1227659 (BSC Operational Land) and BSC may elect to create an easement for the public asset under provisions of the *Conveyancing Act 1919*.
2. Landform, Geology and Soils
• *Further geotechnical investigation is recommended to support erection of the new Booster Pump Station including consideration of specific subsoil conditions and appropriate foundations required for the structure.* • *Site management will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book (4th Edition) on erosion and sediment control and Safe Work Australia 'Excavation Code of Practice (March 2015).* • *Overburden will be placed in the form of a bund upslope of the site where necessary to reduce surface water entering the construction areas.* • *All erosion and silt control devices will be visually inspected weekly and before forecast rain events to ensure effectiveness as well as after each rainfall event.* • *Excavated areas will be stabilised as soon as possible..*
3. Contaminated Land and Acid Sulfate Soils
• *Works are to be managed in accordance with an Acid Sulfate Soils Management Plan, to manage risks associated with exposure of actual and/or potential acid sulfate material. The plan shall be prepared prior to construction with consideration of the Acid Sulfate Soils Manual published by Acid Sulfate Soils Management Advisory Committee.* • *Spill kits maintained onsite during the construction period and employees trained how to use spill kits.* • *CEMP is to contain suitable unexpected finds protocols and waste handling procedures for managing contaminated soils. This should include, as a minimum:* - *Works to proceed with caution and cease immediately if any potential source of contamination are encountered during development, then works should be halted until confirmation of the presence of contamination is undertaken. In instances where contamination is confirmed, remediation in accordance with a Council approved Remediation Action Plan would be required.* - *Excess spoil to be disposed offsite from the proposed works will need to be classified pursuant to the EPA Waste Classification Guidelines. Relevant permits may need to be obtained for such waste in accordance with the POEO Act 1997 and the relevant guidelines.*
4. Water Quality and Hydrology

Safeguards/Mitigation Measures
• *Best practice stormwater, groundwater and sediment and erosion control measures are to accompany the CEMP.* • *All erosion and silt control devices will be visually inspected weekly and before forecast rain events to ensure effectiveness as well as after each rainfall event.* • *Spill kits maintained onsite during the construction period and employees trained how to use spill kits.* • *No dirty water may be released into drainage lines and/or waterways.* • *Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways.* • *Wash down, if undertaken at the site, must be undertaken in a designated and controlled (bunded and plastic lined) area within the site. Wash down shall use potable water and excess debris removed using hand tools. Wash down waste must be filtered before release.* • *Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) is to be undertaken daily to identify any potential spills or deficient erosion and sediment controls. This will be undertaken where works are undertaken within 100m of the waterways.* • *Contractors shall monitor weather forecasts daily and ensure that works are scheduled so that construction is not impacted by flooding where possible.* • *BSC shall consult with Cape Byron Marine Parks prior to crossing Mullumbimby Creek and where required obtain approval under the Marine Estate Management Act 2014 and Section 1.16 of the Marine Estate Management (Management Rules) Regulation 1999.* Any additional safeguards issued by CBMP will also be incorporated into the activity..
5. **Biodiversity**
• *Works are to be undertaken in general accordance with the relevant provisions of AS4970-2009 Protection of Trees on Development Sites.* • *Measures are required to protect existing trees to be retained, including identified threatened species and Figs that contribute to streetscape character, by establishing adequate tree protection / no-go zones around the retained trees. Construction activities are to be managed to restrict excavations, parking of machinery or stockpiling of materials from the tree protection zones, where practicable.* • *If any damage occurs to vegetation outside of the boundaries of the work site as a result of the implementation of the activity, the Construction Contractor will be notified and will establish strategies for mitigation of impacts and site restoration.* • *If incursion into the TPZ of retained trees is necessary, an arborist should be engaged to assess the impact on the health and viability of the tree.* • *WIRES are to be contacted on 1300 094 737 in the unlikely event that fauna become harmed during works.* • *To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity for the seven (7) impacted native trees. The compensatory planting should occur at a suitable BSC owned offset site.* The following refinements may be undertaken to facilitate construction of the activity:

Safeguards/Mitigation Measures
• Minor tree pruning undertaken with supervision of a qualified arborist ensuring the tree health is maintained; • No tree removal permitted for trees of heritage value; • Minor tree removal providing that prior to removal: - A qualified ecologist has assessed the impact of the tree removal within a biodiversity assessment to confirm the significance of the impact on biodiversity in accordance with a test of significance under the *Biodiversity Conservation Act 2016* and the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*. - The biodiversity assessment has confirmed that there will not be a significant impact on biodiversity under the *Biodiversity Conservation Act 2016* and the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* in regard to the additional tree loss and with consideration of the biodiversity impacts outlined within this REF - Tree loss is offset generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity. - The biodiversity assessment is signed off by BSC and appended to the REF forming part of the planning approval for the activity.
6. Aboriginal Cultural Heritage
• *The CEMP is to include the BSC Aboriginal Cultural Heritage Unexpected Finds and Stop Work Protocols. This procedure will be in place and implemented during construction.* • *Construction contractors are to ensure that all staff on site are aware of the requirement to preserve Aboriginal Cultural Heritage andrequirements under the BSC Aboriginal Cultural Heritage Unexpected Finds and Stop Work Protocols under the CEMP.*
7. Historic Heritage
• *In the event of an unexpected find, works will not recommence until signed authority is received from the BSC and any necessary permits and/or approvals are obtained.* • *The Construction Contractor is to ensure all staff on site are aware of the unexpected finds protocol contained in the CEMP.*
8. Noise and Vibration
• *High noise generating activities within 100 m of sensitive residential, commercial and community buildings will not be carried out in continuous period that exceed three hours each, with a minimum respite period of one hour between each period.* • *Notification of all receivers within 100 m of the works (letterbox drop or equivalent) including the anticipated duration of such works at least two weeks prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/ updates associated with the proposed works.*

Safeguards/Mitigation Measures
• *Noise complaints will be recorded, including suitable identification/ description of the noise source (e.g. continual/ impulsive) and general location of the complaint. Any noise complaints will be investigated and actioned as required.* • *Construction working hours will be restricted to the normal daytime construction hours as specified by the EPA being:* - *7 am to 6 pm Monday to Friday.* - *8 am to 1 pm Saturdays.* - *No works will be undertaken on Sundays or Public Holidays.* • *Works may be undertaken outside these hours where:* - *The delivery of materials is required outside these hours.* - *It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm.* - *Variation is approved in advance in writing by the Regulatory Authority.* - *Residents likely to be affected by the works are notified in writing of the timing and duration of these works at least 24 hours prior to the commencement of works (except for emergency work).* • *All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include:* - *All relevant project-specific and standard noise mitigation measures.* - *Permissible hours of work.* - *Any limitations on high noise generating activities.* - *Location of nearest sensitive receivers.* - *Designated loading/ unloading areas and procedures.* - *Escalation protocols for noise complaints.* • It is recommended that building dilapidation reports are prepared for any buildings or structures within 20m of the underboring alignments addressing the pre and post development conditions of the buildings.
9. Air Quality
• Adjacent receivers are to be suitably notified and consulted with prior to the works occurring and kept updated throughout the duration of the activity. • Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation. • The Construction Contractor would observe local meteorological conditions and predicted forecasts daily and prepare site for extreme weather events (i.e., high winds). • All disturbed areas would be stabilised as soon as practicable to prevent or minimise windblown dust.

Safeguards/Mitigation Measures
• Disturbed surfaces and stockpiles would be wetted down or covered with geotextile fabric during high wind conditions to prevent significant dust generation, as required. • All plant and machinery would be serviced at regular intervals to minimise exhaust emissions. • Vehicles would be switched off when not in use.
10. **Traffic and Access**
• Where works occur next to live traffic a Traffic Control Plan (TCP) shall be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW. Licensed traffic controllers will assist with traffic control during the Project. • Where possible, current traffic movements will be maintained during the works. • Regard to public safety will be maintained at all times and appropriate signage will be erected and details will be confirmed by appropriate Council personnel responsible for site safety during the activity. • Any traffic delay notifications will be issued by Council at least two weeks prior to commencement of works. Notification will be made via Council website and potable variable messages sign (VMS) located along the affected public road. • BSC will regularly consult with affected properties along the activity alignment regarding potential property access impacts associated with the activity. • Prior to undertaking works within the road reserves of Mullumbimby Road, BSC shall gain *concurrence from TfNSW under Section 138 of the Roads Act 1993.*
11. Waste and Chemical Management
• Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day. • Waste is to be temporarily stockpiled at the site, classified and transported to a Council waste handling facility. • Where practical excavated road materials shall be stockpiled at a BSC approved site and used in other BSC projects in accordance with the excavated public road material order 2014 and applicable planning and waste legislation. • Waste material with no reuse purpose shall be transported to a licensed waste facility in accordance with the provisions of the applicable planning and waste legislation. • The contractor will provide waste disposal certificates to Council. • Work to be undertaken in accordance with the Protection of the Environment Operations (Waste) Regulation 2014.
12. Visual Amenity & Landscape
• Working areas are to be maintained, kept free of rubbish, and cleaned up at the end of each working day using waste collection bins.

Safeguards/Mitigation Measures
• Upon completion of construction, work areas and waste stockpiles will be removed, and the activity area grassed / stabilised and cleared of all rubbish and materials.
13. Socio-economic Considerations
• Adjacent residents are to be suitably notified and consulted with prior to the works occurring and kept updated throughout the duration of the activity. • Any private property adjustments (e.g. fencing or driveways) required to enable the works will be negotiated with the affected landholders prior to undertaking the works. All property access impacted by the works will be reinstated to existing conditions or better to ensure no negative impact on private access occurs after construction. • Contractors/ workers would be mindful of the needs of the local community. • In accordance with the Work Health and Safety Act 2011, workers would be provided with appropriate safety clothing and equipment. Supervisory staff and any visitors to the work area would also be required to wear protective clothing. Works personnel would be provided with or expected to have protective equipment and appropriate training. • Prior to undertaking any excavation works all underground *services will be clearly located. Any potential services interruptions shall be communicated to the relevant services authorities to enable flow on notifications to any affected services customers.*

7 Conclusion

An assessment of relevant legislation and environmental planning instruments has confirmed the proposed Activity is permitted without development consent in accordance with clause 2.159 of T&I SEPP.

An environmental assessment of the Activity has been undertaken in accordance with Part 5 of the EP&A Act. For this Activity, BSC is both a public authority proponent (EP&A Act s.5.3) and the determining authority (EP&A Act s.5.1). The REF has been prepared in accordance with Section 171 of the EP&A Regulation.

This environmental assessment has also identified the Activity is not a prescribed activity, and therefore does not require an Environmental Impact Statement (EIS) in accordance with Section 5.7 of the EP&A Act 1979, and is not likely to significantly affect threatened species, and therefore does not require a Species Impact Statement (SIS) in accordance with Section 7.8 of the *Biodiversity Conversation Act 2016*. The Activity is also unlikely to affect Commonwealth land or have an impact on any matters of national environmental significance.

Overall, it is considered that having regard to the relevant tests under the NSW and Commonwealth planning frameworks, the Activity will not result in any significant impacts and should be supported subject to the reasonable and relevant safeguards prescribed in this REF.

8 REF Determination Page

8.1 Author Declaration

This REF provides a true and fair review of the activity in relation to its likely effects on the environment. It addresses to the authors best attempt possible all matters affecting or likely to affect the environment as a result of the project and provides information to determine whether there is likely to be a significant impact on the environment as a result of the Project.

Any design variations required as a result of any ancillary approvals process or confirmed through subsequent consultation shall be incorporated in the Construction Environmental Management Plan (CEMP) or an addendum to this REF, before the works commence.

Together with the identified mitigation methods under this report, these safeguards will ensure appropriate environmental outcomes are achieved when undertaking the proposed activity.

Assessor Declaration	
Project Name:	Mullumbimby Trunk Water Main
Assessor Name:	Sean Cochran
Position:	Senior Environmental Planner, Planit Consulting
Phone:	02 6687 4666
Signature:	
Date	27/11/2024

8.2 Determiner declaration & approval

Byron Shire Council is required to review the document and determine the Project. By signing below Council has indicated that it has considered that the project is unlikely to have a significant environmental impact provided the mitigation measures outlined in this REF are followed and therefore an Environmental Impact Statement or a Species Impact Statement is not required.

Determiner declaration & approval	
Determiner Name:	Phillip Holloway
Company:	Byron Shire Council
Position:	Director Infrastructure Services
Phone:	02 6626 7000
Signature:	
Date:	10/12/24

Appendix A – Engineering Plans

BYRON SHIRE COUNCIL

MULLUMBIMBY TRUNK MAIN
TANDYS LANE (LINE 01)
NEW SOUTH WALES 2482

DETAILED DESIGN

PLANIT CONSULTING

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISION
10000	COVER SHEET AND DRAWING REGISTER	0
10010	GENERAL NOTES	0
10600	KEY PLAN	0
10610	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 1 OF 5	0
10611	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 2 OF 5	0
10612	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 3 OF 5	0
10613	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 4 OF 5	0
10614	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 5 OF 5	0
10620	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 1 OF 2	0
10621	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 2 OF 2	0
10622	CONSTRUCTION DETAILS - AIR VALVE AND SCOUR PIT	0
10623	CONSTRUCTION DETAILS - TYPICAL	0
10624	CONSTRCUTION DETAILS - ROAD CROSSING	0
10625	CONSTRUCTION DETAILS - TRENCH BACKFILL	0

LOCALITY PLAN
NOT TO SCALE

SOURCE: NEARMAP

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES: NOT TO SCALE
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED

PLANIT CONSULTING
SUITE 9A, 80-84 BALLINA STREET
PO BOX 161
LENNOX HEAD NSW 2478
PH: 02 6687 4666
ABN: 20 099 281 711
administration@planitconsulting.com.au

CLIENT: BYRON SHIRE COUNCIL
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 01 - TANDYS LANE
COVER SHEET AND DRAWING REGISTER

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	10000	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\TITLE - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAFTING\10000 COVER SHEET.DWG PLOTTED BY: BRENDAN T PLOT DATE: 26/06/2024 8:13:10 AM

GENERAL

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE FOLLOWING DOCUMENTS:
   i. OTHER PROVIDED ENGINEERING DRAWINGS;
   ii. TECHNICAL SPECIFICATIONS;
   iii. PROJECT SPECIFICATIONS;
   iv. SUPPLEMENTARY SPECIFICATIONS; AND
   v. WRITTEN INSTRUCTIONS.
2. BYRON SHIRE COUNCIL/NORTHERN RIVERS LOCAL GOVERNMENT STANDARDS, SPECIFICATIONS AND STANDARD DRAWINGS ARE TO BE ADOPTED UNLESS STATED OTHERWISE.
3. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT SPECIFICATION FOR THE WORKS TOGETHER WITH THE REQUIREMENTS OF ALL THE RELEVANT CODES OF PRACTICE REFERRED TO THEREIN AND THE REQUIREMENTS OF CURRENT LOCAL AUTHORITY STANDARDS AND SPECIFICATIONS. THESE STANDARDS ARE NOTED AS INCLUDING THE FOLLOWING:
   i. NORTHERN RIVER LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D11, WATER SUPPLY.
   ii. WSA 03 2011 WATER SUPPLY CODE OF AUSTRALIA.
   iii. RELEVANT AND CURRENT STANDARDS OF AUSTRALIA.
   iv. PROVISIONS OF THE BUILDING ACT 1975.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND PROVISION OF ANY TEMPORARY BRACING, PROPPING ETC. TO DRAINAGE PIPES DURING CONSTRUCTION. STRUCTURES SHALL BE MAINTAINED IN A STABLE POSITION AND NO PART SHALL BE OVERSTRESSED.
5. ANY PERMITS AND APPROVALS REQUIRED FOR CONSTRUCTION OF PERMANENT OR TEMPORARY WORKS SHALL BE OBTAINED BY THE CONTRACTOR.
6. THE DETAILED DESIGN PLANS HAVE BEEN DEVELOPED BASED ON SURVEY INFORMATION PROVIDED BY BYRON BAY SURVEYING.
7. EXISTING SURFACE LEVELS ON THE DRAWINGS ARE INDICATIVE ONLY.
8. DO NOT OBTAIN DIMENSIONS FROM SCALING.
9. ALL LOCATIONS, ORIENTATION AND LEVELS SHALL BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK. DISCREPANCIES SHALL BE REFERRED TO THE SITE SUPERINTENDENT, PRIOR TO PROCEEDING WITH ANY WORKS.
10. ALL DIMENSIONS ON THE DRAWINGS ARE NOMINAL ONLY. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS ON SITE PRIOR TO FABRICATION OR CONSTRUCTION. DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.
11. NO SUBSTITUTE MATERIALS SHALL BE USED WITHOUT THE WRITTEN APPROVAL OF THE PRINCIPAL.
12. THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY PROTECTION AND SITE FENCING TO PREVENT ENTRY OF ANY UNAUTHORISED PERSONS AND ANIMALS DURING CONSTRUCTION.
13. ACCESS TO AND WORKS WITHIN PRIVATE LAND PARCELS MUST BE UNDERTAKEN IN ACCORDANCE WITH THE RELEVANT APPROVALS AND AGREEMENTS. NO WORK SHALL COMMENCE WITHIN ANY PRIVATE PROPERTY UNTIL THE CONTRACTOR HAS VERIFIED THAT ALL REQUIRED APPROVALS ARE IN PLACE AND THAT ALL OWNERS/RESIDENTS HAVE BEEN PROVIDED WITH THE NECESSARY NOTICES OF ENTRY.
14. RESTORATION OF SUBJECT WORK ZONES MUST BE UNDERTAKEN IN ACCORDANCE WITH THE NRLG GUIDELINES, AND AT THE DISCRETION OF THE PRINCIPAL, BE OF A MINIMUM STANDARD THAT IS EQUAL TO THE SITES EXISTING CONDITIONS.
15. ALL DRIVEWAYS DISTURBED AS A RESULT OF THE WORKS MUST BE RESTORED TO A DEGREE THAT MATCHES AS CLOSE AS POSSIBLE TO THE EXISTING COLOUR, MATERIAL, AND FINISH. ALL PROPERTY OWNERS OF HOUSEHOLDS IN WHICH THE DRIVEWAY WILL BE AFFECTED ARE TO BE CONSULTED WITH IN ADVANCE OF THE WORKS TO ENSURE THAT THE PROPOSED REINSTATEMENT IS ACCEPTABLE.
16. ALL ROAD PAVEMENTS THAT ARE IMPACTED BY THE WORKS ARE TO BE REINSTATED IN ACCORDANCE WITH THE LOCAL GOVERNMENT STANDARDS.

EXISTING SERVICES

1. IN GENERAL, EXISTING SERVICES SHOWN HAVE BEEN DETERMINED BY ELECTRONIC MEANS AND GROUND PENETRATING RADAR, ONLY SELECT POTHOLING HAS BEEN UNDERTAKEN. THE LOCATION OF UNDERGROUND SERVICES SHOWN ON THESE DRAWINGS SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR, NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.
2. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES PRIOR TO ANY WORKS COMMENCING AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. WORK TO ANY SERVICES SHOULD BE DONE IN CONSULTATION WITH THE APPROPRIATE SERVICE PROVIDER. ANY WORKS SURROUNDING APA ASSETS REQUIRE LIAISION WITH APA WHO ADDITIONALLY REQUIRE SUPERVISION OF ANY WORKS SURROUNDING THEIR ASSET.
4. ONLY UNDERGROUND SERVICES IN THE IMMEDIATE VICINITY OF THIS SURVEY HAVE BEEN LOCATED. INFORMATION OF THE EXISTING SERVICES ARE SHOWN IN THE DRAWINGS IN GOOD FAITH, NO GUARANTEE IS GIVEN OR IMPLIED THAT SUCH INFORMATION IS ACCURATE OR COMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE POSITION OF THE EXISTING SERVICES BEFORE COMMENCING CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO EXERCISE CARE WHEN IN CLOSE PROXIMITY OF SERVICES AND EXCAVATION IN GENERAL. CAREFUL HAND EXCAVATION IS RECOMMENDED WHEN WITHIN CLOSE PROXIMITY TO SERVICES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING SERVICES DURING THE COURSE OF THE CONTRACT.
5. IN THE EVENT OF SERVICES DEVIATING FROM LOCATIONS SHOWN OR PRESENT BUT NOT SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT AND PROVIDE 3 DAYS NOTICE PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY THAT MAY AFFECT THE SERVICE.
6. CONTRACTOR TO OBTAIN PRIOR APPROVAL FROM THE SUPERINTENDENT FOR ANY DEVIATIONS REQUIRED TO AVOID EXISTING SERVICES.
7. DISPLACEMENT OR DISTURBANCE TO ANY EXISTING SERVICES MUST BE RECTIFIED BY THE CONTRACTOR PRIOR TO BACKFILLING AND COMPLETION OF WORKS. TEMPORARY SERVICE PROVISION IS TO BE ACCOUNTED FOR BY THE CONTRACTOR TO ENSURE THAT THERE IS NO SERVICE OUTAGE TO ANY PROPERTY IMPACTED BY THE WORKS.
8. REMOVAL AND DISPOSAL OF ASBESTOS CEMENT PIPES TO BE UNDERTAKEN IN ACCORDANCE WITH THE LATEST VERSION OF:
   iv. BYRON SIRE COUNCIL ASBESTOS POLICY;
   ii. SAFEWORK NSW - ASBESTOS HANDLING GUIDELINES;
   iii. SAFEWORK NSW - WORK HEALTH AND SAFETY REGULATION;
   iv. SAFEWORK NSW - HOW TO MANAGE AND CONTROL ASBESTOS IN THE WORKPLACE CODE OF PRACTICE; AND,
   v. SAFEWORK NSW - HOW TO SAFELY REMOVE ASBESTOS CODE OF PRACTICE.

EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE EROSION AND SEDIMENT CONTROL PLAN.
2. ALL CONTROL MEASURES SHALL BE IN ACCORDANCE WITH "NORTHERN RIVERS LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D7 EROSION CONTROL AND STORMWATER MANAGEMENT".
3. THE CONTRACTOR SHALL INFORM ALL STAFF AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN.
4. CONTROL MEASURES SHALL BE IN PLACE PRIOR TO STRIPPING OR DISTURBANCE OF TOPSOIL WITHIN EACH WORK ZONE.
5. ALL WORKS ARE TO BE INSPECTED, AND MAINTAINED WHERE NECESSARY, ON A WEEKLY BASIS AND AFTER EACH RAIN EVENT.
6. ADEQUATE MEASURES SHALL BE TAKEN TO PREVENT DUST FROM AFFECTING THE AMENITY OF THE NEIGHBOURHOOD DURING CONSTRUCTION. WATER SITE AS REQUIRED TO PREVENT DUST GENERATION. USE TEMPORARY SPRINKLERS AS REQUIRED.
7. ALL WORKS ON SITE SHALL STOP WHEN WIND SPEEDS REACHES 35km/h.
8. CLEANING OF FOOTPATHS AND ROADWAYS SHALL BE CARRIED OUT REGULARLY.
9. ALL DISTURBED AREAS ARE TO BE LEFT IN A STABLE CONDITION. SLOPES SHOULD BE STABILISED USING APPROPRIATE EROSION CONTROL MEASURES, WHILE TURF AND VERGE AREAS TO BE REINSTATED WHEN DISTURBED DURING CONSTRUCTION.
10. ALL TURF/PLANTINGS/REINSTATEMENTS WILL NEED TO BE MAINTAINED THROUGHOUT THE ESTABLISHMENT PHASE.

CLEARING

1. ALL TREE AND VEGETATION CLEARING WORKS BY THE CONTRACTOR MUST STRICTLY BE UNDERTAKEN IN ACCORDANCE WITH THE BYRON SHIRE COUNCIL VEGETATION & TREE REMOVAL POLICIES IN CONJUNCTION WITH THE APPROVED, PROJECT SPECIFIC REVIEW OF ENVIRONMENTAL FACTORS (REF) REPORT.

EARTHWORKS/FILL

1. THIS PROJECT PROPOSES NO BULK EARTHWORKS OR CHANGES TO GROUND LEVEL ACTIVITIES. EARTHWORKS FOR TRUNK MAIN INSTALLATION SHALL COMPRISE OF TRENCHING & BACKFILL OR REMOVAL OF UNDERBORE SPOIL ONLY.
2. ALL IMPORTED FILL MATERIAL MUST COMPRISE OF NATURAL EARTH AND ROCK AND IS TO BE FREE OF ALL CONTAINANTS IN ACCORDANCE WITH THE ENVIRONMENTAL PROTECTION ACT 1994 SECTION 11. NO DEMOLITION MATERIAL (I.E. FOOTPATH OR PAVEMENT) SHALL BE USED AS BACKFILL.
3. ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING. RESPREADING THICKNESSES TO BE A MINIMUM OF 100MM AND A MAXIMUM OF 300MM.
4. ALL TRENCH BACKFILL MATERIAL SHALL BE PLACED, COMPACTED, AND TRIMMED TO MATCH WITH THE EXISTING EARTHWORKS LEVELS AND PROFILES SHOWN ON THE DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND MUST BE IN ACCORDANCE WITH AS3798.

WATER MAIN PIPE WORK & INSTALLATION

1. NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS, ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY STANDARD SPECIFICATIONS AND DRAWINGS.
2. WATER SERVICES SHALL NOT BE PERMITTED TO CONNECT TO THE PROPOSED TRUNK MAIN.
3. REINSTATEMENT OF ANY WATER SERVICE CONNECTIONS SHALL BE IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY STANDARD DRAWINGS.
4. ANY WORKS ASSOCIATED WITH LIVE WATER CONNECTIONS MAY BE CARRIED OUT BY THE CONTRACTOR UNDER SUPERVISION BY CURRENT LOCAL AUTHORITY. FEES & EXPENSES FOR THESE EXPENSES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
5. FOR THE INSTALLATION OF PIPEWORK VIA TRENCHING, PROVIDE SUFFICIENT TRENCH DEPTH AND WIDTH TO ALLOW FOR THE PRESCRIBED BEDDING MATERIAL, PIPEWORK DEFLECTIONS, AND A SAFE WORKING ENVIRONMENT.
6. CONTRACTOR TO FOLLOW SAFE WORK AUSTRALIAS GUIDE TO EXCAVATION WORK AND PROVIDE TRENCH BENCHING IN AREAS OF DEEP EXCAVATION TO PREVENT TRENCH COLLAPSE AND SAFE MOVEMENT OF WORKERS IN AND OUT OF TRENCH.
7. ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.
8. CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENT FOR HDPE PIPELINES CAN BE ACHIEVED VIA BENDING OF THE PIPELINE AND DEFLECTION OF THE PIPEWORK DEFLECTIONS AT JOINTS IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICAITONS.
9. FOR PIPEWORK NOT HDPE, CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENTS OTHER THAN BY MANUFACTURED BENDS, SHALL BE ACHIEVED BY DEFLECTING THE PIPES AT JOINTS. MAXIMUM DEFLECTIONS SHALL BE AS PER MANUFACTURER'S SPECIFICATIONS.
10. WHERE CONNECTING TO ANY EXISTING PIPEWORK, THE LEVEL AND THE SIZE OF THE EXISTING PIPEWORK SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO CONNECTION.
11. IF CUTTING OF PIPES IS NECESSARY ON SITE REFER TO MANUFACTURERS REQUIREMENTS.
12. MINIMUM CLEARANCE TO EXISTING SERVICES SHALL BE IN ACCORDANCE WITH TABLE 5.5 OF THE WSA03-2011 CODE.
13. FOR ALL DI PIPE AND FITTINGS:
   i. ALL DICL PIPES & FITTINGS MUST BE IN ACCORDANCE WITH AS 2280.
   ii. PIPES IN PITS AND WELLS SHALL BE FUSION BONDED EPOXY COATED TO AS 4158.
   iii. BURIED PIPES TO BE COVERED WITH POLYETHYLENE SLEEVING AS PER THE MANUFACTURER'S RECOMMENDATION.
14. FOR ALL FLANGED FITTINGS:
   i. ALL FLANGES MUST BE IN ACCORDANCE WITH AS 4087 UNO. ALL VALVES AND FITTINGS SHALL BE DRILLED TO AS 2129 TABLE D OR AS4087 PN16 UNO.
   ii. ALL BOLTS, NUTS AND WASHERS MUST BE 316 STAINLESS STEEL (GRADE B8M) UNO. BOLTS ARE TO BE ASSEMBLED WITH ANTI-GALLING COMPOUND "DURALAC" OR WITH AN APPROVED EQUIVALENT. ALL BURIED FLANGES ARE TO BE WRAPPED WITH "DENSO" PETROLATUM TAPE TO MANUFACTURER'S REQUIREMENTS.
   iii. PRIME, CAULK AND WRAP ALL BURIED FLANGES AND BOLTS WITH DENSO PETROLATUM PRODUCTS OR APPROVED EQUIVALENT AS PER THE MANUFACTURER'S RECOMMENDATIONS.
   iv. EXTERNAL COATING ARE NOT TO BE REMOVED WHEN THE PIPE FITTINGS ARE SURROUNDED OR COVERED IN CONCRETE.
15. THE CONTRACTOR IS TO ESTABLISH THE SOIL CLASSIFICATION FOR THE WATER MAIN ALIGNMENT TO DETERMINE THRUST BLOCK SIZES, FOR DETAILS REFER TO WSAA STANDARD DRAWING WAT-1205. THE CONTRACTOR MUST NOTE THAT THE ST. HELENA SUPPLY RESERVOIR TWL SITS AT APPROXIMATELY 120M AHD AND THE THRUST RESTRAINT AREA MUST BE CALCULATED IN ACCORDANCE WITH NOTE 6 OF WSAA WAT-1205.
16. ANCHOR BLOCKS SHALL BE INSTALLED AT BENDS, JUNCTIONS AND DEAD ENDS AS REQUIRED BY WAT-1205 AND THE PIPELINE MATERIAL.
17. FOR VALVE INSTALLATION DETAILS REFER WSAA STANDARD DRAWINGS WAT-1207, WAT-1300, WAT-1301 AND WAT-1304.
18. FOR FIRE HYDRANTS INSTALLATION DETAILS REFER WSAA STANDARD DRAWING WAT-1302, WAT-1305 AND WAT-1306.
19. ALL PE PIPEWORK TO BE INSTALLED IN ACCORDANCE WITH WSA 01-2004, POLYETHYLENE PIPELINE CODE.
20. ALL PIPEWORK WELDS TO BE BUTT FUSION WELDED WITH INTERNAL WELDS DE-BEADED.
21. ALL BACKING RINGS SHALL BE STAINLESS STEEL (GRADE 316) AND BOLTING COMPATIBILITY - PN16 IN ACCORDANCE WITH AS 4087, UNO.
22. WRAP 3 LAYERS OF PE SHEETING AROUND PIPE AND FITTINGS WHERE PE PIPEWORK IS IN CONTACT WITH CONCRETE.
23. PE WELDS TO BE PRE-QUALIFIED AS PER WSA 01-2004 SECTION 2.12. AT LEAST ONE BUTT WELD TO BE TESTED AT THE START OF EACH DAY OF WELDING. THE SITE ENGINEER CAN AT ANY TIME REQUEST FOR A RECENT WELD TO BE CUT OUT AND TESTED. TESTING AND COMMISSIONING OF THE PE PIPELINE TO CONFORM TO WSA 01-2004 SECTION 2.13.
24. MARKING TAPE SHALL BE PROVIDED ON TOP OF PIPE EMBEDMENT PRIOR TO TRENCHFILLING FOR ANY TRUNK MAINS INSTALLED VIA TRENCHING. WHERE TRENCHLESS TECHNIQUES ARE USED A 2mm DIAMETER GRADE 316 STAINLESS STEEL TRACER WIRE ON TOP OF THE MAIN PROVIDED PER WSA 03-2011-3.2 CL. 15.12.

CONCRETE

1. ALL CONCRETE SHALL COMPLY WITH AS 3600.
2. FORM CONSTRUCTION JOINTS FOR DRIVEWAY REINSTATEMENTS SHALL BE PROVIDED AND APPROVED BY THE SUPERVISING ENGINEER.
3. SUPPORT REINFORCEMENT IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED BAR CHAIRS, SPACERS OR SUPPORT BARS SUITABLE FOR THE EXPOSURE CONDITIONS.
4. LAP MESH REINFORCEMENT BY ONE COMPLETE MESH SQUARE AS A MINIMUM.
5. DO NOT WELD OR SITE BEND REINFORCEMENT UNLESS SHOWN IN THE DRAWINGS OR OTHERWISE SPECIFIED BY THE SUPERVISING ENGINEER.
6. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
7. SAMPLE TEST AND ASSESS CONCRETE COMPLIANCE IN ACCORDANCE WITH PROJECT ASSESSMENT OF STRENGTH GRADE TO SECTION 20 OF AS 3600.
8. THE CONCRETE SHALL BE COMPACTED USING HIGH-FREQUENCY VIBRATORS.
9. ADMIXTURES SHALL NOT BE USED WITHOUT THE WRITTEN APPROVAL OF THE SUPERVISING ENGINEER.

TESTING & COMMISSIONING

1. ALL TESTING SHALL BE CARRIED OUT BY A N.A.T.A. APPROVED TESTER IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
2. THE TEST PROCEDURE FOR PRESSURE MAINS SHALL BE IN ACCORDANCE WITH SECTION 6 OF AS/NZS 2566.2:2002. THE HYDROSTATIC TEST PRESSURE FOR THE PROPOSED MAIN SHALL BE 1200KPa.
3. THE FREQUENCY OF COMPACTION TESTING SHALL BE IN ACCORDANCE WITH CLAUSE 36.3.4.4 OF WSA03-2011.
4. AUDIT AND FINAL INSPECTIONS OF THE WORKS CONSTRUCTED BY THE CONTRACTOR MUST BE ARRANGED WITH THE PRINCIPAL PROVIDING SUFFICIENT NOTICE PERIODS AT THE DISCRETION OF THE PRINCIPAL.
5. ALL NEWLY INSTALLED WATERMAINS ARE TO BE DISINFECTED AND FLUSHED IN ACCORDANCE WITH CLAUSE 20 OF WSA03-2011 FOLLOWING COMPLETION OF SATISFACTORY HYDROSTATIC PRESSURE TESTING.

SURVEY

1. EXISTING SERVICES SHOWN ON DESIGN PLANS HAVE BEEN COMPILED FROM SURVEY INFORMATION PROVIDED BY BYRON BAY SURVEYING.
2. THE INFORMATION IS NOT INTENDED TO PROVIDE THE CONTRACTOR WITH COMPLETE OR ACCURATE INFORMATION CONCERNING THE LOCATION & EXTENT OF ALL UNDERGROUND UTILITY SERVICES, RATHER ITS PURPOSE IS TO ACT AS A GUIDE TO FACILITATE CONSTRUCTION.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH & EXTENT OF ALL EXISTING SERVICES THROUGH USE OF NON-DESTRUCTIVE LOCATING TECHNIQUES PRIOR TO THE COMMENCEMENT OF WORK.
4. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ANY DAMAGE INCURRED TO EXISTING UTILITY SERVICES AS A RESULT OF THE EXECUTION OF WORK UNDER THE CONTRACT.
5. NO WORK SHALL BE CARRIED OUT WITHIN 3 METRES OF ANY EXISTING SERVICES WITHOUT PRIOR RECORDED CONSULTATION WITH THE RELEVANT AUTHORITY.
6. AS-CONSTRUCTED SURVEY OF THE NEWLY INSTALLED TRUNK MAIN IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARDS OF BYRON SHIRE COUNCIL AND PROVIDED TO COUNCIL IN ADAC FORMAT.

DRIVEWAYS

1. DRIVEWAYS SHALL BE INSTATED IN ACCORDANCE WITH NORTHERN RIVERS STANDARD DRAWINGS R14C, 15D, 16B.

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	BT	RW	RW

SCALES: NOT TO SCALE — DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PH: 02 6687 4666
ABN: 20 099 281 711
administration@planitconsulting.com.au

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: GENERAL NOTES
LINE 01 - TANDYS LANE

ORIGINAL SIZE	PLANIT JOB No.	DRAWING No.	REV.
A1	J7708	10010	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\J7708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TM01 - ENGINEERING\7.4 DRAFTING\7.4.01 DRAWING, NOTES, DWG, PLOTTED BY: BRENDAN, PLOT DATE: 28/06/2024 8:14:32 AM

N

MULLUMBIMBY ROAD

GULGAN ROAD

TANDYS LANE

HYRAMA CRESCENT

GULGAN ROAD

TANDYS LANE

PACIFIC MOTORWAY

10610

10611

10612

10613

10614

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:

0 20 40 80 120

Full Size 1:2000 ; Half Size 1:4000

Scale (m)

DO NOT SCALE FROM DRAWING

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CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

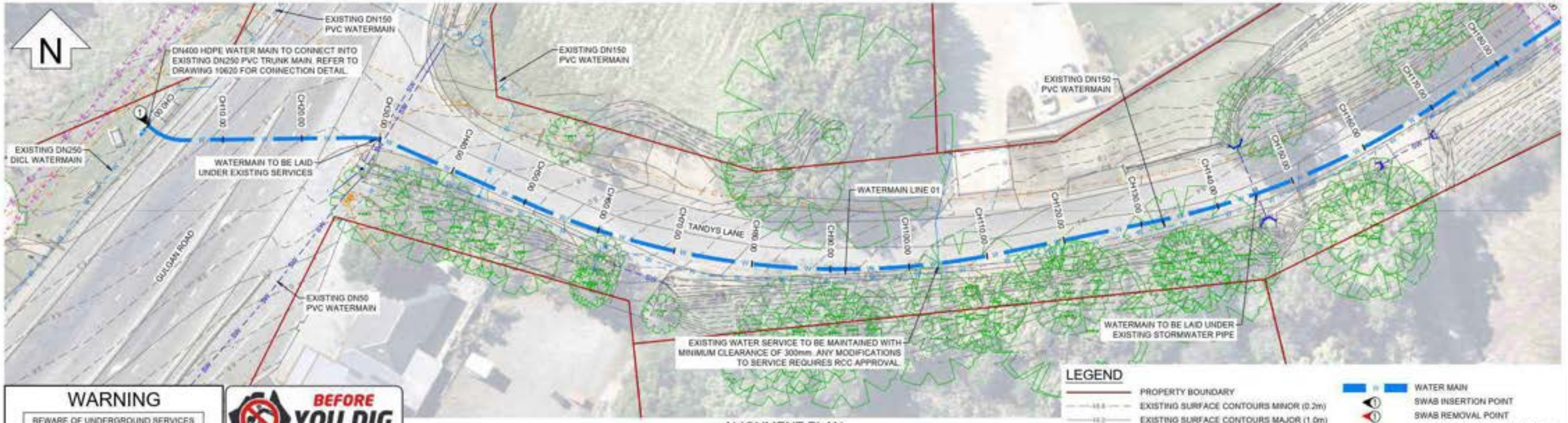
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 01 - TANDYS LANE
KEY PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	10600	0

CAD FILE: C:\DOS\DATA\PLANIT\SVN\JT708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DWG\TMDT0600 KEY PLAN.DWG PLOTTED BY: BRENDAN PLOT DATE: 28/08/2024 9:15:42 AM



WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THESE PLANS.

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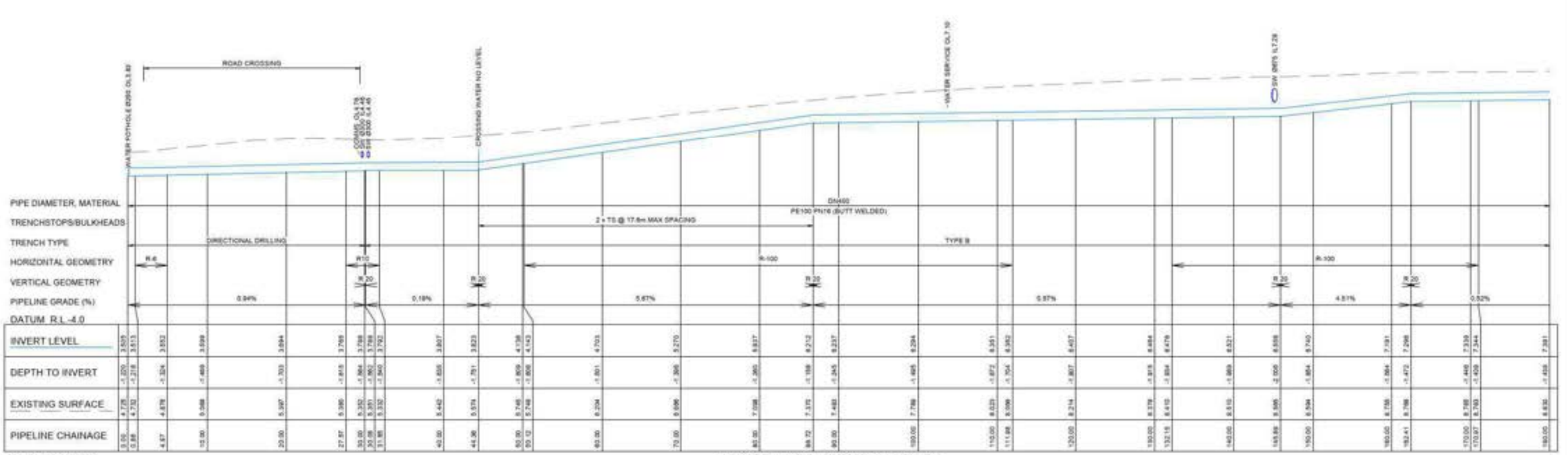
ALIGNMENT PLAN

SCALE 1:250

LEGEND

- PROPERTY BOUNDARY
- EXISTING SURFACE CONTOURS MINOR (0.2m)
- EXISTING SURFACE CONTOURS MAJOR (1.0m)
- EXISTING STORMWATER PIPE
- EXISTING ELECTRICITY UNDERGROUND
- EXISTING ELECTRICITY OVERHEAD
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING WATER MAIN ABANDONED
- WATER MAIN
- SWAB INSERTION POINT
- SWAB REMOVAL POINT
- WATER QUALITY SAMPLING POINT
- AIR VALVE
- SCOUR VALVE
- SLUICE VALVE



SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 01

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES:

Full Size 1:250 ; Half Size 1:500 Scale (m)

Full Size 1:100 ; Half Size 1:200 Scale (m)

DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

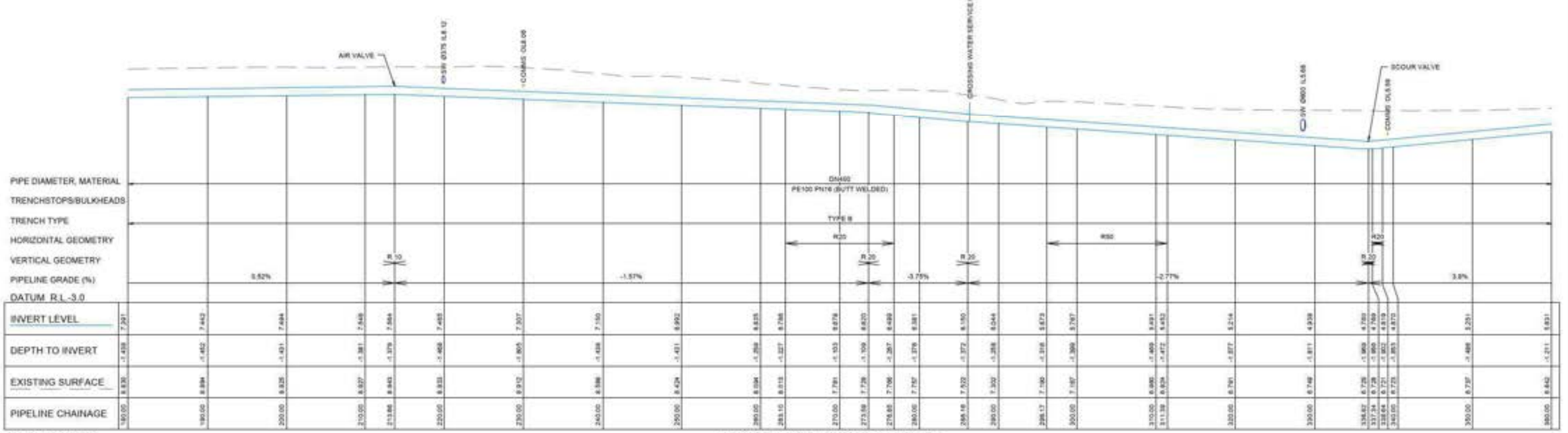
PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 01 - TANDYS LANE ALIGNMENT AND LONGITUDINAL SECTION SHEET 1 OF 5

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	10610	0

ALIGNMENT PLAN

SCALE 1:250



SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 01

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NOTES

1. REFER TO 10610 FOR PLAN LEGEND.

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	BT	RW	RW

SCALES:

Full Size 1:250 : Half Size 1:500 Scale (m)

Full Size 1:100 : Half Size 1:200 Scale (m)

DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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CONSULTING

CLIENT: BYRON SHIRE COUNCIL

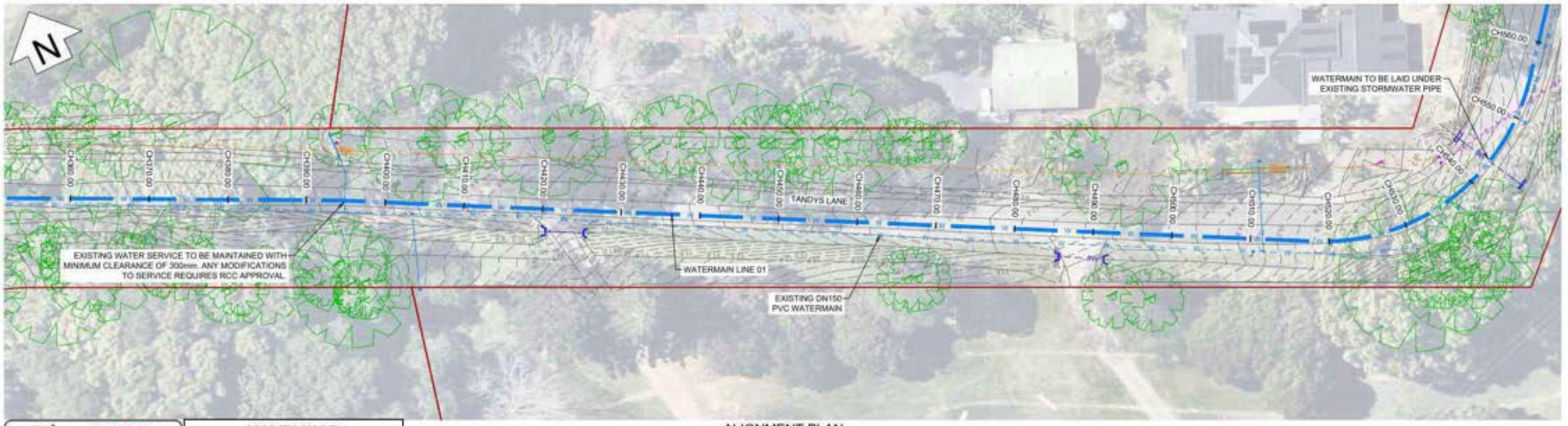
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 01 - TANDYS LANE ALIGNMENT AND LONGITUDINAL SECTION SHEET 2 OF 5

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	10611	0

CAD FILE: C:\USERS\BTAPLANITSYNCUTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAFTING\10610 WATER ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN PLOT DATE: 28/06/2024 9:13:56 AM



ALIGNMENT PLAN
SCALE 1:250

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NOTES

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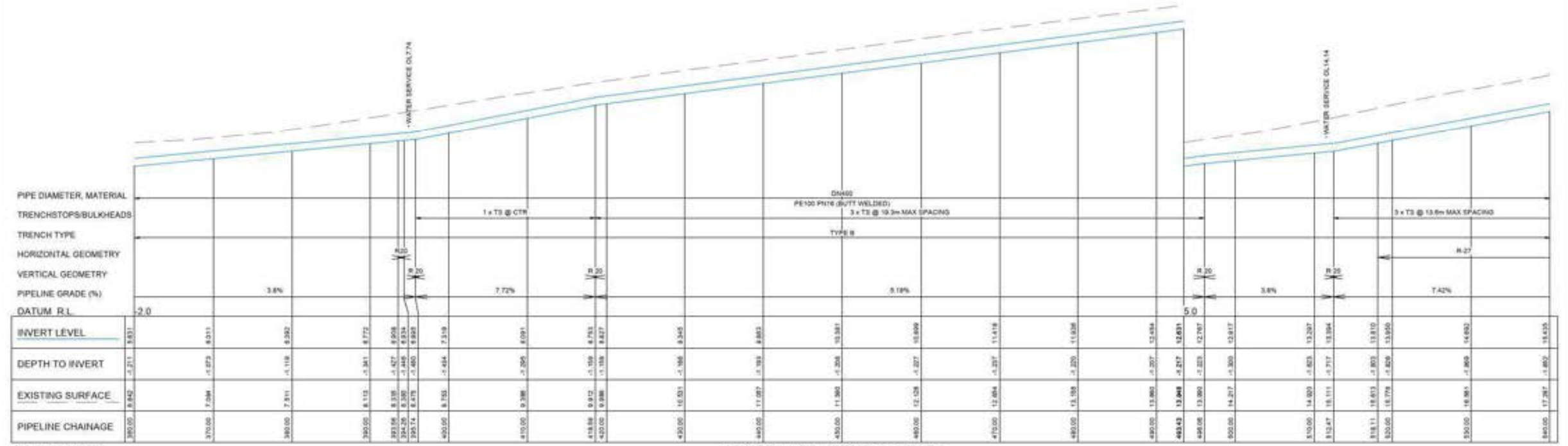

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 01

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:

0 2.5 5 10 15
Full Size 1:250 : Half Size 1:500
Scale (m)

0 1 2 4 6
Full Size 1:100 : Half Size 1:200
Scale (m)

DO NOT SCALE FROM DRAWING

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DATE:

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

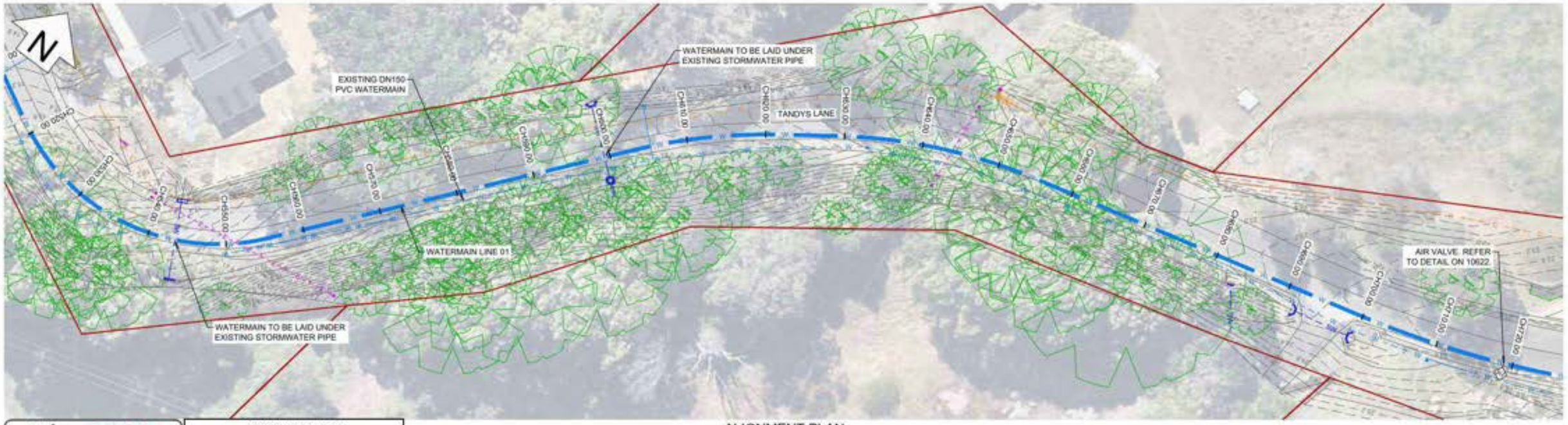
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 01 - TANDYS LANE ALIGNMENT AND LONGITUDINAL SECTION SHEET 3 OF 5

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	10612	0

CAD FILE: C:\USERS\BTAPLANITSYNC\TTSB - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMDT - ENGINEERING\7.4 DRAFTING\10610 WATER ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN P. PLOT DATE: 28/08/2024 9:19:02 AM



ALIGNMENT PLAN

SCALE 1:250

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NOTES

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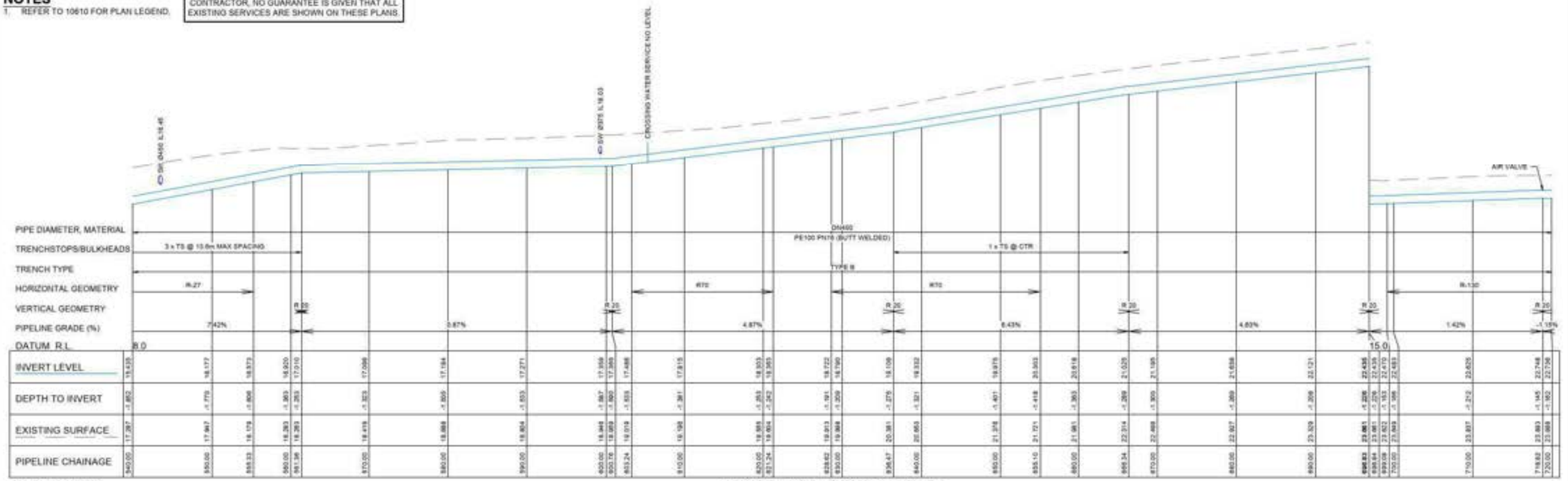

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 01

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES:

0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)

0 1 2 4 6
Full Size 1:100 ; Half Size 1:200
Scale (m)

DO NOT SCALE FROM DRAWING

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DATE:

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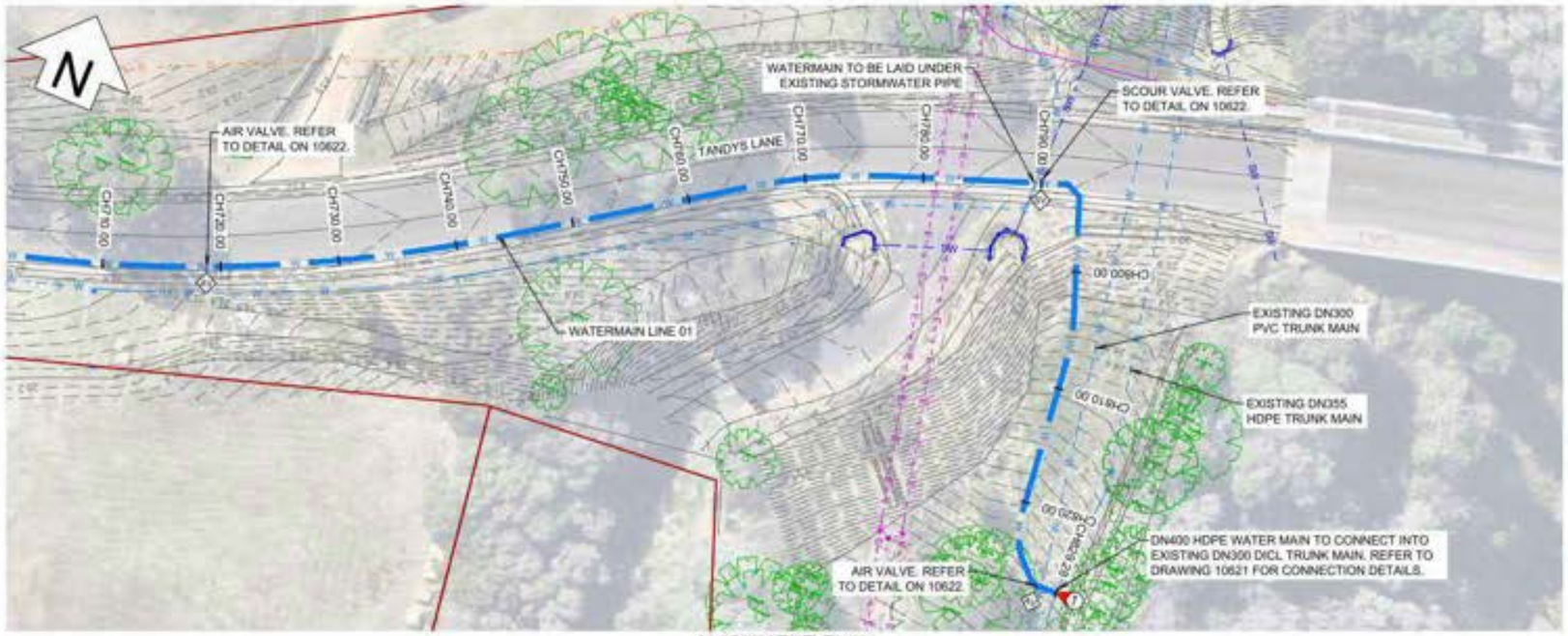
PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 01 - TANDYS LANE ALIGNMENT AND LONGITUDINAL SECTION SHEET 4 OF 5

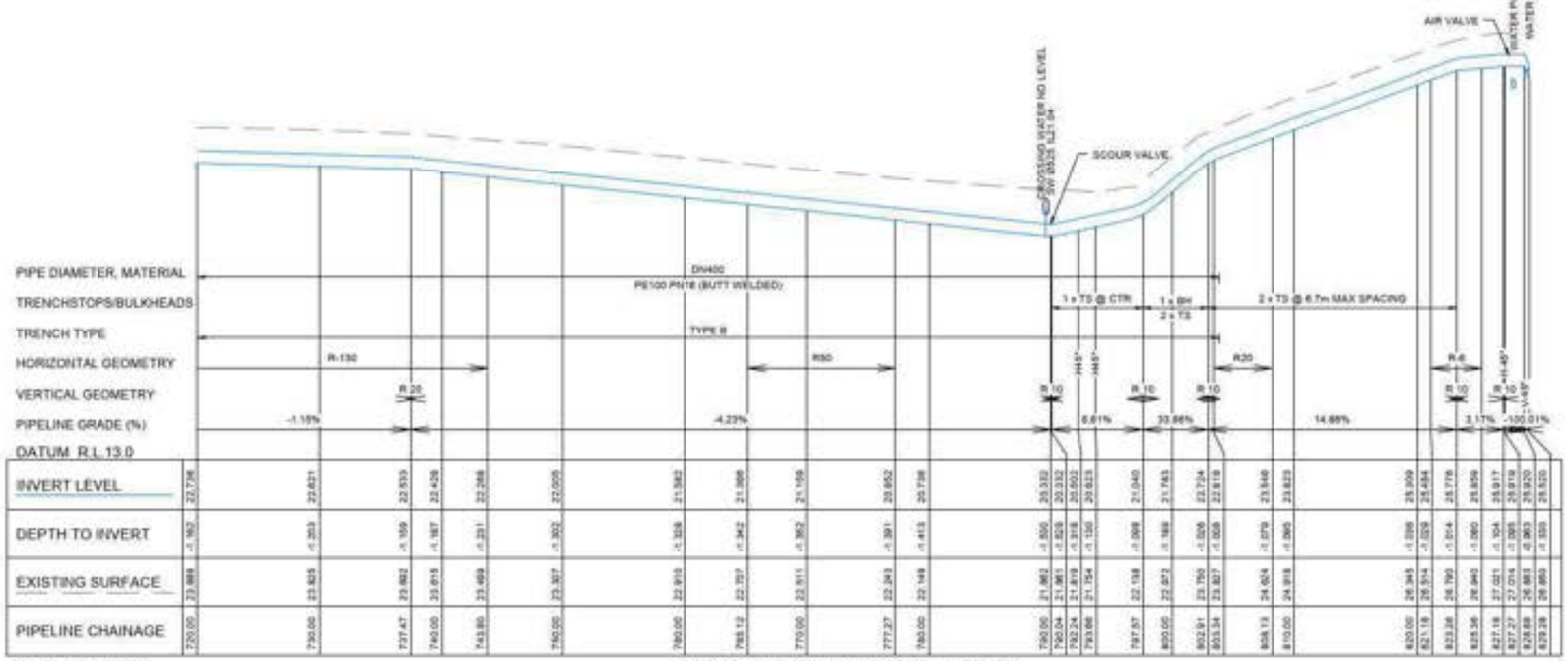
ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	10613	0

CAD FILE: C:\USERS\BTAPLANITSYNLUTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMDT - ENGINEERING\7.4 DRAFTING\10613 WATER ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN PLOT DATE: 26/06/2024 9:14:05 AM



ALIGNMENT PLAN

SCALE 1:250



SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 01

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NOTES

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REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	BT	RW	RW

SCALES:

0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)

0 1 2 4 6
Full Size 1:100 ; Half Size 1:200
Scale (m)

DO NOT SCALE FROM DRAWING

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PLANIT CONSULTING

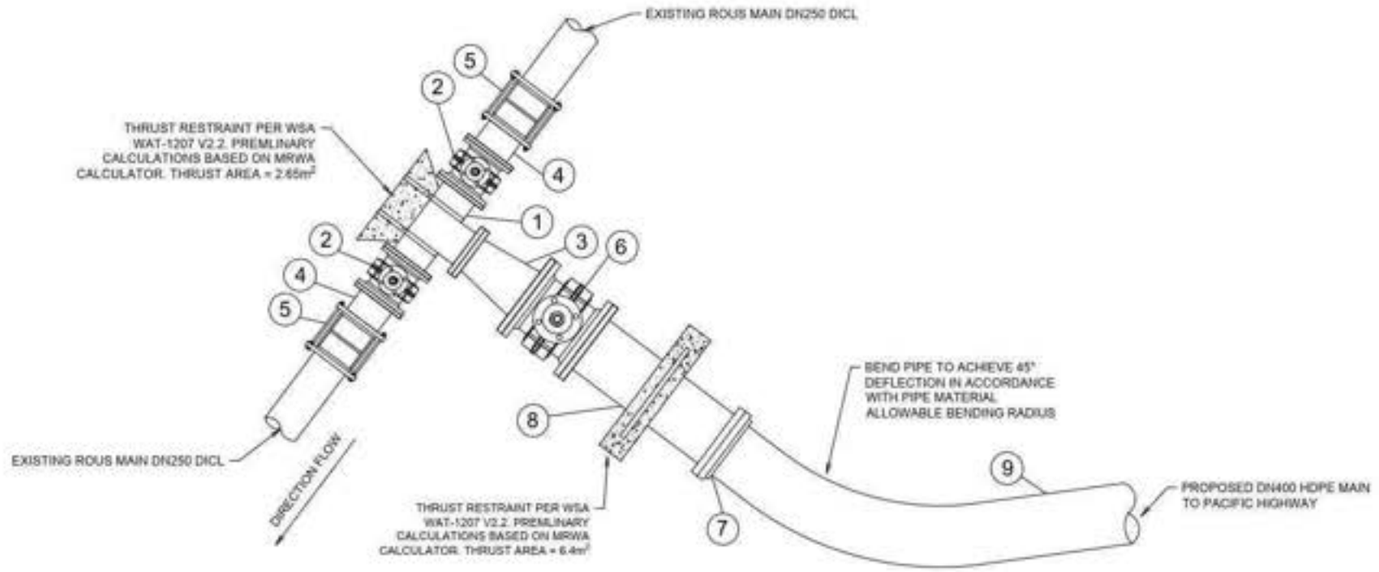
CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 01 - TANDYS LANE ALIGNMENT AND LONGITUDINAL SECTION SHEET 5 OF 5

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.	REV:
A1	J7708	10614	0



	PIPE SCHEDULE
ITEM NO.	DESCRIPTION
1	DN250 x DN250 x DN250 DICL PN16 TEE WITH THRUST BLOCK PER WSA WAT-1207 V2.2.
2	DN250 DICL PN16 SEATED GATE VALVE (FL-FL)
3	DN250 x DN300 DICL PN16 REDUCER (FL-FL)
4	DN250 DICL PN16 1m PIPE SHORT (FL-SP)
5	DN250 DICL PN16 GIBAULT
6	DN300 DICL PN16 SEATED GATE VALVE (FL-FL)
7	DN400 HDPE SDR11 PE100 STUB FLANGE WITH SS BACKING RING TO AS2129 TABLE C
8	DN400 HDPE SDR11 PE100 PUDDLE FLANGE SHORT WITH THRUST RESTRAINT
9	DN400 HDPE SDR11 PE100 PIPE

TANDYS LANE/GULGAN ROAD CONNECTION

NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	RW	RW	RW

SCALES: NOT TO SCALE

DO NOT SCALE FROM DRAWING

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DATE:

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CONSULTING

CLIENT: BYRON SHIRE COUNCIL

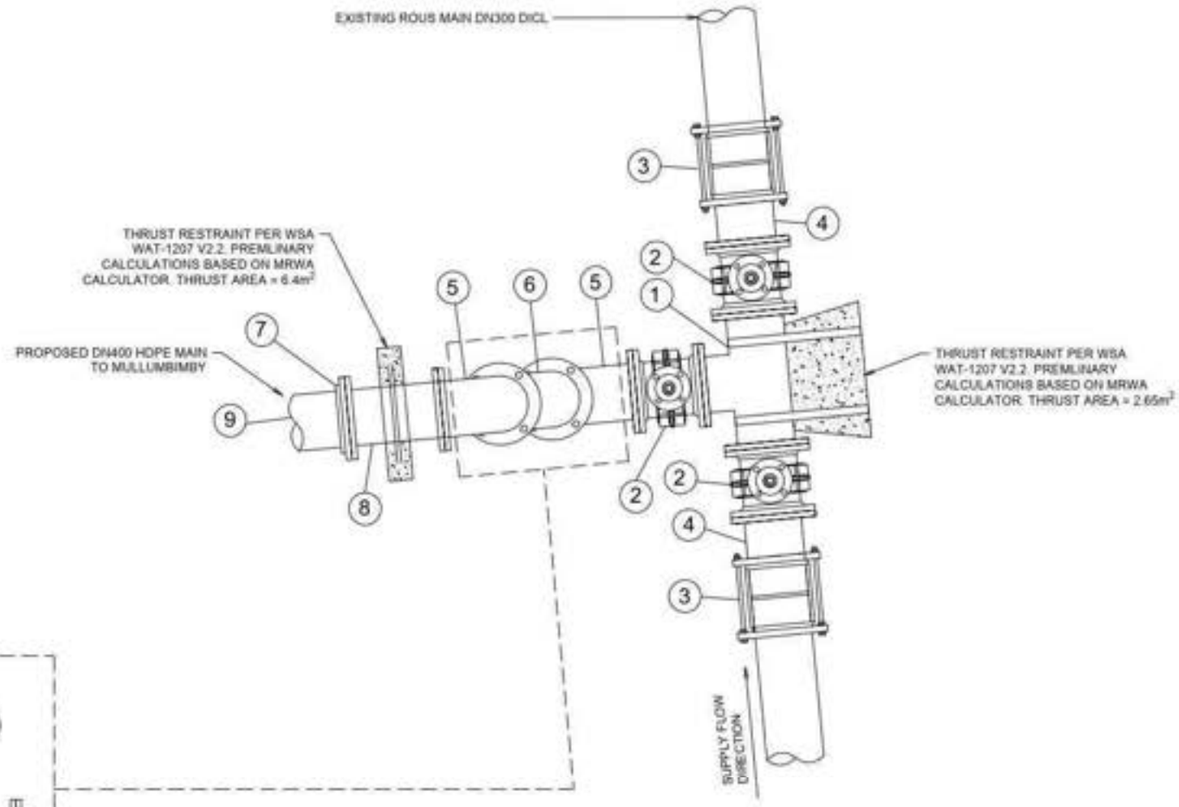
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

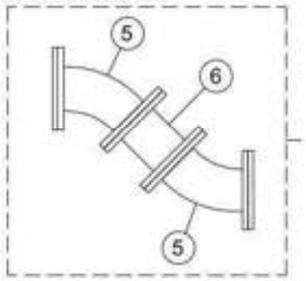
DRAWING TITLE: LINE 01 - TANDYS LANE CONSTRUCTION DETAILS CONNECTIONS - SHEET 1 OF 2

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	10620	0

	PIPE SCHEDULE
ITEM NO.	DESCRIPTION
1	DN300 x DN300 x DN300 DICL PN16 TEE WITH THRUST BLOCK (FL-FL-FL)
2	DN300 DICL PN35 SEATED GATE VALVE (FL-FL)
3	DN300 DICL PN16 GIBAULT
4	DN300 DICL PN16 1m PIPE SHORT (FL-SP)
5	DN300 DICL 45° VERTICAL BEND PN16 (FL-FL)
6	DN300 DICL PN16 PIPE SHORT (FL-FL)
7	DN400 HDPE SDR11 PE100 STUB FLANGE WITH SS BACKING RING TO AS2129 TABLE C
8	DN400 PUDDLE FLANGE HDPE SDR11 PE100 WITH THRUST RESTRAINT
9	DN400 HDPE SDR11 PE100 PIPE



SIDE VIEW OF VERTICAL BENDS AND PIPE ARRANGEMENT



PACIFIC MOTORWAY CONNECTION

NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/08/24	BT	RW	RW	RW

SCALES: NOT TO SCALE — DO NOT SCALE FROM DRAWING

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CONSULTING

CLIENT: BYRON SHIRE COUNCIL

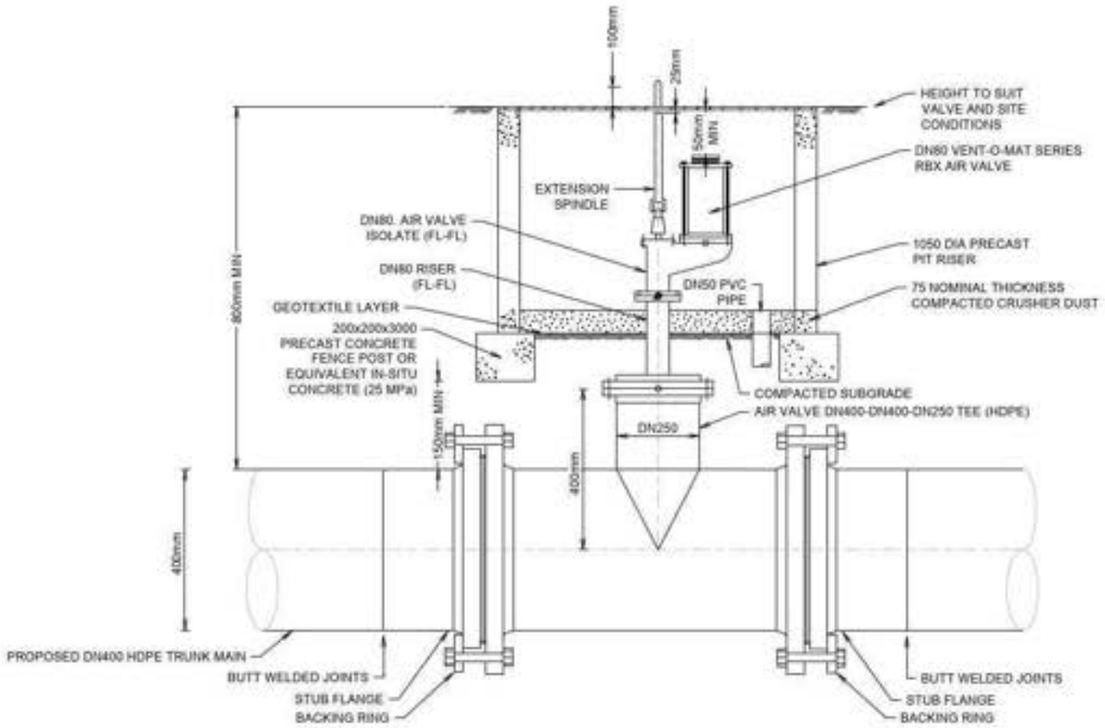
PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 01 - TANDYS LANE CONSTRUCTION DETAILS CONNECTIONS - SHEET 2 OF 2

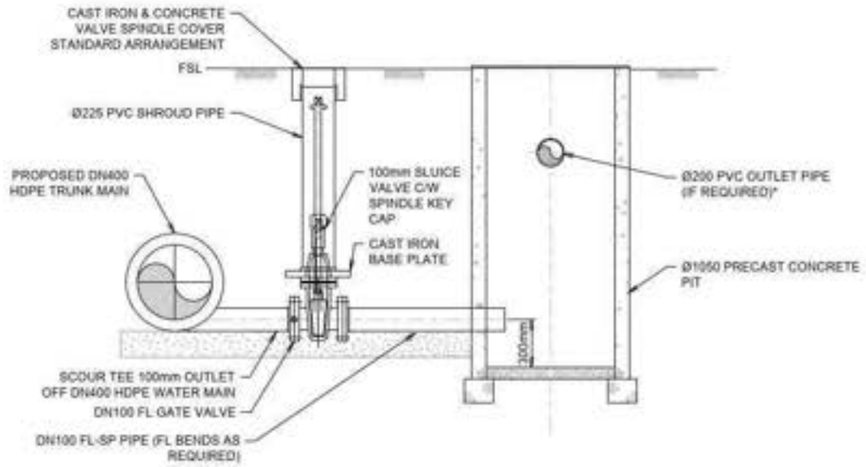
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	10621	0

CAD FILE: C:\USERS\DATA\PLANITSYNC\TTSR - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAFTING\10 WATER DETAILS (DWG PLOTTED BY: BRENDAN) PLOT DATE: 30/09/2024 9:15:54 AM



AIR VALVE TYPICAL DETAIL
(INLINE AIR VALVE WITH AIR VALVE ISOLATOR)
NOT TO SCALE



* EITHER DRILL WEEP HOLES INTO BASE TO LET WATER OUT OR PROVIDE DN200 PVC PIPE AT MINIMUM DEPTH TO OUTLET POINT. ROCK PROTECTION TO BE PROVIDED AT OUTLET.
* ALTERNATIVE - PROVIDE ROCK PROTECTION AROUND PIT & OPEN LID DURING SCOUR OPERATION.

TYPICAL 600mm SCOUR PIT DETAIL
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	RW	RW	RW

SCALES: NTS
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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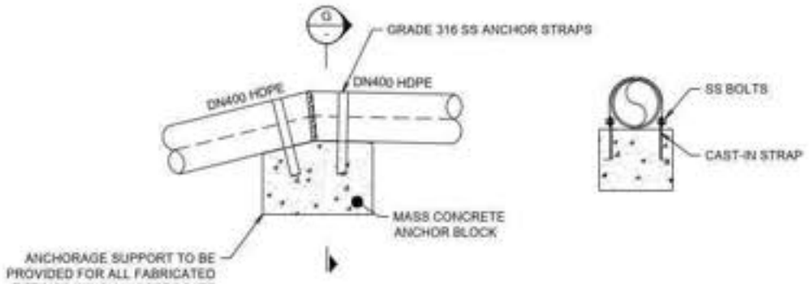
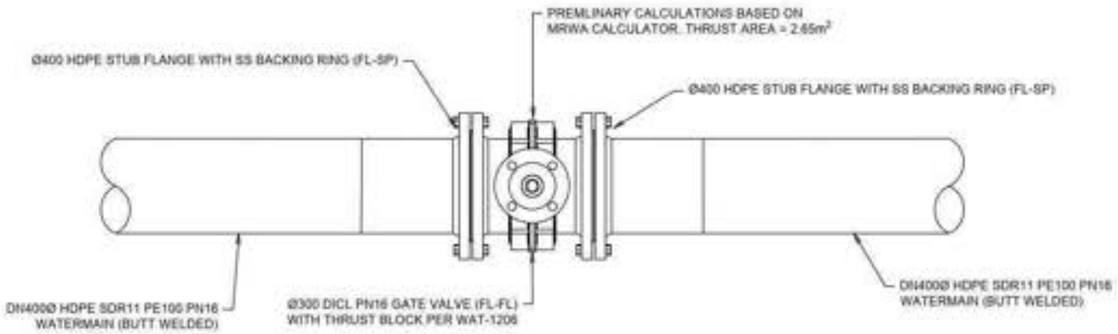
CLIENT: BYRON SHIRE COUNCIL
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 01 - TANDYS LANE CONSTRUCTION DETAILS AIR VALVE AND SCOUR PIT

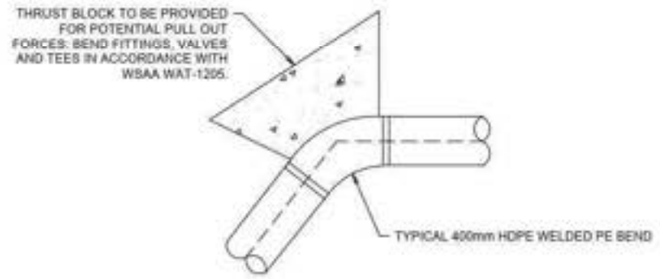
ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.	REV:
A1	J7708	10622	0



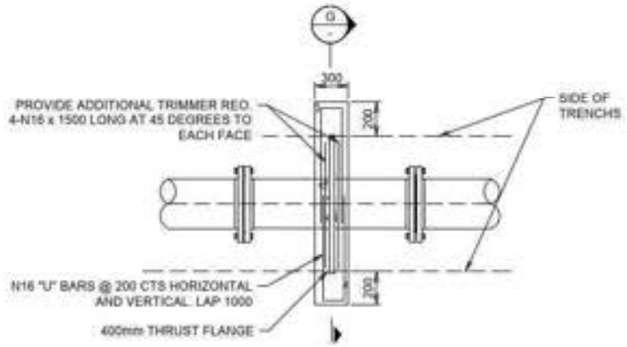
TYPICAL VERTICAL THRUST BLOCK DETAIL
NOT TO SCALE

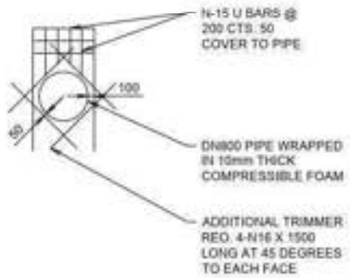


TYPICAL VALVE INSTALLATION DETAIL
NOT TO SCALE



TYPICAL HORIZONTAL THRUST BLOCK DETAIL
NOT TO SCALE





TYPICAL THRUST RESTRAINT DETAIL
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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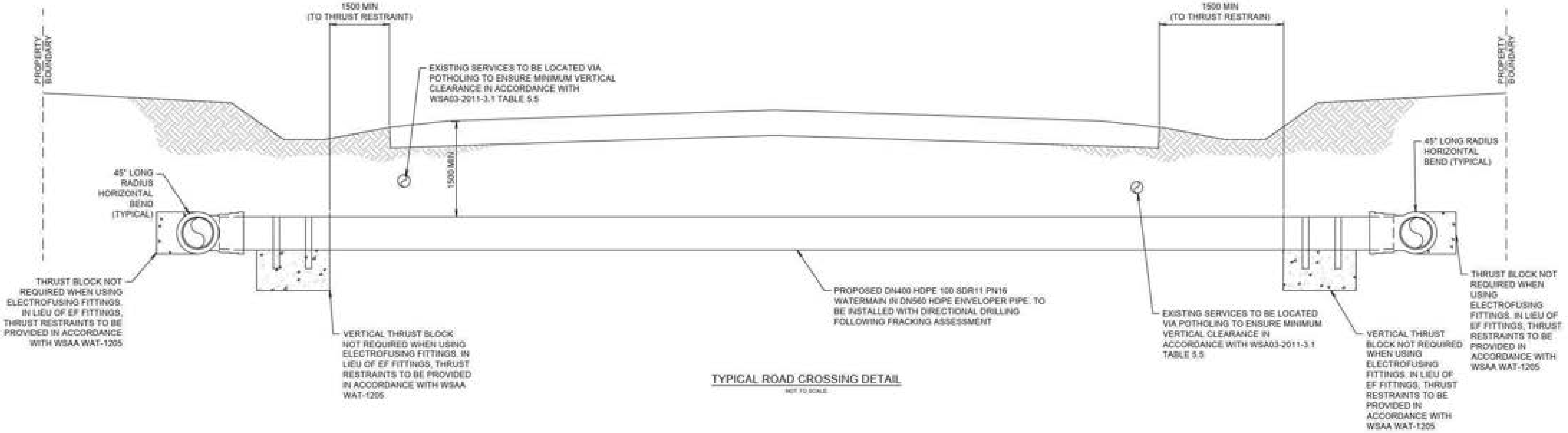
CLIENT: BYRON SHIRE COUNCIL
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 01 - TANDYS LANE CONSTRUCTION DETAILS TYPICAL

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	10623	0



TYPICAL ROAD CROSSING DETAIL

NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS

DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 01 - TANDYS LANE CONSTRUCTION DETAILS ROAD CROSSING

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
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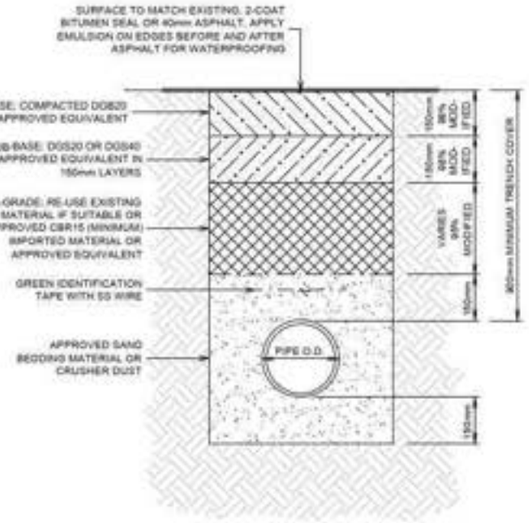
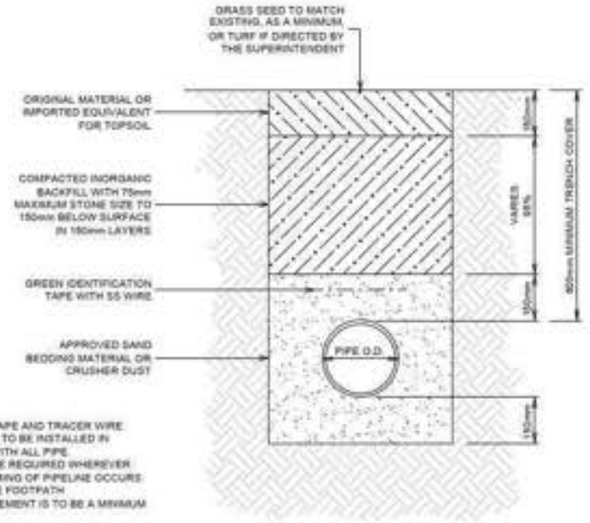


PIPE BACKFILL DETAIL - ROAD PAVEMENT

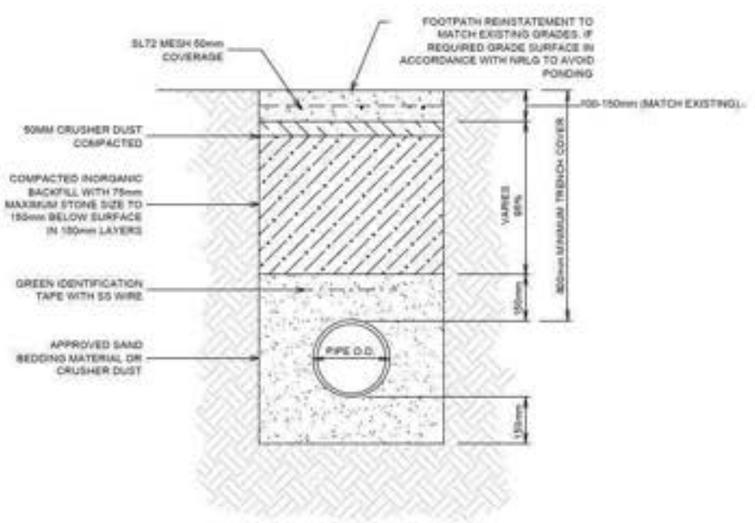
SCALE. 1:10 @ A1, 1:20 @A3



NOTE:
- MARKER TAPE AND TRACER WIRE REQUIRED TO BE INSTALLED IN TRENCH WITH ALL PIPE
- DRAW WIRE REQUIRED WHEREVER UNDERBORING OF PIPELINE OCCURS
- CONCRETE FOOTPATH RE-INSTATEMENT IS TO BE A MINIMUM 20MPA.
- NRLG SPECIFICATIONS REQUIRED.

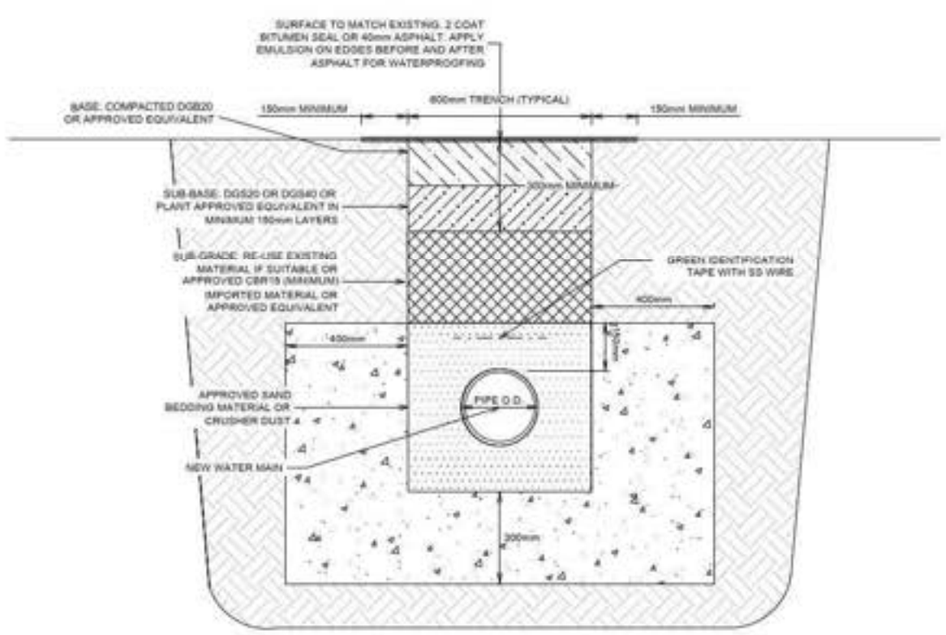
PIPE BACKFILL DETAIL - VERGE

SCALE. 1:10 @ A1, 1:20 @A3



PIPE BACKFILL DETAIL - CONCRETE FOOTPATH

SCALE. 1:10 @ A1, 1:20 @A3



TYPICAL ANCHOR BLOCK DETAIL (TRAFFIC)

1:10 @ A1, 1:20 @A3

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES:
0 0.1 0.2 0.4 0.6
Full Size 1:10 ; Half Size 1:20
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

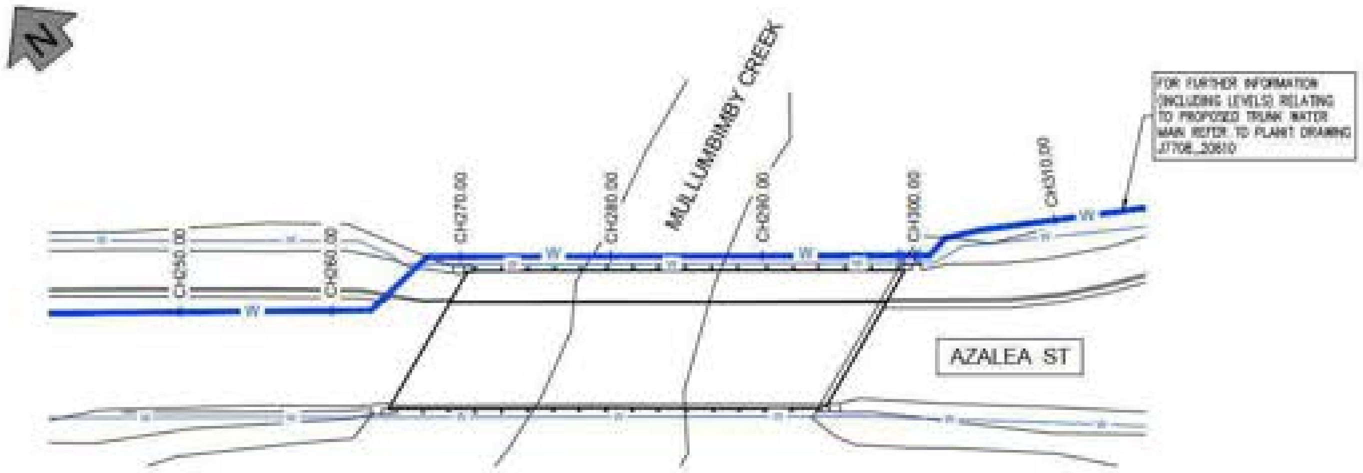
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 01 - TANDYS LANE
CONSTRUCTION DETAILS
TRENCH BACKFILL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	10625	0

CAD FILE: C:\USERS\BT\APPLANITDRIVE\PLANITDRIVE - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DWG\TMD10625 WATER DETAILS.DWG PLOTTED BY: BRENDAN T PLOT DATE: 30/08/2024 9:14:45 AM



AZALEA STREET BRIDGE – PROPOSED DN300 WATERMAIN FIXED TO NORTH (DOWNSTREAM) SIDE

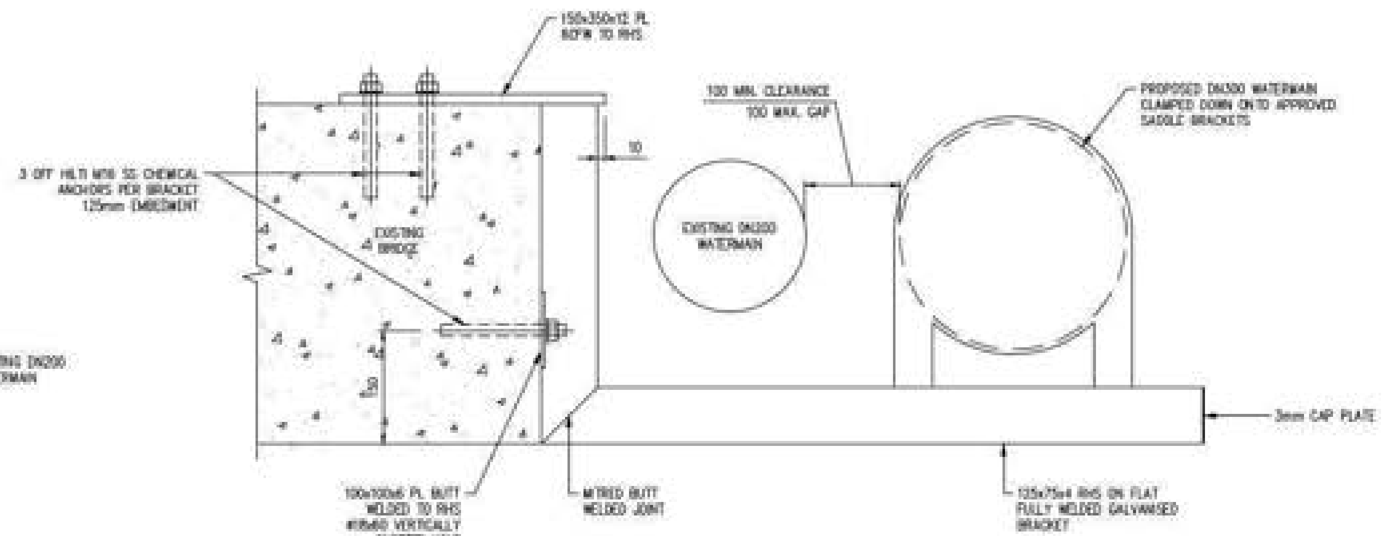
SCALE 1:500

GENERAL NOTES

1. A MINIMUM OF 6 NEW BRACKETS WILL BE REQUIRED TO SUPPORT THE NEW DN300 WATERMAIN.
2. NEW BRACKET LOCATIONS ARE TO BE CONFIRMED RELATIVE TO NEW MAIN SEGMENTS AND EXISTING BRACKETS AND OTHER SURFACE FEATURES PRIOR TO FABRICATION AND INSTALLATION.
3. NEW BRACKET DIMENSIONS ARE TO BE BASED ON SITE MEASUREMENTS TO SUIT THE EXISTING BRIDGE ELEMENTS.
4. NEW MAIN BRACKETS ARE TO ALIGN WITHIN 300mm OF PIPE JOINTS AS SHOWN INDICATIVELY ON THE PLAN VIEW. IF THAT IS NOT POSSIBLE, THEN A BRACKET WILL BE REQUIRED WITHIN 700mm OF EACH SIDE OF THE PIPE JOINT.
5. MAXIMUM SPACING OF NEW MAIN BRACKETS IS TO BE 6600mm. PROVIDE ADDITIONAL BRACKETS IF NECESSARY SUBJECT TO SITE CONSTRAINTS AND PIPE JOINT LOCATIONS.

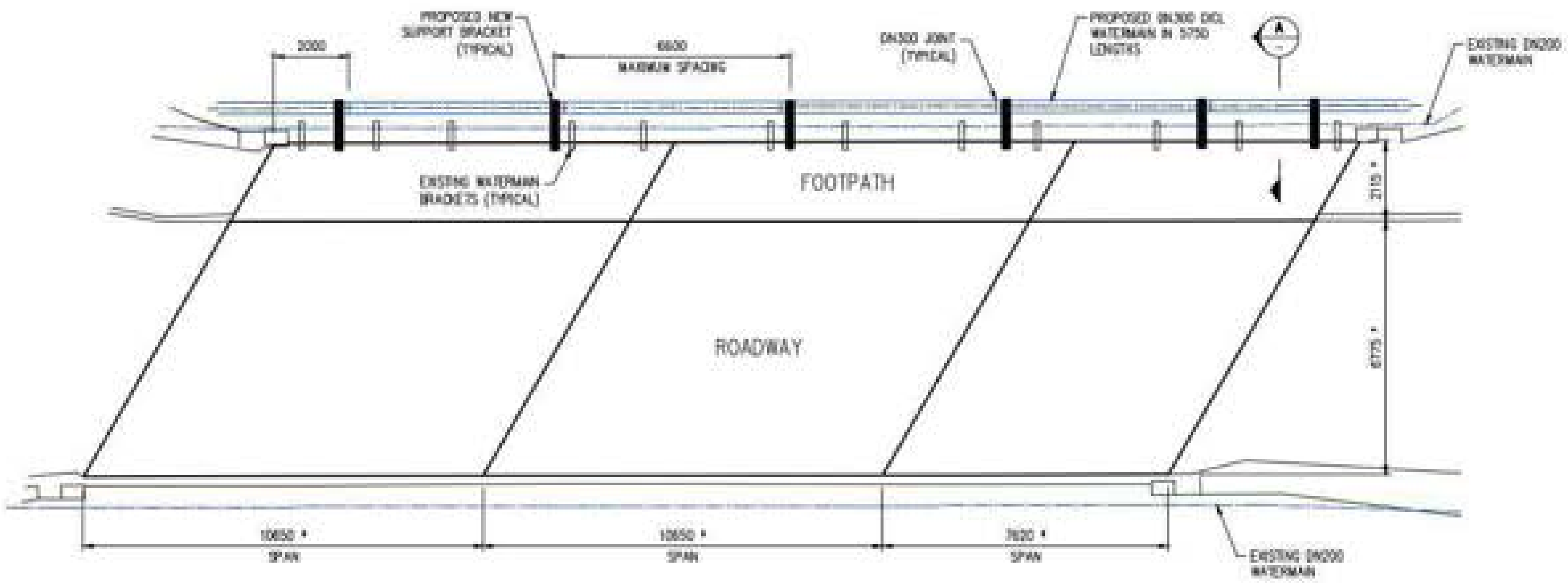
STRUCTURAL STEELWORK NOTES

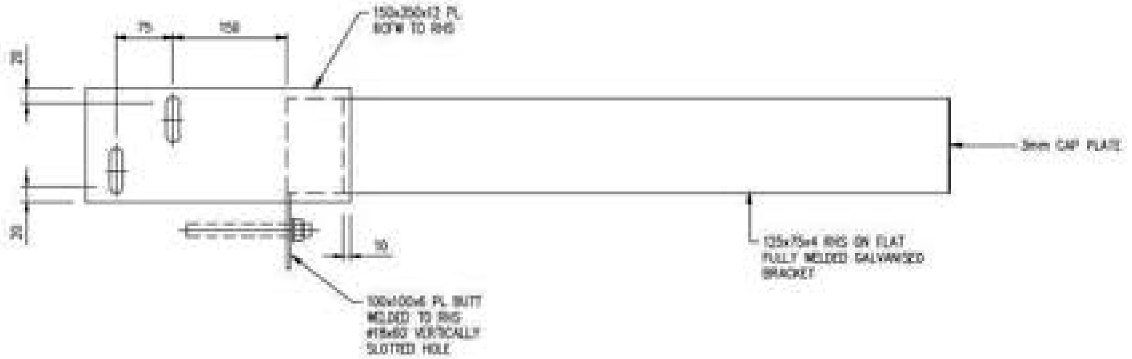
1. ALL WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH AS4100: STEEL STRUCTURES.
2. ALL WELDS ARE TO BE TYPE GP AND IN ACCORDANCE WITH AS/NZS1554. ALL WELDING SHALL BE PERFORMED BY AN EXPERIENCED OPERATOR IN ACCORDANCE WITH AS/NZS1554.
3. ALL STEELWORK SHALL BE HOT DIPPED GALVANISED TO AS/NZS4680 (U.N.O). DUE ALLOWANCES SHALL BE MADE FOR VENTING GALVANISED ITEMS AS APPLICABLE.
4. SITE CUTTING, DRILLING OR WELDING IS NOT PERMITTED.
5. ALL CUT EDGES OF ROLLED STEEL SECTIONS AND PLATES SHALL BE GROUND SMOOTH TO A 2mm MINIMUM RADIUS.
6. ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL A3/316.
7. SUPPLY AND INSTALLATION OF CHEMICAL ANCHORS TO CONCRETE ELEMENTS SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS5131.



SECTION A

SCALE 1:10





EXISTING BRIDGE – PLAN VIEW

SCALE 1:200

NOTE:
* DENOTES DIMENSIONS TO BE CONFIRMED ON SITE

PLAN VIEW

SCALE 1:10

ISSUED FOR CONSTRUCTION

Rev	Date	Drawn	Checked	Description
0	05.03.24	J.N.	M.S.	ISSUED FOR CONSTRUCTION
A	05.03.24	J.N.	M.S.	ISSUED FOR REVIEW

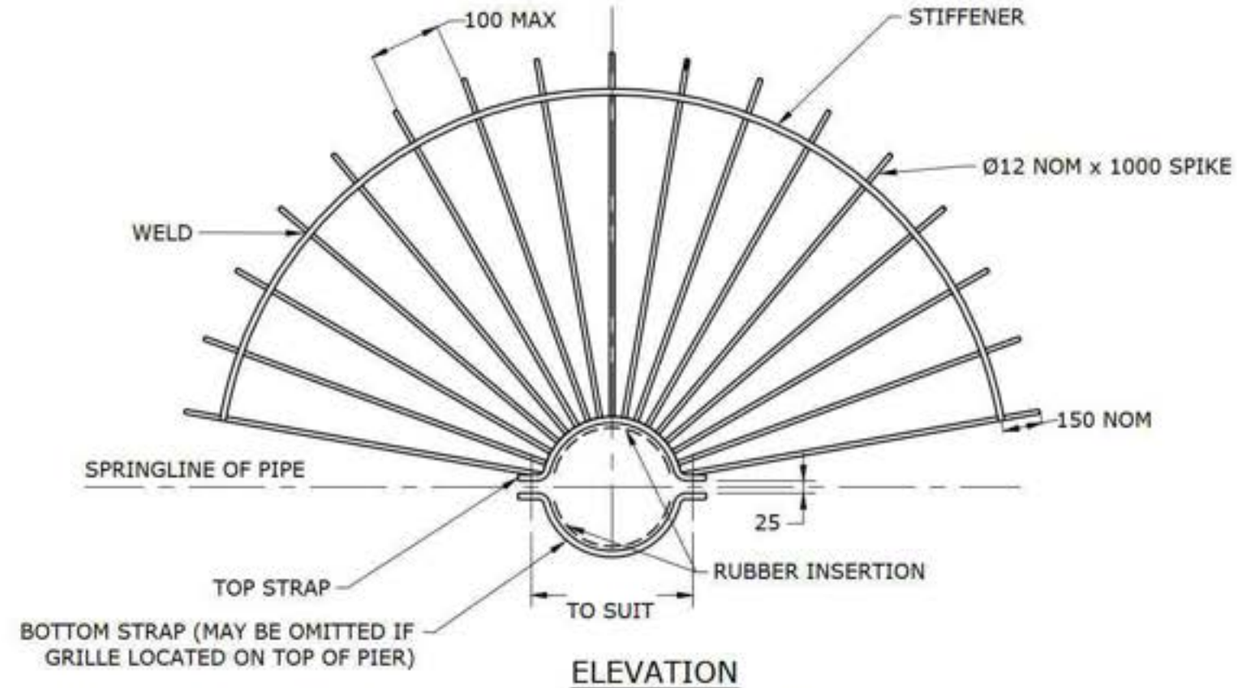
Client: Byron Shire Council

SSE
Solo Structural Engineering Pty Ltd

Project: MULLUMBIMBY TRUNK MAIN

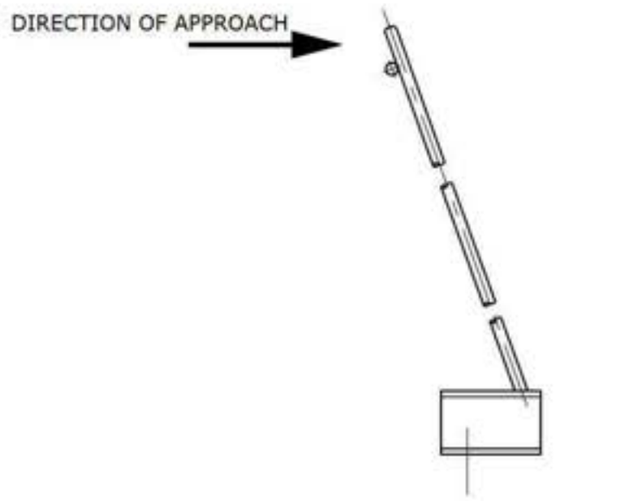
Title: LINE WM02: CH270–CH300
AZALEA STREET BRIDGE CROSSING

Date: 05/03/2024
Designed: M.S.
Drawn: J.N.
Project No.: S300
Drawing No.: S01
Rev: 0
A3

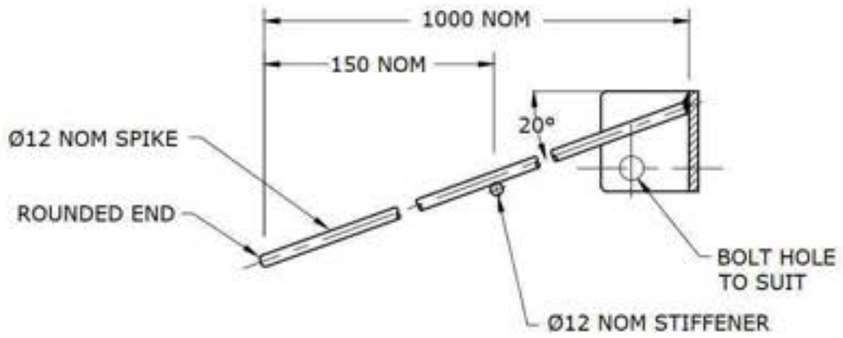


ELEVATION

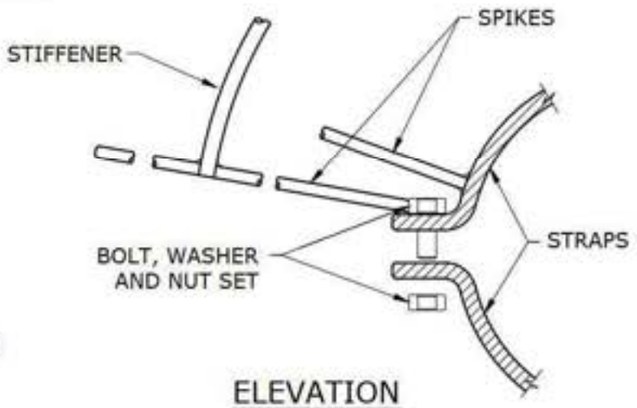
STEEL PROTECTION GRILLE



END ELEVATION



PART PLAN



ELEVATION

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. ALL ITEMS TO BE STEEL AND HOT DIP GALVANISED AFTER FABRICATION.
3. PLACE 3 THICK RUBBER INSERTION BETWEEN CLAMPS AND PIPELINE.
4. INCLUDE SIGN "DANGER KEEP OFF" WHERE SPECIFIED BY WATER AGENCY.
5. STEEL TO BE GRADE 250 TO AS/NZS 3679.1.

COMPONENT & FABRICATION DETAILS

REV. No.	DATE	DESCRIPTION	AUTH.
B	20/07/15	REMOVED CROSS FROM QUU	

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

TYPICAL AERIAL CROSSINGS
AQUEDUCT PROTECTION GRILLE

GCCC	LCC	RCC	QUU	UW

DRAWING No. SEQ-SEW-1405-1

VERSION B

NOT TO SCALE

ORG DATE: 1/1/2013

BYRON SHIRE COUNCIL

MULLUMBIMBY TRUNK MAIN
MULLUMBIMBY TOWNSHIP (LINE 02)
NEW SOUTH WALES 2482

DETAILED DESIGN

PLANIT
CONSULTING

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISION
20000	COVER SHEET AND DRAWING REGISTER	0
20010	GENERAL NOTES	0
20600	WATER ALIGNMENT KEY PLAN	0
20610	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 1 OF 16	0
20611	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 2 OF 16	0
20612	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 3 OF 16	0
20613	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 4 OF 16	0
20614	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 5 OF 16	0
20615	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 6 OF 16	0
20616	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 7 OF 16	0
20617	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 8 OF 16	0
20618	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 9 OF 16	0
20619	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 10 OF 16	0
20620	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 11 OF 16	0
20621	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 12 OF 16	0
20622	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 13 OF 16	0
20623	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 14 OF 16	0
20624	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 15 OF 16	0
20625	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 16 OF 16	0
20628	LINE 02A LONGITUDINAL SECTION	0
20630	CONSTRUCTION DETAILS - CONNECTIONS	0
20631	CONSTRUCTION DETAILS - TYPICAL ROAD CROSSING	0
20632	CONSTRUCTION DETAILS - TYPICAL THRUST BLOCK	0
20633	CONSTRUCTION DETAILS - AIR VALVE AND SCOUR PIT	0
20634	CONSTRUCTION DETAILS - TRENCH BACKFILL	0
20635	CONSTRUCTION DETAILS - WATERMAIN BRIDGING SLAB	0
20636	CONSTRUCTION DETAILS - SALTWATER CREEK CROSSING	0

SOURCE: NEARMAP

LOCALITY PLAN
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
NOT TO SCALE
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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administration@planitconsulting.com.au

PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN COVER SHEET AND DRAWING REGISTER

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20000	0

GENERAL

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE FOLLOWING DOCUMENTS:
   i. OTHER PROVIDED ENGINEERING DRAWINGS;
   ii. TECHNICAL SPECIFICATIONS;
   iii. PROJECT SPECIFICATIONS;
   iv. SUPPLEMENTARY SPECIFICATIONS; AND
   v. WRITTEN INSTRUCTIONS.
2. BYRON SHIRE COUNCIL/NORTHERN RIVERS LOCAL GOVERNMENT STANDARDS, SPECIFICATIONS AND STANDARD DRAWINGS ARE TO BE ADOPTED UNLESS STATED OTHERWISE.
3. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT SPECIFICATION FOR THE WORKS TOGETHER WITH THE REQUIREMENTS OF ALL THE RELEVANT CODES OF PRACTICE REFERRED TO THEREIN AND THE REQUIREMENTS OF CURRENT LOCAL AUTHORITY STANDARDS AND SPECIFICATIONS. THESE STANDARDS ARE NOTED AS INCLUDING THE FOLLOWING:
   i. NORTHERN RIVER LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D11, WATER SUPPLY.
   ii. WSA 03 2011 WATER SUPPLY CODE OF AUSTRALIA.
   iii. RELEVANT AND CURRENT STANDARDS OF AUSTRALIA.
   iv. PROVISIONS OF THE BUILDING ACT 1975.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND PROVISION OF ANY TEMPORARY BRACING, PROPPING ETC. TO DRAINAGE PIPES DURING CONSTRUCTION. STRUCTURES SHALL BE MAINTAINED IN A STABLE POSITION AND NO PART SHALL BE OVERSTRESSED.
5. ANY PERMITS AND APPROVALS REQUIRED FOR CONSTRUCTION OF PERMANENT OR TEMPORARY WORKS SHALL BE OBTAINED BY THE CONTRACTOR.
6. THE DETAILED DESIGN PLANS HAVE BEEN DEVELOPED BASED ON SURVEY INFORMATION PROVIDED BY BYRON BAY SURVEYING.
7. EXISTING SURFACE LEVELS ON THE DRAWINGS ARE INDICATIVE ONLY.
8. DO NOT OBTAIN DIMENSIONS FROM SCALING.
9. ALL LOCATIONS, ORIENTATION AND LEVELS SHALL BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK. DISCREPANCIES SHALL BE REFERRED TO THE SITE SUPERINTENDENT, PRIOR TO PROCEEDING WITH ANY WORKS.
10. ALL DIMENSIONS ON THE DRAWINGS ARE NOMINAL ONLY. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS ON SITE PRIOR TO FABRICATION OR CONSTRUCTION. DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.
11. NO SUBSTITUTE MATERIALS SHALL BE USED WITHOUT THE WRITTEN APPROVAL OF THE PRINCIPAL.
12. THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY PROTECTION AND SITE FENCING TO PREVENT ENTRY OF ANY UNAUTHORISED PERSONS AND ANIMALS DURING CONSTRUCTION.
13. ACCESS TO AND WORKS WITHIN PRIVATE LAND PARCELS MUST BE UNDERTAKEN IN ACCORDANCE WITH THE RELEVANT APPROVALS AND AGREEMENTS. NO WORK SHALL COMMENCE WITHIN ANY PRIVATE PROPERTY UNTIL THE CONTRACTOR HAS VERIFIED THAT ALL REQUIRED APPROVALS ARE IN PLACE AND THAT ALL OWNERS/RESIDENTS HAVE BEEN PROVIDED WITH THE NECESSARY NOTICES OF ENTRY.
14. RESTORATION OF SUBJECT WORK ZONES MUST BE UNDERTAKEN IN ACCORDANCE WITH THE NRLG GUIDELINES, AND AT THE DISCRETION OF THE PRINCIPAL, BE OF A MINIMUM STANDARD THAT IS EQUAL TO THE SITES EXISTING CONDITIONS.
15. ALL DRIVEWAYS DISTURBED AS A RESULT OF THE WORKS MUST BE RESTORED TO A DEGREE THAT MATCHES AS CLOSE AS POSSIBLE TO THE EXISTING COLOUR, MATERIAL, AND FINISH. ALL PROPERTY OWNERS OF HOUSEHOLDS IN WHICH THE DRIVEWAY WILL BE AFFECTED ARE TO BE CONSULTED WITH IN ADVANCE OF THE WORKS TO ENSURE THAT THE PROPOSED REINSTATEMENT IS ACCEPTABLE.
16. ALL ROAD PAVEMENTS THAT ARE IMPACTED BY THE WORKS ARE TO BE REINSTATED IN ACCORDANCE WITH THE LOCAL GOVERNMENT STANDARDS.

EXISTING SERVICES

1. IN GENERAL, EXISTING SERVICES SHOWN HAVE BEEN DETERMINED BY ELECTRONIC MEANS AND GROUND PENETRATING RADAR, ONLY SELECT POTHOLING HAS BEEN UNDERTAKEN. THE LOCATION OF UNDERGROUND SERVICES SHOWN ON THESE DRAWINGS SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR, NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.
2. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES PRIOR TO ANY WORKS COMMENCING AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. WORK TO ANY SERVICES SHOULD BE DONE IN CONSULTATION WITH THE APPROPRIATE SERVICE PROVIDER. ANY WORKS SURROUNDING APA ASSETS REQUIRE LIAISION WITH APA WHO ADDITIONALLY REQUIRE SUPERVISION OF ANY WORKS SURROUNDING THEIR ASSET.
4. ONLY UNDERGROUND SERVICES IN THE IMMEDIATE VICINITY OF THIS SURVEY HAVE BEEN LOCATED. INFORMATION OF THE EXISTING SERVICES ARE SHOWN IN THE DRAWINGS IN GOOD FAITH, NO GUARANTEE IS GIVEN OR IMPLIED THAT SUCH INFORMATION IS ACCURATE OR COMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE POSITION OF THE EXISTING SERVICES BEFORE COMMENCING CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO EXERCISE CARE WHEN IN CLOSE PROXIMITY OF SERVICES AND EXCAVATION IN GENERAL. CAREFUL HAND EXCAVATION IS RECOMMENDED WHEN WITHIN CLOSE PROXIMITY TO SERVICES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING SERVICES DURING THE COURSE OF THE CONTRACT.
5. IN THE EVENT OF SERVICES DEVIATING FROM LOCATIONS SHOWN OR PRESENT BUT NOT SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT AND PROVIDE 3 DAYS NOTICE PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY THAT MAY AFFECT THE SERVICE.
6. CONTRACTOR TO OBTAIN PRIOR APPROVAL FROM THE SUPERINTENDENT FOR ANY DEVIATIONS REQUIRED TO AVOID EXISTING SERVICES.
7. DISPLACEMENT OR DISTURBANCE TO ANY EXISTING SERVICES MUST BE RECTIFIED BY THE CONTRACTOR PRIOR TO BACKFILLING AND COMPLETION OF WORKS. TEMPORARY SERVICE PROVISION IS TO BE ACCOUNTED FOR BY THE CONTRACTOR TO ENSURE THAT THERE IS NO SERVICE OUTAGE TO ANY PROPERTY IMPACTED BY THE WORKS.
8. REMOVAL AND DISPOSAL OF ASBESTOS CEMENT PIPES TO BE UNDERTAKEN IN ACCORDANCE WITH THE LATEST VERSION OF:
   iv. BYRON SIRE COUNCIL ASBESTOS POLICY;
   ii. SAFEWORK NSW - ASBESTOS HANDLING GUIDELINES;
   iii. SAFEWORK NSW - WORK HEALTH AND SAFETY REGULATION;
   iv. SAFEWORK NSW - HOW TO MANAGE AND CONTROL ASBESTOS IN THE WORKPLACE CODE OF PRACTICE; AND,
   v. SAFEWORK NSW - HOW TO SAFELY REMOVE ASBESTOS CODE OF PRACTICE.

EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE EROSION AND SEDIMENT CONTROL PLAN.
2. ALL CONTROL MEASURES SHALL BE IN ACCORDANCE WITH "NORTHERN RIVERS LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D7 EROSION CONTROL AND STORMWATER MANAGEMENT".
3. THE CONTRACTOR SHALL INFORM ALL STAFF AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN.
4. CONTROL MEASURES SHALL BE IN PLACE PRIOR TO STRIPPING OR DISTURBANCE OF TOPSOIL WITHIN EACH WORK ZONE.
5. ALL WORKS ARE TO BE INSPECTED, AND MAINTAINED WHERE NECESSARY, ON A WEEKLY BASIS AND AFTER EACH RAIN EVENT.
6. ADEQUATE MEASURES SHALL BE TAKEN TO PREVENT DUST FROM AFFECTING THE AMENITY OF THE NEIGHBOURHOOD DURING CONSTRUCTION. WATER SITE AS REQUIRED TO PREVENT DUST GENERATION. USE TEMPORARY SPRINKLERS AS REQUIRED.
7. ALL WORKS ON SITE SHALL STOP WHEN WIND SPEEDS REACHES 35km/h.
8. CLEANING OF FOOTPATHS AND ROADWAYS SHALL BE CARRIED OUT REGULARLY.
9. ALL DISTURBED AREAS ARE TO BE LEFT IN A STABLE CONDITION. SLOPES SHOULD BE STABILISED USING APPROPRIATE EROSION CONTROL MEASURES, WHILE TURF AND VERGE AREAS TO BE REINSTATED WHEN DISTURBED DURING CONSTRUCTION.
10. ALL TURF/PLANTINGS/REINSTATEMENTS WILL NEED TO BE MAINTAINED THROUGHOUT THE ESTABLISHMENT PHASE.

CLEARING

1. ALL TREE AND VEGETATION CLEARING WORKS BY THE CONTRACTOR MUST STRICTLY BE UNDERTAKEN IN ACCORDANCE WITH THE BYRON SHIRE COUNCIL VEGETATION & TREE REMOVAL POLICIES IN CONJUNCTION WITH THE APPROVED, PROJECT SPECIFIC REVIEW OF ENVIRONMENTAL FACTORS (REF) REPORT.

EARTHWORKS/FILL

1. THIS PROJECT PROPOSES NO BULK EARTHWORKS OR CHANGES TO GROUND LEVEL ACTIVITIES. EARTHWORKS FOR TRUNK MAIN INSTALLATION SHALL COMPRISE OF TRENCHING & BACKFILL OR REMOVAL OF UNDERBORE SPOIL ONLY.
2. ALL IMPORTED FILL MATERIAL MUST COMPRISE OF NATURAL EARTH AND ROCK AND IS TO BE FREE OF ALL CONTAINANTS IN ACCORDANCE WITH THE ENVIRONMENTAL PROTECTION ACT 1994 SECTION 11. NO DEMOLITION MATERIAL (I.E. FOOTPATH OR PAVEMENT) SHALL BE USED AS BACKFILL.
3. ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING. RESPREADING THICKNESSES TO BE A MINIMUM OF 100MM AND A MAXIMUM OF 300MM.
4. ALL TRENCH BACKFILL MATERIAL SHALL BE PLACED, COMPACTED, AND TRIMMED TO MATCH WITH THE EXISTING EARTHWORKS LEVELS AND PROFILES SHOWN ON THE DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND MUST BE IN ACCORDANCE WITH AS3798.

WATER MAIN PIPE WORK & INSTALLATION

1. NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS, ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY STANDARD SPECIFICATIONS AND DRAWINGS.
2. WATER SERVICES SHALL NOT BE PERMITTED TO CONNECT TO THE PROPOSED TRUNK MAIN.
3. REINSTATEMENT OF ANY WATER SERVICE CONNECTIONS SHALL BE IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY STANDARD DRAWINGS.
4. ANY WORKS ASSOCIATED WITH LIVE WATER CONNECTIONS MAY BE CARRIED OUT BY THE CONTRACTOR UNDER SUPERVISION BY CURRENT LOCAL AUTHORITY. FEES & EXPENSES FOR THESE EXPENSES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
5. FOR THE INSTALLATION OF PIPEWORK VIA TRENCHING, PROVIDE SUFFICIENT TRENCH DEPTH AND WIDTH TO ALLOW FOR THE PRESCRIBED BEDDING MATERIAL, PIPEWORK DEFLECTIONS, AND A SAFE WORKING ENVIRONMENT.
6. CONTRACTOR TO FOLLOW SAFE WORK AUSTRALIAS GUIDE TO EXCAVATION WORK AND PROVIDE TRENCH BENCHING IN AREAS OF DEEP EXCAVATION TO PREVENT TRENCH COLLAPSE AND SAFE MOVEMENT OF WORKERS IN AND OUT OF TRENCH.
7. ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.
8. CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENT FOR HDPE PIPELINES CAN BE ACHIEVED VIA BENDING OF THE PIPELINE AND DEFLECTION OF THE PIPEWORK DEFLECTIONS AT JOINTS IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICAITONS.
9. FOR PIPEWORK NOT HDPE, CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENTS OTHER THAN BY MANUFACTURED BENDS, SHALL BE ACHIEVED BY DEFLECTING THE PIPES AT JOINTS. MAXIMUM DEFLECTIONS SHALL BE AS PER MANUFACTURER'S SPECIFICATIONS.
10. WHERE CONNECTING TO ANY EXISTING PIPEWORK, THE LEVEL AND THE SIZE OF THE EXISTING PIPEWORK SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO CONNECTION.
11. IF CUTTING OF PIPES IS NECESSARY ON SITE REFER TO MANUFACTURERS REQUIREMENTS.
12. MINIMUM CLEARANCE TO EXISTING SERVICES SHALL BE IN ACCORDANCE WITH TABLE 5.5 OF THE WSA03-2011 CODE.
13. FOR ALL DI PIPE AND FITTINGS:
   i. ALL DICL PIPES & FITTINGS MUST BE IN ACCORDANCE WITH AS 2280.
   ii. PIPES IN PITS AND WELLS SHALL BE FUSION BONDED EPOXY COATED TO AS 4158.
   iii. BURIED PIPES TO BE COVERED WITH POLYETHYLENE SLEEVING AS PER THE MANUFACTURER'S RECOMMENDATION.
14. FOR ALL FLANGED FITTINGS:
   i. ALL FLANGES MUST BE IN ACCORDANCE WITH AS 4087 UNO. ALL VALVES AND FITTINGS SHALL BE DRILLED TO AS 2129 TABLE D OR AS4087 PN16 UNO.
   ii. ALL BOLTS, NUTS AND WASHERS MUST BE 316 STAINLESS STEEL (GRADE B8M) UNO. BOLTS ARE TO BE ASSEMBLED WITH ANTI-GALLING COMPOUND "DURALAC" OR WITH AN APPROVED EQUIVALENT. ALL BURIED FLANGES ARE TO BE WRAPPED WITH "DENSO" PETROLATUM TAPE TO MANUFACTURER'S REQUIREMENTS.
   iii. PRIME, CAULK AND WRAP ALL BURIED FLANGES AND BOLTS WITH DENSO PETROLATUM PRODUCTS OR APPROVED EQUIVALENT AS PER THE MANUFACTURER'S RECOMMENDATIONS.
   iv. EXTERNAL COATING ARE NOT TO BE REMOVED WHEN THE PIPE FITTINGS ARE SURROUNDED OR COVERED IN CONCRETE.
15. THE CONTRACTOR IS TO ESTABLISH THE SOIL CLASSIFICATION FOR THE WATER MAIN ALIGNMENT TO DETERMINE THRUST BLOCK SIZES, FOR DETAILS REFER TO WSAA STANDARD DRAWING WAT-1205. THE CONTRACTOR MUST NOTE THAT THE ST. HELENA SUPPLY RESERVOIR TWL SITS AT APPROXIMATELY 120M AHD AND THE THRUST RESTRAINT AREA MUST BE CALCULATED IN ACCORDANCE WITH NOTE 6 OF WSAA WAT-1205.
16. ANCHOR BLOCKS SHALL BE INSTALLED AT BENDS, JUNCTIONS AND DEAD ENDS AS REQUIRED BY WAT-1205 AND THE PIPELINE MATERIAL.
17. FOR VALVE INSTALLATION DETAILS REFER WSAA STANDARD DRAWINGS WAT-1207, WAT-1300, WAT-1301 AND WAT-1304.
18. FOR FIRE HYDRANTS INSTALLATION DETAILS REFER WSAA STANDARD DRAWING WAT-1302, WAT-1305 AND WAT-1306.
19. ALL PE PIPEWORK TO BE INSTALLED IN ACCORDANCE WITH WSA 01-2004, POLYETHYLENE PIPELINE CODE.
20. ALL PIPEWORK WELDS TO BE BUTT FUSION WELDED WITH INTERNAL WELDS DE-BEADED.
21. ALL BACKING RINGS SHALL BE STAINLESS STEEL (GRADE 316) AND BOLTING COMPATIBILITY - PN16 IN ACCORDANCE WITH AS 4087, UNO.
22. WRAP 3 LAYERS OF PE SHEETING AROUND PIPE AND FITTINGS WHERE PE PIPEWORK IS IN CONTACT WITH CONCRETE.
23. PE WELDS TO BE PRE-QUALIFIED AS PER WSA 01-2004 SECTION 2.12. AT LEAST ONE BUTT WELD TO BE TESTED AT THE START OF EACH DAY OF WELDING. THE SITE ENGINEER CAN AT ANY TIME REQUEST FOR A RECENT WELD TO BE CUT OUT AND TESTED. TESTING AND COMMISSIONING OF THE PE PIPELINE TO CONFORM TO WSA 01-2004 SECTION 2.13.
24. MARKING TAPE SHALL BE PROVIDED ON TOP OF PIPE EMBEDMENT PRIOR TO TRENCHFILLING FOR ANY TRUNK MAINS INSTALLED VIA TRENCHING. WHERE TRENCHLESS TECHNIQUES ARE USED A 2mm DIAMETER GRADE 316 STAINLESS STEEL TRACER WIRE ON TOP OF THE MAIN PROVIDED PER WSA 03-2011-3.2 CL. 15.12.

CONCRETE

1. ALL CONCRETE SHALL COMPLY WITH AS 3600.
2. FORM CONSTRUCTION JOINTS FOR DRIVEWAY REINSTATEMENTS SHALL BE PROVIDED AND APPROVED BY THE SUPERVISING ENGINEER.
3. SUPPORT REINFORCEMENT IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED BAR CHAIRS, SPACERS OR SUPPORT BARS SUITABLE FOR THE EXPOSURE CONDITIONS.
4. LAP MESH REINFORCEMENT BY ONE COMPLETE MESH SQUARE AS A MINIMUM.
5. DO NOT WELD OR SITE BEND REINFORCEMENT UNLESS SHOWN IN THE DRAWINGS OR OTHERWISE SPECIFIED BY THE SUPERVISING ENGINEER.
6. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
7. SAMPLE TEST AND ASSESS CONCRETE COMPLIANCE IN ACCORDANCE WITH PROJECT ASSESSMENT OF STRENGTH GRADE TO SECTION 20 OF AS 3600.
8. THE CONCRETE SHALL BE COMPACTED USING HIGH-FREQUENCY VIBRATORS.
9. ADMIXTURES SHALL NOT BE USED WITHOUT THE WRITTEN APPROVAL OF THE SUPERVISING ENGINEER.

TESTING & COMMISSIONING

1. ALL TESTING SHALL BE CARRIED OUT BY A N.A.T.A. APPROVED TESTER IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
2. THE TEST PROCEDURE FOR PRESSURE MAINS SHALL BE IN ACCORDANCE WITH SECTION 6 OF AS/NZS 2566.2:2002. THE HYDROSTATIC TEST PRESSURE FOR THE PROPOSED MAIN SHALL BE 1200KPa.
3. THE FREQUENCY OF COMPACTION TESTING SHALL BE IN ACCORDANCE WITH CLAUSE 36.3.4.4 OF WSA03-2011.
4. AUDIT AND FINAL INSPECTIONS OF THE WORKS CONSTRUCTED BY THE CONTRACTOR MUST BE ARRANGED WITH THE PRINCIPAL PROVIDING SUFFICIENT NOTICE PERIODS AT THE DISCRETION OF THE PRINCIPAL.
5. ALL NEWLY INSTALLED WATERMAINS ARE TO BE DISINFECTED AND FLUSHED IN ACCORDANCE WITH CLAUSE 20 OF WSA03-2011 FOLLOWING COMPLETION OF SATISFACTORY HYDROSTATIC PRESSURE TESTING.

SURVEY

1. EXISTING SERVICES SHOWN ON DESIGN PLANS HAVE BEEN COMPILED FROM SURVEY INFORMATION PROVIDED BY BYRON BAY SURVEYING.
2. THE INFORMATION IS NOT INTENDED TO PROVIDE THE CONTRACTOR WITH COMPLETE OR ACCURATE INFORMATION CONCERNING THE LOCATION & EXTENT OF ALL UNDERGROUND UTILITY SERVICES, RATHER ITS PURPOSE IS TO ACT AS A GUIDE TO FACILITATE CONSTRUCTION.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH & EXTENT OF ALL EXISTING SERVICES THROUGH USE OF NON-DESTRUCTIVE LOCATING TECHNIQUES PRIOR TO THE COMMENCEMENT OF WORK.
4. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ANY DAMAGE INCURRED TO EXISTING UTILITY SERVICES AS A RESULT OF THE EXECUTION OF WORK UNDER THE CONTRACT.
5. NO WORK SHALL BE CARRIED OUT WITHIN 3 METRES OF ANY EXISTING SERVICES WITHOUT PRIOR RECORDED CONSULTATION WITH THE RELEVANT AUTHORITY.
6. AS-CONSTRUCTED SURVEY OF THE NEWLY INSTALLED TRUNK MAIN IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARDS OF BYRON SHIRE COUNCIL AND PROVIDED TO COUNCIL IN ADAC FORMAT.

DRIVEWAYS

1. DRIVEWAYS SHALL BE INSTATED IN ACCORDANCE WITH NORTHERN RIVERS STANDARD DRAWINGS R14C, 15D, 16B.

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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SCALES: NOT TO SCALE — DO NOT SCALE FROM DRAWING

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PLANIT CONSULTING
SUITE 9A, 80-84 BALLINA STREET
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LENNOX HEAD NSW 2478
PH: 02 6687 4666
ABN: 20 099 281 711
administration@planitconsulting.com.au

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN GENERAL NOTES

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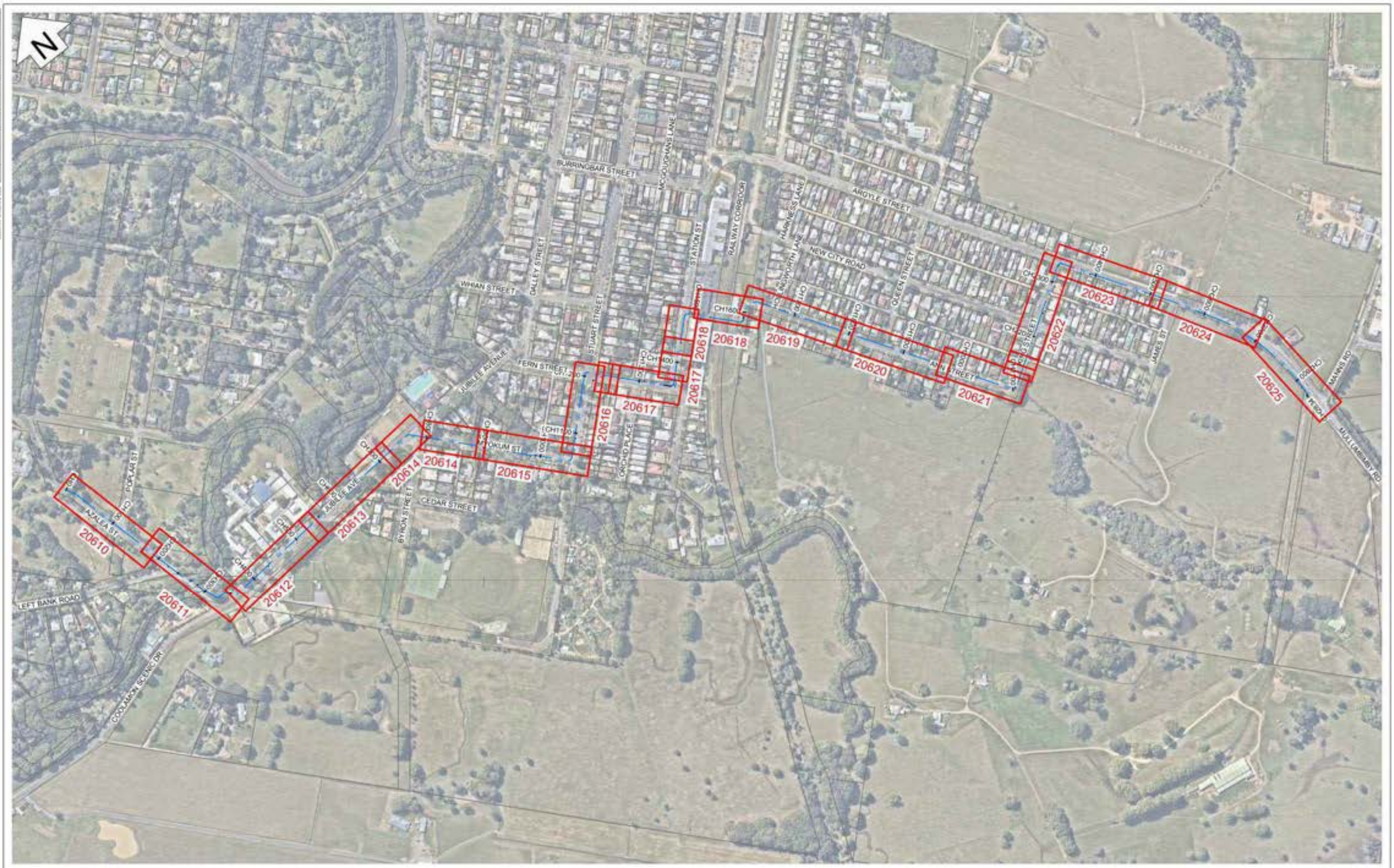

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Scale (m)
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PLANIT CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
WATER ALIGNMENT KEY PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
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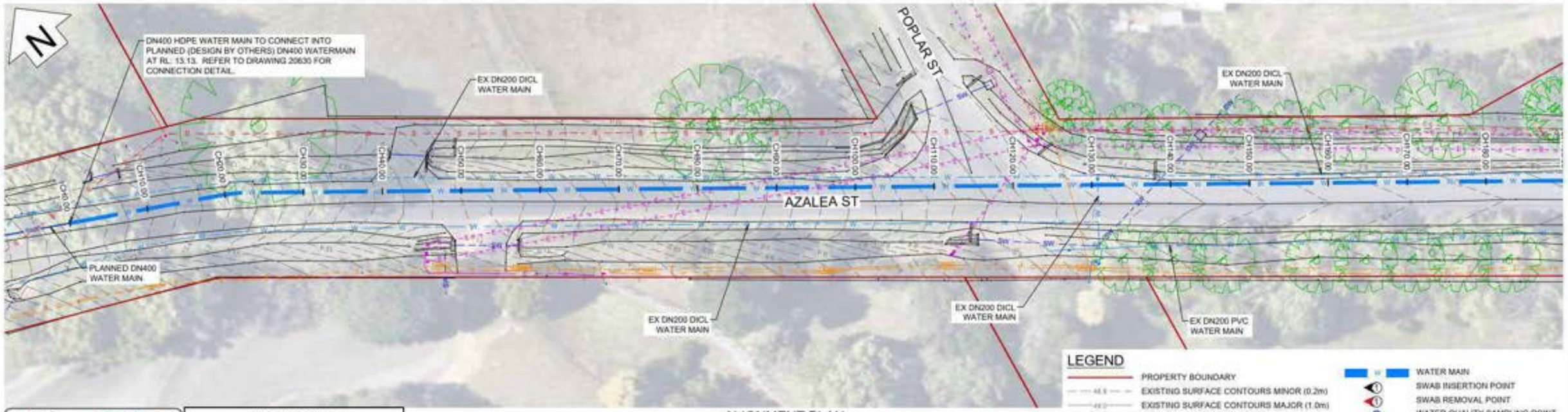

ALIGNMENT PLAN
SCALE 1:250

LEGEND

- PROPERTY BOUNDARY
- EXISTING SURFACE CONTOURS MINOR (0.2m)
- EXISTING SURFACE CONTOURS MAJOR (1.0m)
- EXISTING STORMWATER PIPE
- EXISTING GRAVITY SEWER
- EXISTING GRAVITY SEWER ABANDONED
- EXISTING SEWER RISING MAIN
- EXISTING ELECTRICITY UNDERGROUND
- EXISTING ELECTRICITY OVERHEAD
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING WATER MAIN ABANDONED
- WATER MAIN
- SWAB INSERTION POINT
- SWAB REMOVAL POINT
- WATER QUALITY SAMPLING POINT
- AIR VALVE
- SCOUR VALVE
- SLUICE VALVE
- FUTURE STORMWATER (OSKA)
- END CAP
- LIMIT OF WORKS

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WARNING

BEWARE OF UNDERGROUND SERVICES

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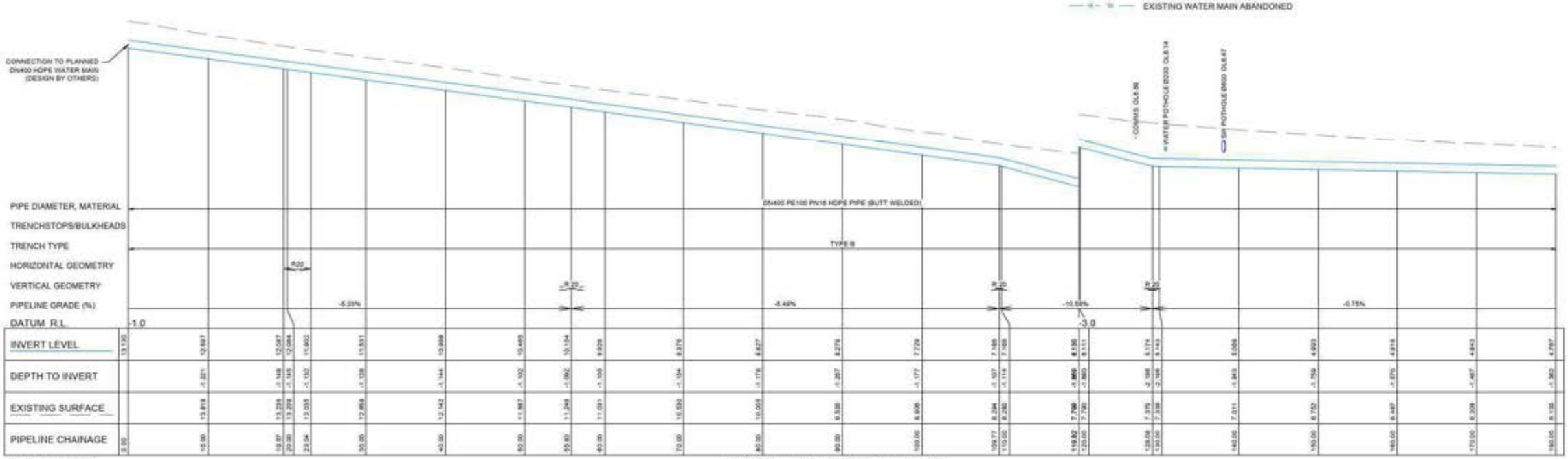

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LONGITUDINAL SECTION LINE 02

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Full Size 1:100 | Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

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CLIENT:
BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
ALIGNMENT AND LONGITUDINAL SECTION
SHEET 1 OF 16

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
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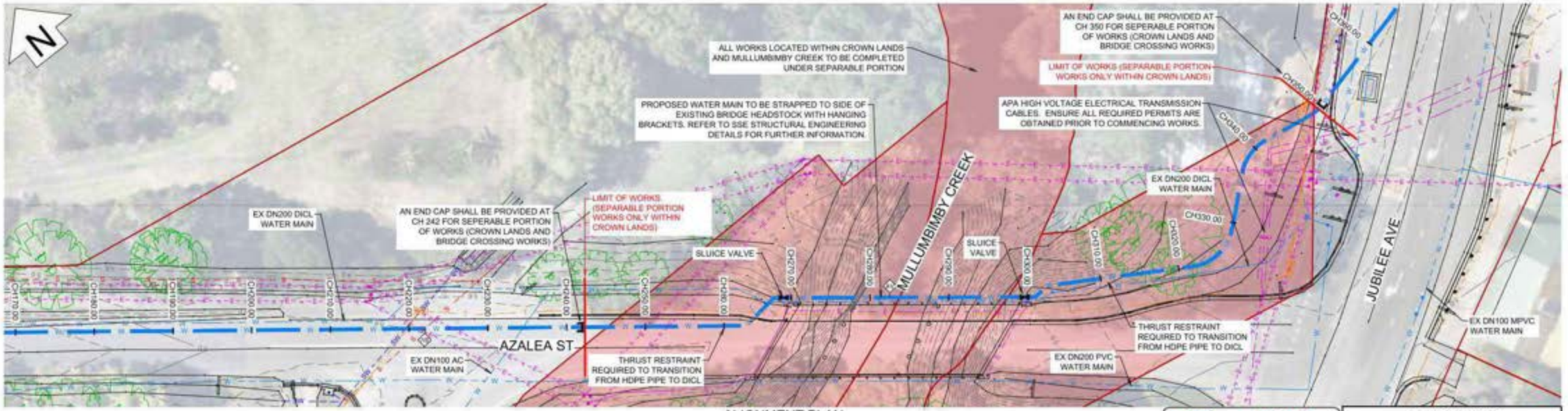

ALIGNMENT PLAN
SCALE 1:250

NOTES
1. REFER TO 20610 FOR PLAN LEGEND.

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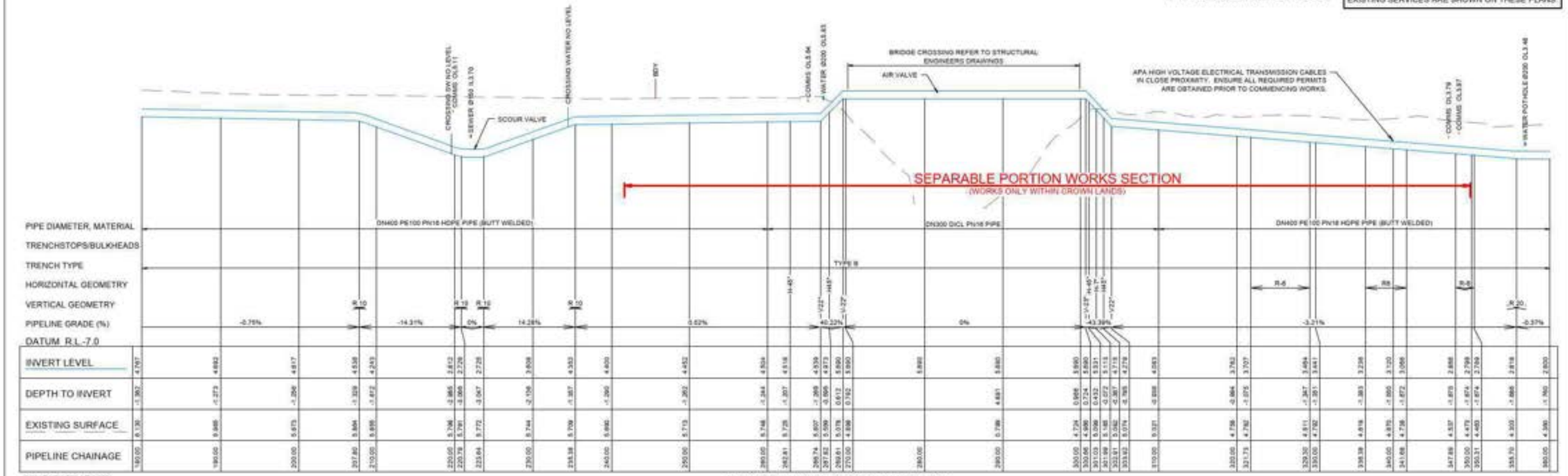

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LONGITUDINAL SECTION LINE 02

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Scale (m)
DO NOT SCALE FROM DRAWING

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CLIENT: BYRON SHIRE COUNCIL
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN ALIGNMENT AND LONGITUDINAL SECTION SHEET 2 OF 16

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
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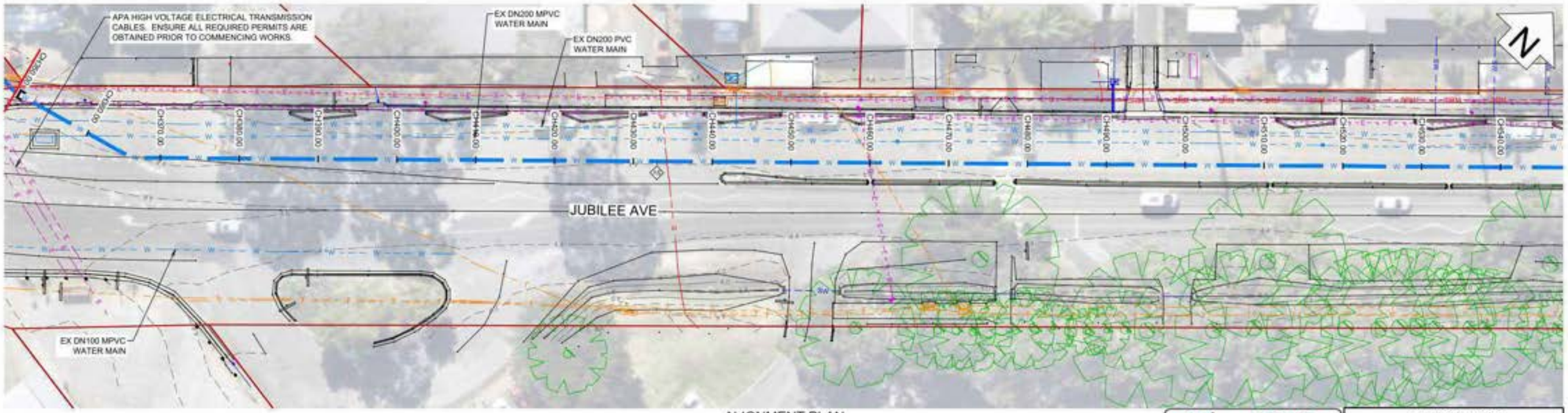

ALIGNMENT PLAN
SCALE 1:250

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NOTES
1. REFER TO 20610 FOR PLAN LEGEND.

WARNING

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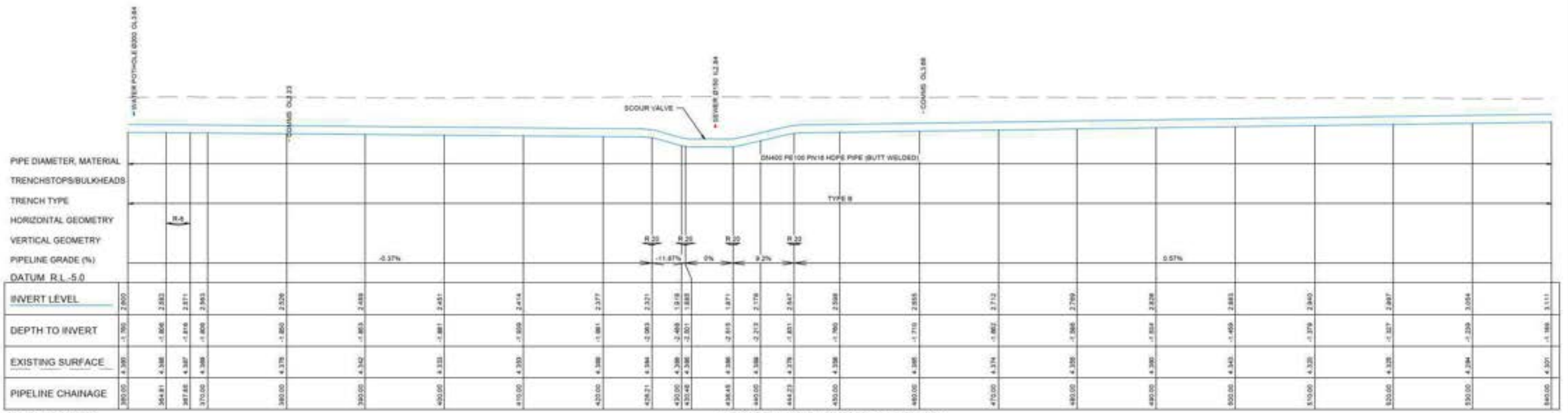

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

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Full Size 1:100 ; Half Size 1:200
Scale (m)
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CLIENT:
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PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
ALIGNMENT AND LONGITUDINAL SECTION
SHEET 3 OF 16

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
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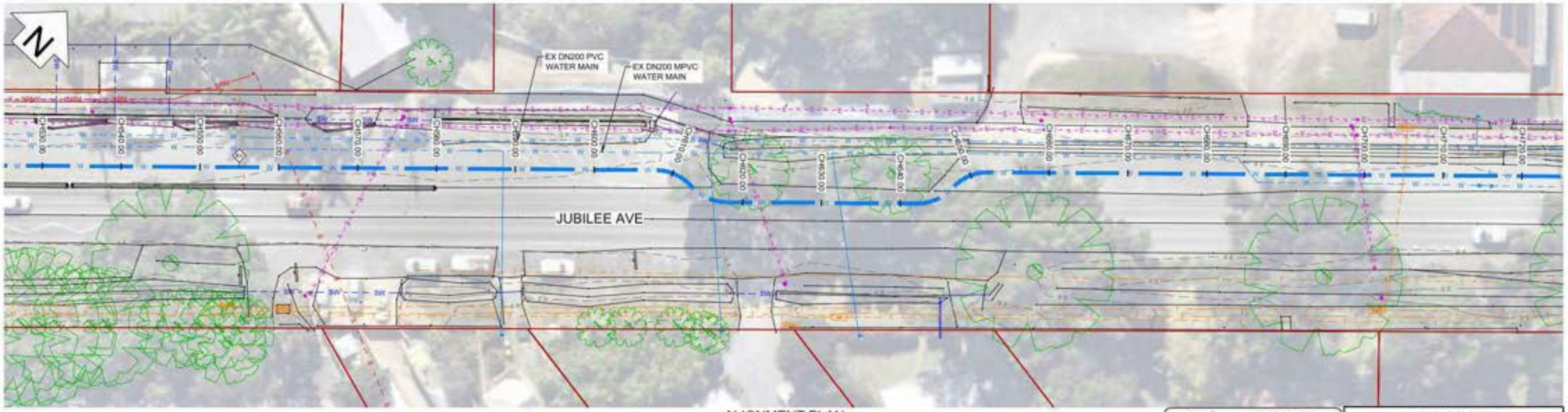

ALIGNMENT PLAN
SCALE 1:250

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NOTES
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SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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DO NOT SCALE FROM DRAWING

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CLIENT:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
ALIGNMENT AND LONGITUDINAL SECTION
SHEET 4 OF 16

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
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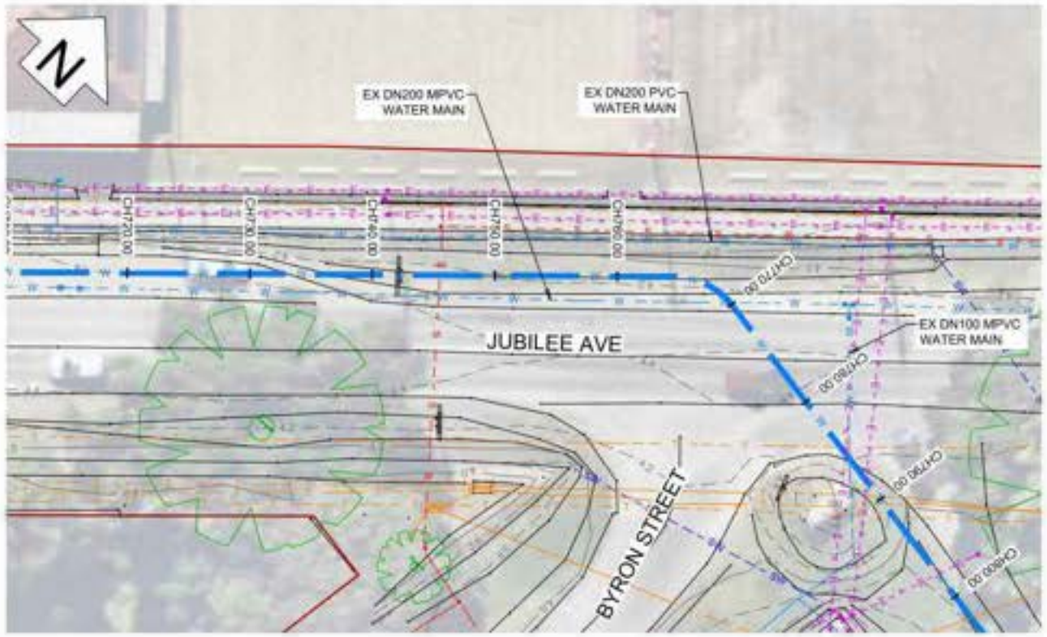

ALIGNMENT PLANS
SCALE 1:250

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NOTES
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WARNING

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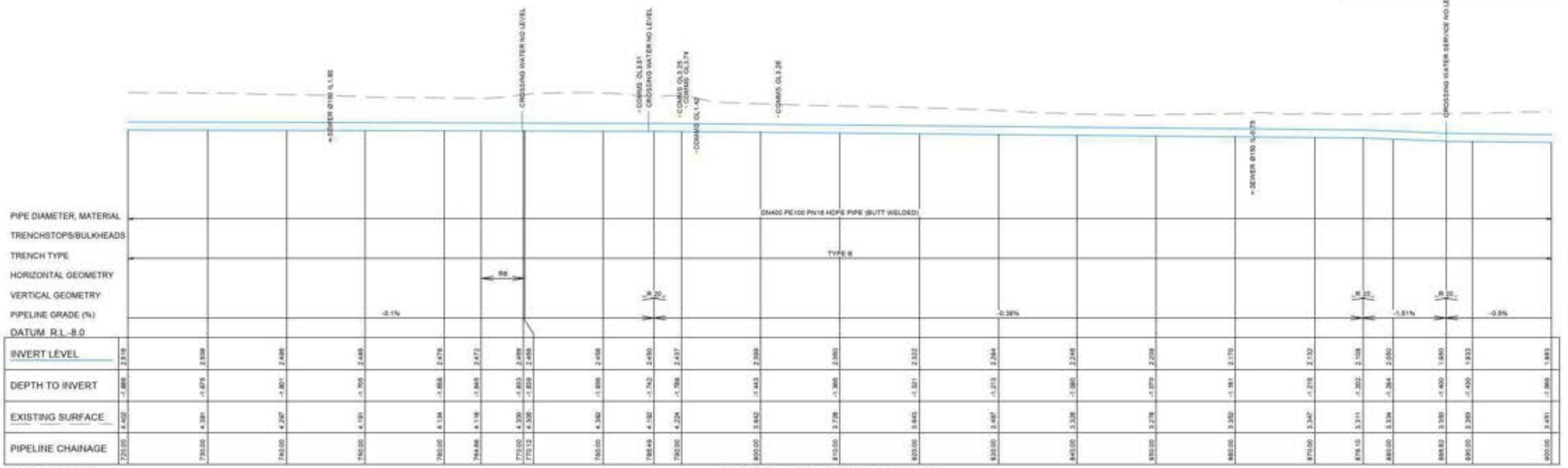

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LONGITUDINAL SECTION LINE 02

REV.	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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Scale (m)
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Full Size 1:100 ; Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

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CLIENT:
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LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
ALIGNMENT AND LONGITUDINAL SECTION
SHEET 5 OF 16

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	20614	0

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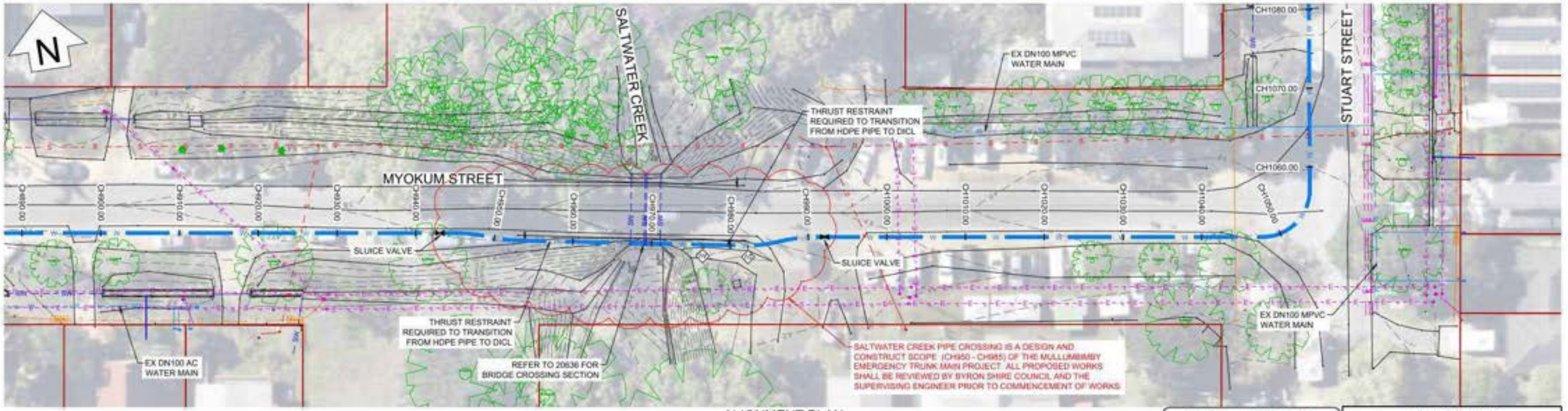

ALIGNMENT PLAN
SCALE 1:250

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NOTES
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WARNING
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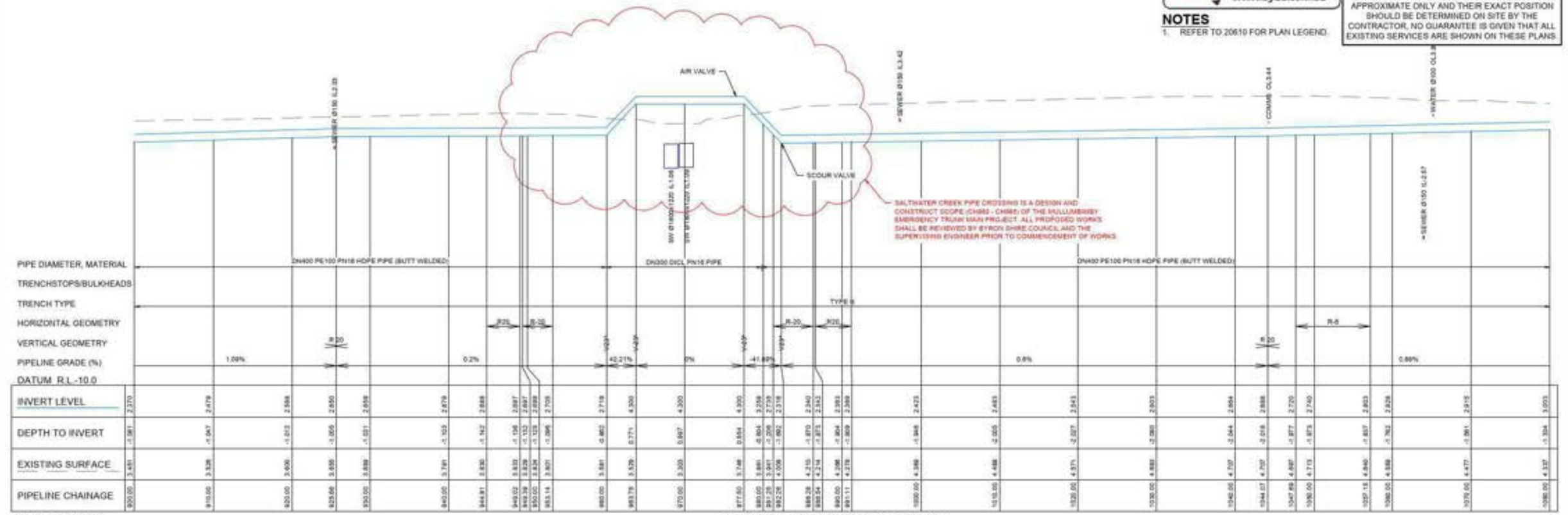

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LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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SCALES:
Full Size 1:250 ; Half Size 1:500 Scale (m)
Full Size 1:100 ; Half Size 1:200 Scale (m)
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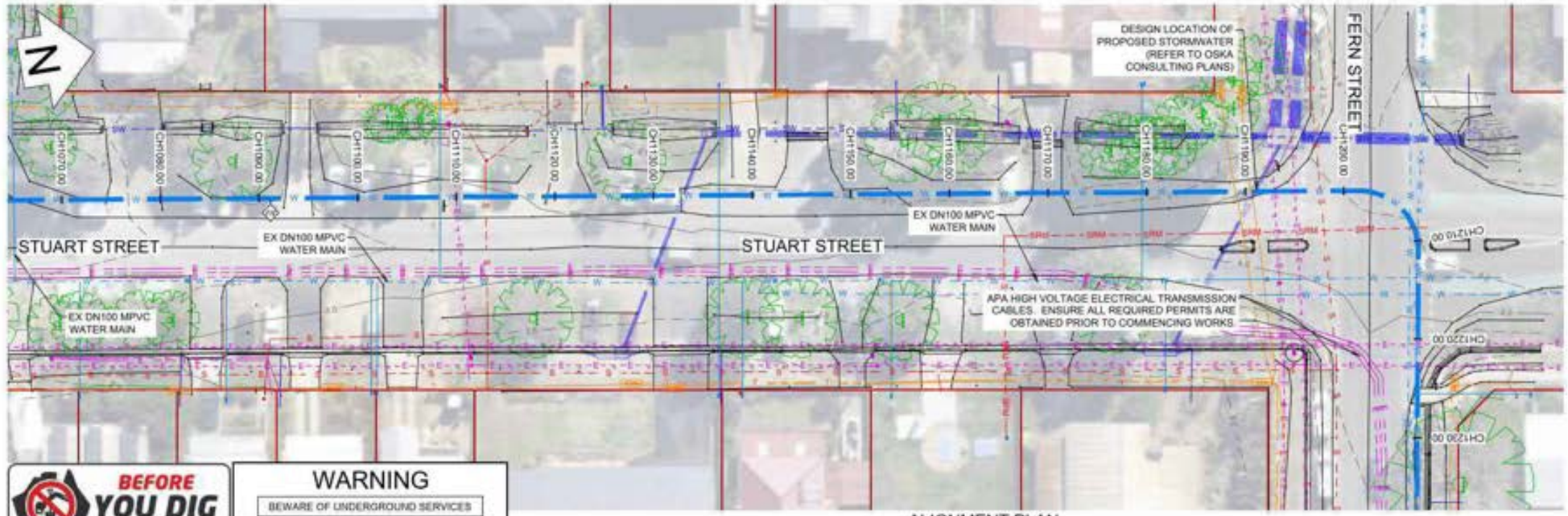
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN ALIGNMENT AND LONGITUDINAL SECTION SHEET 6 OF 16

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	20615	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRAFT\BYRON - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAWINGS\20615 ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN T PLOT DATE: 28/08/2024 10:09:04 AM



ALIGNMENT PLAN
SCALE 1:250

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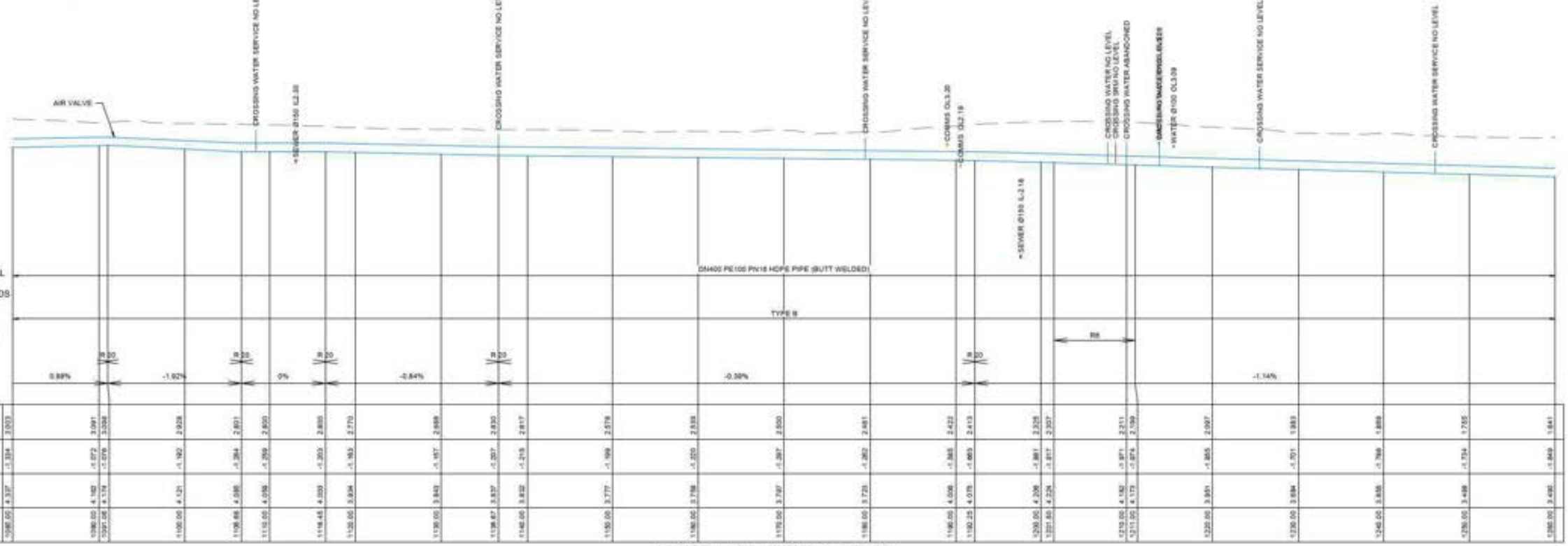
WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THESE PLANS.

NOTES
1. REFER TO 20610 FOR PLAN LEGEND.



SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
0 2.5 5 10 15
Full Size 1:250 : Half Size 1:500
Scale (m)
0 1 2 4 6
Full Size 1:100 : Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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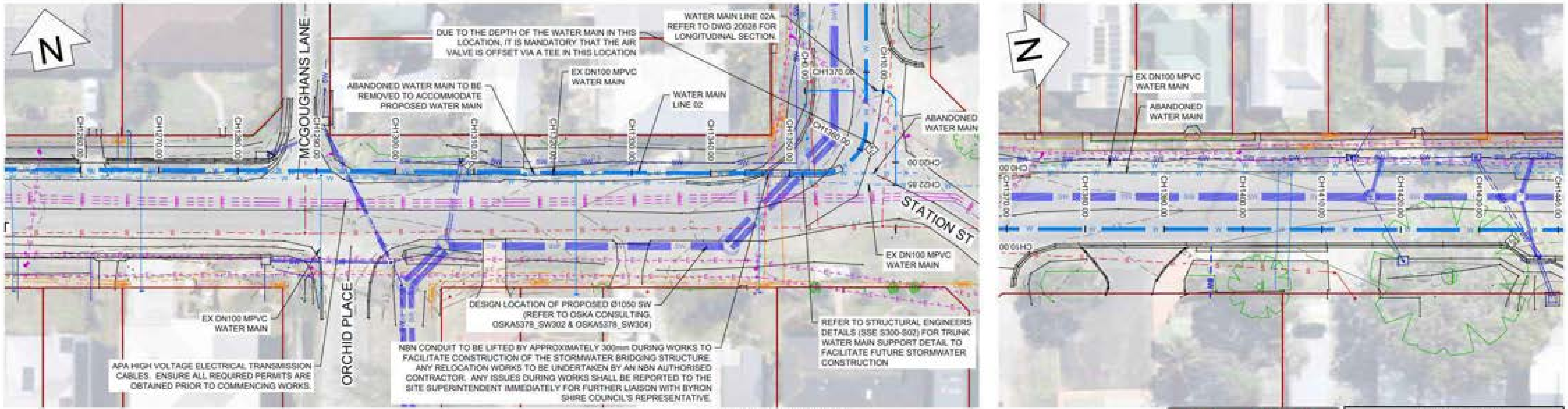
PLANIT CONSULTING
SUITE 9A, 80-84 BALLINA STREET
PO BOX 161
LENNOX HEAD NSW 2478
PH: 02 6687 4666
ABN: 20 099 281 711
administration@planitconsulting.com.au

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN ALIGNMENT AND LONGITUDINAL SECTION SHEET 7 OF 16

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20616	0



ALIGNMENT PLANS

SCALE 1:250

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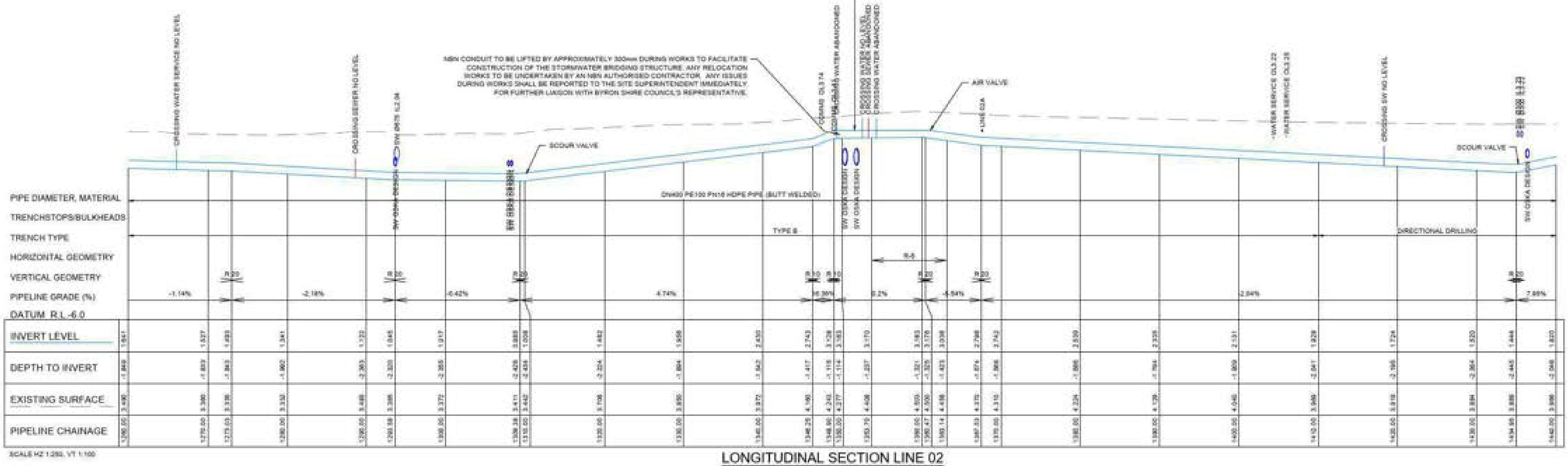
NOTES

1. REFER TO 20610 FOR PLAN LEGEND.



LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
0 2.5 5 10 15 — Full Size 1:250 ; Half Size 1:500 Scale (m)
0 1 2 4 6 — Full Size 1:100 ; Half Size 1:200 Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PLANIT CONSULTING

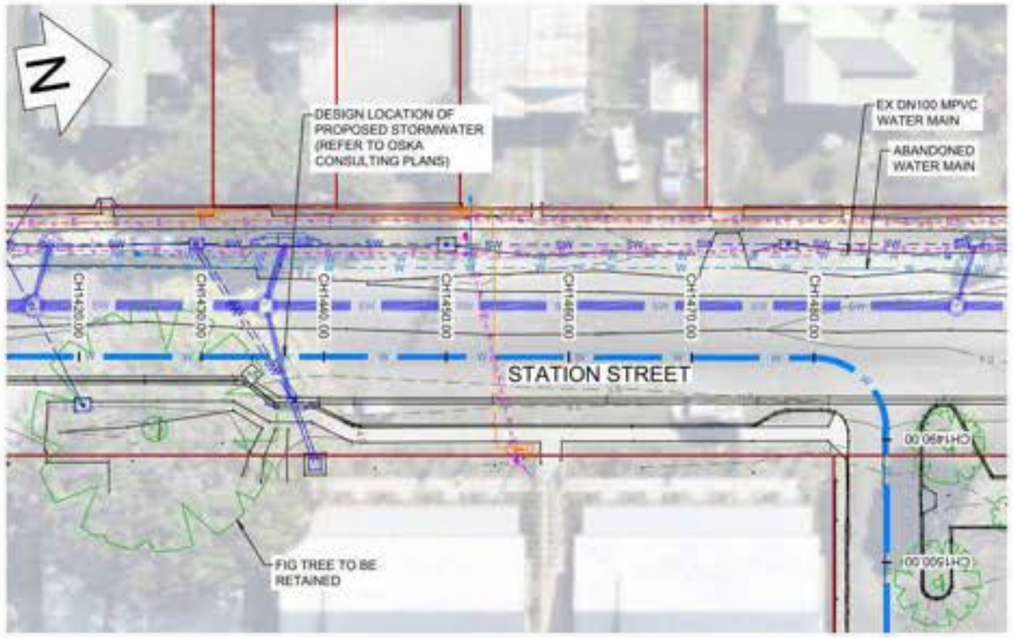
CLIENT: BYRON SHIRE COUNCIL

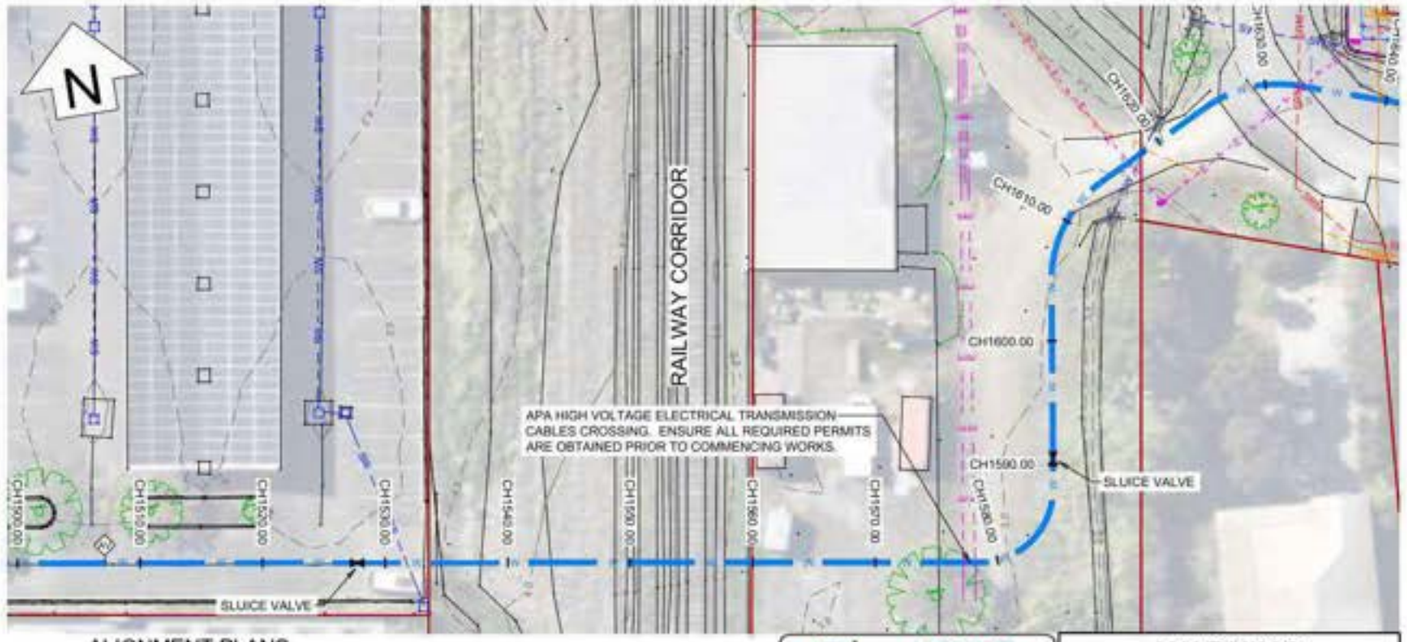
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN ALIGNMENT AND LONGITUDINAL SECTION SHEET 8 OF 16

ORIGINAL SIZE	PLANIT JOB No.	DRAWING No.	REV
A1	J7708	20617	0





ALIGNMENT PLANS
SCALE 1:250

BEFORE YOU DIG www.byda.com.au

NOTES
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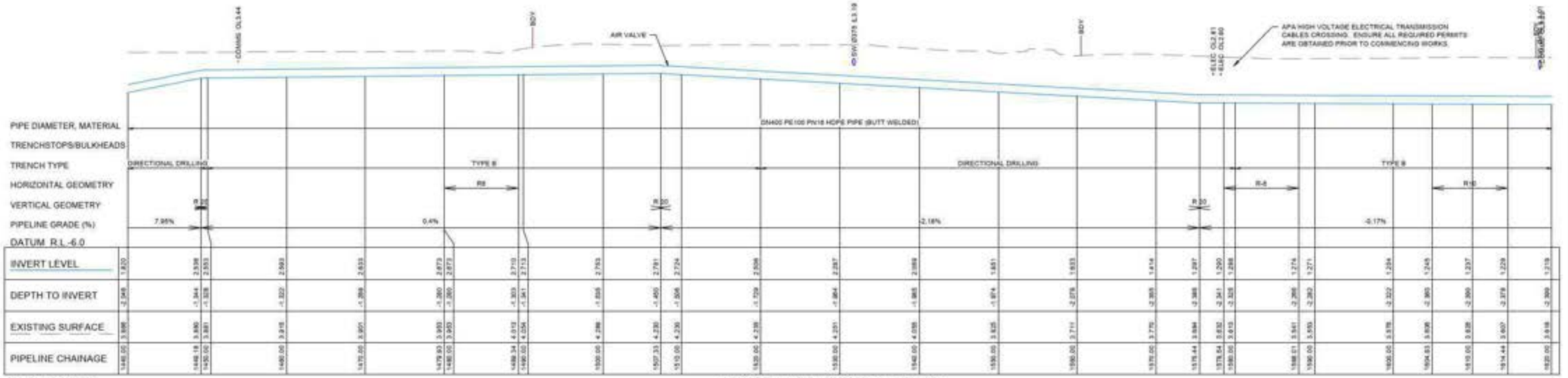

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES:
0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)
0 1 2 4 6
Full Size 1:100 ; Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PLANIT CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

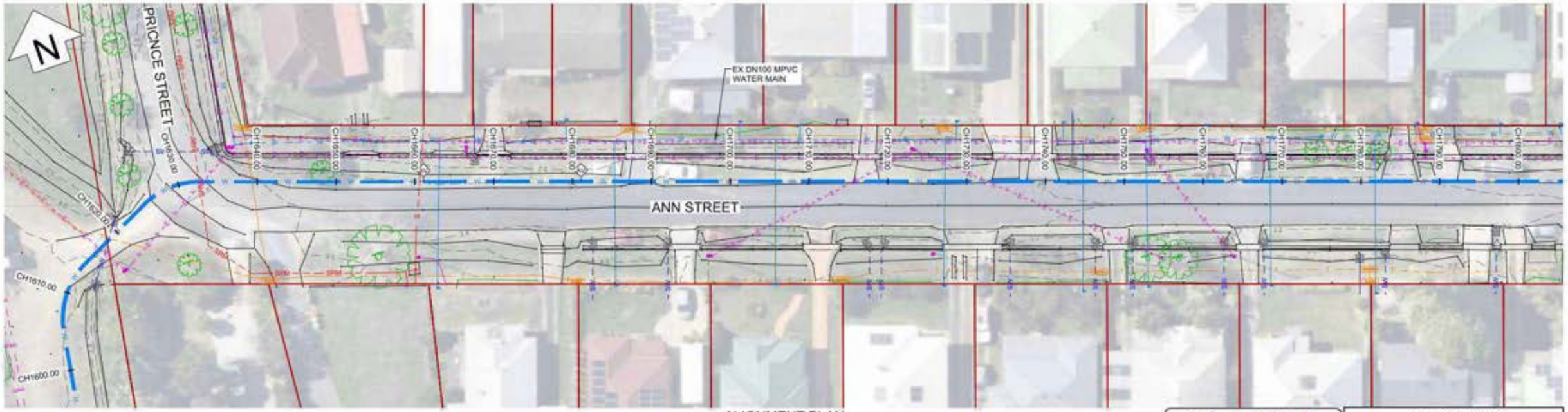
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
ALIGNMENT AND LONGITUDINAL SECTION
SHEET 9 OF 16

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	20618	0

CAD FILE: C:\USERS\BT\PLANITDYNAMICS\TEMP - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMP - ENGINEERING\7.4 DRAWINGS\20618 WATER ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN P. PLOT DATE: 26/06/2024 10:07:06 AM



ALIGNMENT PLAN
SCALE 1:250

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www.byda.com.au

NOTES
1. REFER TO 20610 FOR PLAN LEGEND.

WARNING

BEWARE OF UNDERGROUND SERVICES

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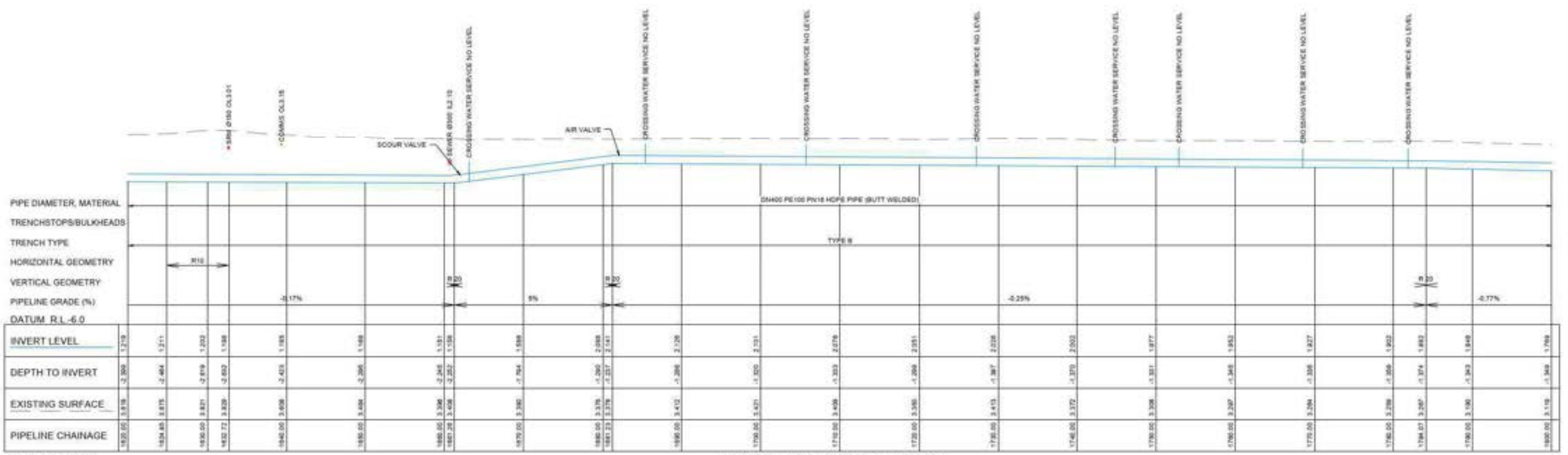

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)
0 1 2 4 6
Full Size 1:100 ; Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PLANIT CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

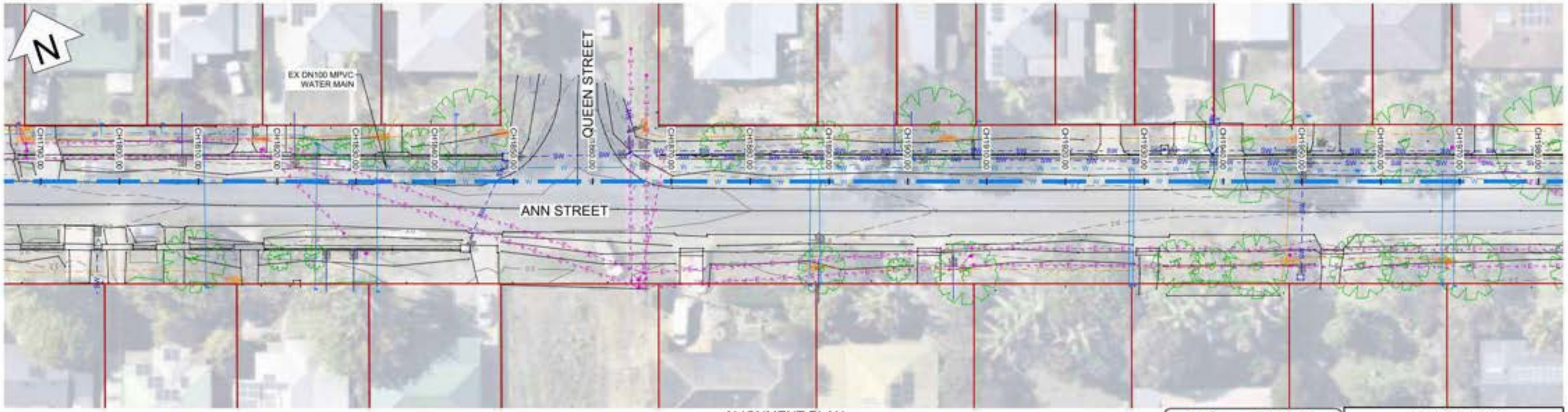
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
ALIGNMENT AND LONGITUDINAL SECTION
SHEET 10 OF 16

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20619	0

CAD FILE: C:\USERS\DATA\PLANITSYNC\7708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DWG\TMT\20619 WATER ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN T PLOT DATE: 28/08/2024 10:03:15 AM



ALIGNMENT PLAN
SCALE 1:250

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NOTES
1. REFER TO 20610 FOR PLAN LEGEND.

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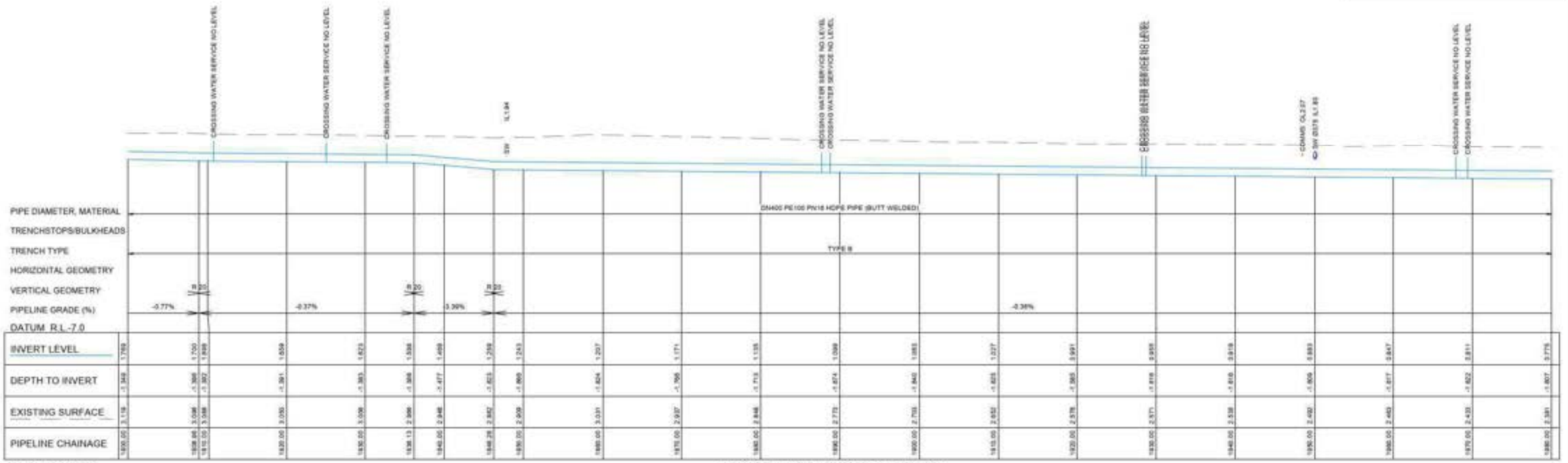

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES:
0 3.5 5 10 15
Full Size 1:250 : Half Size 1:500
Scale (m)
0 1 2 4 6
Full Size 1:100 : Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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ABN: 20 099 281 711
administration@planitconsulting.com.au

PLANIT CONSULTING

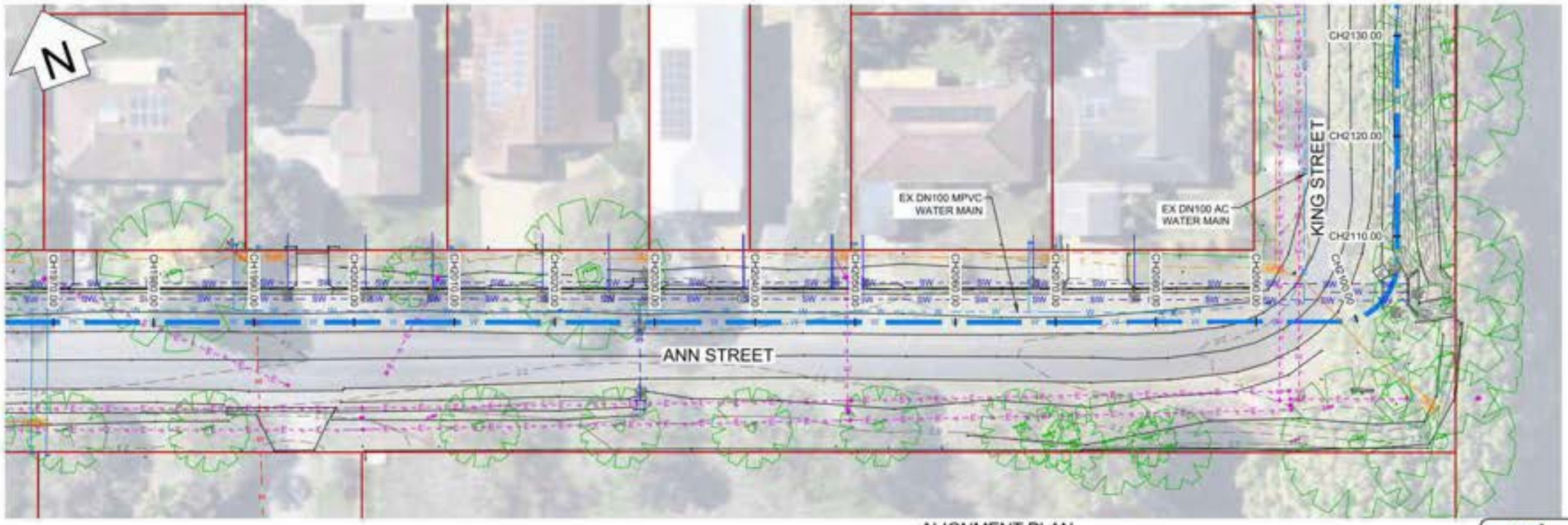
CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

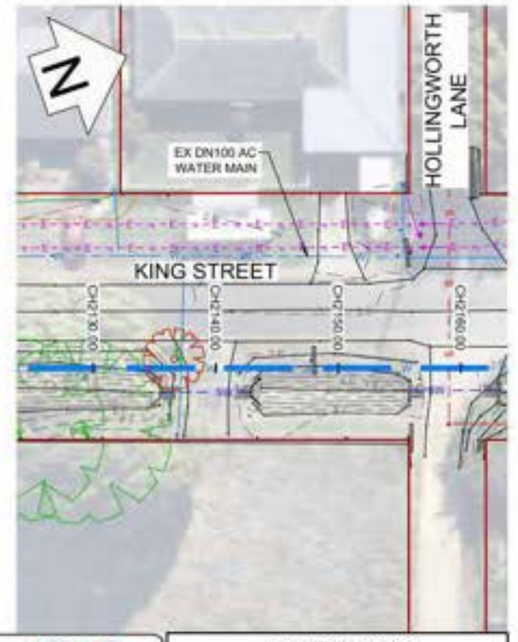
PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN ALIGNMENT AND LONGITUDINAL SECTION SHEET 11 OF 16

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	20620	0



ALIGNMENT PLAN
SCALE 1:250



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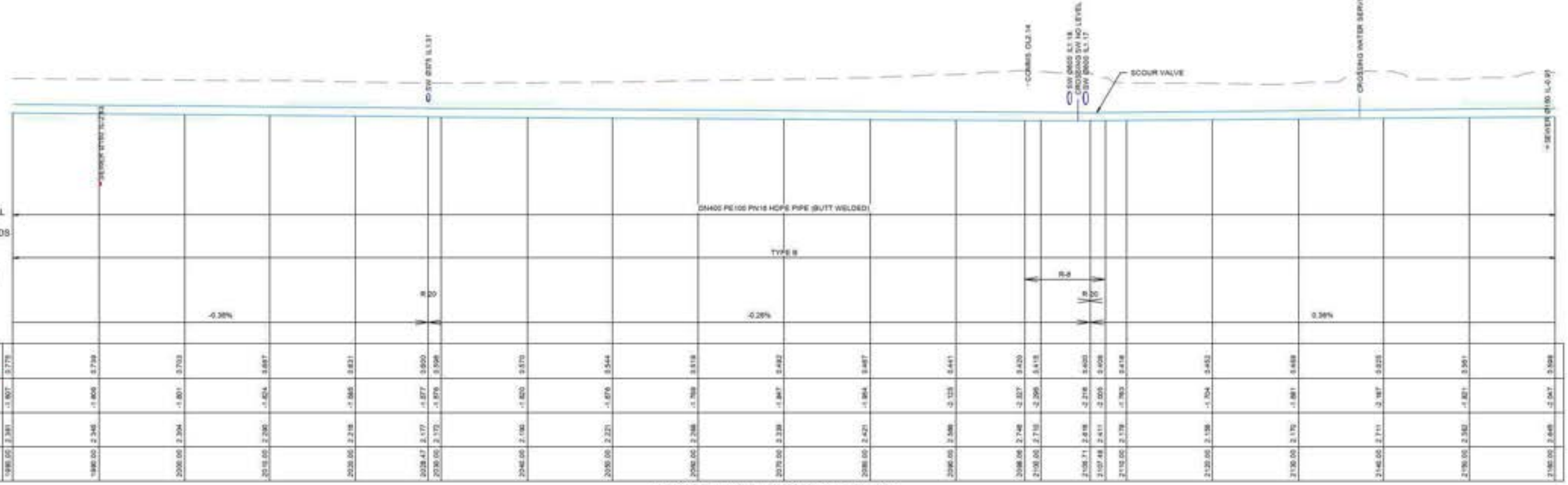

PIPE DIAMETER, MATERIAL	
TRENCHTOPS/BULKHEADS	
TRENCH TYPE	
HORIZONTAL GEOMETRY	
VERTICAL GEOMETRY	
PIPELINE GRADE (%)	
DATUM R.L -10.0	

INVERT LEVEL	2.779	2.739	2.703	2.667	2.631	2.600	2.568	2.570	2.544	2.518	2.492	2.467	2.441	2.420	2.418	2.403	2.408	2.418	2.453	2.489	2.525	2.561	2.598	
DEPTH TO INVERT	-1.607	-1.606	-1.601	-1.624	-1.595	-1.577	-1.576	-1.620	-1.676	-1.769	-1.847	-1.954	-2.123	-2.327	-2.295	-2.318	-2.005	-1.763	-1.704	-1.881	-2.187	-1.821	-2.047	
EXISTING SURFACE	2.381	2.345	2.304	2.290	2.226	2.177	2.172	2.190	2.221	2.288	2.339	2.421	2.568	2.748	2.713	2.818	2.411	2.179	2.158	2.370	2.711	2.382	2.645	
PIPELINE CHAINAGE	1980.00	1980.00	2000.00	2015.00	2030.00	2039.47	2040.00	2042.00	2050.00	2060.00	2070.00	2080.00	2090.00	2098.06	2100.00	2108.71	2107.48	2110.00	2120.00	2130.00	2140.00	2150.00	2160.00	2160.00

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
0 2.5 5 10 15
Full Size 1:250 : Half Size 1:500
Scale (m)
0 1 2 4 6
Full Size 1:100 : Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PO BOX 161
LENNOX HEAD NSW 2478
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ABN: 20 099 281 711
administration@planitconsulting.com.au

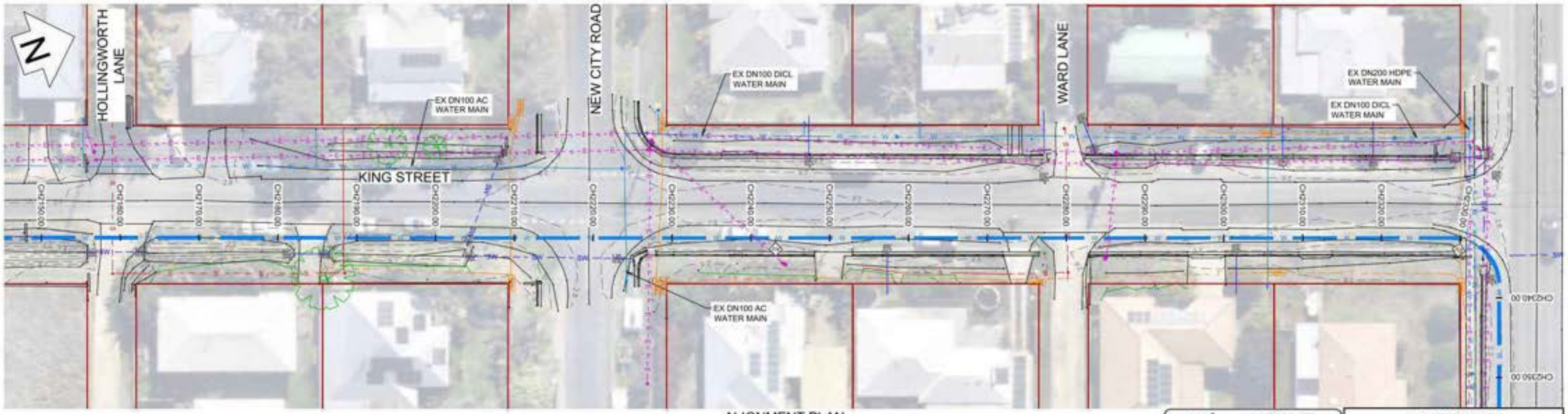
CLIENT:
BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
ALIGNMENT AND LONGITUDINAL SECTION
SHEET 12 OF 16

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20621	0



ALIGNMENT PLAN
SCALE 1:250

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WARNING

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NOTES

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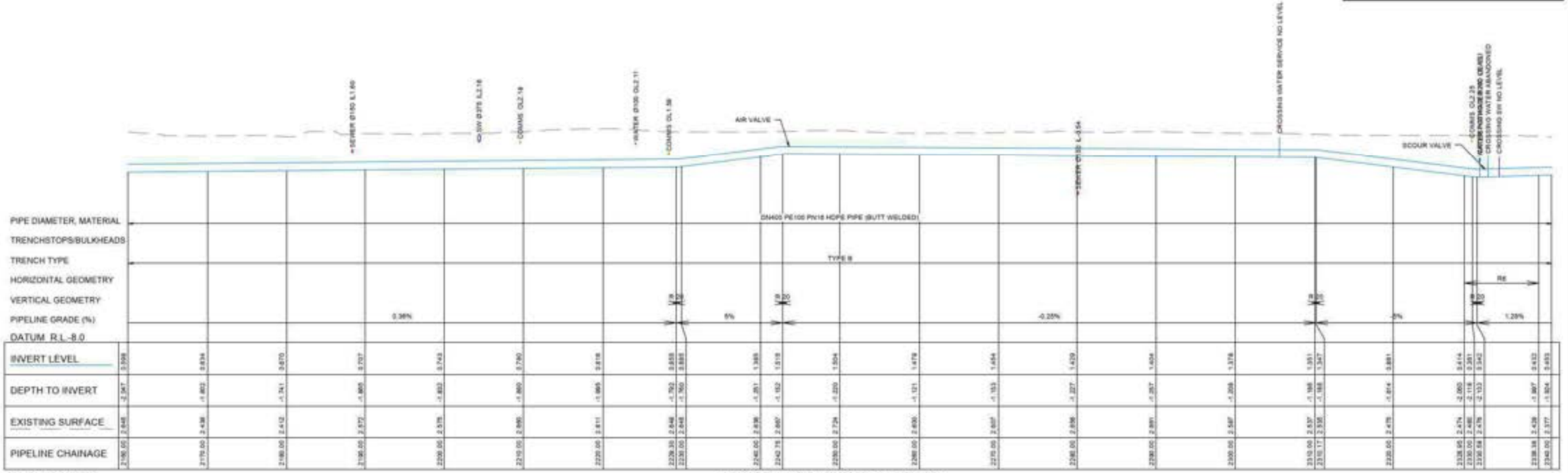

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
Full Size 1:250 : Half Size 1:500 Scale (m)
Full Size 1:100 : Half Size 1:200 Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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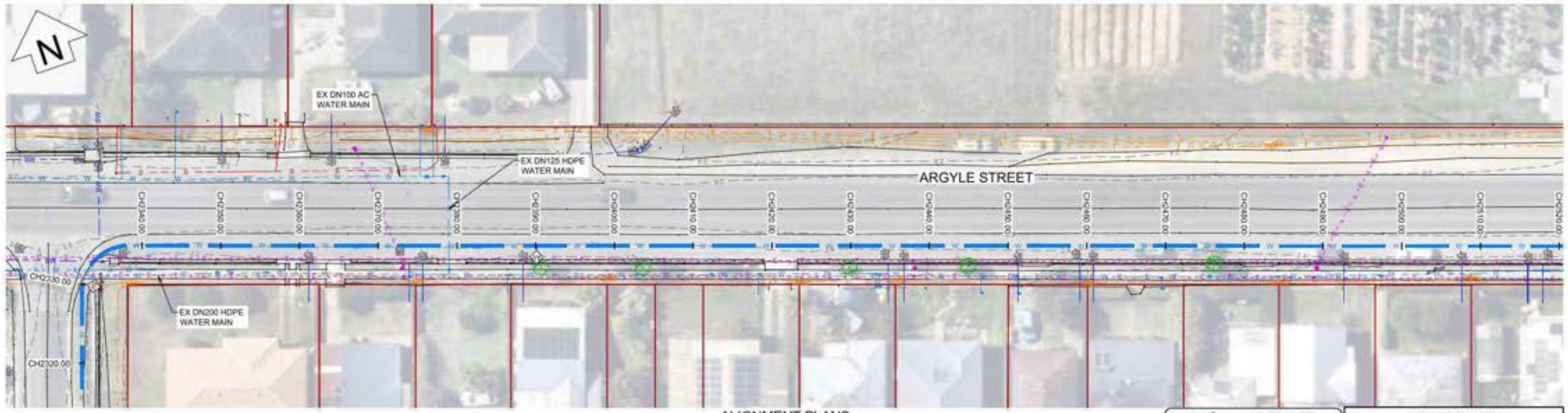
LENNOX HEAD NSW 2478
PH: 02 6687 4666
ABN: 20 099 281 711
administration@planitconsulting.com.au

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN ALIGNMENT AND LONGITUDINAL SECTION SHEET 13 OF 16

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20622	0



ALIGNMENT PLANS
SCALE 1:250

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NOTES
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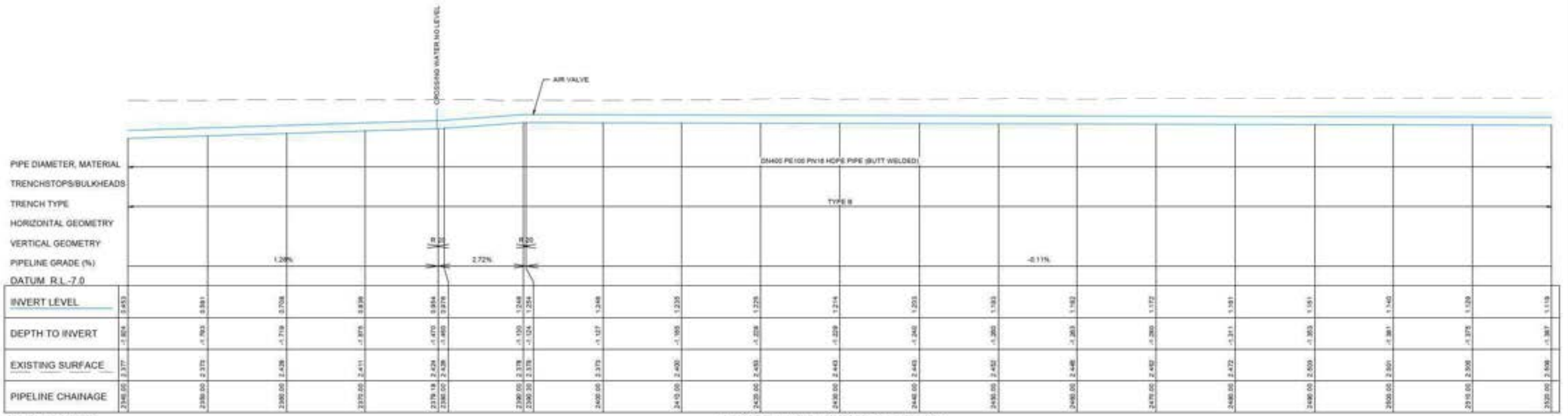

SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES:
0 2.5 5 10 15
Full Size 1:250 | Half Size 1:500
Scale (m)
0 1 2 4 6
Full Size 1:100 | Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:
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ABN: 20 099 281 711
administration@planitconsulting.com.au

CLIENT:
BYRON SHIRE COUNCIL

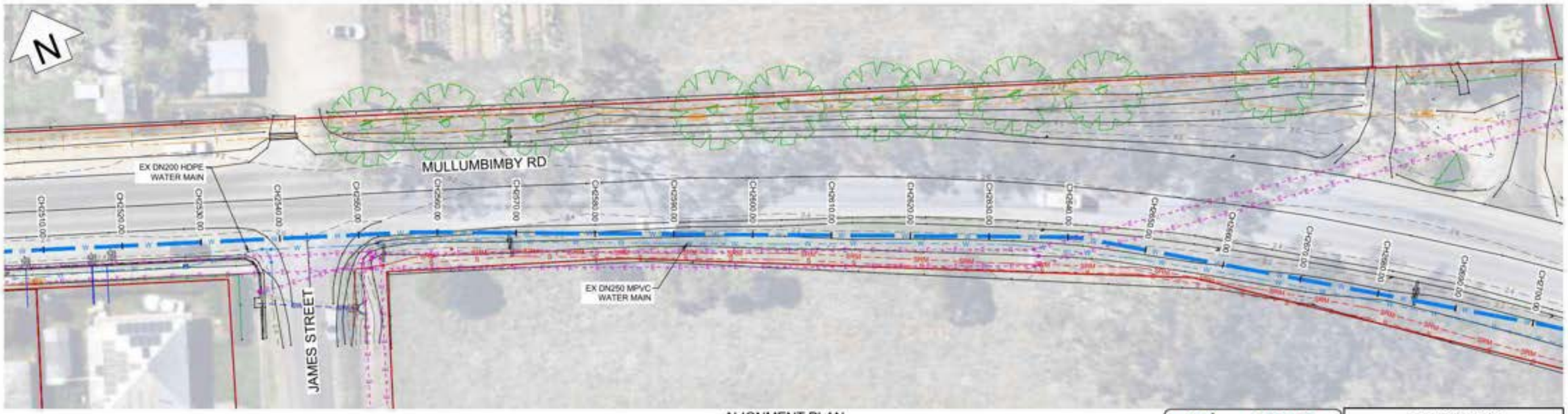
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
ALIGNMENT AND LONGITUDINAL SECTION
SHEET 14 OF 16

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20623	0

CAD FILE: C:\USERS\BTAPLANITSYNCUTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAFTING\20610 WATER ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN P LOT DATE: 26/06/2024 10:28:45 AM



ALIGNMENT PLAN
SCALE 1:250

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NOTES
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SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)
0 1 2 4 6
Full Size 1:100 ; Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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LENNOX HEAD NSW 2478
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administration@planitconsulting.com.au

PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

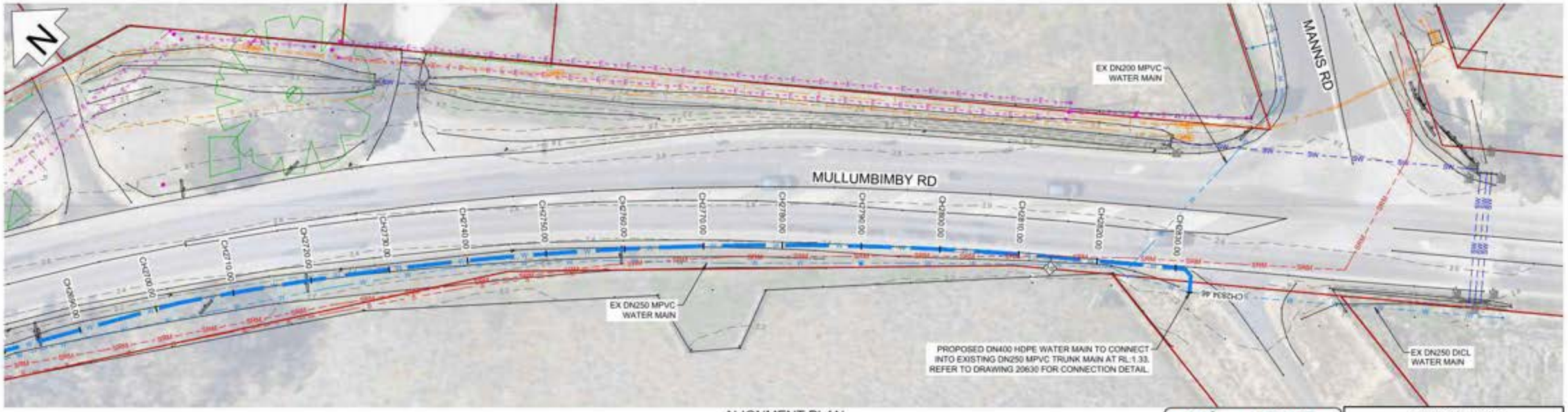
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN ALIGNMENT AND LONGITUDINAL SECTION SHEET 15 OF 16

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20624	0

CAD FILE: C:\USERS\BTAPLANITSYNC\UTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMDT - ENGINEERING\7.4 DRAFTING\20610 WATER ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN T PLOT DATE: 28/08/2024 10:05:34 AM



ALIGNMENT PLAN

SCALE 1:250

NOTES

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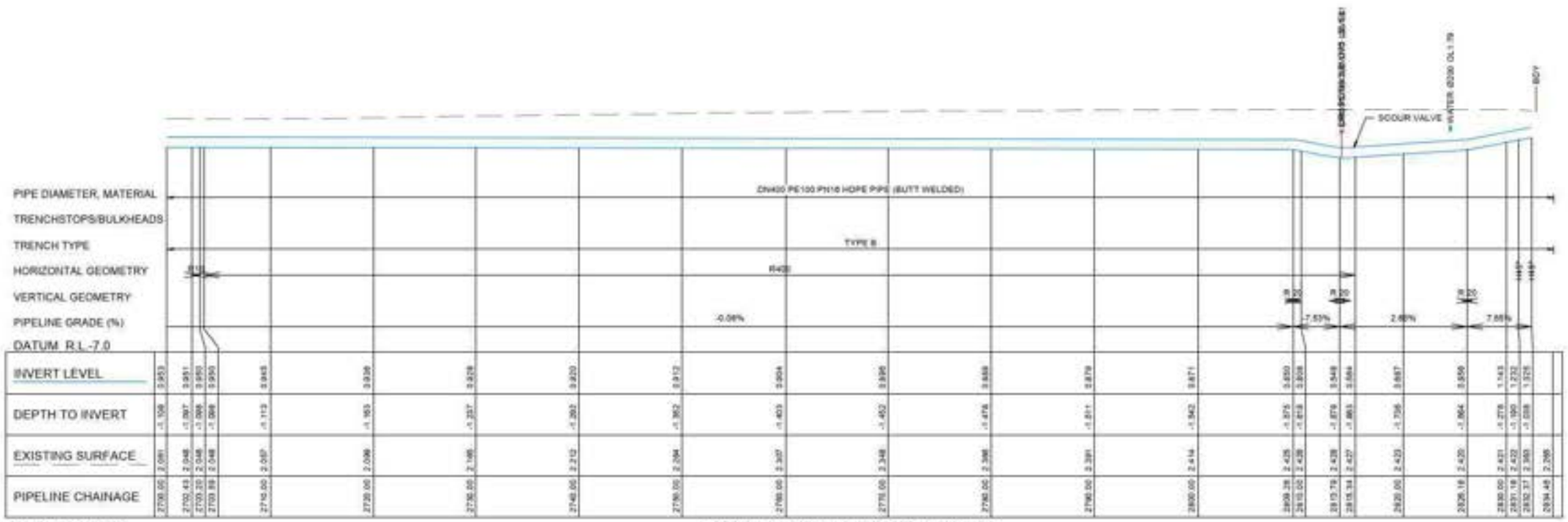
BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THESE PLANS.



SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES:

0 2.5 5 10 15
Full Size 1:250 | Half Size 1:500
Scale (m)

0 1 2 4 6
Full Size 1:100 | Half Size 1:200
Scale (m)

DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

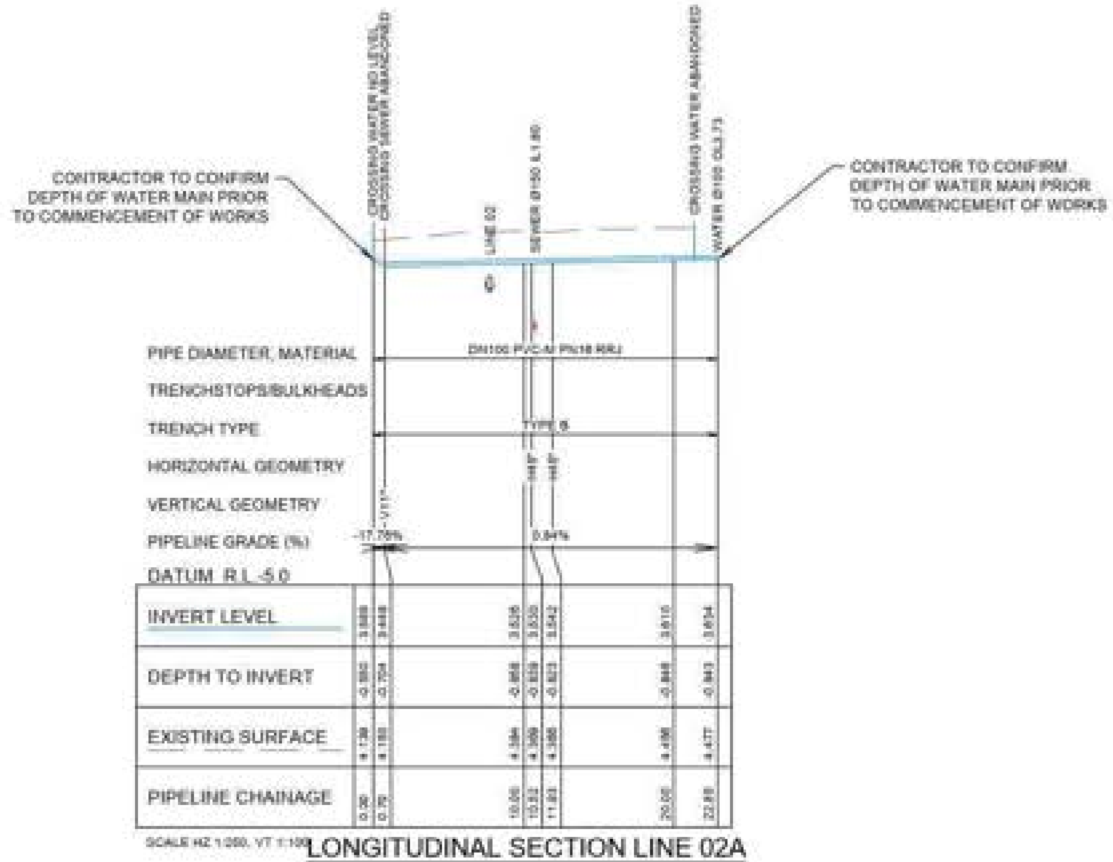
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN ALIGNMENT AND LONGITUDINAL SECTION SHEET 16 OF 16

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20625	0

CAD FILE: C:\USERS\BTAPLANITSYNCUTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAFTING\20610 WATER ALIGNMENT PLANS.DWG PLOTTED BY: BRENDAN T PLOT DATE: 26/06/2024 10:26:46 AM



SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 02A

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
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Full Size 1:250 : Half Size 1:500
Scale (m)
0 1 2 4 6
Full Size 1:100 : Half Size 1:200
Scale (m)
DO NOT SCALE FROM DRAWING

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CLIENT: BYRON SHIRE COUNCIL

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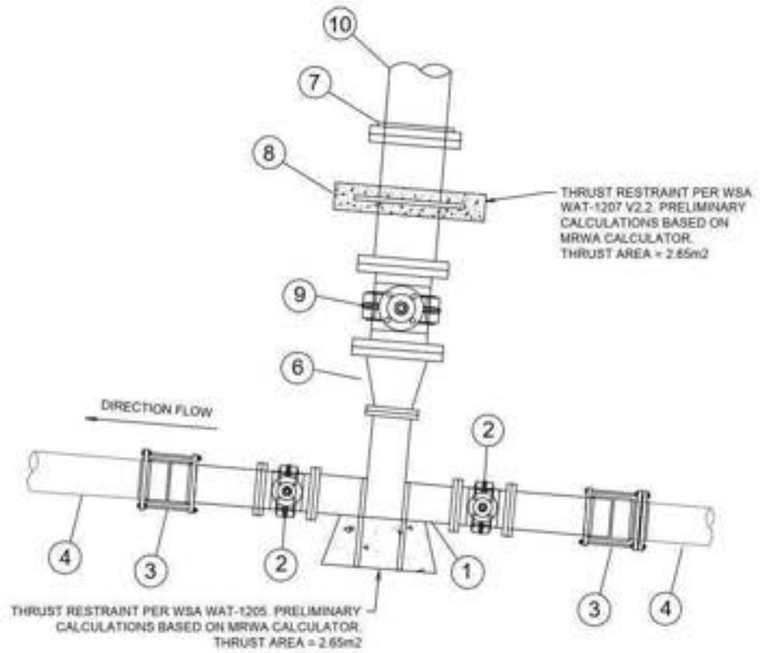
PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN
LINE 02A LONGITUDINAL SECTION

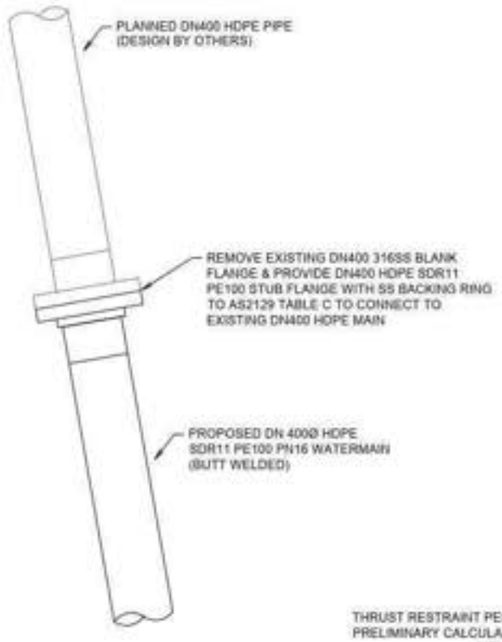
ORIGINAL SIZE	PLANIT JOB No.	DRAWING No.	REV
A1	J7708	20628	0



MULLUMBIMBY ROAD CONNECTION DETAIL

NOT TO SCALE

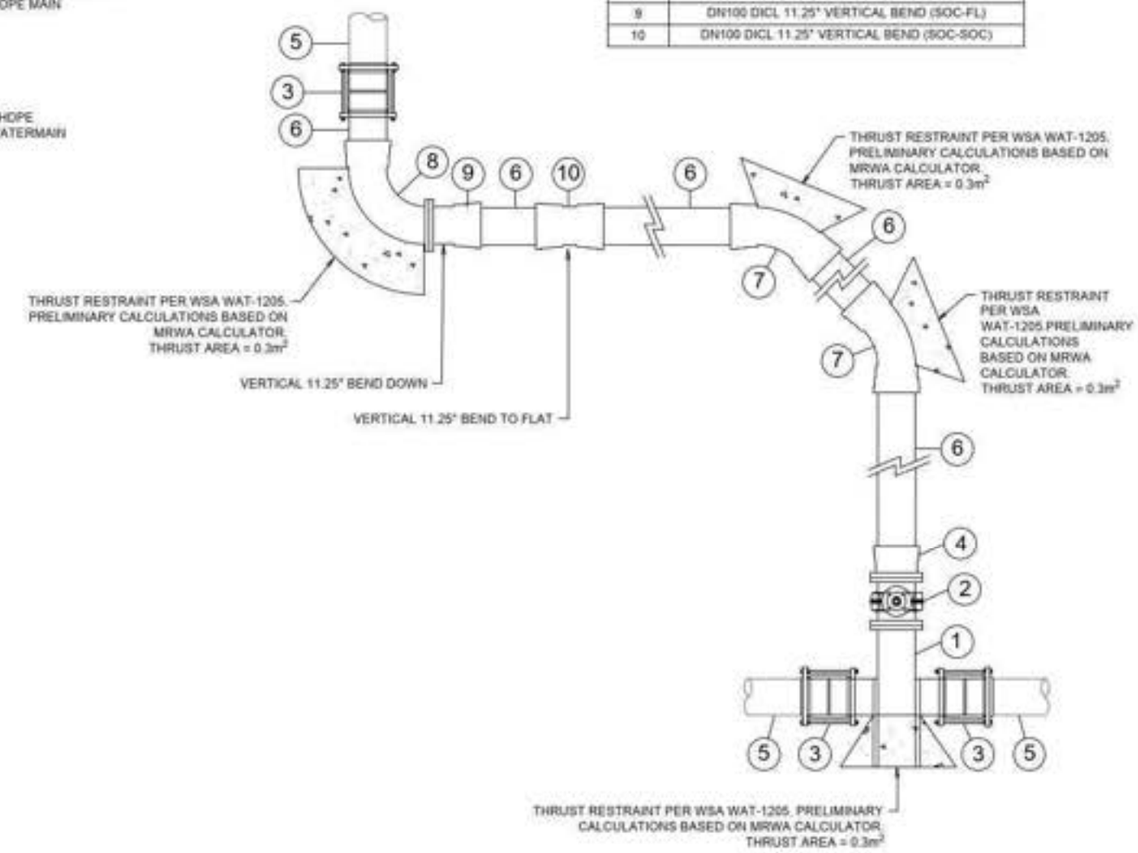
PIPE SCHEDULE	
ITEM	PIPE FITTING SCHEDULE
1	DN250 DICL PN16 TEE (FL-FL)
2	DN250 DICL PN16 GATE VALVE (FL-FL)
3	DN250 DICL PN16 GIBAULT
4	EXISTING DN250 PVC TRUNK MAIN
5	PROPOSED DN400 HDPE SDR11 PE100 TRUNK MAIN
6	DN250 x DN300 DICL REDUCER (FL-FL)
7	DN400 HDPE STUB FLANGE WITH SS BACKING RING
8	DN400 HDPE SDR11 PE 100 PUDDLE FLANGE SHORT
9	DN250 DICL PN16 GATE VALVE (FL-FL)
10	DN400 HDPE SDR11 PE100 MAIN



AZALEA STREET CONNECTION DETAIL

NOT TO SCALE

PIPE SCHEDULE	
ITEM	PIPE FITTING SCHEDULE
1	DN100 DICL TEE (SP-SP-FL)
2	DN100 DICL GATE VALVE (FL-FL)
3	DN100 DICL PN16 GIBAULT
4	DN100 DICL CONNECTOR (FL-SOC)
5	EXISTING DN100 mPVC PIPE
6	PROPOSED DN100 PVC PIPE LENGTH TO SUIT
7	DN100 DICL 45° BEND (SOC-SOC)
8	DN150 DICL 90° BEND (SOC-FL)
9	DN100 DICL 11.25° VERTICAL BEND (SOC-FL)
10	DN100 DICL 11.25° VERTICAL BEND (SOC-SOC)



STATION STREET CONNECTION DETAIL

NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	RW	RW	RW

SCALES: NTS

DO NOT SCALE FROM DRAWING

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PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN CONSTRUCTION DETAILS CONNECTIONS

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
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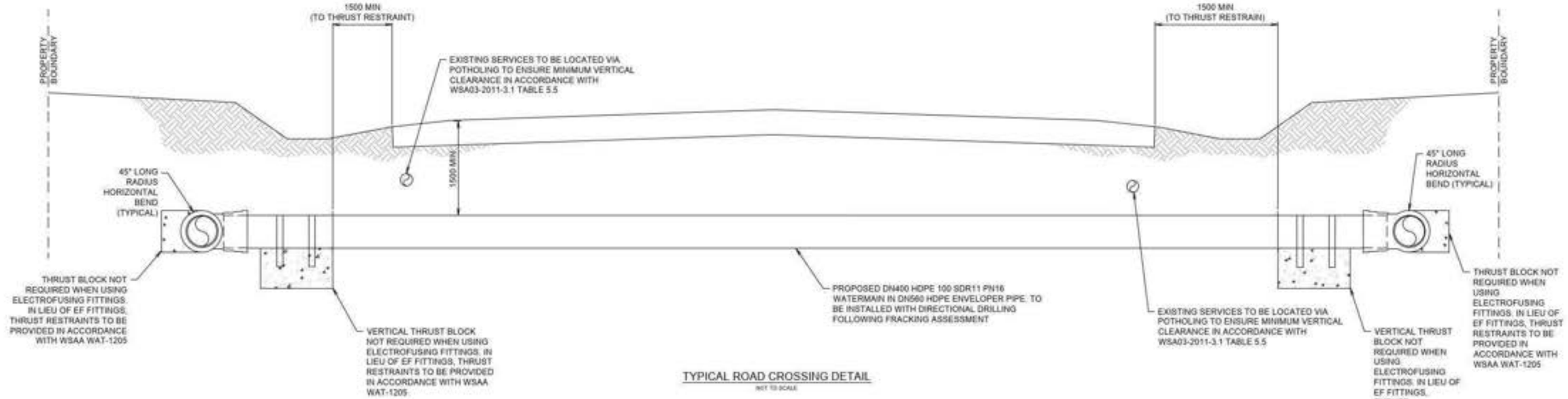
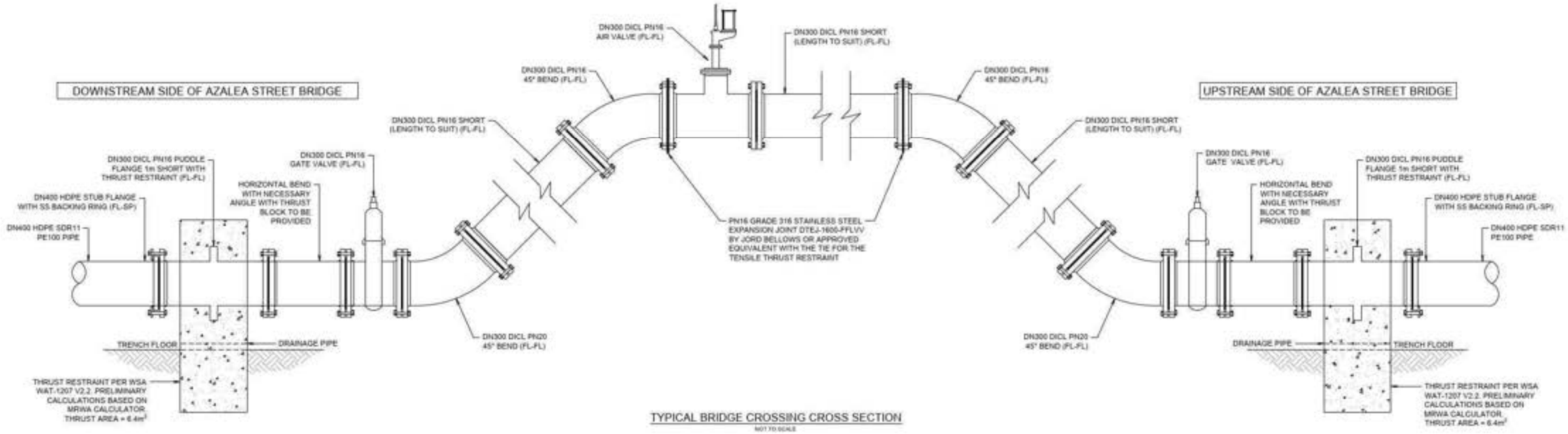


TYPICAL ROAD CROSSING DETAIL

NOT TO SCALE



TYPICAL BRIDGE CROSSING CROSS SECTION

NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS

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PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN CONSTRUCTION DETAILS TYPICAL ROAD CROSSING

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
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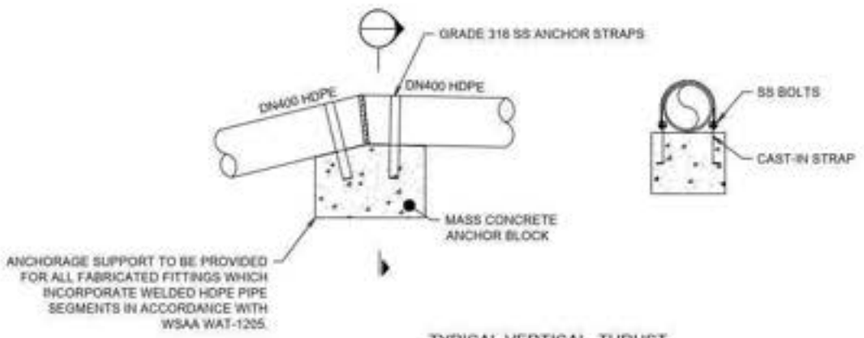
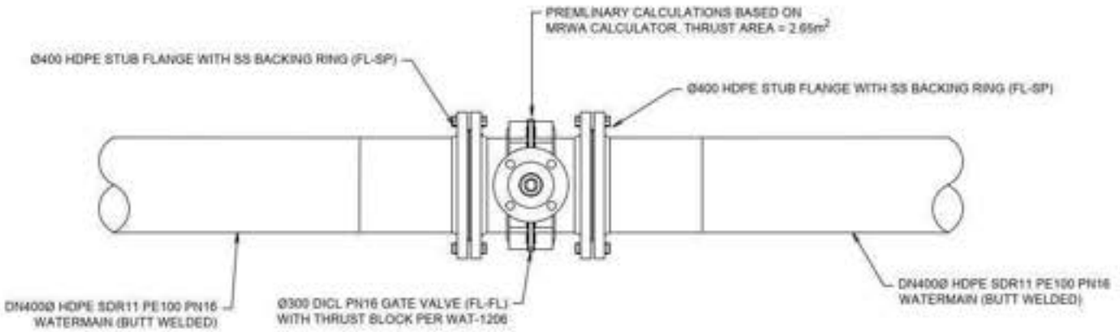
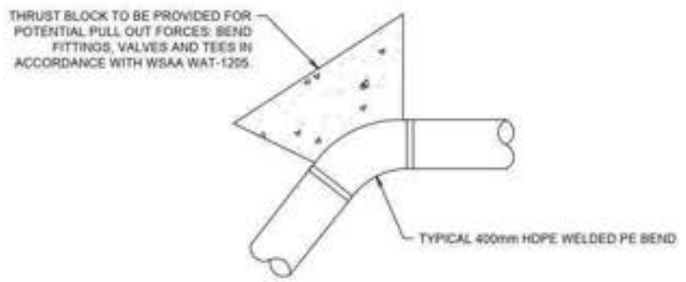


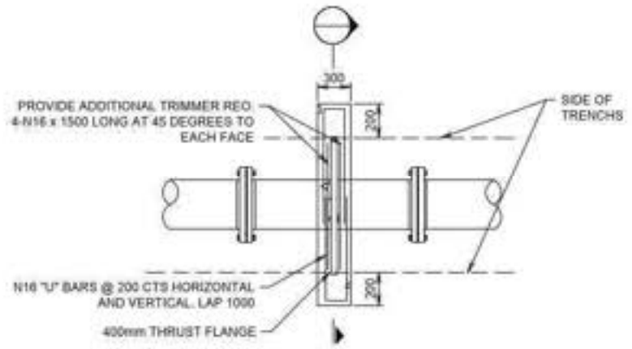
TYPICAL VERTICAL THRUST BLOCK DETAIL
NOT TO SCALE

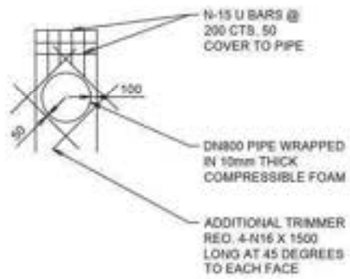


TYPICAL VALVE INSTALLATION DETAIL
NOT TO SCALE



TYPICAL HORIZONTAL THRUST BLOCK DETAIL
NOT TO SCALE





TYPICAL THRUST RESTRAINT DETAIL
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS
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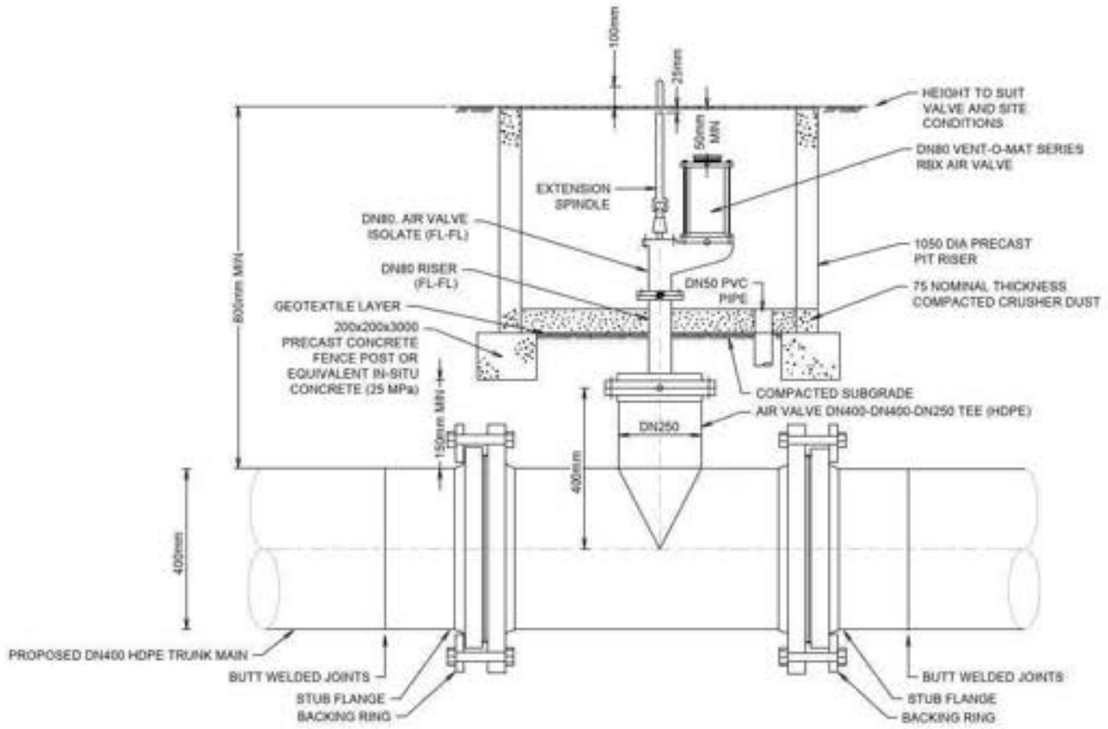
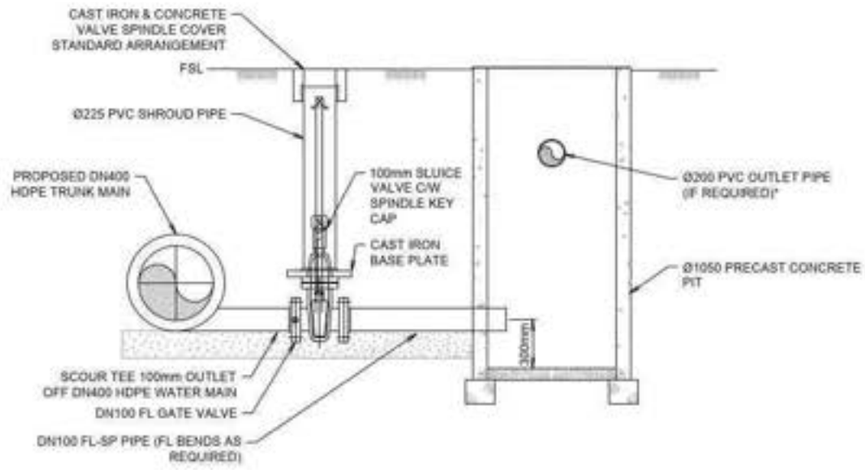
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN CONSTRUCTION DETAILS TYPICAL THRUST BLOCK

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	20632	0

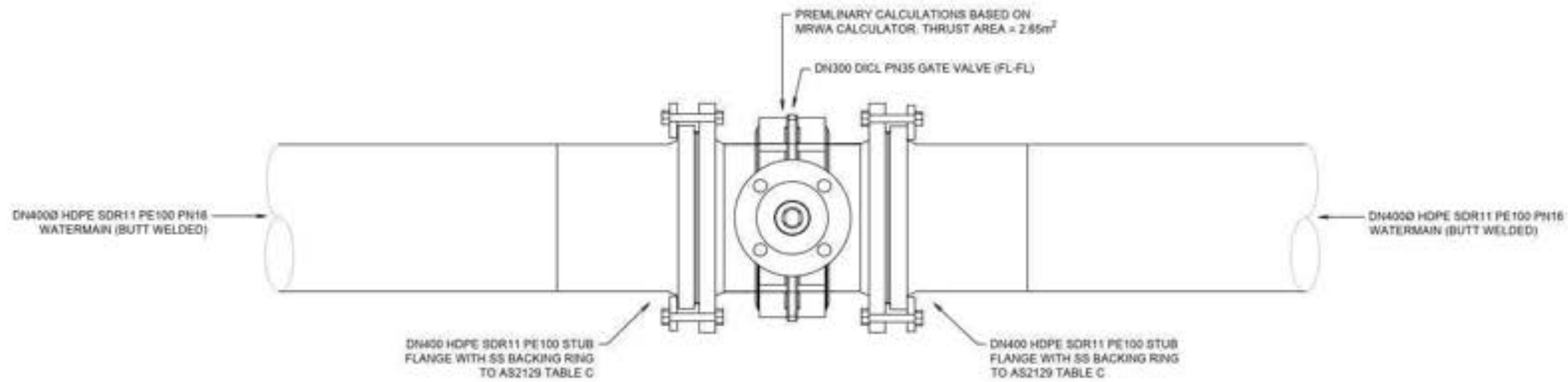


AIR VALVE TYPICAL DETAIL
(INLINE AIR VALVE WITH AIR VALVE ISOLATOR)
NOT TO SCALE



* EITHER DRILL WEEP HOLES INTO BASE TO LET WATER OUT OR PROVIDE DN200 PVC PIPE AT MINIMUM DEPTH TO OUTLET POINT. ROCK PROTECTION TO BE PROVIDED AT OUTLET.
* ALTERNATIVE - PROVIDE ROCK PROTECTION AROUND PIT & OPEN LID DURING SCOUR OPERATION.

TYPICAL 600mm SCOUR PIT DETAIL
NOT TO SCALE



HDPE PIPE TO VALVE CONNECTION &
INSTALLATION TYPICAL DETAIL
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS
DO NOT SCALE FROM DRAWING

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PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN CONSTRUCTION DETAILS AIR VALVE AND SCOUR PIT

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
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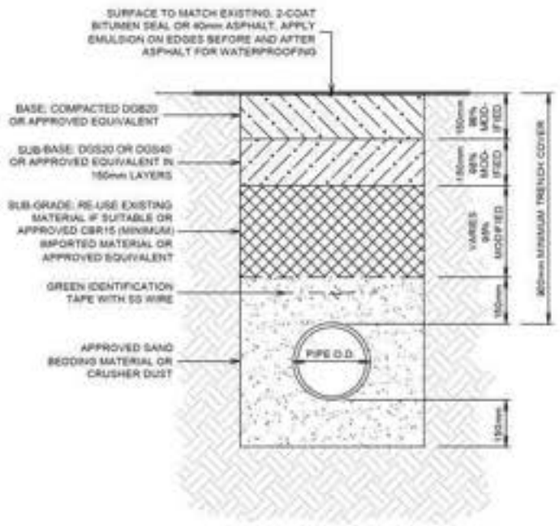
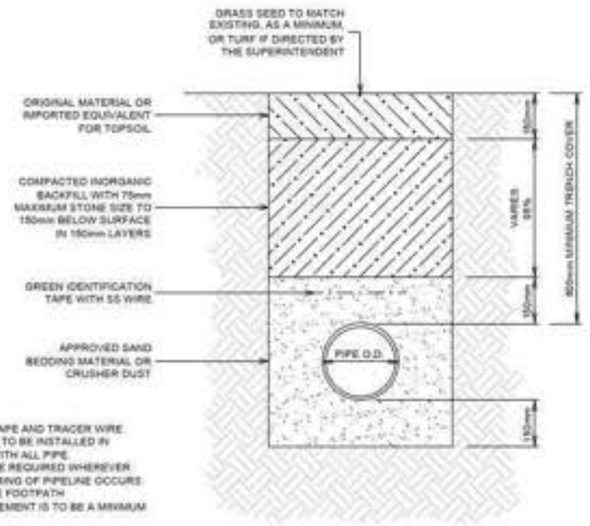


PIPE BACKFILL DETAIL - ROAD PAVEMENT

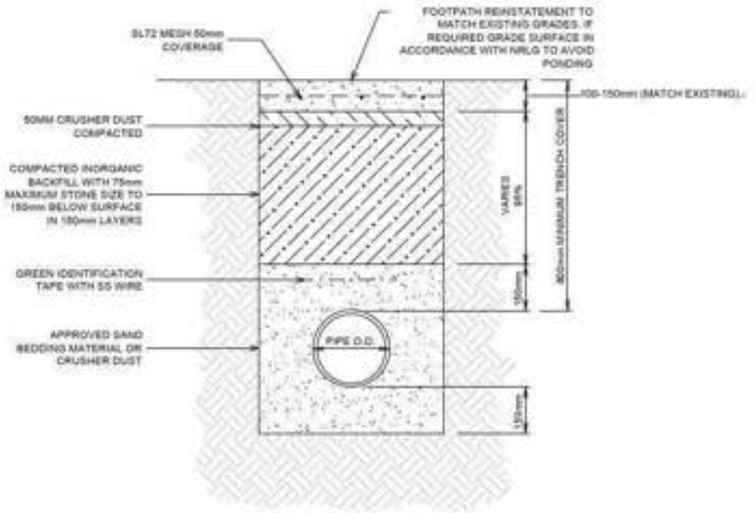
SCALE. 1:10 @ A1, 1:20 @A3



NOTE:
- MARKER TAPE AND TRACER WIRE REQUIRED TO BE INSTALLED IN TRENCH WITH ALL PIPE
- DRAW WIRE REQUIRED WHEREVER UNDERBORING OF PIPELINE OCCURS
- CONCRETE FOOTPATH RE-INSTATEMENT IS TO BE A MINIMUM 20MPA.
- NRLG SPECIFICATIONS REQUIRED.

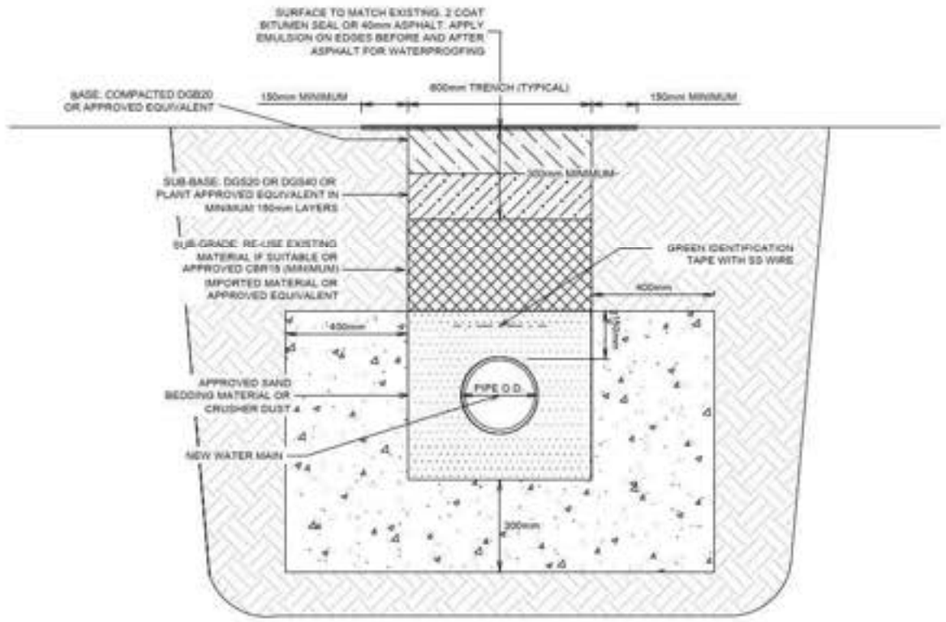
PIPE BACKFILL DETAIL - VERGE

SCALE. 1:10 @ A1, 1:20 @A3



PIPE BACKFILL DETAIL - CONCRETE FOOTPATH

SCALE. 1:10 @ A1, 1:20 @A3



TYPICAL ANCHOR BLOCK DETAIL (TRAFFIC)

1:10 @ A1, 1:20 @A3

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES:
0 0.1 0.2 0.4 0.6
Full Size 1:10 ; Half Size 1:20
Scale (m)
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CLIENT:
BYRON SHIRE COUNCIL

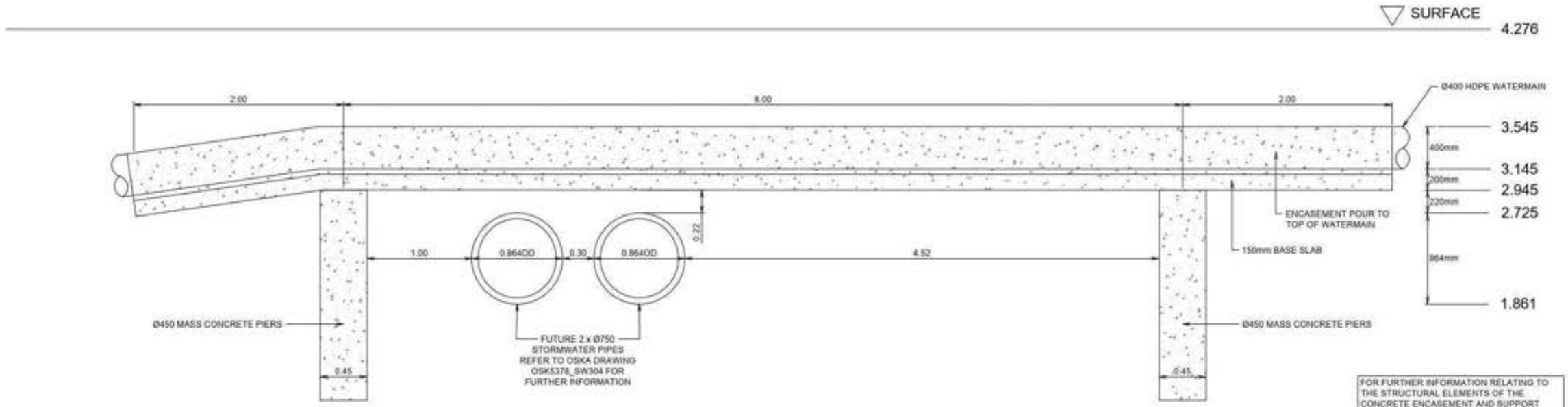
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
CONSTRUCTION DETAILS
TRENCH BACKFILL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20634	0

CAD FILE: C:\USERS\BT\APPLANITSYNC\TTBB - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DWG\TMD20630 WATER DETAILS.DWG PLOTTED BY: BRENDANT PLOT DATE: 30/08/2024 10:51:19 AM



WATERMAIN BRIDGING SLAB ELEVATION
SCALE 1:20m

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES:
0 0.2 0.4 0.8 1.2
Full Size 1:20 ; Half Size 1:40
Scale (m)
DO NOT SCALE FROM DRAWING

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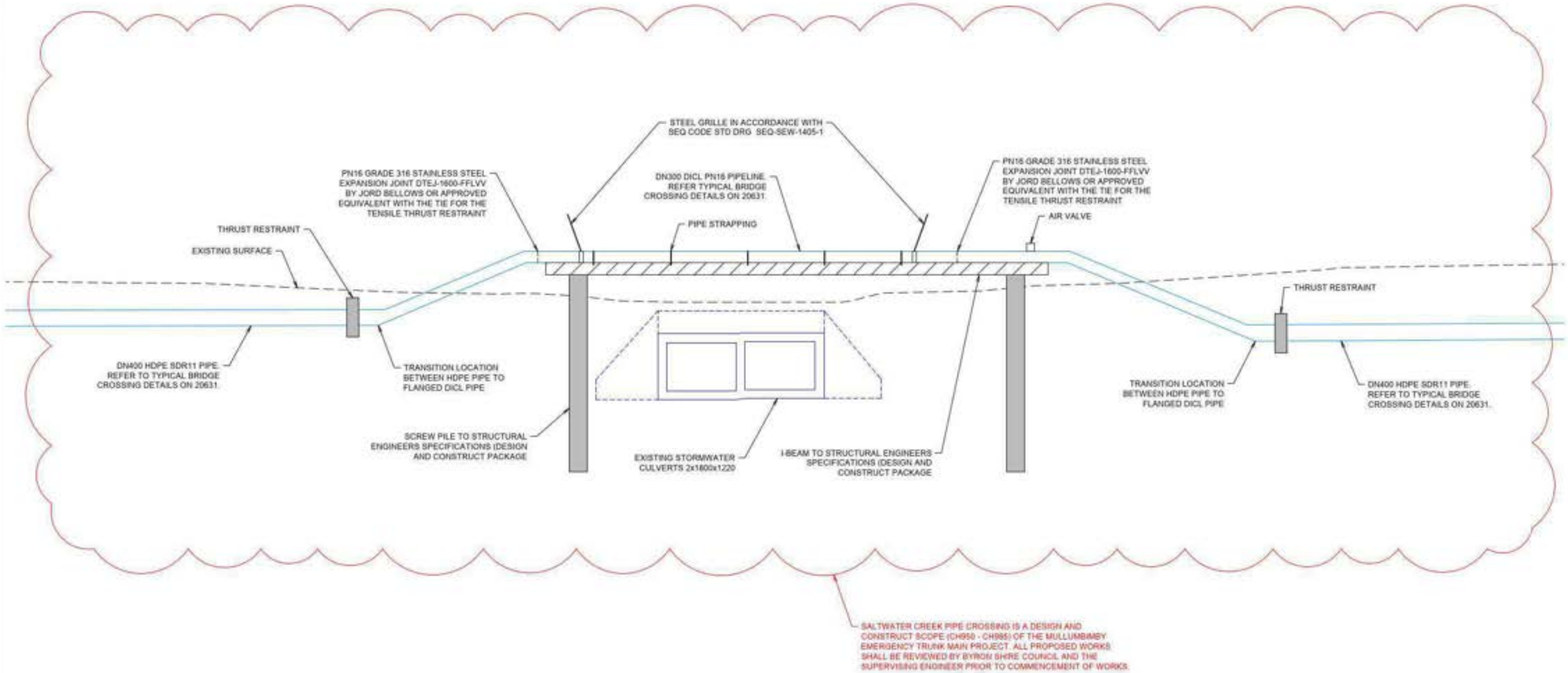
PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN CONSTRUCTION DETAILS WATERMAIN BRIDGING SLAB

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20635	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\J7708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMP - ENGINEERING\7.4 DWG\TMD\DESIGN WATER DETAILS.DWG PLOTTED BY: BRENDAN T. PLOT DATE: 30/08/2024 10:55:08 AM



PIPE BRIDGE SECTION

SCALE 1:50

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES:

0 0.5 1 2 3

Full Size 1:50 ; Half Size 1:100
Scale (m)

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PLANIT CONSULTING

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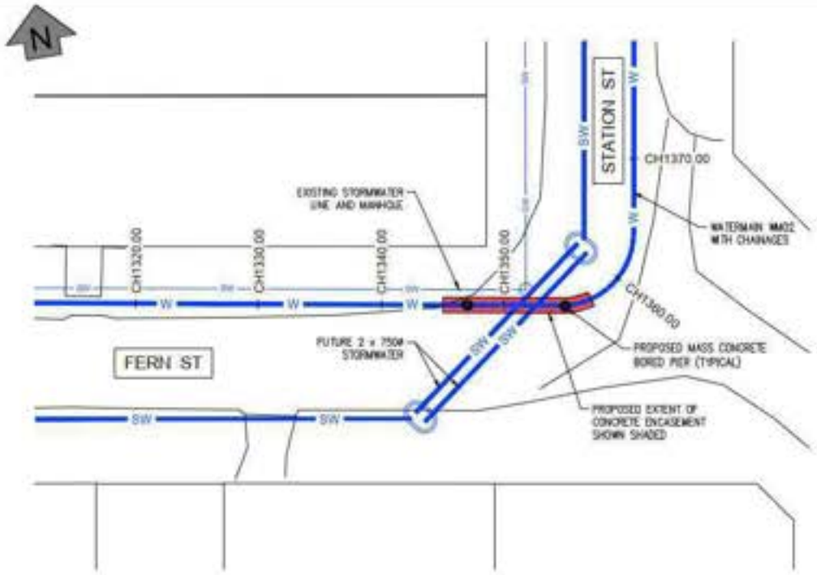
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

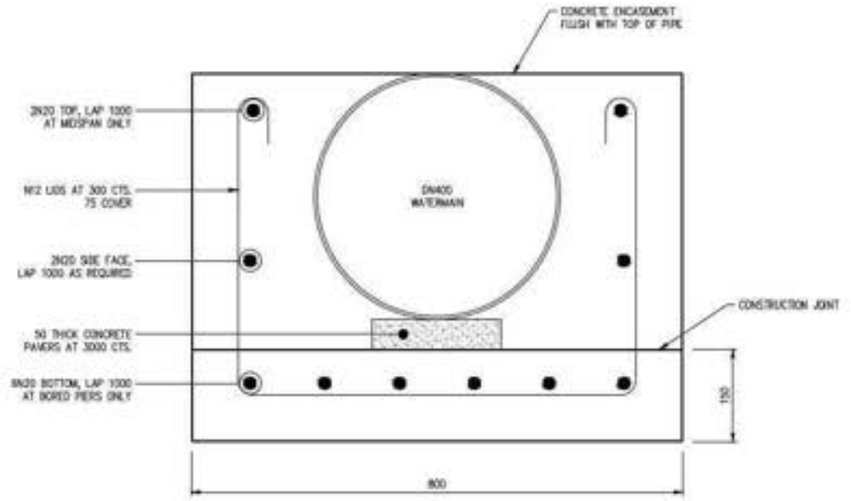
PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
CONSTRUCTION DETAILS
SALTWATER CREEK CROSSING

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20636	0



WATERMAIN WM02 CONCRETE ENCASEMENT PLAN
SCALE 1:500



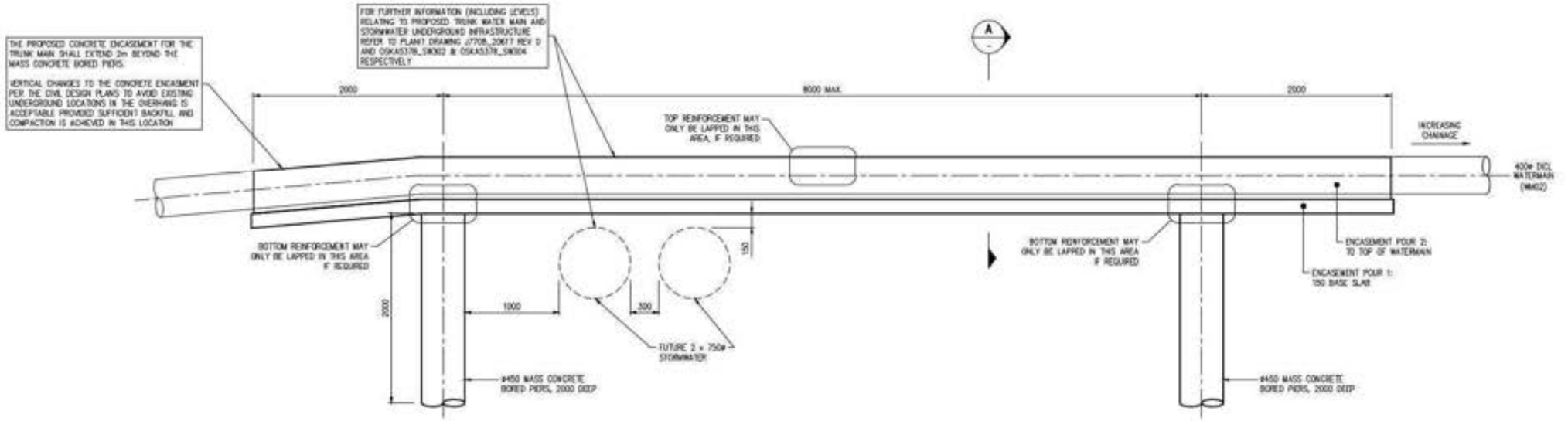
SECTION A
SCALE 1:10

GENERAL NOTES

1. BORED PIERS ARE TO BE CONSTRUCTED USING UNREINFORCED GRADE N32 MASS CONCRETE. THE TOP OF THE BORED PIERS SHOULD BE SET 0-50mm BELOW THE UNDERSIDE OF THE CONCRETE ENCASEMENT.
2. THE CONCRETE ENCASEMENT BASE SLAB MUST BE CAST IN A SINGLE OPERATION.
3. THE TOP SURFACE OF THE BASE SLAB (POUR 1) MUST BE GREEN CUT WITHIN 24 HOURS TO PROVIDE A GOOD BOND FOR POUR 2.
4. THE WATERMAIN CAN BE LAID WITH CARE, 24 HOURS AFTER COMPLETION OF POUR 1.
5. ALL LOOSE MATERIAL AND RUBBISH MUST BE CLEANED OUT OF THE EXCAVATION PRIOR TO POUR 2. THIS CAN BE ACHIEVED BY BLOWING OUT WITH COMPRESSED AIR TOWARDS THE ENDS.
6. THE PIPE CONCRETE ENCASEMENT (POUR 2) MUST BE CAST IN A SINGLE OPERATION.
7. ON COMPLETION OF POUR 2, THE CONCRETE SURFACE MUST BE COVERED WITH PLASTIC SHEETING AND WEIGHTED DOWN TO PROVIDE CURING.
8. BACKFILLING OF THE ENCASED PIPE MAY COMMENCE 3 DAYS AFTER POUR 2 AND FULL TRAFFIC LOADING MAY COMMENCE 7 DAYS AFTER POUR 2.

REINFORCED CONCRETE NOTES

1. ALL CONCRETE WORK IS TO BE EXECUTED IN ACCORDANCE WITH THE CURRENT EDITION OF:
   - AS3600: CONCRETE STRUCTURES
   - AS1379: SPECIFICATION AND SUPPLY OF CONCRETE
2. CHARACTERISTIC COMPRESSIVE STRENGTH (f'_c) AT 28 DAYS SHALL BE:
   - 32MPa FOR CONCRETE ENCASEMENT AND BORED PIERS
3. ALL CONCRETE SHALL BE THOROUGHLY AND MECHANICALLY VIBRATED.
4. PLASTIC CHAIRS OR PLASTIC TIPPED STEEL CHAIRS ARE TO BE USED TO SUPPORT REINFORCEMENT AND GIVE CORRECT CONCRETE COVER.
5. REINFORCEMENT IS SHOWN DIAGRAMATICALLY AND NOT IN TRUE PROJECTION.
6. WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
7. UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE CONCRETE COVER TO OUTSIDE OF ANY REINFORCEMENT IS TO BE:
   - 75mm WHERE CONCRETE POURED IS IN OR WILL BE IN DIRECT CONTACT WITH THE GROUND
   - 40mm TOP AND SIDES
8. BAR NOMENCLATURE:
   'N' INDICATES DEFORMED BARS GRADE 500N TO AS4671



WATERMAIN WM02 CONCRETE ENCASEMENT ELEVATION
SCALE 1:50

ISSUED FOR CONSTRUCTION

Rev	Date	Drawn	Checked	Description
B	05.03.24	J.K.	M.S.	ISSUED FOR CONSTRUCTION
A	05.03.24	J.K.	M.S.	ISSUED FOR REVIEW

Client: Byron Shire Council

SSE
Sole Structural Engineering Pty Ltd
A.B.N. 48 642 088 180
EMAIL: mail@sse.com
MOBILE: 0401 148 133

Project: MULLUMBIMBY TRUNK MAIN

Title: LINE WM02: CH1350
FERN AND STATION STREETS
CONCRETE ENCASEMENT

Scale: A3

Date:	05/03/2024
Designed:	M.S.
Drawn:	J.K.
Project No.	S300
Drawing No.	S02
Rev	0

Authorised:
Date:
FILE NAME:
PLOT DATE:

BYRON SHIRE COUNCIL

MULLUMBIMBY TRUNK MAIN
RESERVOIR (LINE 03)
NEW SOUTH WALES 2482

DETAILED DESIGN

PLANIT CONSULTING

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISION
30000	COVER SHEET AND DRAWING REGISTER	0
30010	GENERAL NOTES	0
30600	WATER MAIN ALIGNMENT PLAN	0
30610	WATER MAIN LONGITUDINAL SECTIONS	0
30620	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 1 OF 3	0
30621	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 2 OF 3	0
30622	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 3 OF 3	0
30623	CONSTRUCTION DETAILS - BELOW GROUND PRV	0
30624	CONSTRUCTION DETAILS - AIR VALVE AND SCOUR PIT	0
30625	CONSTRUCTION DETAILS - TYPICALS	0
30626	CONSTRUCTION DETAILS - TYPICAL ROAD CROSSING	0
30627	CONSTRUCTION DETAILS - TRENCH BACKFILL	0
30628	CONSTRUCTION DETAILS - BOOSTER PUMP STATION	0
30629	CONSTRUCTION DETAILS - BULK WATER METER	0

SOURCE: NEARMAP

LOCALITY PLAN
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
NOT TO SCALE
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR
COVER SHEET AND DRAWING REGISTER

ORIGINAL SIZE	PLANIT JOB No.	DRAWING No.	REV
A1	J7708	30000	0

GENERAL

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE FOLLOWING DOCUMENTS:
   i. OTHER PROVIDED ENGINEERING DRAWINGS;
   ii. TECHNICAL SPECIFICATIONS;
   iii. PROJECT SPECIFICATIONS;
   iv. SUPPLEMENTARY SPECIFICATIONS; AND
   v. WRITTEN INSTRUCTIONS.
2. BYRON SHIRE COUNCIL/NORTHERN RIVERS LOCAL GOVERNMENT STANDARDS, SPECIFICATIONS AND STANDARD DRAWINGS ARE TO BE ADOPTED UNLESS STATED OTHERWISE.
3. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT SPECIFICATION FOR THE WORKS TOGETHER WITH THE REQUIREMENTS OF ALL THE RELEVANT CODES OF PRACTICE REFERRED TO THEREIN AND THE REQUIREMENTS OF CURRENT LOCAL AUTHORITY STANDARDS AND SPECIFICATIONS. THESE STANDARDS ARE NOTED AS INCLUDING THE FOLLOWING:
   i. NORTHERN RIVER LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D11, WATER SUPPLY.
   ii. WSA 03 2011 WATER SUPPLY CODE OF AUSTRALIA.
   iii. RELEVANT AND CURRENT STANDARDS OF AUSTRALIA.
   iv. PROVISIONS OF THE BUILDING ACT 1975.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND PROVISION OF ANY TEMPORARY BRACING, PROPPING ETC. TO DRAINAGE PIPES DURING CONSTRUCTION. STRUCTURES SHALL BE MAINTAINED IN A STABLE POSITION AND NO PART SHALL BE OVERSTRESSED.
5. ANY PERMITS AND APPROVALS REQUIRED FOR CONSTRUCTION OF PERMANENT OR TEMPORARY WORKS SHALL BE OBTAINED BY THE CONTRACTOR.
6. THE DETAILED DESIGN PLANS HAVE BEEN DEVELOPED BASED ON SURVEY INFORMATION PROVIDED BY BYRON BAY SURVEYING.
7. EXISTING SURFACE LEVELS ON THE DRAWINGS ARE INDICATIVE ONLY.
8. DO NOT OBTAIN DIMENSIONS FROM SCALING.
9. ALL LOCATIONS, ORIENTATION AND LEVELS SHALL BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK. DISCREPANCIES SHALL BE REFERRED TO THE SITE SUPERINTENDENT, PRIOR TO PROCEEDING WITH ANY WORKS.
10. ALL DIMENSIONS ON THE DRAWINGS ARE NOMINAL ONLY. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS ON SITE PRIOR TO FABRICATION OR CONSTRUCTION. DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.
11. NO SUBSTITUTE MATERIALS SHALL BE USED WITHOUT THE WRITTEN APPROVAL OF THE PRINCIPAL.
12. THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY PROTECTION AND SITE FENCING TO PREVENT ENTRY OF ANY UNAUTHORISED PERSONS AND ANIMALS DURING CONSTRUCTION.
13. ACCESS TO AND WORKS WITHIN PRIVATE LAND PARCELS MUST BE UNDERTAKEN IN ACCORDANCE WITH THE RELEVANT APPROVALS AND AGREEMENTS. NO WORK SHALL COMMENCE WITHIN ANY PRIVATE PROPERTY UNTIL THE CONTRACTOR HAS VERIFIED THAT ALL REQUIRED APPROVALS ARE IN PLACE AND THAT ALL OWNERS/RESIDENTS HAVE BEEN PROVIDED WITH THE NECESSARY NOTICES OF ENTRY.
14. RESTORATION OF SUBJECT WORK ZONES MUST BE UNDERTAKEN IN ACCORDANCE WITH THE NRLG GUIDELINES, AND AT THE DISCRETION OF THE PRINCIPAL, BE OF A MINIMUM STANDARD THAT IS EQUAL TO THE SITES EXISTING CONDITIONS.
15. ALL DRIVEWAYS DISTURBED AS A RESULT OF THE WORKS MUST BE RESTORED TO A DEGREE THAT MATCHES AS CLOSE AS POSSIBLE TO THE EXISTING COLOUR, MATERIAL, AND FINISH. ALL PROPERTY OWNERS OF HOUSEHOLDS IN WHICH THE DRIVEWAY WILL BE AFFECTED ARE TO BE CONSULTED WITH IN ADVANCE OF THE WORKS TO ENSURE THAT THE PROPOSED REINSTATEMENT IS ACCEPTABLE.
16. ALL ROAD PAVEMENTS THAT ARE IMPACTED BY THE WORKS ARE TO BE REINSTATED IN ACCORDANCE WITH THE LOCAL GOVERNMENT STANDARDS.

EXISTING SERVICES

1. IN GENERAL, EXISTING SERVICES SHOWN HAVE BEEN DETERMINED BY ELECTRONIC MEANS AND GROUND PENETRATING RADAR. ONLY SELECT POTHOLING HAS BEEN UNDERTAKEN. THE LOCATION OF UNDERGROUND SERVICES SHOWN ON THESE DRAWINGS SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR, NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.
2. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES PRIOR TO ANY WORKS COMMENCING AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. WORK TO ANY SERVICES SHOULD BE DONE IN CONSULTATION WITH THE APPROPRIATE SERVICE PROVIDER. ANY WORKS SURROUNDING APA ASSETS REQUIRE LIAISION WITH APA WHO ADDITIONALLY REQUIRE SUPERVISION OF ANY WORKS SURROUNDING THEIR ASSET.
4. ONLY UNDERGROUND SERVICES IN THE IMMEDIATE VICINITY OF THIS SURVEY HAVE BEEN LOCATED. INFORMATION OF THE EXISTING SERVICES ARE SHOWN IN THE DRAWINGS IN GOOD FAITH, NO GUARANTEE IS GIVEN OR IMPLIED THAT SUCH INFORMATION IS ACCURATE OR COMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE POSITION OF THE EXISTING SERVICES BEFORE COMMENCING CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO EXERCISE CARE WHEN IN CLOSE PROXIMITY OF SERVICES AND EXCAVATION IN GENERAL. CAREFUL HAND EXCAVATION IS RECOMMENDED WHEN WITHIN CLOSE PROXIMITY TO SERVICES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING SERVICES DURING THE COURSE OF THE CONTRACT.
5. IN THE EVENT OF SERVICES DEVIATING FROM LOCATIONS SHOWN OR PRESENT BUT NOT SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT AND PROVIDE 3 DAYS NOTICE PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY THAT MAY AFFECT THE SERVICE.
6. CONTRACTOR TO OBTAIN PRIOR APPROVAL FROM THE SUPERINTENDENT FOR ANY DEVIATIONS REQUIRED TO AVOID EXISTING SERVICES.
7. DISPLACEMENT OR DISTURBANCE TO ANY EXISTING SERVICES MUST BE RECTIFIED BY THE CONTRACTOR PRIOR TO BACKFILLING AND COMPLETION OF WORKS. TEMPORARY SERVICE PROVISION IS TO BE ACCOUNTED FOR BY THE CONTRACTOR TO ENSURE THAT THERE IS NO SERVICE OUTAGE TO ANY PROPERTY IMPACTED BY THE WORKS.
8. REMOVAL AND DISPOSAL OF ASBESTOS CEMENT PIPES TO BE UNDERTAKEN IN ACCORDANCE WITH THE LATEST VERSION OF:
   iv. BYRON SIRE COUNCIL ASBESTOS POLICY;
   ii. SAFEWORK NSW - ASBESTOS HANDLING GUIDELINES;
   iii. SAFEWORK NSW - WORK HEALTH AND SAFETY REGULATION;
   iv. SAFEWORK NSW - HOW TO MANAGE AND CONTROL ASBESTOS IN THE WORKPLACE CODE OF PRACTICE; AND,
   v. SAFEWORK NSW - HOW TO SAFELY REMOVE ASBESTOS CODE OF PRACTICE.

EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE EROSION AND SEDIMENT CONTROL PLAN.
2. ALL CONTROL MEASURES SHALL BE IN ACCORDANCE WITH "NORTHERN RIVERS LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D7 EROSION CONTROL AND STORMWATER MANAGEMENT".
3. THE CONTRACTOR SHALL INFORM ALL STAFF AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN.
4. CONTROL MEASURES SHALL BE IN PLACE PRIOR TO STRIPPING OR DISTURBANCE OF TOPSOIL WITHIN EACH WORK ZONE.
5. ALL WORKS ARE TO BE INSPECTED, AND MAINTAINED WHERE NECESSARY, ON A WEEKLY BASIS AND AFTER EACH RAIN EVENT.
6. ADEQUATE MEASURES SHALL BE TAKEN TO PREVENT DUST FROM AFFECTING THE AMENITY OF THE NEIGHBOURHOOD DURING CONSTRUCTION. WATER SITE AS REQUIRED TO PREVENT DUST GENERATION. USE TEMPORARY SPRINKLERS AS REQUIRED.
7. ALL WORKS ON SITE SHALL STOP WHEN WIND SPEEDS REACHES 35km/h.
8. CLEANING OF FOOTPATHS AND ROADWAYS SHALL BE CARRIED OUT REGULARLY.
9. ALL DISTURBED AREAS ARE TO BE LEFT IN A STABLE CONDITION. SLOPES SHOULD BE STABILISED USING APPROPRIATE EROSION CONTROL MEASURES, WHILE TURF AND VERGE AREAS TO BE REINSTATED WHEN DISTURBED DURING CONSTRUCTION.
10. ALL TURF/PLANTINGS/REINSTATEMENTS WILL NEED TO BE MAINTAINED THROUGHOUT THE ESTABLISHMENT PHASE.

CLEARING

1. ALL TREE AND VEGETATION CLEARING WORKS BY THE CONTRACTOR MUST STRICTLY BE UNDERTAKEN IN ACCORDANCE WITH THE BYRON SHIRE COUNCIL VEGETATION & TREE REMOVAL POLICIES IN CONJUNCTION WITH THE APPROVED, PROJECT SPECIFIC REVIEW OF ENVIRONMENTAL FACTORS (REF) REPORT.

EARTHWORKS/FILL

1. THIS PROJECT PROPOSES NO BULK EARTHWORKS OR CHANGES TO GROUND LEVEL ACTIVITIES. EARTHWORKS FOR TRUNK MAIN INSTALLATION SHALL COMPRISE OF TRENCHING & BACKFILL OR REMOVAL OF UNDERBORE SPOIL ONLY.
2. ALL IMPORTED FILL MATERIAL MUST COMPRISE OF NATURAL EARTH AND ROCK AND IS TO BE FREE OF ALL CONTAINANTS IN ACCORDANCE WITH THE ENVIRONMENTAL PROTECTION ACT 1994 SECTION 11. NO DEMOLITION MATERIAL (I.E. FOOTPATH OR PAVEMENT) SHALL BE USED AS BACKFILL.
3. ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING. RESPREADING THICKNESSES TO BE A MINIMUM OF 100MM AND A MAXIMUM OF 300MM.
4. ALL TRENCH BACKFILL MATERIAL SHALL BE PLACED, COMPACTED, AND TRIMMED TO MATCH WITH THE EXISTING EARTHWORKS LEVELS AND PROFILES SHOWN ON THE DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND MUST BE IN ACCORDANCE WITH AS3798.

WATER MAIN PIPE WORK & INSTALLATION

1. NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS, ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY STANDARD SPECIFICATIONS AND DRAWINGS.
2. WATER SERVICES SHALL NOT BE PERMITTED TO CONNECT TO THE PROPOSED TRUNK MAIN.
3. REINSTATEMENT OF ANY WATER SERVICE CONNECTIONS SHALL BE IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY STANDARD DRAWINGS.
4. ANY WORKS ASSOCIATED WITH LIVE WATER CONNECTIONS MAY BE CARRIED OUT BY THE CONTRACTOR UNDER SUPERVISION BY CURRENT LOCAL AUTHORITY. FEES & EXPENSES FOR THESE EXPENSES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
5. FOR THE INSTALLATION OF PIPEWORK VIA TRENCHING, PROVIDE SUFFICIENT TRENCH DEPTH AND WIDTH TO ALLOW FOR THE PRESCRIBED BEDDING MATERIAL, PIPEWORK DEFLECTIONS, AND A SAFE WORKING ENVIRONMENT.
6. CONTRACTOR TO FOLLOW SAFE WORK AUSTRALIAS GUIDE TO EXCAVATION WORK AND PROVIDE TRENCH BENCHING IN AREAS OF DEEP EXCAVATION TO PREVENT TRENCH COLLAPSE AND SAFE MOVEMENT OF WORKERS IN AND OUT OF TRENCH.
7. ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.
8. CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENT FOR HDPE PIPELINES CAN BE ACHIEVED VIA BENDING OF THE PIPELINE AND DEFLECTION OF THE PIPEWORK DEFLECTIONS AT JOINTS IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICAITONS.
9. FOR PIPEWORK NOT HDPE, CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENTS OTHER THAN BY MANUFACTURED BENDS, SHALL BE ACHIEVED BY DEFLECTING THE PIPES AT JOINTS. MAXIMUM DEFLECTIONS SHALL BE AS PER MANUFACTURER'S SPECIFICATIONS.
10. WHERE CONNECTING TO ANY EXISTING PIPEWORK, THE LEVEL AND THE SIZE OF THE EXISTING PIPEWORK SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO CONNECTION.
11. IF CUTTING OF PIPES IS NECESSARY ON SITE REFER TO MANUFACTURERS REQUIREMENTS.
12. MINIMUM CLEARANCE TO EXISTING SERVICES SHALL BE IN ACCORDANCE WITH TABLE 5.5 OF THE WSA03-2011 CODE.
13. FOR ALL DI PIPE AND FITTINGS:
   i. ALL DICL PIPES & FITTINGS MUST BE IN ACCORDANCE WITH AS 2280.
   ii. PIPES IN PITS AND WELLS SHALL BE FUSION BONDED EPOXY COATED TO AS 4158.
   iii. BURIED PIPES TO BE COVERED WITH POLYETHYLENE SLEEVING AS PER THE MANUFACTURER'S RECOMMENDATION.
14. FOR ALL FLANGED FITTINGS:
   i. ALL FLANGES MUST BE IN ACCORDANCE WITH AS 4087 UNO. ALL VALVES AND FITTINGS SHALL BE DRILLED TO AS 2129 TABLE D OR AS4087 PN16 UNO.
   ii. ALL BOLTS, NUTS AND WASHERS MUST BE 316 STAINLESS STEEL (GRADE B8M) UNO. BOLTS ARE TO BE ASSEMBLED WITH ANTI-GALLING COMPOUND "DURALAC" OR WITH AN APPROVED EQUIVALENT. ALL BURIED FLANGES ARE TO BE WRAPPED WITH "DENSO" PETROLATUM TAPE TO MANUFACTURER'S REQUIREMENTS.
   iii. PRIME, CAULK AND WRAP ALL BURIED FLANGES AND BOLTS WITH DENSO PETROLATUM PRODUCTS OR APPROVED EQUIVALENT AS PER THE MANUFACTURER'S RECOMMENDATIONS.
   iv. EXTERNAL COATING ARE NOT TO BE REMOVED WHEN THE PIPE FITTINGS ARE SURROUNDED OR COVERED IN CONCRETE.
15. THE CONTRACTOR IS TO ESTABLISH THE SOIL CLASSIFICATION FOR THE WATER MAIN ALIGNMENT TO DETERMINE THRUST BLOCK SIZES, FOR DETAILS REFER TO WSAA STANDARD DRAWING WAT-1205. THE CONTRACTOR MUST NOTE THAT THE ST. HELENA SUPPLY RESERVOIR TWL SITS AT APPROXIMATELY 120M AHD AND THE THRUST RESTRAINT AREA MUST BE CALCULATED IN ACCORDANCE WITH NOTE 6 OF WSAA WAT-1205.
16. ANCHOR BLOCKS SHALL BE INSTALLED AT BENDS, JUNCTIONS AND DEAD ENDS AS REQUIRED BY WAT-1205 AND THE PIPELINE MATERIAL.
17. FOR VALVE INSTALLATION DETAILS REFER WSAA STANDARD DRAWINGS WAT-1207, WAT-1300, WAT-1301 AND WAT-1304.
18. FOR FIRE HYDRANTS INSTALLATION DETAILS REFER WSAA STANDARD DRAWING WAT-1302, WAT-1305 AND WAT-1306.
19. ALL PE PIPEWORK TO BE INSTALLED IN ACCORDANCE WITH WSA 01-2004, POLYETHYLENE PIPELINE CODE.
20. ALL PIPEWORK WELDS TO BE BUTT FUSION WELDED WITH INTERNAL WELDS DE-BEADED.
21. ALL BACKING RINGS SHALL BE STAINLESS STEEL (GRADE 316) AND BOLTING COMPATIBILITY - PN16 IN ACCORDANCE WITH AS 4087, UNO.
22. WRAP 3 LAYERS OF PE SHEETING AROUND PIPE AND FITTINGS WHERE PE PIPEWORK IS IN CONTACT WITH CONCRETE.
23. PE WELDS TO BE PRE-QUALIFIED AS PER WSA 01-2004 SECTION 2.12. AT LEAST ONE BUTT WELD TO BE TESTED AT THE START OF EACH DAY OF WELDING. THE SITE ENGINEER CAN AT ANY TIME REQUEST FOR A RECENT WELD TO BE CUT OUT AND TESTED. TESTING AND COMMISSIONING OF THE PE PIPELINE TO CONFORM TO WSA 01-2004 SECTION 2.13.
24. MARKING TAPE SHALL BE PROVIDED ON TOP OF PIPE EMBEDMENT PRIOR TO TRENCHFILLING FOR ANY TRUNK MAINS INSTALLED VIA TRENCHING. WHERE TRENCHLESS TECHNIQUES ARE USED A 2mm DIAMETER GRADE 316 STAINLESS STEEL TRACER WIRE ON TOP OF THE MAIN PROVIDED PER WSA 03-2011-3.2 CL. 15.12.

CONCRETE

1. ALL CONCRETE SHALL COMPLY WITH AS 3600.
2. FORM CONSTRUCTION JOINTS FOR DRIVEWAY REINSTATEMENTS SHALL BE PROVIDED AND APPROVED BY THE SUPERVISING ENGINEER.
3. SUPPORT REINFORCEMENT IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED BAR CHAIRS, SPACERS OR SUPPORT BARS SUITABLE FOR THE EXPOSURE CONDITIONS.
4. LAP MESH REINFORCEMENT BY ONE COMPLETE MESH SQUARE AS A MINIMUM.
5. DO NOT WELD OR SITE BEND REINFORCEMENT UNLESS SHOWN IN THE DRAWINGS OR OTHERWISE SPECIFIED BY THE SUPERVISING ENGINEER.
6. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
7. SAMPLE TEST AND ASSESS CONCRETE COMPLIANCE IN ACCORDANCE WITH PROJECT ASSESSMENT OF STRENGTH GRADE TO SECTION 20 OF AS 3600.
8. THE CONCRETE SHALL BE COMPACTED USING HIGH-FREQUENCY VIBRATORS.
9. ADMIXTURES SHALL NOT BE USED WITHOUT THE WRITTEN APPROVAL OF THE SUPERVISING ENGINEER.

TESTING & COMMISSIONING

1. ALL TESTING SHALL BE CARRIED OUT BY A N.A.T.A. APPROVED TESTER IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
2. THE TEST PROCEDURE FOR PRESSURE MAINS SHALL BE IN ACCORDANCE WITH SECTION 6 OF AS/NZS 2566.2:2002. THE HYDROSTATIC TEST PRESSURE FOR THE PROPOSED MAIN SHALL BE 1200KPa.
3. THE FREQUENCY OF COMPACTION TESTING SHALL BE IN ACCORDANCE WITH CLAUSE 36.3.4.4 OF WSA03-2011.
4. AUDIT AND FINAL INSPECTIONS OF THE WORKS CONSTRUCTED BY THE CONTRACTOR MUST BE ARRANGED WITH THE PRINCIPAL PROVIDING SUFFICIENT NOTICE PERIODS AT THE DISCRETION OF THE PRINCIPAL.
5. ALL NEWLY INSTALLED WATERMAINS ARE TO BE DISINFECTED AND FLUSHED IN ACCORDANCE WITH CLAUSE 20 OF WSA03-2011 FOLLOWING COMPLETION OF SATISFACTORY HYDROSTATIC PRESSURE TESTING.

SURVEY

1. EXISTING SERVICES SHOWN ON DESIGN PLANS HAVE BEEN COMPILED FROM SURVEY INFORMATION PROVIDED BY BYRON BAY SURVEYING.
2. THE INFORMATION IS NOT INTENDED TO PROVIDE THE CONTRACTOR WITH COMPLETE OR ACCURATE INFORMATION CONCERNING THE LOCATION & EXTENT OF ALL UNDERGROUND UTILITY SERVICES, RATHER ITS PURPOSE IS TO ACT AS A GUIDE TO FACILITATE CONSTRUCTION.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH & EXTENT OF ALL EXISTING SERVICES THROUGH USE OF NON-DESTRUCTIVE LOCATING TECHNIQUES PRIOR TO THE COMMENCEMENT OF WORK.
4. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ANY DAMAGE INCURRED TO EXISTING UTILITY SERVICES AS A RESULT OF THE EXECUTION OF WORK UNDER THE CONTRACT.
5. NO WORK SHALL BE CARRIED OUT WITHIN 3 METRES OF ANY EXISTING SERVICES WITHOUT PRIOR RECORDED CONSULTATION WITH THE RELEVANT AUTHORITY.
6. AS-CONSTRUCTED SURVEY OF THE NEWLY INSTALLED TRUNK MAIN IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARDS OF BYRON SHIRE COUNCIL AND PROVIDED TO COUNCIL IN ADAC FORMAT.

DRIVEWAYS

1. DRIVEWAYS SHALL BE INSTATED IN ACCORDANCE WITH NORTHERN RIVERS STANDARD DRAWINGS R14C, 15D, 16B.

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	BT	RW	RW

SCALES: NOT TO SCALE — DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR GENERAL NOTES

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	30010	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\J7708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TM01 - ENGINEERING\7.4 DRAFTING\10-01 DRAWING NOTES.DWG, PLOTTED BY: BRENDAN, PLOT DATE: 28/06/2024 8:29:29 AM

LEGEND

- PROPERTY BOUNDARY
- EXISTING SURFACE CONTOURS MINOR (0.2m)
- EXISTING SURFACE CONTOURS MAJOR (1.0m)
- EXISTING STORMWATER PIPE
- EXISTING GRAVITY SEWER
- EXISTING SEWER RISING MAIN
- EXISTING ELECTRICITY UNDERGROUND
- EXISTING ELECTRICITY OVERHEAD
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING WATER MAIN ABANDONED (DBYD)
- EXISTING SCOUR MAINS
- EXISTING SLUICE VALVE
- WATER MAIN
- SWAB INSERTION POINT
- SWAB REMOVAL POINT
- WATER QUALITY SAMPLING POINT
- AIR VALVE
- SCOUR VALVE
- SLUICE VALVE
- NON RETURN VALVE
- LIMIT OF WORKS

N

EXISTING MAIN, RECENTLY INSTALLED AND END-CAPPED UNDER SEPARATE WORKS PACKAGE (BY OTHERS).

REMOVE END CAP OF EXISTING MAIN AND ESTABLISH CONNECTION TO NEW PROPOSED TRUNK MAIN. REFER TO CONNECTION DETAIL AS PROVIDED ON DRAWING 30620.

CONSTRUCTION OF NEW CHAIN MESH FENCE 1.8m HIGH

THRUST RESTRAINT TO BE PROVIDED AT TRANSITION OF HDPE PIPE TO DICL

EXISTING SCOUR MAINS (TO REMAIN)

WATER MAIN LINE 03B

PRESSURE REDUCING VALVE REFER DETAIL 0 30620

WATER MAIN LINE 03A

PEDESTRIAN GATE TO BE INSTALLED

EXISTING SHELTER TO BE REMOVED

DN200 NON RETURN VALVE

WATER MAIN LINE 03B

THIS CUT IN IS LIVE WORKS AND SHALL REQUIRE SUPERVISION AND COORDINATION WITH BYRON SHIRE COUNCIL

DN300 NON RETURN VALVE

REFER DETAIL C 30621

GIBAULT CONNECTION

REFER DETAIL B 30621

ABB ELECTROMAGNETIC MAGFLOW METER REFER 30629

DN300 SLUICE VALVE

WATER MAIN LINE 03B

REMOVAL OF SECTION OF EXISTING CHAIN MESH FENCE

WATER MAIN LINE 03A

WATER MAIN LINE 03C

THIS CUT IN IS LIVE WORKS AND SHALL REQUIRE SUPERVISION AND COORDINATION WITH BYRON SHIRE COUNCIL

THIS CUT IN IS LIVE WORKS AND SHALL REQUIRE SUPERVISION AND COORDINATION WITH BYRON SHIRE COUNCIL

DN300xDN250 REDUCER

DN300 SLUICE VALVE (CLOSED IN NORMAL OPERATIONS)

GIBAULT CONNECTION

REFER DETAIL A 30621

DN200 SLUICE VALVE

DN300 SLUICE VALVE (OPEN IN NORMAL OPERATIONS)

BOOSTER PUMP STATION TO BE SUPPLIED BY ELITE AQUA, WITH A DUAL DUTY/STANDBY LOWARA MODEL: 22SV04F040T 4.0KW VERTICAL MULTISTAGE PUMP UNIT (OR APPROVED EQUIVALENT BY BSC).

REPLACE SECTION OF EXISTING WATERMAIN WITH DICL DN300

REFER DETAIL 1 30622

BEFORE YOU DIG www.byda.com.au

WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR, NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THESE PLANS.

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	BT	RW	RW

SCALES:

0 1 2 4 6

Full Size 1:100 ; Half Size 1:200

Scale (m)

DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

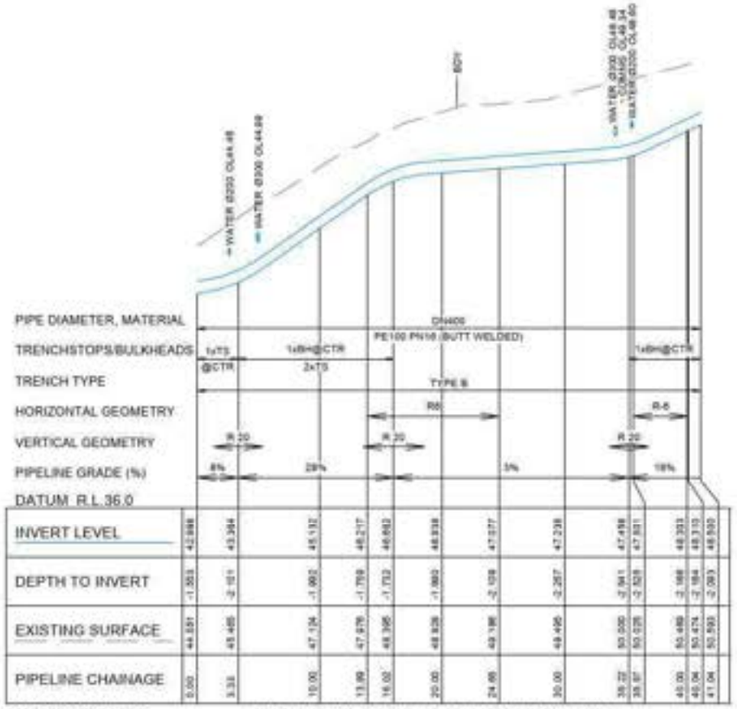
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR WATER MAIN ALIGNMENT PLAN

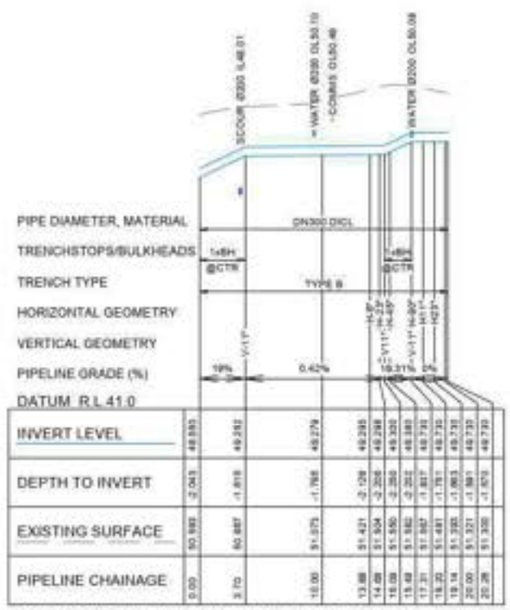
ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	30600	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\TITTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMDT - ENGINEERING\7.4 DRAWTTING\DWG\ WATER MAIN ALIGNMENT.DWG PLOTTED BY: BRENDAN T PLOT DATE: 28/06/2024 9:51:47 AM



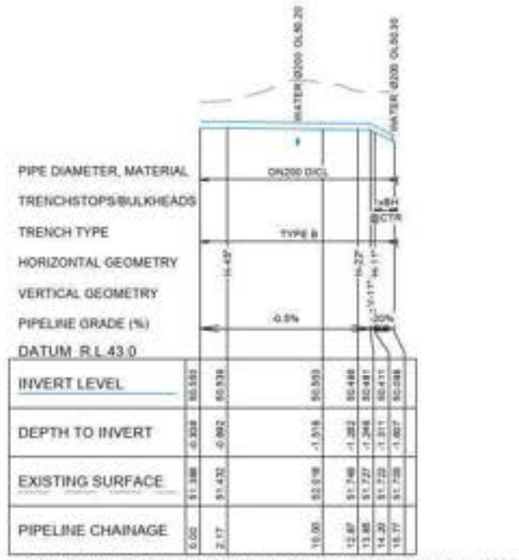
SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 03A



SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 03B



SCALE HZ 1:250, VT 1:100

LONGITUDINAL SECTION LINE 03C

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES:

0 1 2 3 4 5
Full Size 1:100 ; Half Size 1:200
Scale (m)

0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)

DO NOT SCALE FROM DRAWING

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DATE:

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PLANIT CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

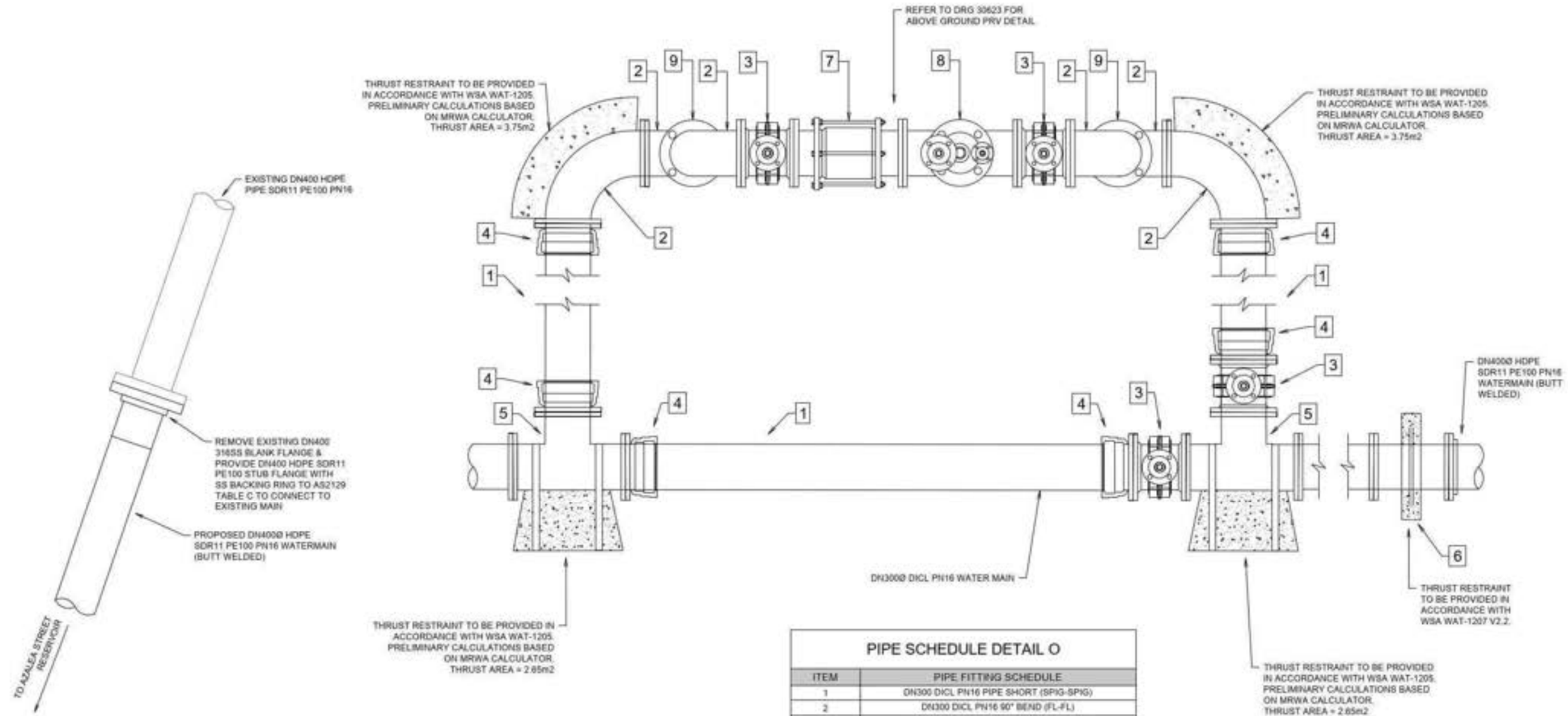
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 03 - RESERVOIR
WATER MAIN LONGITUDINAL SECTIONS

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	30610	0

CAD FILE: C:\USERS\BT\PLANITDRIVE\JT708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMDT - ENGINEERING\7.4 DRAFTING\03 LY WATER MAIN LONGITUDINAL SECTIONS.DWG PLOTTED BY: BRENDAN T PLOT DATE: 26/06/2024 9:24:46 AM



RESERVOIR ROAD CONNECTION DETAIL

NOT TO SCALE

PIPE SCHEDULE DETAIL O

ITEM	PIPE FITTING SCHEDULE
1	DN300 DICL PN16 PIPE SHORT (SPIG-SPIG)
2	DN300 DICL PN16 90° BEND (FL-FL)
3	DN300 DICL PN16 GATE VALVE (FL-FL)
4	DN300 DICL PN16 COUPLING JOINT (SOC-FL)
5	DN300xDN300xDN300 DICL PN16 TEE (FL-FL)
6	DN400 HDPE SDR11 PE100 PUDDLE FLANGE SHORT (FL-FL) WITH THRUST RESTRAINT PER WSA WAT-1207 V2.2
7	DN300 DICL DISMANTLING JOINT (FL-FL)
8	DN300 DICL PRESSURE REDUCING VALVE (FL-FL)
9	DN300 DICL PN16 PIPE SHORT (FL-FL)

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS

DO NOT SCALE FROM DRAWING

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CONSULTING

CLIENT: BYRON SHIRE COUNCIL

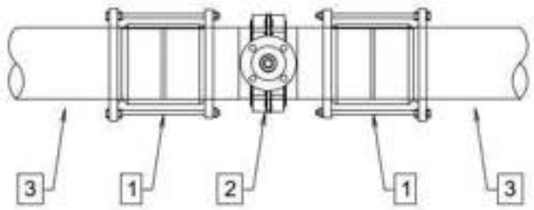
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS CONNECTIONS - SHEET 1 OF 3

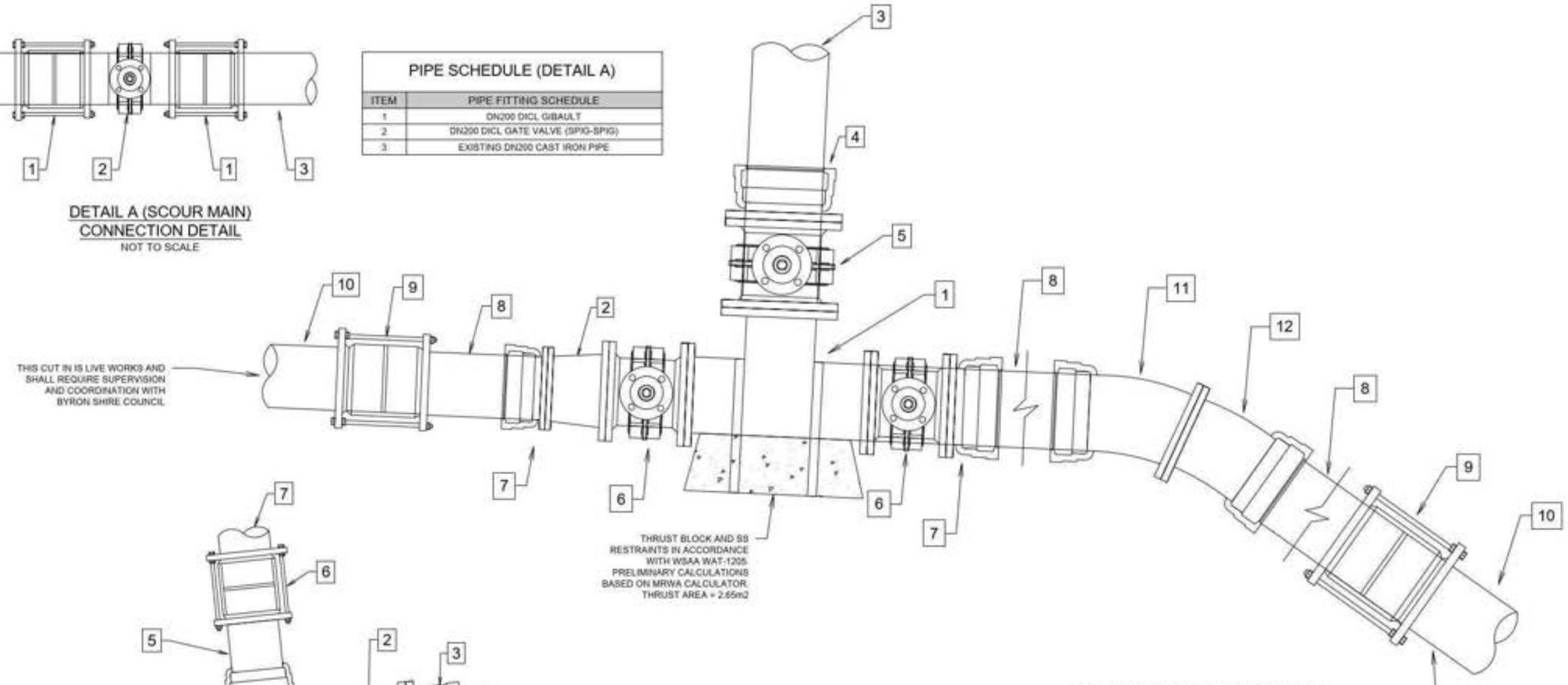
ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	30620	0

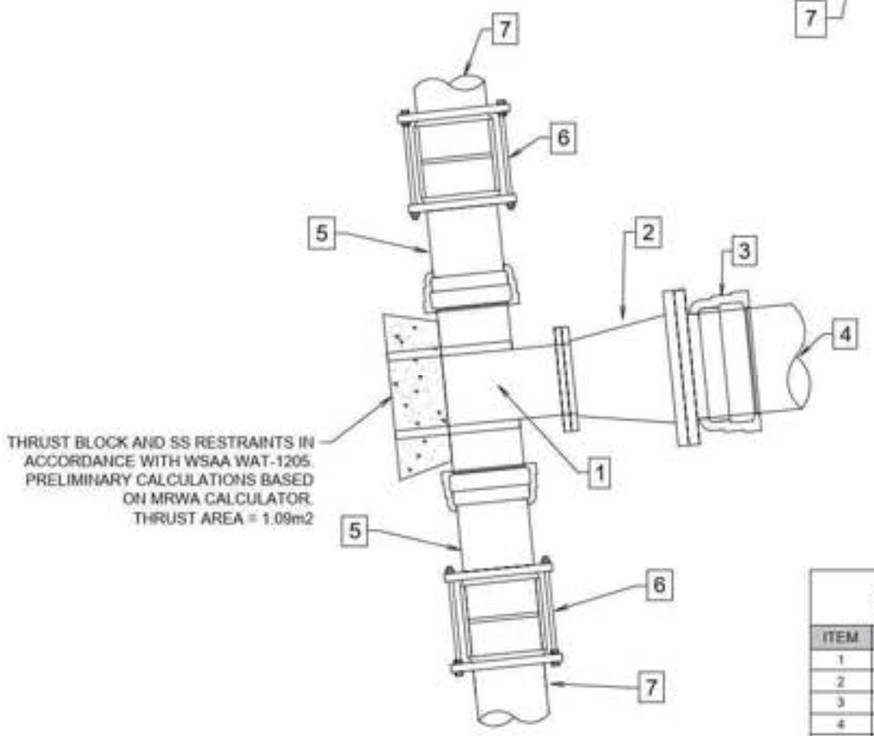
CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\JOTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 SHAFTING\03 WATER DETAILS.DWG PLOTTED BY: BRENDAN PLOT DATE: 30/08/2024 9:32:55 AM



DETAIL A (SCOUR MAIN) CONNECTION DETAIL
NOT TO SCALE

PIPE SCHEDULE (DETAIL A)	
ITEM	PIPE FITTING SCHEDULE
1	DN200 DICL GIBAULT
2	DN200 DICL GATE VALVE (SPIG-SPIG)
3	EXISTING DN200 CAST IRON PIPE





DETAIL B (LEFT BANK MAIN CONNECTION) CONNECTION DETAIL
NOT TO SCALE

PIPE SCHEDULE (DETAIL B)	
ITEM	PIPE FITTING SCHEDULE
1	DN200xDN200xDN200 DICL PN16 TEE (SP-SP-FL)
2	DN300xDN200 DICL PN16 REDUCER (FL-FL)
3	DN300 DICL PN16 CONNECTOR (FL-SOC)
4	DN300 DICL PN16 MAIN
5	DN200 DICL 1m PIPE SHORT (SOC-SP)
6	DN200 GIBAULT
7	EXISTING DN200 DICL MAIN

DETAIL C (AZALEA ST RESERVOIR INLET CONNECTION) CONNECTION DETAIL
NOT TO SCALE

PIPE SCHEDULE (DETAIL C)	
ITEM	PIPE FITTING SCHEDULE
1	DN300xDN300xDN300 DICL PN16 TEE (FL-FL-FL)
2	DN300x250 DICL PN16 REDUCER (FL-FL)
3	DN300 DICL PN16 CONNECTOR (FL-SOC)
4	DN300 PN16 DICL MAIN
5	DN300 DICL PN16 GATE VALVE (FL-FL)
6	DN250 DICL PN16 GATE VALVE (FL-FL)
7	DN250 DICL PN16 CONNECTOR (FL-SOC)
8	DN300 DICL PN16 1m PIPE SHORT (SOC-SP)
9	DN250 GIBAULT JOINT
10	DN300 DICL PN16 MAIN
11	DN300 DICL 22.5° BEND (FL-SOC)
12	DN300 DICL 11.25° BEND (FL-SOC)

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	RW	RW	RW

SCALES: NTS
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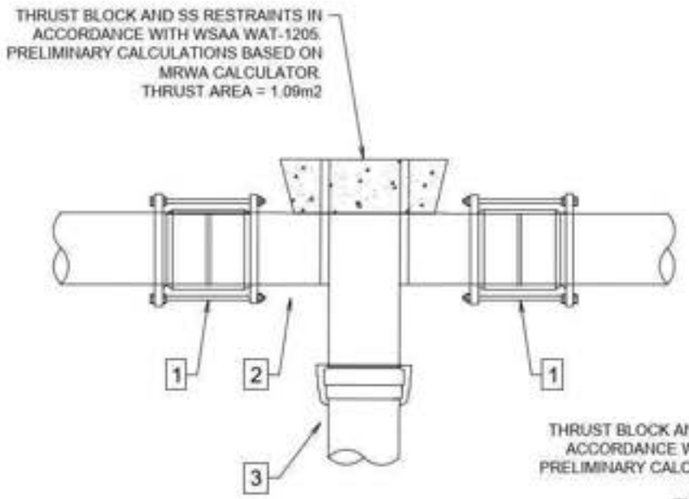
CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

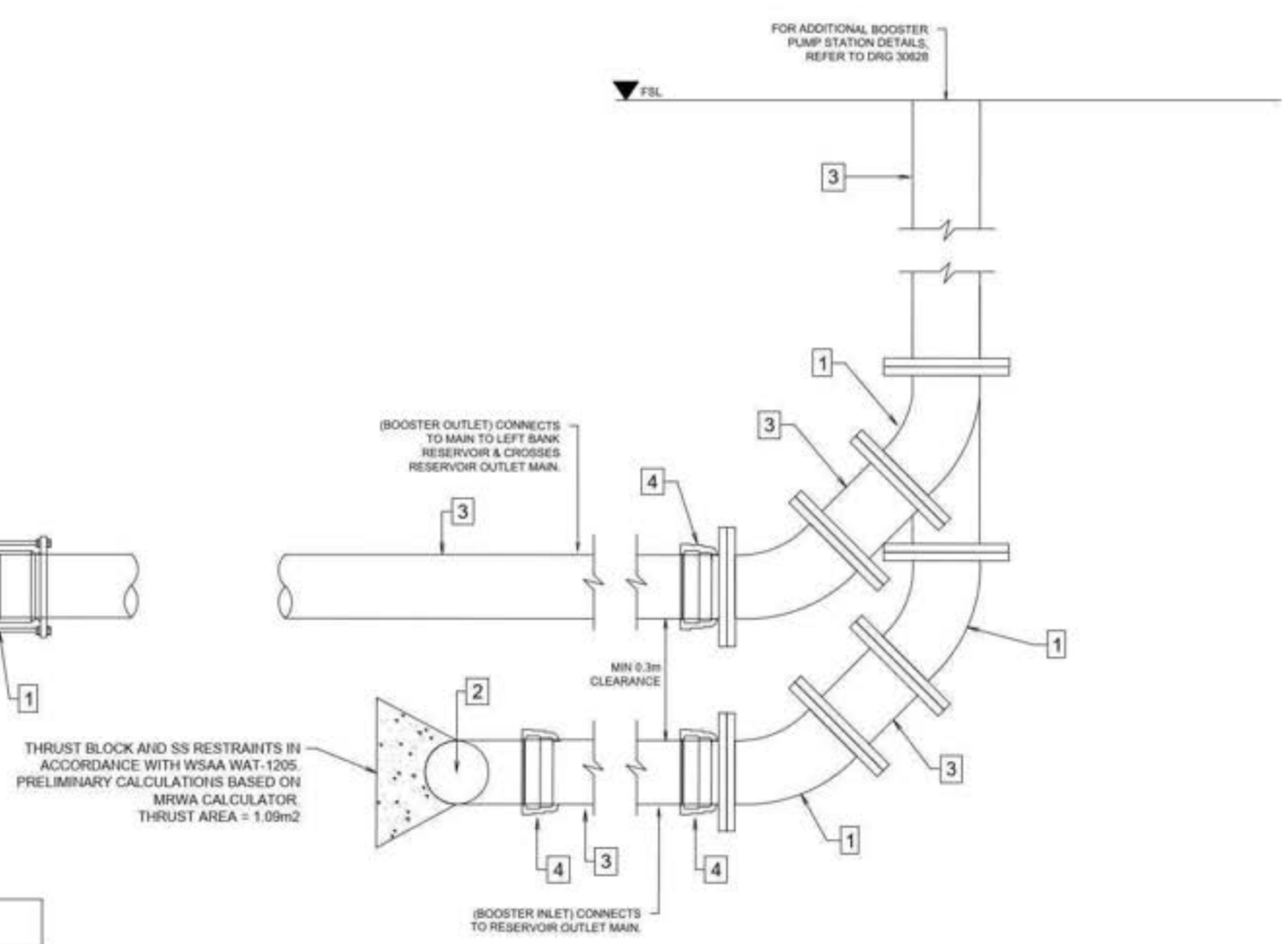
PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS CONNECTIONS - SHEET 2 OF 3

ORIGINAL SIZE	PLANIT JOB No.	DRAWING No.	REV.
A1	J7708	30621	0



DETAIL 1
NOT TO SCALE

PIPE SCHEDULE (DETAIL 1)	
ITEM	PIPE FITTING SCHEDULE
1	DN200 DICL GIBAULT
2	DN200xDN200xDN200 DICL TEE (SPIG-SPIG-SPIG)
3	DN200 DICL PN16 MAIN



BOOSTER PUMP STATION
CONNECTION SECTION
NOT TO SCALE

PIPE SCHEDULE	
ITEM	PIPE FITTING SCHEDULE
1	DN200 DICL 45° BEND
2	DN200xDN200xDN200 DICL TEE (SPIG-SPIG-SPIG)
3	DN200 DICL PN16 MAIN
4	DN200 CONNECTOR (FL-SOC)

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/08/24	BT	RW	RW	RW

SCALES: NTS
DO NOT SCALE FROM DRAWING

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CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS CONNECTIONS - SHEET 3 OF 3

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
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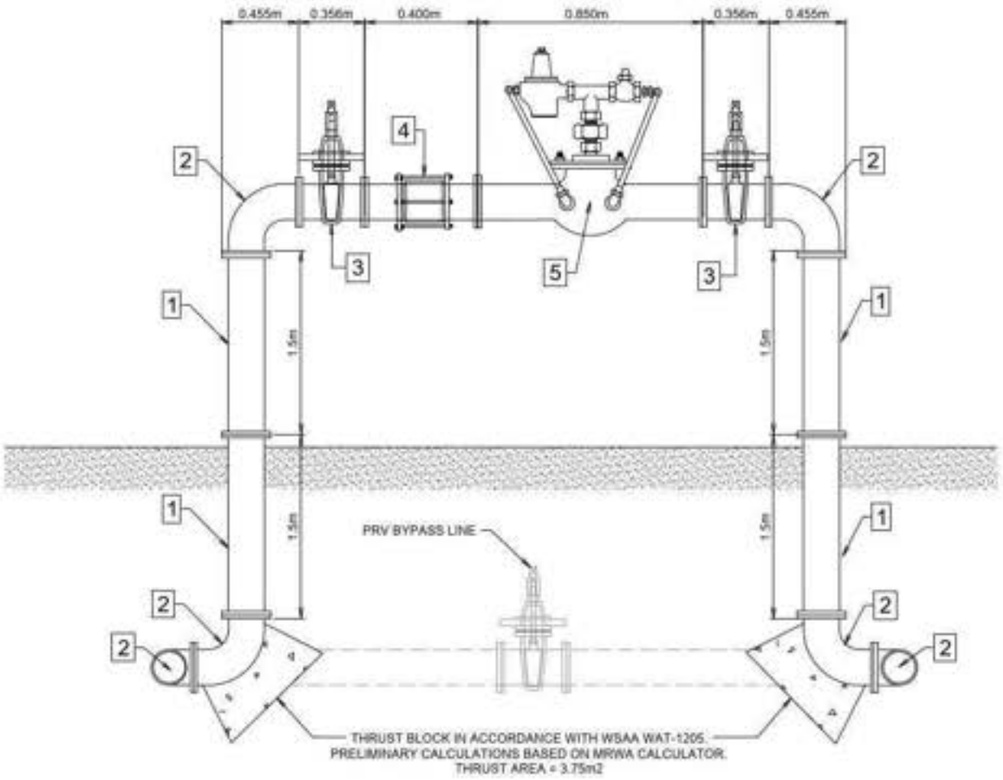

PRV (ABOVE GROUND) SECTION

NOT TO SCALE

PIPE SCHEDULE	
ITEM	PIPE FITTING SCHEDULE
1	DN300 DICL PIPE SHORT (FL-FL)
2	DN300 DICL 90° BEND (FL-FL)
3	DN300 DICL SLUICE VALVE (FL-FL)
4	DN300 DICL DISMANTLING JOINT (FL-FL)
5	DN300 DICL PRESSURE REDUCING VALVE (FL-FL)

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS

DO NOT SCALE FROM DRAWING

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LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS BELOW GROUND PRV

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.	REV:
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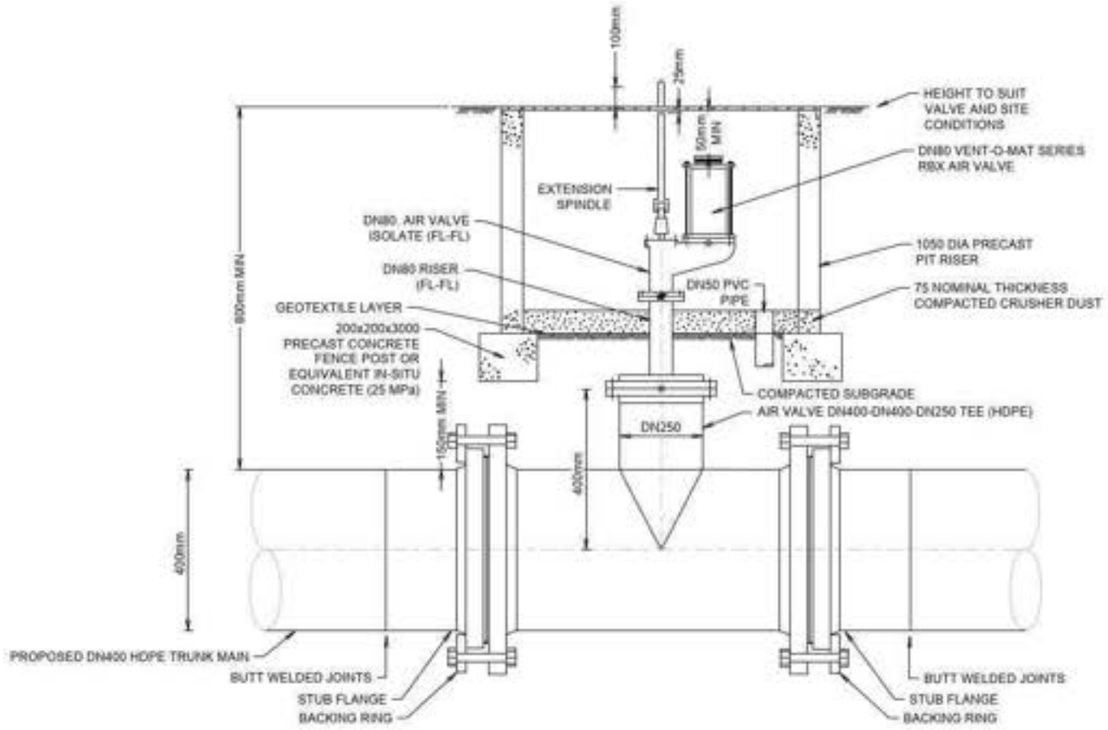
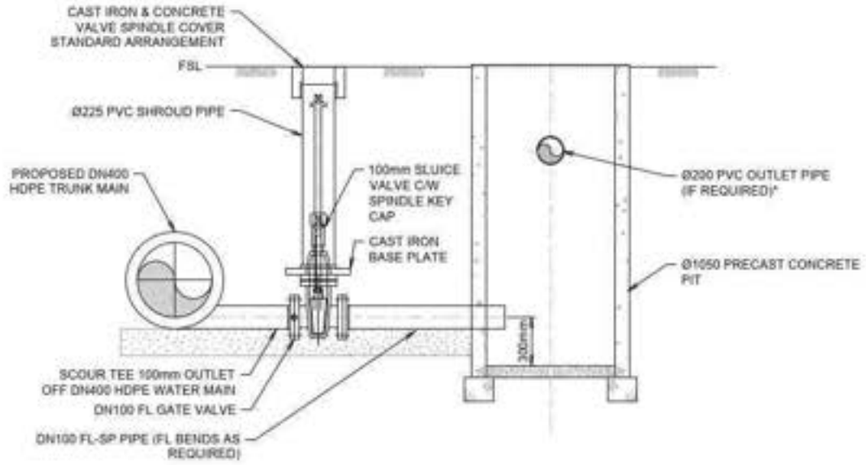


AIR VALVE TYPICAL DETAIL
(INLINE AIR VALVE WITH AIR VALVE ISOLATOR)
NOT TO SCALE



* EITHER DRILL WEEP HOLES INTO BASE TO LET WATER OUT OR PROVIDE DN200 PVC PIPE AT MINIMUM DEPTH TO OUTLET POINT. ROCK PROTECTION TO BE PROVIDED AT OUTLET.
* ALTERNATIVE - PROVIDE ROCK PROTECTION AROUND PIT & OPEN LID DURING SCOUR OPERATION.

TYPICAL 600mm SCOUR PIT DETAIL
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/08/24	BT	RW	RW	RW

SCALES: NTS
DO NOT SCALE FROM DRAWING

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CONSULTING

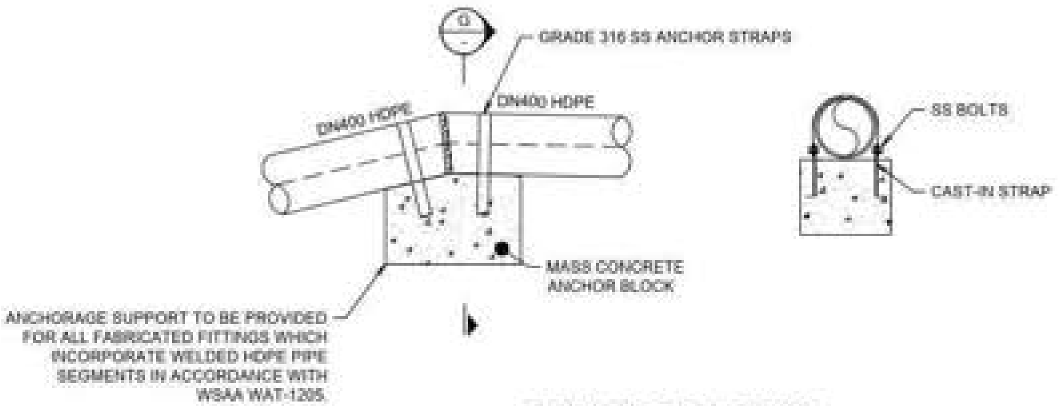
CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

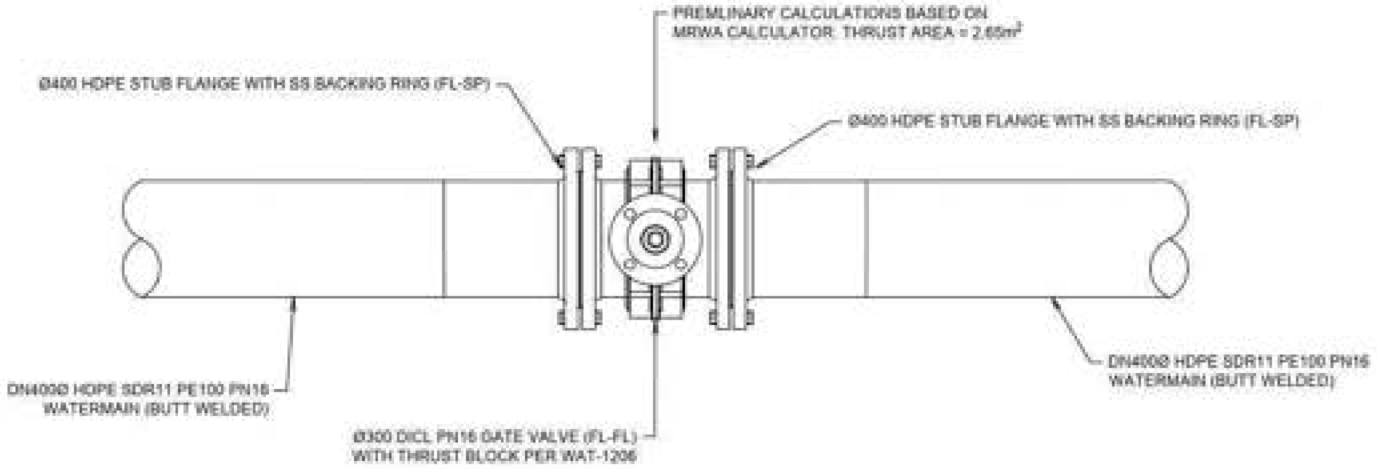
PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS AIR VALVE AND SCOUR PIT

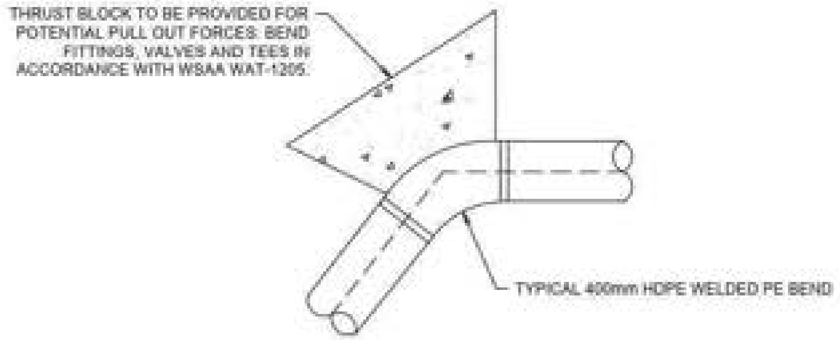
ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	30624	0



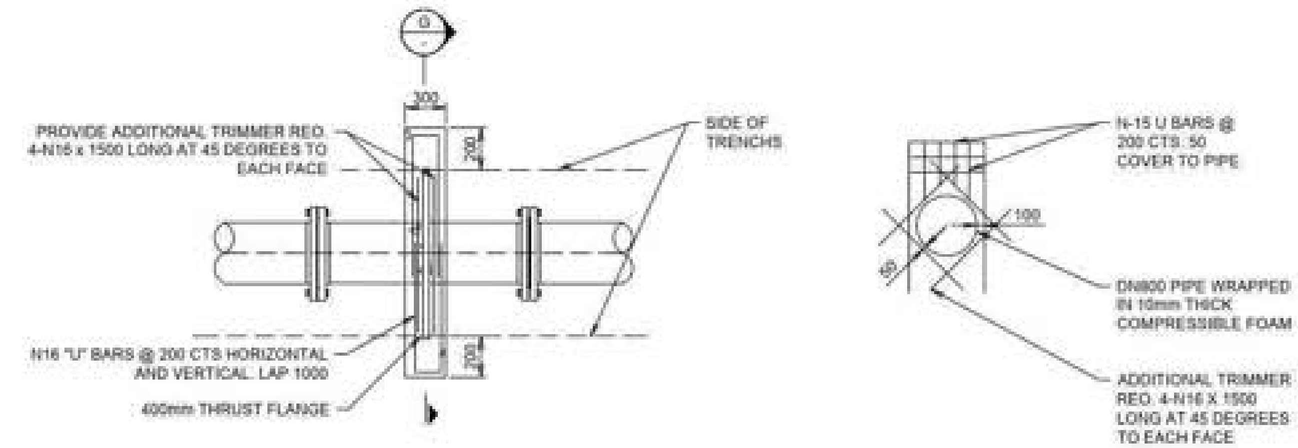
TYPICAL VERTICAL THRUST BLOCK DETAIL
NOT TO SCALE



TYPICAL VALVE INSTALLATION DETAIL
NOT TO SCALE



TYPICAL HORIZONTAL THRUST BLOCK DETAIL
NOT TO SCALE



TYPICAL THRUST RESTRAINT DETAIL
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS

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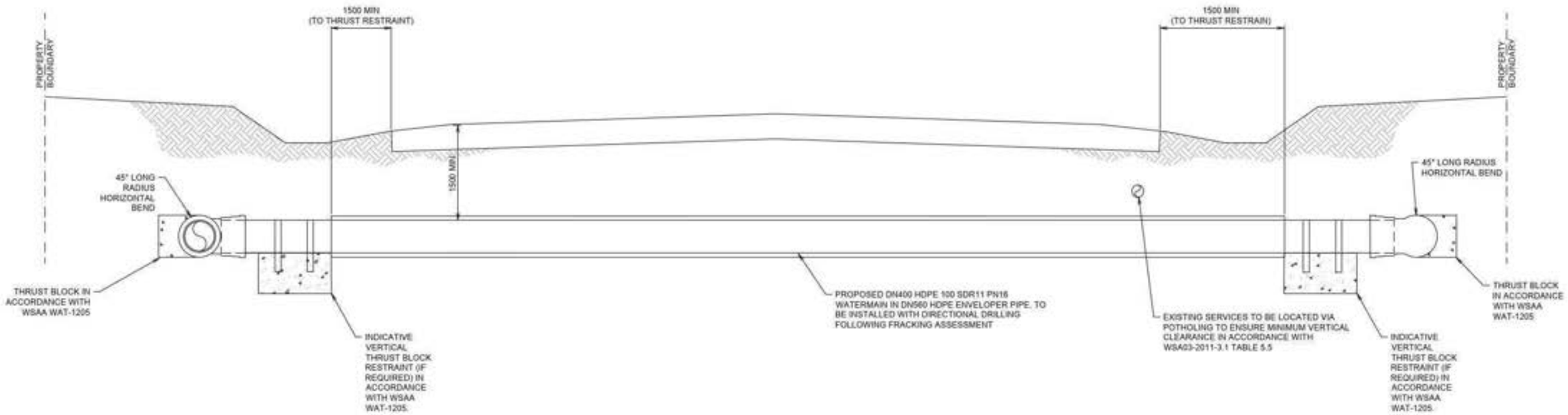
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS TYPICALS

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	30625	0



TYPICAL ROAD CROSSING DETAIL

NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NTS

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

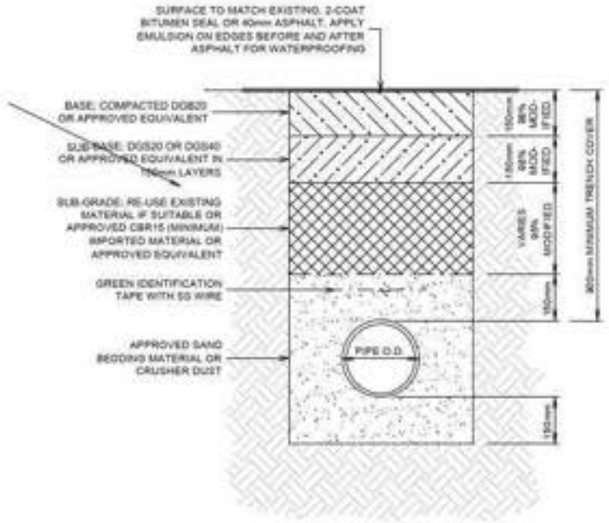
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS TYPICAL ROAD CROSSING

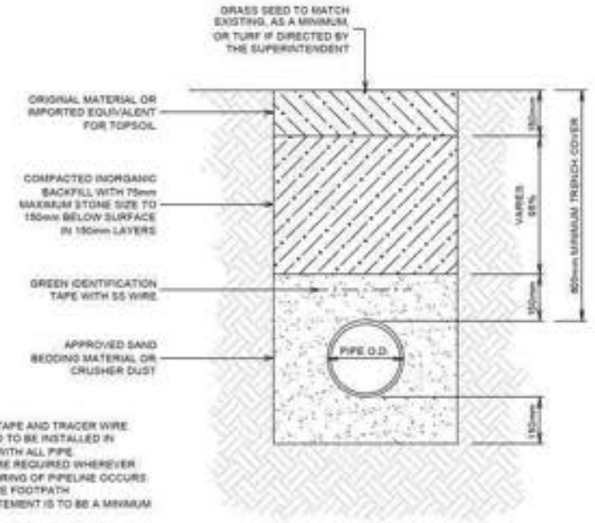
ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	30626	0

CAD FILE: C:\USERS\BT\PLANITDRIVE\JOTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAFTING\01-WATER DETAILS.DWG PLOTTED BY: BRENDAN T. PLOT DATE: 30/08/2024 9:33:18 AM



PIPE BACKFILL DETAIL - ROAD PAVEMENT

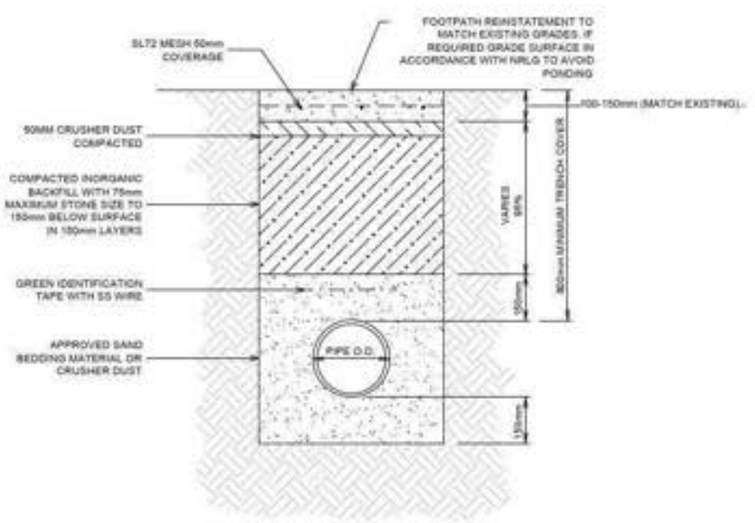
SCALE: 1:10 @ A1, 1:20 @A3



NOTE:
- MARKER TAPE AND TRACER WIRE REQUIRED TO BE INSTALLED IN TRENCH WITH ALL PIPE
- DRAW WIRE REQUIRED WHEREVER UNDERBORING OF PIPELINE OCCURS
- CONCRETE FOOTPATH RE-INSTATEMENT IS TO BE A MINIMUM 20MPA.
- NRLG SPECIFICATIONS REQUIRED.

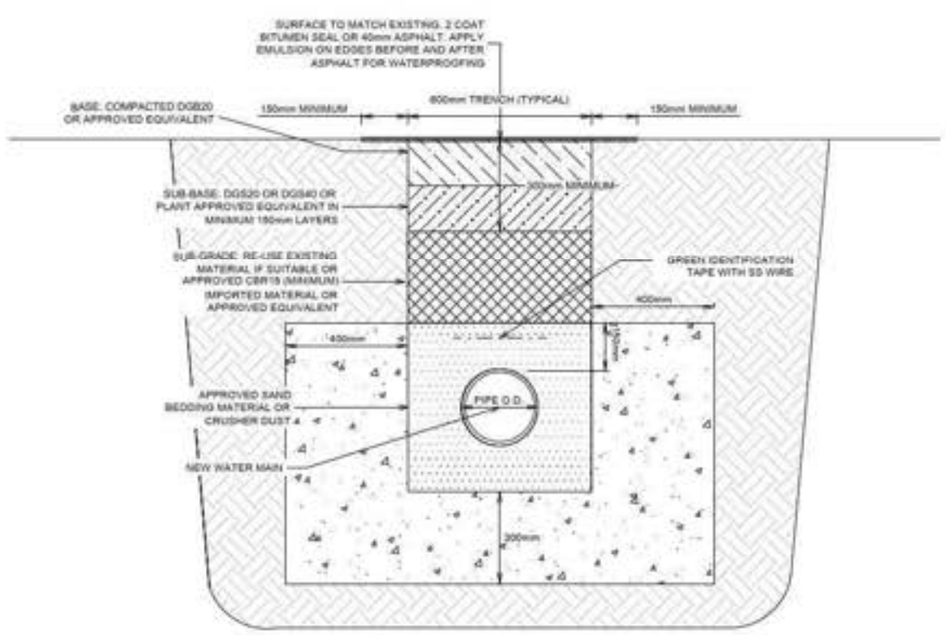
PIPE BACKFILL DETAIL - VERGE

SCALE: 1:10 @ A1, 1:20 @A3



PIPE BACKFILL DETAIL - CONCRETE FOOTPATH

SCALE: 1:10 @ A1, 1:20 @A3



TYPICAL ANCHOR BLOCK DETAIL (TRAFFIC)

1:10 @ A1, 1:20 @A3

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES:
0 0.1 0.2 0.4 0.6
Full Size 1:10 ; Half Size 1:20
Scale (m)
DO NOT SCALE FROM DRAWING

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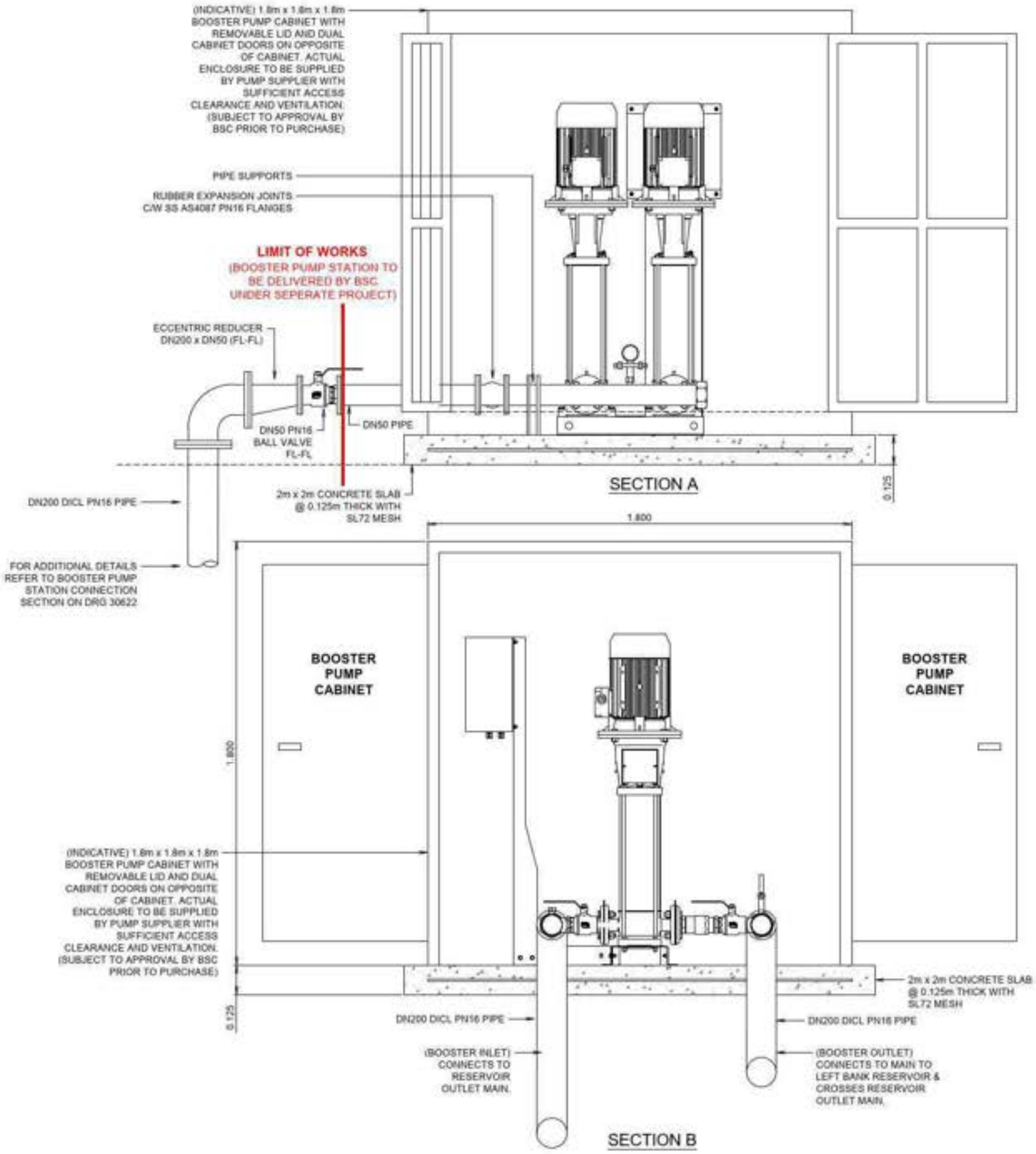
CLIENT:
BYRON SHIRE COUNCIL

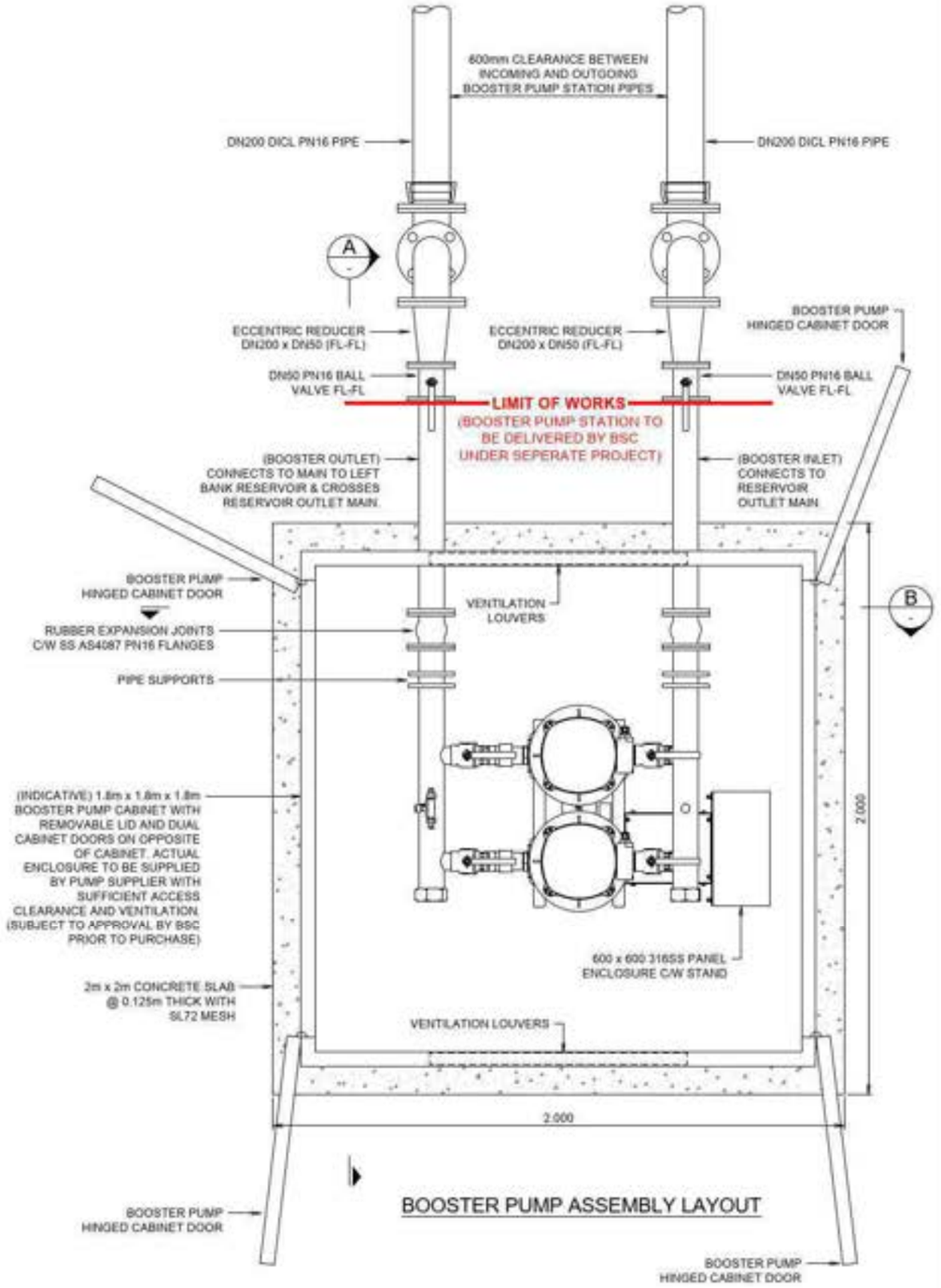
LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 03 - RESERVOIR
CONSTRUCTION DETAILS
TRENCH BACKFILL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	30627	0





REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	RW	RW	RW

SCALES: NOT TO SCALE

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PLANIT CONSULTING

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PROJECT: MULLUMBIMBY TRUNK MAIN

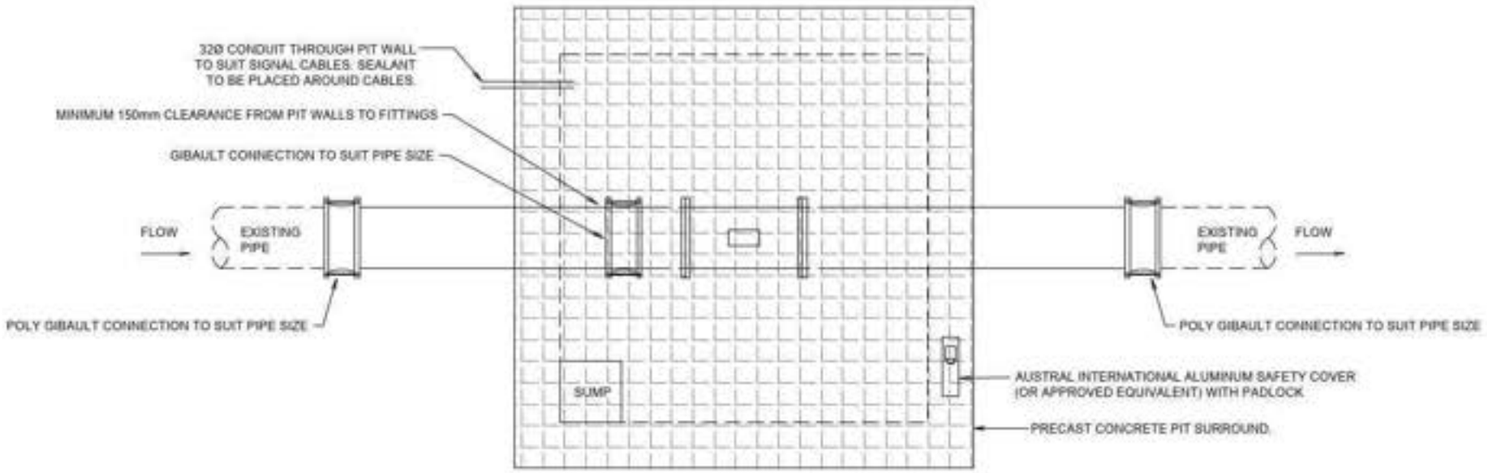
DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS BOOSTER PUMP STATION

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.	REV:
A1	J7708	30628	0

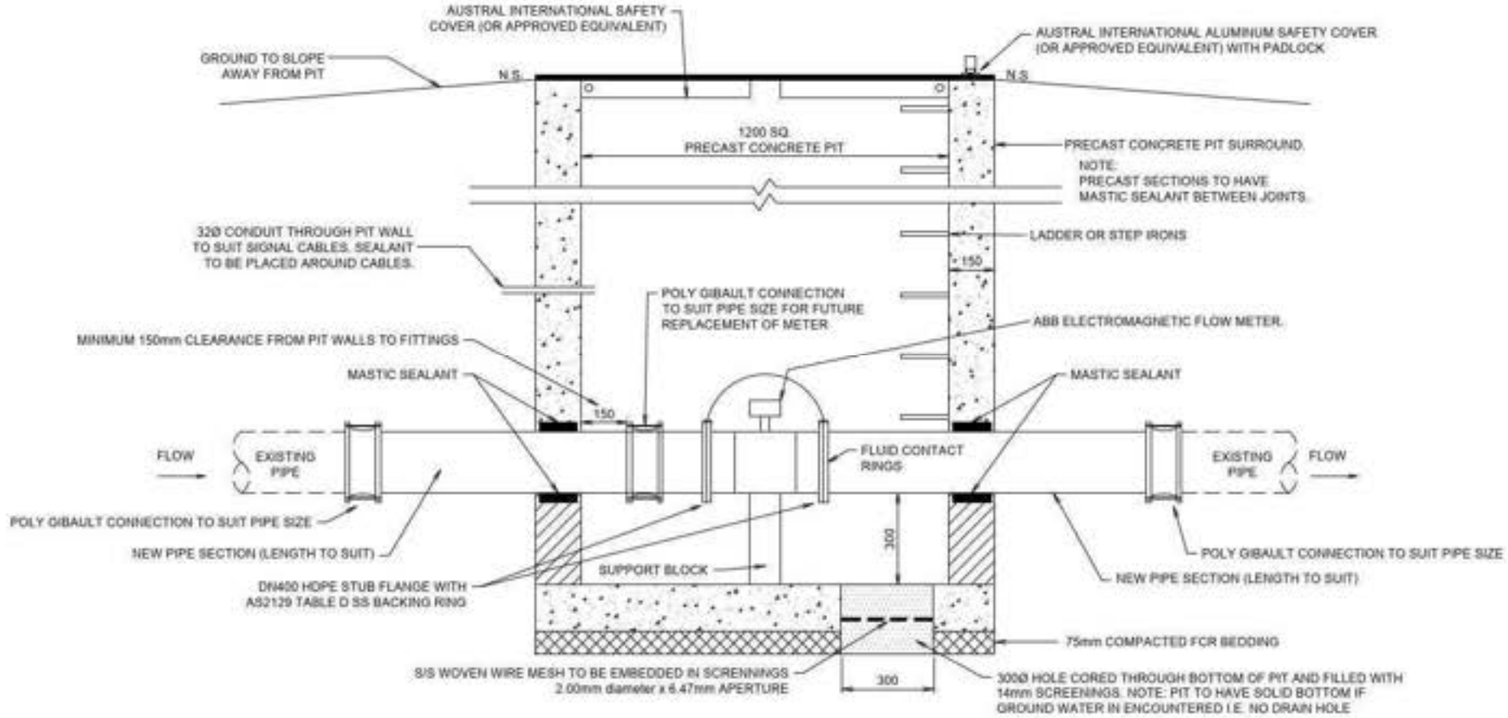
CAD FILE: C:\USERS\BTHPLANITSYNCUTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAFTING\01 WATER\DETAILS\DWG PLOTTED BY: BRENDAN PLOT DATE: 28/08/2024 9:41:03 AM

NOTES:

1. FOR PITS BEING RETROFITTED OVER EXISTING FLOW METERS, I.E. NO METER REPLACEMENT, THE BASE IS TO BE CONSTRUCTED SEPARATELY INSITU WITH CONCRETE A MINIMUM OF 150mm THICKNESS.
2. INSTALLATION DISTANCES ARE TO BE A MINIMUM OF 10xPIPE Ø UPSTREAM AND 5xPIPE Ø DOWNSTREAM OF PIPE TEES AND 90 DEGREE BENDS WHERE EXISTING SITE CONDITIONS PERMIT. WHERE SITE CONSTRAINS NECESSITATE DISTANCES LESS THAN A 10:5 RATIO THEN APPROVAL IS TO BE SOUGHT FROM SUPERVISING ENGINEER PRIOR TO INSTALLATION.
3. DEPTH OF PIT TO SUIT.
4. TYPICAL PIT WALL THICKNESS TO BE 150mm.
5. PADLOCK TO BE SECURED TO LID AND PIT.
6. TYPICAL LID AND CONCRETE PIT FORMAT SHOWN IS NON-TRAFFICABLE.
7. MASTIC SEALANT TO BE PROVIDED AROUND PIPE EDGES TO CREATE WATER TIGHT PIT.
8. WORKS RELATING TO ELECTRICAL SUPPLY AND INSTALLATION OF MONITORING AND CONTROL EQUIPMENT (SCADA) IS TO BE PROVIDED BY BYRON SHIRE COUNCIL UNDER SEPARATE WORKS CONTRACT.



TYPICAL BULK WATER METER PIT PLAN
DN300mm MAIN
NOT TO SCALE



TYPICAL BULK WATER METER PIT SECTION
DN300 MAIN
NOT TO SCALE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR CONSTRUCTION DETAILS BULK WATER METER

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.	REV:
A1	J7708	30629	0

BYRON SHIRE COUNCIL

MULLUMBIMBY TRUNK MAIN
LEFT BANK ROAD / TRISTAN PARADE (LINE 04)
NEW SOUTH WALES 2482

PLANIT CONSULTING

DETAILED DESIGN

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISION
40000	COVER SHEET AND DRAWING REGISTER	0
40010	GENERAL NOTES	0
40600	WATER MAIN ALIGNMENT PLAN	0
40610	WATER MAIN LONGITUDINAL SECTION	0
40620	CONSTRUCTION DETAILS - CONNECTIONS	0
40621	CONSTRUCTION DETAILS - TRENCH BACKFILL	0

LOCALITY PLAN
NOT TO SCALE

SOURCE: NEARMAP

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0	TENDER	26/06/24	BT	BT	RW	RW

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CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 04 - LEFT BANK ROAD / TRISTRAN PARADE COVER SHEET AND DRAWING REGISTER

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	40000	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\J7708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAWITNG\ENGG\COVER SHEET DWG PLOTTED BY: BRENDAN T PLOT DATE: 26/06/2024 9:32:46 AM

GENERAL

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE FOLLOWING DOCUMENTS:
   i. OTHER PROVIDED ENGINEERING DRAWINGS;
   ii. TECHNICAL SPECIFICATIONS;
   iii. PROJECT SPECIFICATIONS;
   iv. SUPPLEMENTARY SPECIFICATIONS; AND
   v. WRITTEN INSTRUCTIONS.
2. BYRON SHIRE COUNCIL/NORTHERN RIVERS LOCAL GOVERNMENT STANDARDS, SPECIFICATIONS AND STANDARD DRAWINGS ARE TO BE ADOPTED UNLESS STATED OTHERWISE.
3. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT SPECIFICATION FOR THE WORKS TOGETHER WITH THE REQUIREMENTS OF ALL THE RELEVANT CODES OF PRACTICE REFERRED TO THEREIN AND THE REQUIREMENTS OF CURRENT LOCAL AUTHORITY STANDARDS AND SPECIFICATIONS. THESE STANDARDS ARE NOTED AS INCLUDING THE FOLLOWING:
   i. NORTHERN RIVER LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D11, WATER SUPPLY,
   ii. WSA 03 2011 WATER SUPPLY CODE OF AUSTRALIA.
   iii. RELEVANT AND CURRENT STANDARDS OF AUSTRALIA.
   iv. PROVISIONS OF THE BUILDING ACT 1975.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND PROVISION OF ANY TEMPORARY BRACING, PROPPING ETC. TO DRAINAGE PIPES DURING CONSTRUCTION. STRUCTURES SHALL BE MAINTAINED IN A STABLE POSITION AND NO PART SHALL BE OVERSTRESSED.
5. ANY PERMITS AND APPROVALS REQUIRED FOR CONSTRUCTION OF PERMANENT OR TEMPORARY WORKS SHALL BE OBTAINED BY THE CONTRACTOR.
6. THE DETAILED DESIGN PLANS HAVE BEEN DEVELOPED BASED ON SURVEY INFORMATION PROVIDED BY BYRON BAY SURVEYING.
7. EXISTING SURFACE LEVELS ON THE DRAWINGS ARE INDICATIVE ONLY.
8. DO NOT OBTAIN DIMENSIONS FROM SCALING.
9. ALL LOCATIONS, ORIENTATION AND LEVELS SHALL BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK. DISCREPANCIES SHALL BE REFERRED TO THE SITE SUPERINTENDENT, PRIOR TO PROCEEDING WITH ANY WORKS.
10. ALL DIMENSIONS ON THE DRAWINGS ARE NOMINAL ONLY. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS ON SITE PRIOR TO FABRICATION OR CONSTRUCTION. DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.
11. NO SUBSTITUTE MATERIALS SHALL BE USED WITHOUT THE WRITTEN APPROVAL OF THE PRINCIPAL.
12. THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY PROTECTION AND SITE FENCING TO PREVENT ENTRY OF ANY UNAUTHORISED PERSONS AND ANIMALS DURING CONSTRUCTION.
13. ACCESS TO AND WORKS WITHIN PRIVATE LAND PARCELS MUST BE UNDERTAKEN IN ACCORDANCE WITH THE RELEVANT APPROVALS AND AGREEMENTS. NO WORK SHALL COMMENCE WITHIN ANY PRIVATE PROPERTY UNTIL THE CONTRACTOR HAS VERIFIED THAT ALL REQUIRED APPROVALS ARE IN PLACE AND THAT ALL OWNERS/RESIDENTS HAVE BEEN PROVIDED WITH THE NECESSARY NOTICES OF ENTRY.
14. RESTORATION OF SUBJECT WORK ZONES MUST BE UNDERTAKEN IN ACCORDANCE WITH THE NRLG GUIDELINES, AND AT THE DISCRETION OF THE PRINCIPAL, BE OF A MINIMUM STANDARD THAT IS EQUAL TO THE SITES EXISTING CONDITIONS.
15. ALL DRIVEWAYS DISTURBED AS A RESULT OF THE WORKS MUST BE RESTORED TO A DEGREE THAT MATCHES AS CLOSE AS POSSIBLE TO THE EXISTING COLOUR, MATERIAL, AND FINISH. ALL PROPERTY OWNERS OF HOUSEHOLDS IN WHICH THE DRIVEWAY WILL BE AFFECTED ARE TO BE CONSULTED WITH IN ADVANCE OF THE WORKS TO ENSURE THAT THE PROPOSED REINSTATEMENT IS ACCEPTABLE.
16. ALL ROAD PAVEMENTS THAT ARE IMPACTED BY THE WORKS ARE TO BE REINSTATED IN ACCORDANCE WITH THE LOCAL GOVERNMENT STANDARDS.

EXISTING SERVICES

1. IN GENERAL, EXISTING SERVICES SHOWN HAVE BEEN DETERMINED BY ELECTRONIC MEANS AND GROUND PENETRATING RADAR. ONLY SELECT POTHOLING HAS BEEN UNDERTAKEN. THE LOCATION OF UNDERGROUND SERVICES SHOWN ON THESE DRAWINGS SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR, NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.
2. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES PRIOR TO ANY WORKS COMMENCING AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. WORK TO ANY SERVICES SHOULD BE DONE IN CONSULTATION WITH THE APPROPRIATE SERVICE PROVIDER. ANY WORKS SURROUNDING APA ASSETS REQUIRE LIAISION WITH APA WHO ADDITIONALLY REQUIRE SUPERVISION OF ANY WORKS SURROUNDING THEIR ASSET.
4. ONLY UNDERGROUND SERVICES IN THE IMMEDIATE VICINITY OF THIS SURVEY HAVE BEEN LOCATED. INFORMATION OF THE EXISTING SERVICES ARE SHOWN IN THE DRAWINGS IN GOOD FAITH. NO GUARANTEE IS GIVEN OR IMPLIED THAT SUCH INFORMATION IS ACCURATE OR COMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE POSITION OF THE EXISTING SERVICES BEFORE COMMENCING CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO EXERCISE CARE WHEN IN CLOSE PROXIMITY OF SERVICES AND EXCAVATION IN GENERAL. CAREFUL HAND EXCAVATION IS RECOMMENDED WHEN WITHIN CLOSE PROXIMITY TO SERVICES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING SERVICES DURING THE COURSE OF THE CONTRACT.
5. IN THE EVENT OF SERVICES DEVIATING FROM LOCATIONS SHOWN OR PRESENT BUT NOT SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT AND PROVIDE 3 DAYS NOTICE PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY THAT MAY AFFECT THE SERVICE.
6. CONTRACTOR TO OBTAIN PRIOR APPROVAL FROM THE SUPERINTENDENT FOR ANY DEVIATIONS REQUIRED TO AVOID EXISTING SERVICES.
7. DISPLACEMENT OR DISTURBANCE TO ANY EXISTING SERVICES MUST BE RECTIFIED BY THE CONTRACTOR PRIOR TO BACKFILLING AND COMPLETION OF WORKS. TEMPORARY SERVICE PROVISION IS TO BE ACCOUNTED FOR BY THE CONTRACTOR TO ENSURE THAT THERE IS NO SERVICE OUTAGE TO ANY PROPERTY IMPACTED BY THE WORKS.
8. REMOVAL AND DISPOSAL OF ASBESTOS CEMENT PIPES TO BE UNDERTAKEN IN ACCORDANCE WITH THE LATEST VERSION OF:
   iw. BYRON SIRE COUNCIL ASBESTOS POLICY;
   ii. SAFEWORK NSW - ASBESTOS HANDLING GUIDELINES;
   iii. SAFEWORK NSW - WORK HEALTH AND SAFETY REGULATION;
   iv. SAFEWORK NSW - HOW TO MANAGE AND CONTROL ASBESTOS IN THE WORKPLACE CODE OF PRACTICE; AND,
   v. SAFEWORK NSW - HOW TO SAFELY REMOVE ASBESTOS CODE OF PRACTICE.

EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE EROSION AND SEDIMENT CONTROL PLAN.
2. ALL CONTROL MEASURES SHALL BE IN ACCORDANCE WITH "NORTHERN RIVERS LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D7 EROSION CONTROL AND STORMWATER MANAGEMENT".
3. THE CONTRACTOR SHALL INFORM ALL STAFF AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN.
4. CONTROL MEASURES SHALL BE IN PLACE PRIOR TO STRIPPING OR DISTURBANCE OF TOPSOIL WITHIN EACH WORK ZONE.
5. ALL WORKS ARE TO BE INSPECTED, AND MAINTAINED WHERE NECESSARY, ON A WEEKLY BASIS AND AFTER EACH RAIN EVENT.
6. ADEQUATE MEASURES SHALL BE TAKEN TO PREVENT DUST FROM AFFECTING THE AMENITY OF THE NEIGHBOURHOOD DURING CONSTRUCTION. WATER SITE AS REQUIRED TO PREVENT DUST GENERATION. USE TEMPORARY SPRINKLERS AS REQUIRED.
7. ALL WORKS ON SITE SHALL STOP WHEN WIND SPEEDS REACHES 35km/h.
8. CLEANING OF FOOTPATHS AND ROADWAYS SHALL BE CARRIED OUT REGULARLY.
9. ALL DISTURBED AREAS ARE TO BE LEFT IN A STABLE CONDITION. SLOPES SHOULD BE STABILISED USING APPROPRIATE EROSION CONTROL MEASURES, WHILE TURF AND VERGE AREAS TO BE REINSTATED WHEN DISTURBED DURING CONSTRUCTION.
10. ALL TURF/PLANTINGS/REINSTATEMENTS WILL NEED TO BE MAINTAINED THROUGHOUT THE ESTABLISHMENT PHASE.

CLEARING

1. ALL TREE AND VEGETATION CLEARING WORKS BY THE CONTRACTOR MUST STRICTLY BE UNDERTAKEN IN ACCORDANCE WITH THE BYRON SHIRE COUNCIL VEGETATION & TREE REMOVAL POLICIES IN CONJUNCTION WITH THE APPROVED, PROJECT SPECIFIC REVIEW OF ENVIRONMENTAL FACTORS (REF) REPORT.

EARTHWORKS/FILL

1. THIS PROJECT PROPOSES NO BULK EARTHWORKS OR CHANGES TO GROUND LEVEL ACTIVITIES. EARTHWORKS FOR TRUNK MAIN INSTALLATION SHALL COMPRISE OF TRENCHING & BACKFILL OR REMOVAL OF UNDERBORE SPOIL ONLY.
2. ALL IMPORTED FILL MATERIAL MUST COMPRISE OF NATURAL EARTH AND ROCK AND IS TO BE FREE OF ALL CONTAINANTS IN ACCORDANCE WITH THE ENVIRONMENTAL PROTECTION ACT 1994 SECTION 11. NO DEMOLITION MATERIAL (I.E. FOOTPATH OR PAVEMENT) SHALL BE USED AS BACKFILL.
3. ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING. RESPREADING THICKNESSES TO BE A MINIMUM OF 100MM AND A MAXIMUM OF 300MM.
4. ALL TRENCH BACKFILL MATERIAL SHALL BE PLACED, COMPACTED, AND TRIMMED TO MATCH WITH THE EXISTING EARTHWORKS LEVELS AND PROFILES SHOWN ON THE DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND MUST BE IN ACCORDANCE WITH AS3798.

WATER MAIN PIPE WORK & INSTALLATION

1. NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS, ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY STANDARD SPECIFICATIONS AND DRAWINGS.
2. WATER SERVICES SHALL NOT BE PERMITTED TO CONNECT TO THE PROPOSED TRUNK MAIN.
3. REINSTATEMENT OF ANY WATER SERVICE CONNECTIONS SHALL BE IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY STANDARD DRAWINGS.
4. ANY WORKS ASSOCIATED WITH LIVE WATER CONNECTIONS MAY BE CARRIED OUT BY THE CONTRACTOR UNDER SUPERVISION BY CURRENT LOCAL AUTHORITY. FEES & EXPENSES FOR THESE EXPENSES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
5. FOR THE INSTALLATION OF PIPEWORK VIA TRENCHING, PROVIDE SUFFICIENT TRENCH DEPTH AND WIDTH TO ALLOW FOR THE PRESCRIBED BEDDING MATERIAL, PIPEWORK DEFLECTIONS, AND A SAFE WORKING ENVIRONMENT.
6. CONTRACTOR TO FOLLOW SAFE WORK AUSTRALIAS GUIDE TO EXCAVATION WORK AND PROVIDE TRENCH BENCHING IN AREAS OF DEEP EXCAVATION TO PREVENT TRENCH COLLAPSE AND SAFE MOVEMENT OF WORKERS IN AND OUT OF TRENCH.
7. ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.
8. CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENT FOR HDPE PIPELINES CAN BE ACHIEVED VIA BENDING OF THE PIPELINE AND DEFLECTION OF THE PIPEWORK DEFLECTIONS AT JOINTS IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICAITONS.
9. FOR PIPEWORK NOT HDPE, CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENTS OTHER THAN BY MANUFACTURED BENDS, SHALL BE ACHIEVED BY DEFLECTING THE PIPES AT JOINTS. MAXIMUM DEFLECTIONS SHALL BE AS PER MANUFACTURER'S SPECIFICATIONS.
10. WHERE CONNECTING TO ANY EXISTING PIPEWORK, THE LEVEL AND THE SIZE OF THE EXISTING PIPEWORK SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO CONNECTION.
11. IF CUTTING OF PIPES IS NECESSARY ON SITE REFER TO MANUFACTURERS REQUIREMENTS.
12. MINIMUM CLEARANCE TO EXISTING SERVICES SHALL BE IN ACCORDANCE WITH TABLE 5.5 OF THE WSA03-2011 CODE.
13. FOR ALL DI PIPE AND FITTINGS:
    i. ALL DICL PIPES & FITTINGS MUST BE IN ACCORDANCE WITH AS 2280.
    ii. PIPES IN PITS AND WELLS SHALL BE FUSION BONDED EPOXY COATED TO AS 4158.
    iii. BURIED PIPES TO BE COVERED WITH POLYETHYLENE SLEEVING AS PER THE MANUFACTURER'S RECOMMENDATION.
14. FOR ALL FLANGED FITTINGS:
    i. ALL FLANGES MUST BE IN ACCORDANCE WITH AS 4087 UNO. ALL VALVES AND FITTINGS SHALL BE DRILLED TO AS 2129 TABLE D OR AS4087 PN16 UNO.
    ii. ALL BOLTS, NUTS AND WASHERS MUST BE 316 STAINLESS STEEL (GRADE B8M) UNO. BOLTS ARE TO BE ASSEMBLED WITH ANTI-GALLING COMPOUND "DURALAC" OR WITH AN APPROVED EQUIVALENT. ALL BURIED FLANGES ARE TO BE WRAPPED WITH "DENSO" PETROLATUM TAPE TO MANUFACTURER'S REQUIREMENTS.
    iii. PRIME, CAULK AND WRAP ALL BURIED FLANGES AND BOLTS WITH DENSO PETROLATUM PRODUCTS OR APPROVED EQUIVALENT AS PER THE MANUFACTURER'S RECOMMENDATIONS.
    iv. EXTERNAL COATING ARE NOT TO BE REMOVED WHEN THE PIPE FITTINGS ARE SURROUNDED OR COVERED IN CONCRETE.
15. THE CONTRACTOR IS TO ESTABLISH THE SOIL CLASSIFICATION FOR THE WATER MAIN ALIGNMENT TO DETERMINE THRUST BLOCK SIZES, FOR DETAILS REFER TO WSAA STANDARD DRAWING WAT-1205. THE CONTRACTOR MUST NOTE THAT THE ST. HELENA SUPPLY RESERVOIR TWL SITS AT APPROXIMATELY 120M AHD AND THE THRUST RESTRAINT AREA MUST BE CALCULATED IN ACCORDANCE WITH NOTE 6 OF WSAA WAT-1205.
16. ANCHOR BLOCKS SHALL BE INSTALLED AT BENDS, JUNCTIONS AND DEAD ENDS AS REQUIRED BY WAT-1205 AND THE PIPELINE MATERIAL.
17. FOR VALVE INSTALLATION DETAILS REFER WSAA STANDARD DRAWINGS WAT-1207, WAT-1300, WAT-1301 AND WAT-1304.
18. FOR FIRE HYDRANTS INSTALLATION DETAILS REFER WSAA STANDARD DRAWING WAT-1302, WAT-1305 AND WAT-1306.
19. ALL PE PIPEWORK TO BE INSTALLED IN ACCORDANCE WITH WSA 01-2004, POLYETHYLENE PIPELINE CODE.
20. ALL PIPEWORK WELDS TO BE BUTT FUSION WELDED WITH INTERNAL WELDS DE-BEADED.
21. ALL BACKING RINGS SHALL BE STAINLESS STEEL (GRADE 316) AND BOLTING COMPATIBILITY - PN16 IN ACCORDANCE WITH AS 4087, UNO.
22. WRAP 3 LAYERS OF PE SHEETING AROUND PIPE AND FITTINGS WHERE PE PIPEWORK IS IN CONTACT WITH CONCRETE.
23. PE WELDS TO BE PRE-QUALIFIED AS PER WSA 01-2004 SECTION 2.12. AT LEAST ONE BUTT WELD TO BE TESTED AT THE START OF EACH DAY OF WELDING. THE SITE ENGINEER CAN AT ANY TIME REQUEST FOR A RECENT WELD TO BE CUT OUT AND TESTED. TESTING AND COMMISSIONING OF THE PE PIPELINE TO CONFORM TO WSA 01-2004 SECTION 2.13.
24. MARKING TAPE SHALL BE PROVIDED ON TOP OF PIPE EMBEDMENT PRIOR TO TRENCHFILLING FOR ANY TRUNK MAINS INSTALLED VIA TRENCHING. WHERE TRENCHLESS TECHNIQUES ARE USED A 2mm DIAMETER GRADE 316 STAINLESS STEEL TRACER WIRE ON TOP OF THE MAIN PROVIDED PER WSA 03-2011-3.2 CL. 15.12.

CONCRETE

1. ALL CONCRETE SHALL COMPLY WITH AS 3600.
2. FORM CONSTRUCTION JOINTS FOR DRIVEWAY REINSTATEMENTS SHALL BE PROVIDED AND APPROVED BY THE SUPERVISING ENGINEER.
3. SUPPORT REINFORCEMENT IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED BAR CHAIRS, SPACERS OR SUPPORT BARS SUITABLE FOR THE EXPOSURE CONDITIONS.
4. LAP MESH REINFORCEMENT BY ONE COMPLETE MESH SQUARE AS A MINIMUM.
5. DO NOT WELD OR SITE BEND REINFORCEMENT UNLESS SHOWN IN THE DRAWINGS OR OTHERWISE SPECIFIED BY THE SUPERVISING ENGINEER.
6. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
7. SAMPLE TEST AND ASSESS CONCRETE COMPLIANCE IN ACCORDANCE WITH PROJECT ASSESSMENT OF STRENGTH GRADE TO SECTION 20 OF AS 3600.
8. THE CONCRETE SHALL BE COMPACTED USING HIGH-FREQUENCY VIBRATORS.
9. ADMIXTURES SHALL NOT BE USED WITHOUT THE WRITTEN APPROVAL OF THE SUPERVISING ENGINEER.

TESTING & COMMISSIONING

1. ALL TESTING SHALL BE CARRIED OUT BY A N.A.T.A. APPROVED TESTER IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
2. THE TEST PROCEDURE FOR PRESSURE MAINS SHALL BE IN ACCORDANCE WITH SECTION 6 OF AS/NZS 2566.2:2002. THE HYDROSTATIC TEST PRESSURE FOR THE PROPOSED MAIN SHALL BE 1200KPa.
3. THE FREQUENCY OF COMPACTION TESTING SHALL BE IN ACCORDANCE WITH CLAUSE 36.3.4.4 OF WSA03-2011.
4. AUDIT AND FINAL INSPECTIONS OF THE WORKS CONSTRUCTED BY THE CONTRACTOR MUST BE ARRANGED WITH THE PRINCIPAL PROVIDING SUFFICIENT NOTICE PERIODS AT THE DISCRETION OF THE PRINCIPAL.
5. ALL NEWLY INSTALLED WATERMAINS ARE TO BE DISINFECTED AND FLUSHED IN ACCORDANCE WITH CLAUSE 20 OF WSA03-2011 FOLLOWING COMPLETION OF SATISFACTORY HYDROSTATIC PRESSURE TESTING.

SURVEY

1. EXISTING SERVICES SHOWN ON DESIGN PLANS HAVE BEEN COMPILED FROM SURVEY INFORMATION PROVIDED BY BYRON BAY SURVEYING.
2. THE INFORMATION IS NOT INTENDED TO PROVIDE THE CONTRACTOR WITH COMPLETE OR ACCURATE INFORMATION CONCERNING THE LOCATION & EXTENT OF ALL UNDERGROUND UTILITY SERVICES, RATHER ITS PURPOSE IS TO ACT AS A GUIDE TO FACILITATE CONSTRUCTION.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH & EXTENT OF ALL EXISTING SERVICES THROUGH USE OF NON-DESTRUCTIVE LOCATING TECHNIQUES PRIOR TO THE COMMENCEMENT OF WORK.
4. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ANY DAMAGE INCURRED TO EXISTING UTILITY SERVICES AS A RESULT OF THE EXECUTION OF WORK UNDER THE CONTRACT.
5. NO WORK SHALL BE CARRIED OUT WITHIN 3 METRES OF ANY EXISTING SERVICES WITHOUT PRIOR RECORDED CONSULTATION WITH THE RELEVANT AUTHORITY.
6. AS-CONSTRUCTED SURVEY OF THE NEWLY INSTALLED TRUNK MAIN IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE STANDARDS OF BYRON SHIRE COUNCIL AND PROVIDED TO COUNCIL IN ADAC FORMAT.

DRIVEWAYS

1. DRIVEWAYS SHALL BE INSTATED IN ACCORDANCE WITH NORTHERN RIVERS STANDARD DRAWINGS R14C, 15D, 16B.

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LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 04 - LEFT BANK ROAD / TRISTRAN PARADE GENERAL NOTES

ORIGINAL SIZE	PLANIT JOB No.	DRAWING No.	REV
A1	J7708	40010	0

N

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WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR, NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THESE PLANS

EXISTING DN100 M-PVC MAIN FROM LEFT BANK RESERVOIR

EXISTING DN200 M-PVC MAIN TO LEFT BANK RESERVOIR

EXISTING UNDERGROUND ELECTRICAL

EXISTING GATE VALVE

EXISTING GATE VALVE

TRISTRAN PARADE

HORIZONTAL CLEARANCE OF 600mm TO TELECOMMUNICATIONS TO BE PROVIDED AT ALL TIMES (INCLUDING THRUST BLOCKS)

REFER TO DRAWING 40620 FOR CONNECTION DETAIL

OBVERT RL:8.57 #150 DCIL E 546049.11 N 6840602.72

PROPOSED DN150 GATE VALVE

EXISTING GATE VALVE (CURRENT BOUNDARY VALVE)

EXISTING GATE VALVE

EXISTING DN200 D.I.C.L MAIN TO AZALEA STREET RESERVOIR

EXISTING TELSTRA SERVICE TO BE LOCATED PRIOR TO CONSTRUCTION

PROPOSED DN100 GATE VALVE

PROPOSED DN150 GATE VALVE

WATERMAIN LINE 04

EXISTING DN100 M-PVC MAIN

OBVERT RL:8.58 #150 DCIL E 546050.65 N 6840598.50

EXISTING GATE VALVE (CURRENT BOUNDARY VALVE)

EXISTING DN100 M-PVC MAIN

EXISTING DN200 D.I.C.L MAIN TO BE ABANDONED

EXISTING DN100 M-PVC MAIN

LEFT BANK ROAD

EXISTING DN150 D.I.C.L MAIN TO WILSONS CREEK

EXISTING OVERHEAD ELECTRICAL

BENCHMARK 101 DUMPY PEG E 540066.063 N 6840585.981

LEGEND

- PROPERTY BOUNDARY
- EXISTING SURFACE CONTOURS MINOR (0.2m)
- EXISTING SURFACE CONTOURS MAJOR (1.0m)
- EXISTING STORMWATER PIPE
- EXISTING ELECTRICITY UNDERGROUND
- EXISTING ELECTRICITY OVERHEAD
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- WATER MAIN
- GATE VALVE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES: 0 0.5 1 2 3 — Full Size 1:50 ; Half Size 1:100 Scale (m)

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PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 04 - LEFT BANK ROAD / TRISTRAN PARADE WATER MAIN ALIGNMENT PLAN

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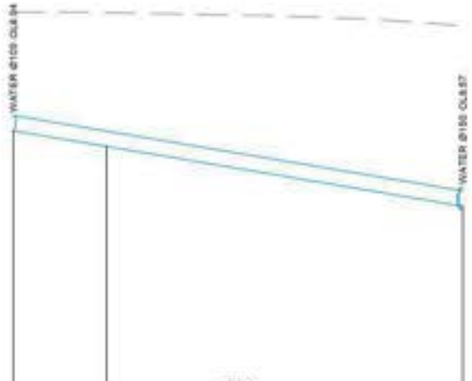

PIPE DIAMETER, MATERIAL	DN100 PVC-M PN16 SERIES 2 RRJ		
TRENCHSTOPS/BULKHEADS	1 x TS @ CTR		
TRENCH TYPE	TYPE B		
HORIZONTAL GEOMETRY		H-11°	
VERTICAL GEOMETRY			
PIPELINE GRADE (%)	-6.71%		
DATUM R.L 6.0			
INVERT LEVEL	8.941	8.839	8.449
DEPTH TO INVERT	-0.777	-0.874	-1.177
EXISTING SURFACE	8.718	8.712	8.827
PIPELINE CHAINAGE	0.00	1.54	7.34

SCALE HZ 1:50, VT 1:20

LONGITUDINAL SECTION LINE 04

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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Full Size 1:20 ; Half Size 1:40
Scale (m)
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APPROVED BY:

DATE:

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PLANIT CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 04 - LEFT BANK ROAD / TRISTRAN PARADE
WATER MAIN LONGITUDINAL SECTION

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N

EXISTING DN200
mPVC MAIN

EXISTING DN200
GATE VALVE

EXISTING DN200 GATE
VALVE (FOR SCOUR)

EX. 45° HORIZONTAL BEND

EXISTING DN150
DICL MAIN

EXISTING DN100 M-PVC
MAIN FROM LEFT BANK
RESERVOIR

PROPOSED DN150 GIBALT

PROPOSED DN150 DICL CONNECTOR (FL-SP)

PROPOSED DICL DN150 GATE VALVE
(FL-FL) PRELIMINARY CALCULATIONS
BASED ON MRWA CALCULATOR.
THRUST AREA = 0.69m2

PROPOSED DICL DN150 GATE VALVE (FL-FL) PRELIMINARY
CALCULATIONS BASED ON MRWA CALCULATOR.
THRUST AREA = 0.69m2

PROPOSED DN150xDN100
DICL REDUCER (FL-FL)

THRUST BLOCK (REQUIREMENT TO BE ASSESSED IN ACCORDANCE
WITH TSC STANDARD DRAWING SD303) PRELIMINARY
CALCULATIONS BASED ON MRWA CALCULATOR.
THRUST AREA = 0.69m2

PROPOSED DICL DN100 CONNECTOR (FL-SP)

PROPOSED DICL DN150 GATE VALVE (FL-FL) PRELIMINARY
CALCULATIONS BASED ON MRWA CALCULATOR.
THRUST AREA = 0.69m2

PROPOSED DN150 CONNECTOR (FL-SP)

PROPOSED DN150 GIBALT

EXISTING TELECOMMS

PROPOSED PVC-M PN16 DN100
(SPIG-SOC)

PROPOSED
DN100 GIBAULT

PROPOSED
DN100 (SOC-SOC)
11.25° BEND

PROPOSED
DN100xDN100xDN100
(SP-SP-SP) DICL TEE

EXISTING DN150 DICL
MAIN TO WILSONS CREEK

PROPOSED DN100 GIBAULT

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ACCORDANCE WITH TSC STANDARD DRAWING SD303)
PRELIMINARY CALCULATIONS BASED ON MRWA CALCULATOR.
THRUST AREA = 0.33m2

THRUST BLOCK (REQUIREMENT TO BE ASSESSED IN
ACCORDANCE WITH TSC STANDARD DRAWING SD303)
PRELIMINARY CALCULATIONS BASED ON MRWA CALCULATOR.
THRUST AREA = 0.69m2

PROPOSED DN100 GIBAULT

PROPOSED PVC-M
PN16 DN100
(SPIG-SOC)

PROPOSED DN100 (SOC-SOC) DICL GATE
VALVE. PRELIMINARY CALCULATIONS
BASED ON MRWA CALCULATOR.
THRUST AREA = 0.33m2

EXISTING DN100
M-PVC MAIN

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	RW	RW	RW

SCALES: NTS

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CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 04 - LEFT BANK ROAD / TRISTRAN PARADE CONSTRUCTION DETAILS CONNECTIONS

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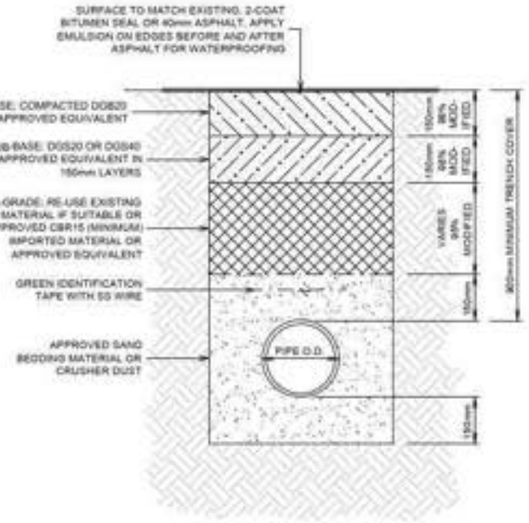

PIPE BACKFILL DETAIL - ROAD PAVEMENT

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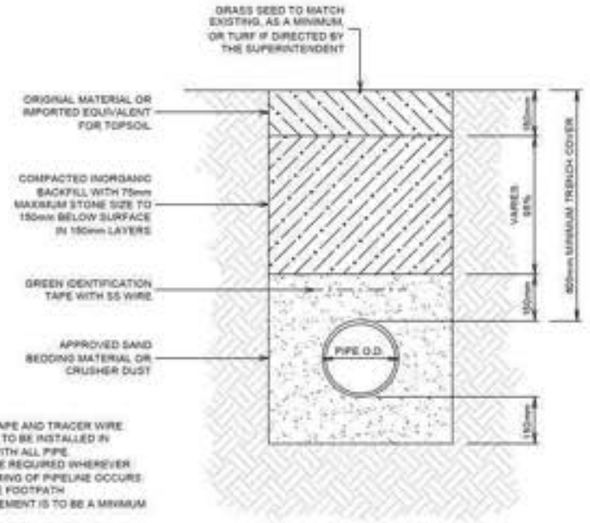
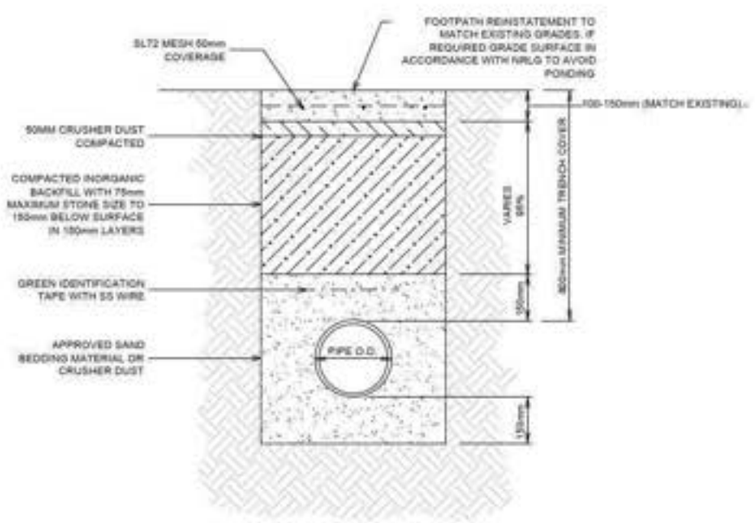


NOTE:
- MARKER TAPE AND TRACER WIRE REQUIRED TO BE INSTALLED IN TRENCH WITH ALL PIPE
- DRAW WIRE REQUIRED WHEREVER UNDERBORING OF PIPELINE OCCURS
- CONCRETE FOOTPATH RE-INSTATEMENT IS TO BE A MINIMUM 20MPA.
- NRLG SPECIFICATIONS REQUIRED.

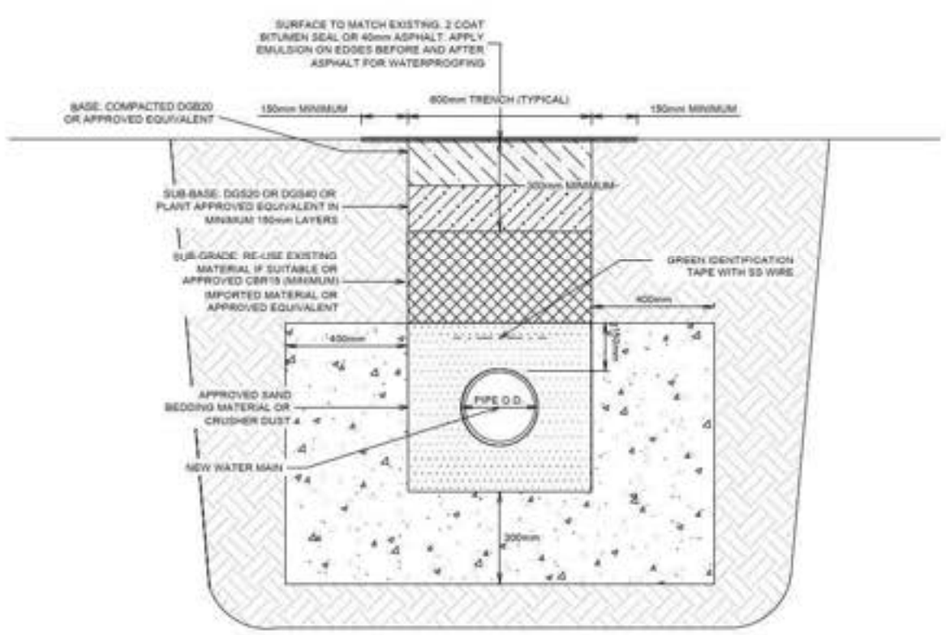
PIPE BACKFILL DETAIL - VERGE

SCALE. 1:10 @ A1, 1:20 @A3



PIPE BACKFILL DETAIL - CONCRETE FOOTPATH

SCALE. 1:10 @ A1, 1:20 @A3



TYPICAL ANCHOR BLOCK DETAIL (TRAFFIC)

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Scale (m)
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CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 04 - LEFT BANK ROAD / TRISTRAN PARADE
CONSTRUCTION DETAILS
TRENCH BACKFILL

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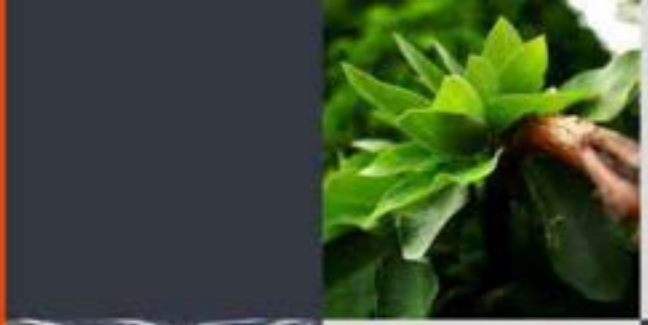
Appendix B – Mullumbimby Trunk Water Main Assessment and Options Report







Mullumbimby Trunk Water Supply Assessment

Mullumbimby, New South Wales, 2482

Prepared for Byron Shire Council
By Planit Consulting Pty Ltd

March 2022 Rev 00



This report has been written by

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Document Control

Version	Date	Document Type	Prepared By	Reviewed By
A	14.07.2021	DRAFT	RW	SM
0	22.02.2022	FINAL	RW	SM

Project Details

Project Name	Mullumbimby Trunk Water Supply Assessment
Client	Byron Shire Council
Client Project Manager	Simon Millichamp
Authors	Robert Wise
Planit Reference	J7232-RPT-001_Rev 00

Disclaimer

Contents

Figures

Tables

1 Executive Summary

The purpose of this report is to document the outcomes of the Mullumbimby Trunk Water Supply Assessment that has been prepared to develop a direct water feed from the Rous County Council (RCC) water supply mains at Tandys Lane to the Azalea Street reservoir and Left Bank reservoir which are both located in Mullumbimby, NSW and located in the Byron Shire Council (BSC) local government area.

The investigation of the new water supply was initiated by BSC in order to provide for additional water supply and cater for: future population growth; potential closure of the Mullumbimby Water Treatment Plant; prepare for any future drought conditions; and firefighting water supply.

The Mullumbimby Trunk Water Supply Assessment has been undertaken in three stages:

1. **Stage 1: Review of the Existing Network and Water Supply:** This stage involved a review of the existing reports and data in relation to BSC's and RCC's water supply including yield of the existing resources and demand forecasts.
2. **Stage 2: Undertake Hydraulic Modelling and Assessment:** This stage involves:
   - Updating the BSC water supply hydraulic model to represent existing infrastructure and available supply from RCC in current and future planning horizons.
   - Model the proposed trunk main to Azaela Street reservoir.
   - Identify any capacity limitations of the existing DN250 trunk main to determine whether duplication, augmentation, booster pump stations or any other network upgrades are required to meet current and future demands with supply from the RCC trunk water supply.
3. **Stage 3: Preliminary Assessment of the required works:** This stage will focus on the detailed investigation of the works required in order to analyse in detail the capital and operating costs, timing and constraints.

Results

The hydraulic modelling review identified the following dedicated water supply constraints and solutions:

- The existing DN150 trunk water supply main owned by RCC between the intersection of Tandy's Lane/Gulgan Road/Mullumbimby Road and the Pacific Highway cannot provide sufficient water supply for the 2046 planning horizon as the available pressure in RCC models was lower than the Azalea Street reservoir ground level.
- A full length DN250 dedicated water supply main extending from the RCC supply at the Pacific Highway to the Azalea St reservoir has a flow capacity of 31 L/s, while the average peak day outflow of the Azalea St reservoir is 30.5L/s and 47.5L/s at the 2016 and 2046 planning horizons respectively. The hydraulic modelling simulated a loss of 35% in the storage level of the reservoir during the peak hour for this supply configuration.
- A repeat of the above simulation was undertaken with a full length DN300 dedicated water supply main from the Pacific Highway to the Azalea Street reservoir. In this simulation the modelling indicated the reservoir as being able to be filled during the peak hour.
- Based on these results, BSC Officers requested further modelling of the above scenarios which maintained the existing DN250 main in Mullumbimby Rd, while having all new dedicated supply mains between the Pacific Highway and the Azalea Street reservoir be sized at DN300. The hydraulic modelling simulated that theoretically the loss in storage level of the reservoir would be 15% during the peak hour.

In summary, as the peak hour event is rare and it is likely that the Azalea Street reservoir would have filled overnight the hydraulic assessment has indicated that theoretically by installing new DN300 mains and utilising the existing DN250 main between the Pacific Highway and the Azalea Street reservoir would be sufficient to provide water supply to meet 2046 planning horizon demands.

This shall also allow for the for the existing DN250 main in Mullumbimby Road to be utilised until such time that additional water supply is required, at which point an upgrade to a DN300 main may be installed to increase the capacity of the supply main.

2 Introduction

Planit Consulting has been engaged by Byron Shire Council (BSC) to investigate the creation of a direct water feed from the Rous County Council (RCC) water supply mains at Tandys Lane to the Azalea St reservoir and Left Bank reservoir in Mullumbimby.

This requirement of the water feed has been identified by BSC to provide for: additional water supply to cater future population growth: potential closure of the Mullumbimby Water Treatment Plant; drought conditions; and firefighting water supply.

As such this report shall investigate servicing Mullumbimby from the RCC trunk mains rather than from the Mullumbimby Water Treatment Plant (WTP) as shown in Figure 1.

Figure 1 | Overview of Mullumbimby Water Supply

Currently, there is an existing Council DN250 water main that runs from RCC's DN150 high pressure main at the intersection of Tandys Lane/Mullumbimby Road/Gulgan Road along Mullumbimby Road, through to a boundary valve at Manns Road (and the Mullumbimby Industrial Estate). This trunk main has existing connections to service properties along its alignment to the Azalea Street Reservoir.

Any direct feed from the RCC supply main at the Tandys Lane/Mullumbimby Road/Gulgan Road intersection to the Azalea Street reservoir is believed to require an extension of the existing DN250 main from Mann's Rd to Azalea St and potentially to the Left Bank reservoirs. This is to be confirmed by hydraulic modelling.

It is assumed any dedicated new main to the reservoirs would follow a similar route to the existing water mains which service properties through Mullumbimby.

Further investigation is also required to assess the compatibility of a booster pump station from the Azalea Street reservoir to the Left Bank reservoir with existing mains or if this requires new mains to be constructed between the two reservoirs.

The above items form the investigations of this report. For additional details of the location of the investigations refer to Figure 2.

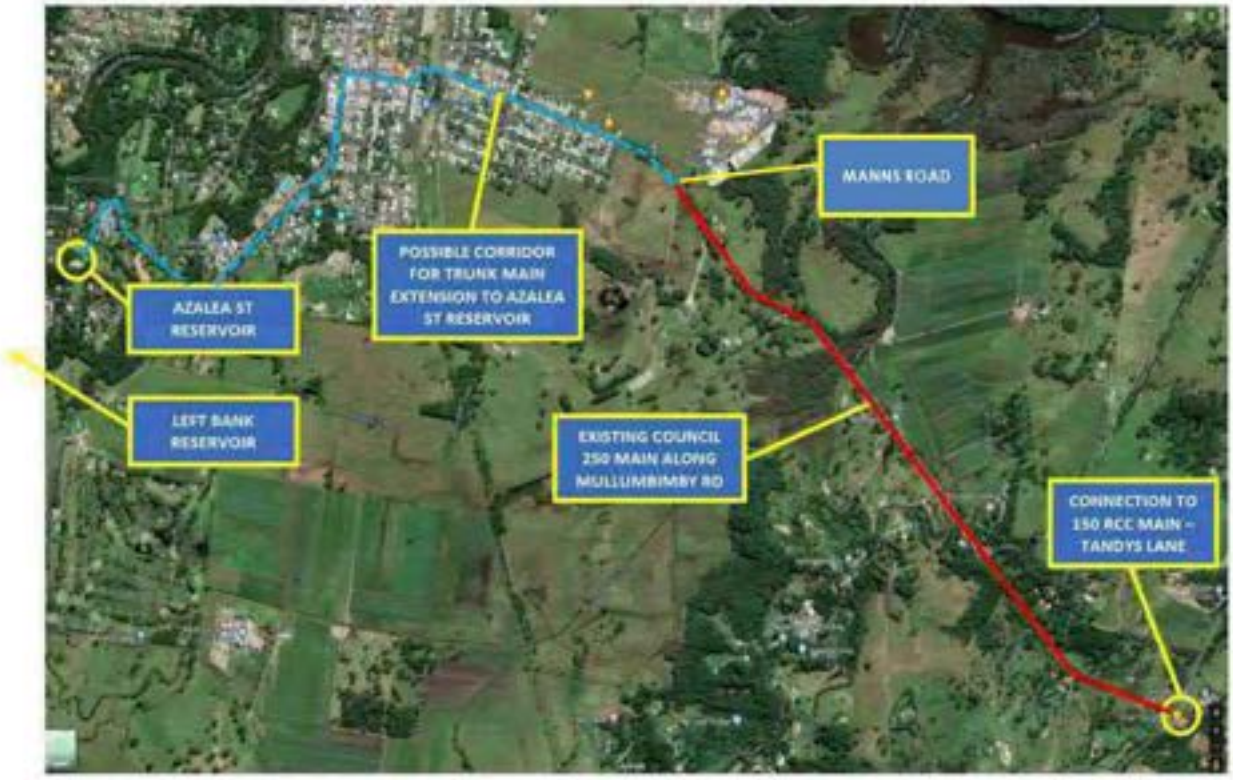


Figure 2 | Site Location (Source: SixMaps)

2.1 Project Objectives

The objectives of the project are to determine whether an extension to the existing trunk DN250 trunk main along Mullumbimby Road has sufficient capacity to service a dedicated trunk main and reticulation main through Mullumbimby to the Azalea Street reservoir and further onto the Left Bank reservoir.

Additionally, the project seeks to identify any augmentations or upgrades that are required to cater for the demand of the 2016 and 2046 planning horizons of BSC for Mullumbimby, which shall incorporate supply information from RCC.

2.2 Project Scope and Limitations

This project has been undertaken utilising the modelling information provided by BSC and RCC. Hydraulic modelling was carried out by H2One, with direction from Planit Consulting.

Planit Consulting shall rely upon instructions from BSC and prepare documentation of all information including site observations into this report. Additionally, Planit shall review all available information: drawings, documentation, data and other relevant of RCC water mains, BSC water mains and BSC reservoirs.

2.3 Project Stages

The Mullumbimby Trunk Water Supply Assessment is being undertaken in three stages:

1. **Stage 1: Review of the Existing Network and Water Supply:** This stage involved a review of the existing reports and data in relation to BSC's and RCC's water supply including yield of the existing resources and demand forecasts.
2. **Stage 2: Undertake Hydraulic Modelling and Assessment:** This stage involves:
   - Updating the BSC water supply hydraulic model to represent existing infrastructure and available supply from RCC in current and future planning horizons.

- Model the proposed trunk main to Azaela Street reservoir.
- Identify any capacity limitations of the existing DN250 trunk main to determine whether duplication, augmentation, booster pump stations or any other network upgrades are required to meet current and future demands with supply from the RCC trunk water supply.

3. **Stage 3: Preliminary Assessment of the required works:** This stage will focus on the detailed investigation of the works required in order to analyse in detail the capital and operating costs, timing and constraints.

2.4 Reference Documents and Design Criteria

The design was completed in accordance with and with reference to the following standards and manuals:

- All relevant Australian / NZ codes and standards:
  - AS/NZS 3500.1 – Plumbing and drainage;
  - AS 2200 – Design charts for water supply and sewerage;
- Northern Rivers Local Government Development Specifications;
- Byron Shire Council Development Control Plan (DCP) 2014
- Byron Shire Council Local Environmental Plan (LEP) 1988;
- Water Industry Technical standards;
- Water Supply Code of Australia;
- Byron Shire Development Design Specifications;
- Water Directorate Guidelines (including Third Party Infrastructure on Water Supply Reservoir Guidelines) and
- Other recognised industry design guidance.

3 Site Assessment

3.1 Site Description

The proposed location of the direct water feed from the RCC water main in Tandys Lane/Gulgan Road/Mullumbimby Road to Azalea Street reservoir and Left Bank reservoir, is located in and adjacent to the Mullumbimby township (See Figure 2). The RCC water main is noted at being DN150 between the intersection of Tandys Lane/Gulgan Road/Mullumbimby Road and DN375 on the Pacific Highway.

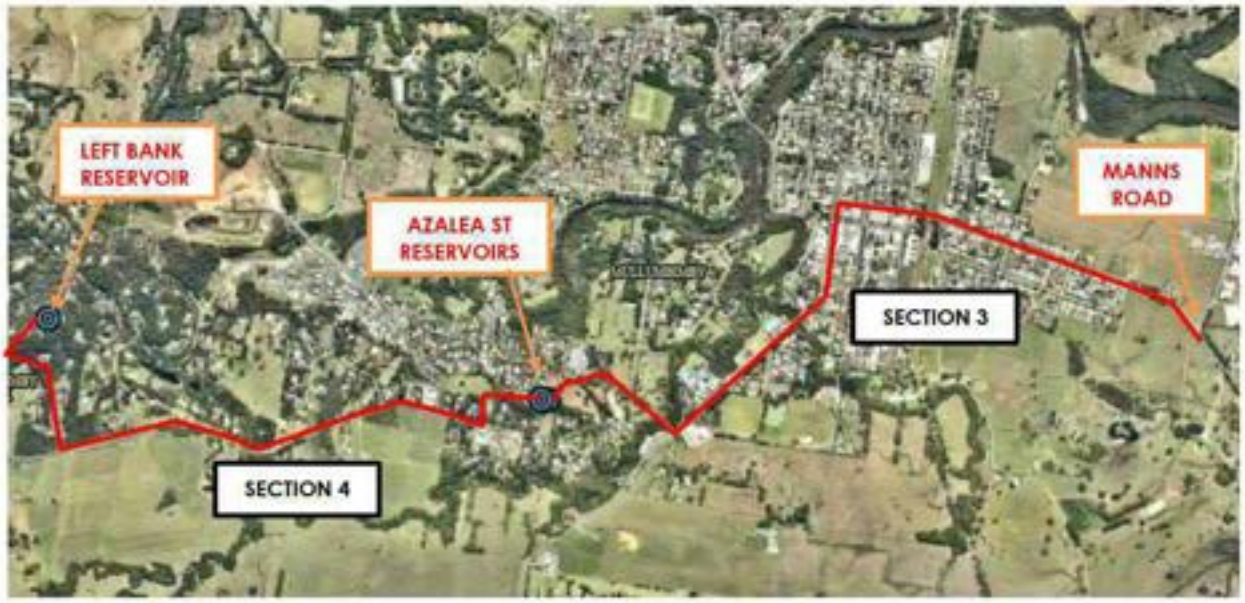


Figure 3 | Site Location (Source: BSC Geocortex Mapping)

Figure 4 | Site Location (Source: BSC Geocortex Mapping)

The land and road reserves potentially impacted by this proposal are therefore summarised as follows:

Section 1 (Pacific Highway to Mullumbimby Road/Tandy's Lane Intersection)

- Gulgan Road, Tandy's Lane

Section 2 (Mullumbimby Road/Tandy's Lane Intersection to Manns Road)

- Mullumbimby Road

Section 3 (Mann's Road to Azalea Street Reservoirs)

- Mullumbimby Road, Argyle Street, Burringbar Road, Dalley Road, Jubillee Ave, Azelea Street and Reservoir Road.
- Lot 1 DP 342369 (Azalea Street reservior lot).

Section 4 (Azalea Street Reservoirs to Left Bank Reservoir)

- Part Lot 32 DP 1169053, Tuckeroo Avenue, Left Bank Road, Tristran Road, Lot 13 DP 880189, Lot 12 DP 880189 and Lot 11 DP 865338.

As shown in Figures 5 and 6, the surrounding areas of these potential water main works include:

- Rural residentail properties located adjacent to the aforementioned roads;
- Residentail and commerical properties in the Mullumbimby township;
- Mullumbimby High Scool, Mullumbimby Petria Thomas swimming pool and the Mullumbimby Co-op located in Jubilee Avenu.

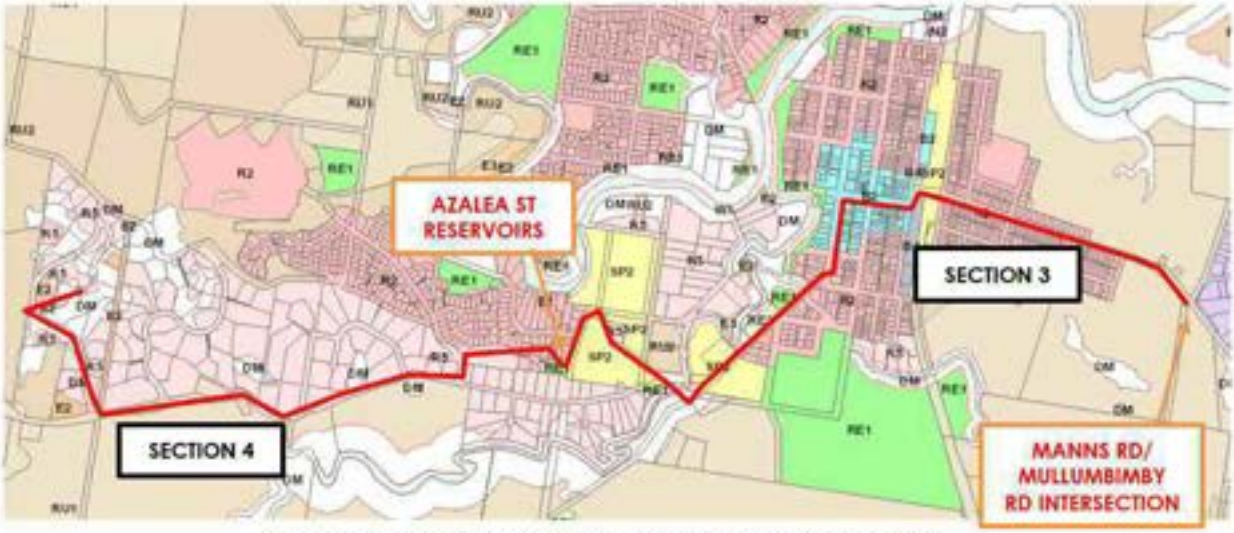


Figure 5 | Land Zonings (Source Byron Shire Interactive Mapping)

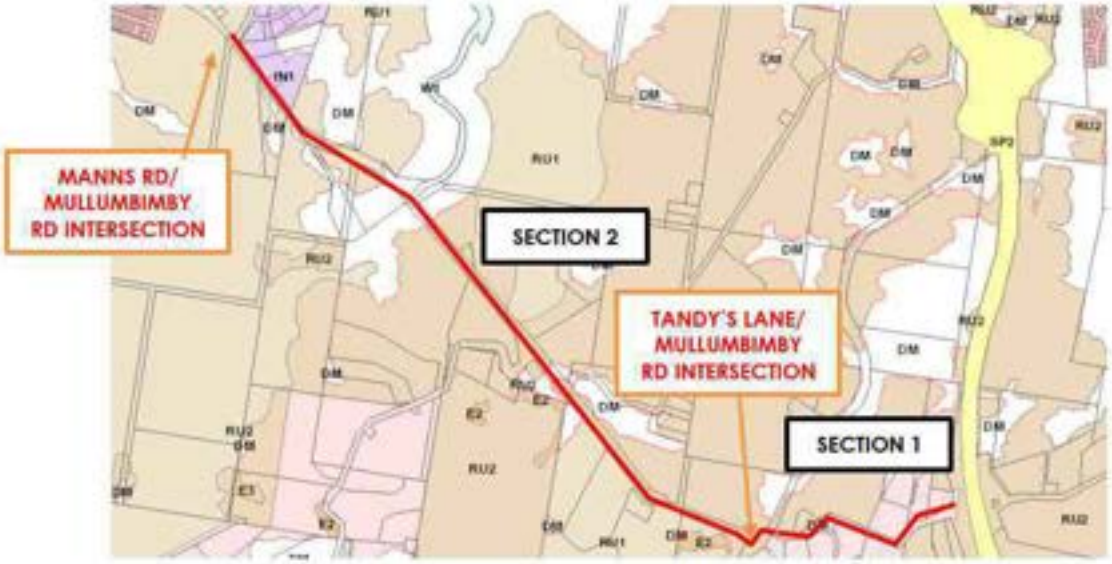


Figure 6 | Land Zonings (Source Byron Shire Interactive Mapping)

3.2 Reservoir Site Details

3.2.1 Azalea Street Reservoir

Azalea Street Reservoir is located on Lot 1 DP 342369 and is accessed from reservoir road in Mullumbimby as shown in Figure 3. The subject site has two existing reservoirs. To the West there is Reservoir A, which has a capacity of 0.923 ML Reservoir B to the East which has a capacity of 4.5ML. Azalea Street Reservoir A is currently not operational and unlikely to be used as a permanent water storage asset into the future.

Figure 7 | Azalea Street Reservoir (Source: SixMaps)

3.2.2 Left Bank Reservoir

Left Bank Reservoir is located on Lot 11 DP 865388 known as 25 Scotts Wood Grove Mullumbimby Creek and is accessed from Scotts Wood Grove as shown in Figure 4. The subject site has one reservoir, which has a capacity of 1.5ML.

Figure 8 | Left Bank Reservoir (Source: SixMaps)

A summary of the subject water reservoir asset details provided by BSC is provided below in Table 1.

Table 1 | Reservoir Asset Details

Reservoir	Capacity	Total Water Level (mAHD)	Base Water Level (mAHD)
Azalea Street Reservoir A	0.923 ML	56.2	50.38
Azalea Street Reservoir A	4.5 ML	60.2	49.49
Left Bank Reservoir	1.5 ML	97.2	93.28

3.3 Topography and Geology

3.3.1 Section 1 (Pacific Highway to Mullumbimby Road/Tandy's Lane Intersection)

Moving West to East, the water main alignment is gently undulating, rising from RL~10 to RL-20 at the proposed Pacific Highway trunk main connection.

3.3.2 Section 2 (Mullumbimby Road/Tandy's Lane Intersection to Manns Road)

Moving West to East, the water main alignment is relatively flat until reaching the rural residential properties at Myocum where the alignment rises from RL ~2 to RL ~40 and then falls to approx. RL 10 at the Mullumbimby Road/Tandy's Lane intersection.

3.3.3 Section 3 (Mann's Road to Azalea Street Reservoirs)

Moving from West to East, the water main alignment steeply falls from the Azalea Street reservoirs RL ~50 to Azlea Street, below Mullumbimby Creek (RL0) to Jubilee Avenue. The alignment is then relatively through Fern Street, Station Street, Argyle Street and onto Mullumbimby Road to the Mann's Road intersection.

3.3.4 Section 4 (Azalea Street Reservoirs to Left Bank Reservoir)

Moving from West to East, the water main alignment steeply falls from RL ~90 to RL ~50 from the Left Bank reservoir to Tristan Parade and then continues to fall to RL 10 at Left Bank Road. The alignment on Left Bank Road is gently undulating until rising at Tuckeroo Avenue and up to the Azalea Street reservoir.

3.4 Impacts to Roads, Services and Utilities

Due to the presence of existing underground services along the proposed alignments there is a likelihood of potential clashes. This will be required to be assessed during detailed design to ensure the proposed works meet minimum clearance requirements.

The concept design indicates that road crossings for new mains shall be required in developed residential and commercial zones. To reduce the impacts to road pavements and road closures under boring of the mains shall be the preferred construction method and will be considered in the design and construction planning processes.

Any impacts to traffic due to under boring shall also need to be managed during construction under relevant Traffic Management Plans.

The new trunk main will cross over the existing rail corridor near Argyle Street in Mullumbimby. Consultation with the current rail corridor manager and subsequent approvals will be required prior to finalisation of detailed design.

4 Hydraulic Modelling Background

4.1 Modelling Purpose and Extents

To undertake this trunk water supply assessment, BSC have provided all existing water supply reticulation hydraulic models. The purpose of this being to:

- Determine capacity of existing mains.
- Identification of any water main upgrades/augmentations to provide adequate water supply for the 2016 and 2046 ultimate planning horizon from the RCC trunk water supply and not the Wilsons Creek Water Treatment Plant as this may be decommissioned in the future.
- Develop a strategy that can bypass the Azalea Street reservoir to facilitate any reservoir maintenance activities.

4.2 Existing and Future Demands

The BSC models have been developed for the 2016 and 2046 (PD demand) planning horizons. The peak outflows from the Azalea Street reservoir were determined to be 30.5L/s in the 2016 planning horizon and 47.5L/s in the 2046 planning horizon.

5 Hydraulic Modelling and Assessment

5.1 Preliminary Investigations

To undertake the hydraulic modelling Planit obtained existing InfoWater models from BSC. Once the water models were received and able to be interrogated, in partnership with specialist water modelling consultant H2One, the following investigations were undertaken:

1. Obtain boundary conditions from the existing trunk water supply from the DN150 at Tandy's Lane by RCC (Section 1).
    - This boundary condition will assume the existing Pressure Reducing Valve at the water supply connection is not in service as this shall be relocated as part of any water supply upgrade works to the Azalea Street reservoir site.
2. Develop a hydraulic model which includes:
    - The existing DN250 main in Mullumbimby Road (Section 2).
    - A new dedicated DN250 from Manns Road to Azalea St reservoir (Section 3).
    - A new dedicated DN250 from Azalea Street reservoir to Left Bank reservoir, with consideration of a booster pump station at the Azalea Street reservoir (Section 4).
3. Run water supply scenarios to determine the capacity of the existing DN250 main in Mullumbimby Road and whether it has the capacity of providing a sufficient supply main to service Azalea St reservoir and Left Bank reservoir from the RCC main.

5.2 Preliminary Trunk Water Supply Results

During the preliminary modelling investigations, the hydraulic model was run utilising existing infrastructure in Section 2 and providing a new dedicated DN250 in Sections 2 and 4, between the Mullumbimby township and between the Azalea Street reservoirs and Left Bank Reservoir (see Figure 9).

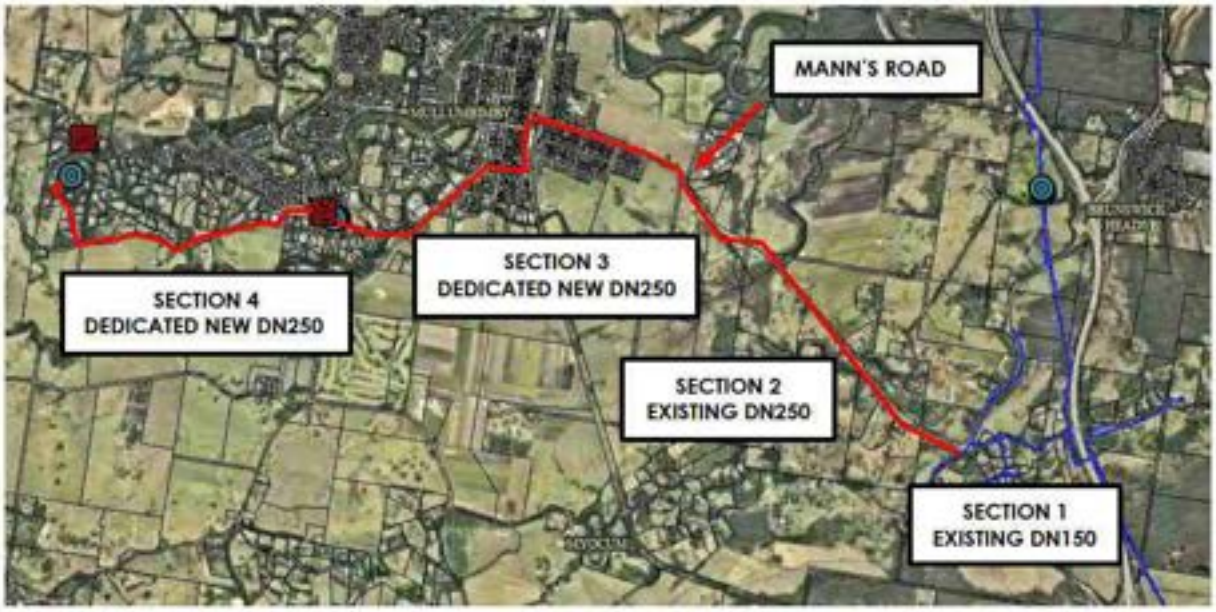


Figure 9 | Preliminary Modelling Layout

The hydraulic model results indicated that theoretically the DN250 main extension from Manns Rd to Azalea Street ***cannot*** provide adequate supply at the 2046 planning horizon. This result was due to the available pressure at the DN150 boundary condition (41m head) being lower than the Azalea Street reservoir ground level (49m).

Additionally, the hydraulic model results for the current planning horizons (2016 and 2021) indicated that the existing DN250 main on Mullumbimby Road (Section 2) only has an estimated flow capacity of 20 L/s, while the average peak day demand from the Azalea Street reservoir was 26 L/s for 2016 and 31.4L/s for 2021. As such the existing DN250 is ***unable*** to maintain the average peak day demand over 24 hours, and the demand shortfall is provided by existing volumes in the reservoirs.

It is also noted that the dedicated DN250 main and booster pump station between the Azalea Street reservoirs and Left Bank reservoir (Section 4) had no issues in servicing the Left Bank reservoir and downstream peak demands of this reservoir including those previously serviced directly from the Mullumbimby Water Treatment Plant.

5.3 Revised Trunk Water Supply Investigations

BSC were presented with the preliminary results, and it was agreed that the water supply network insufficiencies could be resolved by investigating:

1. Booster Pump Station installation at the Mullumbimby Road/Tandy's Lane Intersection.
2. Upgrading or duplication of the RCC DN150 main from Mullumbimby Road/Tandy's Lane Intersection to the RCC DN375 adjacent to the Pacific Highway (Section 1).

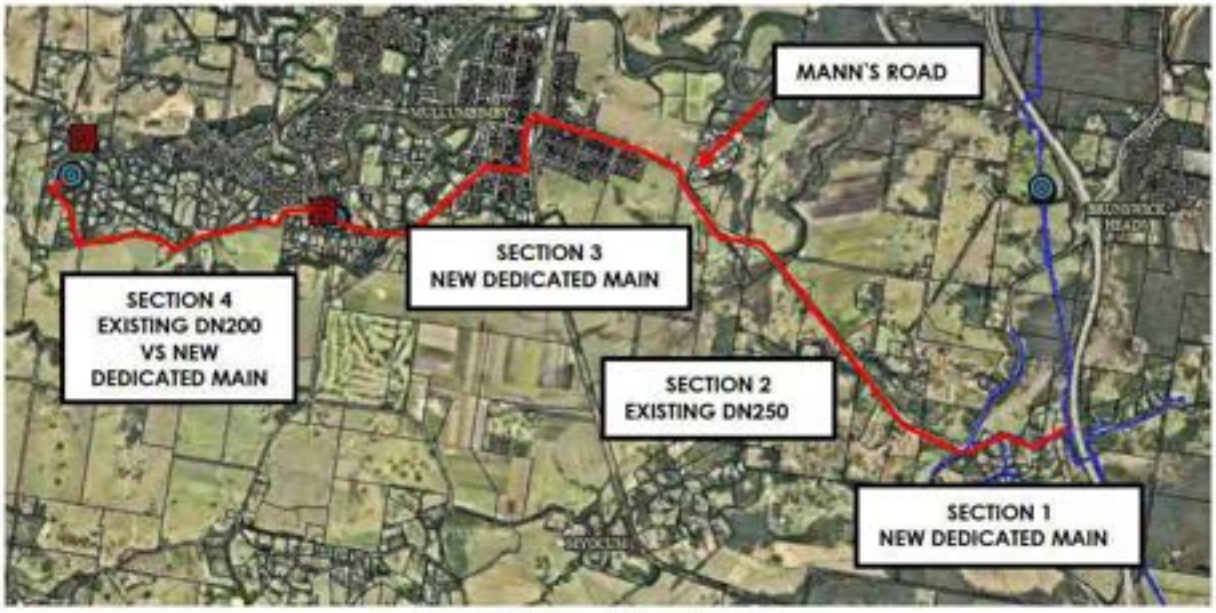


Figure 10 | Revised Modelling Layout

Both scenarios were investigated, however it was quickly identified that upgrading/duplication of the RCC trunk supply was the preferred option. As it was identified that:

- The velocity through the RCC DN150 was very high at the ultimate planning horizon in 2046.
- Utilisation of the high-pressure supply network directly to the Azalea Street reservoir will maximise the use of available pressures and lead to a reduction in operational costs.

5.4 Revised Hydraulic Modelling Results

5.4.1 RCC Water Supply to Azalea Street Reservoir (Section 1, 2 and 3)

As stated previously, the modelling has identified an average peak outflow from Azalea Reservoir of 47.5L/s for the 2046 planning horizon.

Modelling of a dedicated DN250 main (Option 1) from the RCC DN375 main at the Pacific Hwy through to the Azalea Street reservoir (Sections 1, 2 and 3) shows an approximate flow capacity of 31 L/s, indicating the Azalea Street reservoir storage level would reduce by 35% after peak hour demands in the 2046 planning horizon.

This was considered unacceptable and thus additional modelling was undertaken to simulate a full length DN300 trunk main (Option 2) between the RCC supply at the Pacific Highway and the Azalea Street reservoir (Sections 1, 2 and 3). This scenario showed sufficient capacity to meet the 2046 planning horizon demands and fill the reservoir during peak periods.

The above information was presented to BSC, and it was agreed that further sensitivity analysis would be undertaken to quantify the Azalea Street reservoir level during peak hour demands in the 2046 planning

horizon. This intent was to maintain the existing DN250 main in Mullumbimby Road (Section 2) and providing a DN300 mains for Section 1 and Section 3 (Option 3). Hydraulic analysis indicated the Azalea Street reservoir storage level would reduce by 15% during peak hour demands in the 2046 planning horizon.

A summary of these hydraulic simulations is provided in Figure 2.

Table 2 | Hydraulic Modelling Outcomes Pacific Highway to Azalea Street Reservoir

Option	Configuration	Supply Pipeline Flow Capacity (L/s)	2016 | 2046 Azalea St Reservoir Outflow Demand in Model (L/s)	Azalea Reservoir storage loss during peak hour 2046 demand
Option 1	DN250 – full length	31 L/s	30.5 L/s | 47.5 L/s	35%
Option 2	DN300 – Full Length	> 47.5 L/s	30.5 L/s | 47.5 L/s	Nil
Option 3	DN250 – Section 2 DN300 – Section 1 & 3	39 L/s	30.5 L/s | 47.5 L/s	15%

Note: The above modelling scenarios were undertaken with the Azalea Street reservoir simulated with an initial water level of 70% the hydraulic model for the 2046 planning horizon. Option 1 and 3 were also found to have the Azalea Street reservoir filling after the peak hour event. This is detailed further in Appendix A.

Based on conversations with Council it was agreed that Option 3 is the recommended water supply option, as the peak day demand event is rare and the configuration is able to maintain reservoir levels above the Minimum Operating Level. Additionally, this configuration ensures that all new infrastructure is sufficiently sized at DN300 for the 2046 planning horizon and allows for the existing DN250 main in Mullumbimby Road to be utilised until such time that additional water supply is required, at which point a DN300 main may be installed.

5.4.2 Azalea Street Reservoir to Left Bank Reservoir (Section 4)

The Left Bank reservoir is located at a higher elevation than the Azalea Street reservoir and at a higher elevation than the available water supply connection. As such with the potential future closure of the Mullumbimby WTP the Azalea Street reservoir requires a booster pump station to supply the Left Bank reservoir.

Subsequently, modelling analysis was undertaken with a new dedicated DN250 supply main or a DN150 supply main (with a larger booster pump) from a booster pump station at the Azalea Street reservoir to the Left Bank reservoir. Both of these options were determined to theoretically provide sufficient water supply for the demands in the 2046 planning horizon.

Further modelling was undertaken to review whether the existing DN200 water mains between these two reservoirs had sufficient capacity to cater for the 2046 planning horizon. This modelling simulated that theoretically do have capacity for the 2046 planning horizon, however, minor pipework upgrades at the intersection of Tristran Parade and Left Bank Road are required to service lots near Wilsons Creek Water Treatment Plant from the Left Bank Reservoir. Preliminary drawings of these works are provided in Appendix B.

A review of suitable booster pump stations revealed that the Xylem Lowara GHV20 15SV04 4kw in-line booster set can sufficiently meet the system requirements, for additional information refer to Appendix C.

6 Summary of Recommended Works

6.1 Summary of Hydraulic Assessment

Based on the hydraulic assessment, the following water supply infrastructure is recommended to meet the peak day 2046 planning horizon demands per Table 3 and Figure 11. Preliminary drawings have also been provided in Appendix B.

Table 3 | Summary of proposed water supply infrastructure

Location		Works Required	Details
Section 1	Pacific Highway to Tandys Ln/ Mullumbimby Rd	New dedicated DN300 main along existing DN150 RCC alignment	DN300 potable water main, connecting from DN375 RCC main at Pac Hwy into existing DN250 BSC main on Mullumbimby Rd.
Section 2	Tandys Ln/ Mullumbimby Rd to Manns Rd	Keep existing DN250 BSC main	Minor connection works Tandys Ln/Mullumbimby Rd intersection including removal of the existing PRV.
Section 3	Manns Rd to Azalea St Reservoir Site	New dedicated DN300 main along Mullumbimby Rd and through Mullumbimby township	DN300 potable water main, connecting from DN250 main at Manns Road and connecting into existing DN200 main at Azalea St reservoir A inlet main.
Azalea Street Reservoir	Azalea St Reservoir Site	Booster pump station, PRV and Bypass main.	Installation of Booster Pump Station, PRV spool and PRV and bypass main adjacent to Azalea St reservoir. Additional works include scour realignment, removal of picnic shelter and new air gap at reservoir inlet.
Section 4	Azalea St Reservoir Site to Left Bank Reservoir	New DN150 to facilate service to Wilsons Creek from Left Bank Reservoir	Upgrade water main works at Tristran Pde/Left Bank Rd intersection.

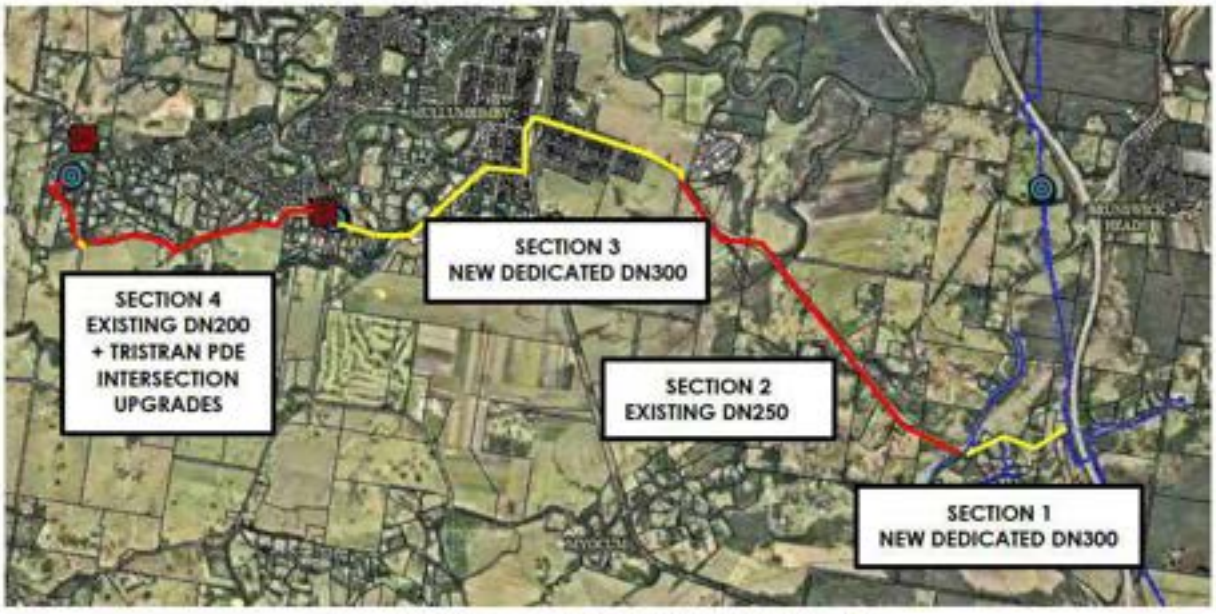


Figure 11 | Recommened Trunk Water Main Upgrades
(Note: New Mains in Yellow, Existing mains in RED)

6.2 Azalea Street Reservoir Upgrades

In addition to providing additional capacity to the water supply network, should the Wilsons Creek Water Treatment Plant be decommissioned a new reservoir bypass is required at the Azalea Street reservoir as currently there is compatible bypass or redundancy plan if this reservoir were to go offline.

As detailed in the *Planit Consulting BSC Reservoir Bypassing Standard Operating Procedure 2022*, the key to this bypass procedure was that the following works occur at the Azalea reservoir site:

- A new reservoir bypass, booster pump station, temporary pressure reducing valve (PRV) spool and procurement of a PRV to service the Left Bank reservoir from a dedicated supply from the RCC.
- Scour realignment (To be confirmed in detailed design)
- Removal and relocation of picnic table and shelter.
- The Inlet to reservoir from the bypass shall have an air gap.

A summary of the bypass and reservoir upgrades is shown in Figure 12.

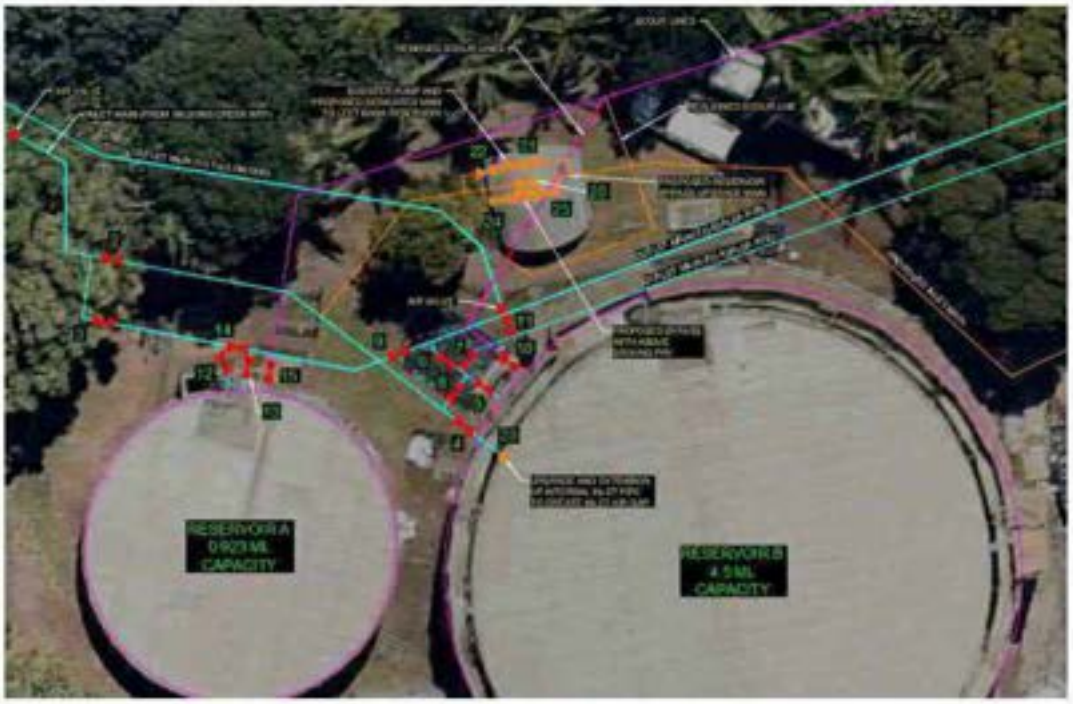


Figure 12 | Recommened Azalea Street Reservoir Bypass Arrangement

6.3 Cost Estimate of Recommended Option

Following the hydraulic analysis, a cost estimate has been undertaken based on the new water infrastructure recommendations. As attached in Appendix D the total estimate for all recommended works is $3.2M which includes a 20% contingency and Goods and Services Tax (GST).

7 Conclusion and Recommendations

7.1 Recommendations

The Mullumbimby Trunk Water Supply Assessment has reviewed the capacity of the existing trunk main in Mullumbimby Road to achieve Council's objectives of a connection to Azalea St reservoir and Left Bank reservoir.

The investigations have determined that should BSC wish to proceed decommissioning of the Mullumbimby Water Treatment Plant that the following works are required:

Table 4 | Summary of new water infrastructure

Description	Location	Size	Length (m)
Potable water trunk pipe	**Section 1:** DN300 main between DN375 RCC main at Pacific Highway and DN250 main at Tandy's Ln/Mullumbimby Rd	DN300	900
	Section 3: Intersection of Manns Rd/Mullumbimby Rd to Azalea St reservoir through Mullumbimby township		3,050
	Azalea St reservoir bypass to booster pump station		40
	Tristran Pde/Left Bank Rd intersection	DN150	20
Booster pump station	Azalea St reservoir	43 m @ 4.5 L/s	N/A

7.2 Scope for future investigations

1. Validation of hydraulic modelling. This shall be performed by installing pressure and flow sensors on the RCC assets to confirm boundary conditions provided by the RCC model are comparable with existing network conditions.
2. BSC to proceed with consultation with RCC for water supply main upgrades in accordance with the Level of Service Agreement between RCC and BSC where RCC shall supply trunk water to the reservoir.
3. BSC proceed with consultation with TfNSW for a new crossing of the rail corridor with the new main on Argyle St.
4. BSC develop a concept design to commence the planning approvals pathway investigations
5. Undertake a preliminary route options analysis (3 or 4 options) through/around Mullumbimby CBD.
6. To support the preliminary route analysis, engage a planning consultant for preliminary planning/environmental/approvals advice. The deliverables shall be a planning pathways letter, identification of project risks and approval timeframes.
7. BSC to discuss ownership of the proposed water supply upgrades and incorporate the project into the BSC (or RCC) capital works program which details both funding and timing of construction of the project to commence.
8. Following the above items, a Detailed Design of Water main upgrades can then be undertaken, including but not limited to:
    - A detailed survey of alignment and potholing at constrained locations.
    - A detailed Review of Environmental Factors of the proposed alignment is also required.

PLANIT
CONSULTING

Appendix A

Hydraulic Water Modelling

TECHNICAL MEMORANDUM

To: Robert Wise

From: Joshua May

CC: David Colledge

Date: 3 February, 2022

Ref: Tandys Lane, Mullumbimby NSW - Potable Water Supply Service Assessment

INTRODUCTION

Byron Shire Council (BSC) has proposed a significant upgrade to the Mullumbimby water supply trunk system, in order to improve the servicing of future development, fire fighting demand, security of supply and prolonged drought conditions. The proposed strategy consists of installing necessary trunk pipe infrastructure, from Rous County Council's (RCC) existing pipe system, located on Tandys Lane, Brunswick Heads NSW, to the Left Bank reservoir, in addition to the potential decommissioning of the Mullumbimby Water Treatment Plant (WTP). Further details of the proposed service strategy are as follows.

- A dedicated DN300 supply main extending west, from RCC's DN375 trunk main along the Pacific Highway, connecting into the existing DN250 trunk main at the intersection of Mullumbimby Road and Tandys Lane.
- A dedicated DN300 supply main extending 3 km, from the existing DN250 trunk main along Mullumbimby Road, from the intersection of Manns Road and Mullumbimby Road, to the Azalea Street reservoirs.
- A booster pump station at the Azalea Street reservoir, using BSC's existing DN200 pipework, extending west along Left Bank Road, to the Left Bank reservoir.

BSC requested a hydraulic modelling analysis of the proposed service strategy, to prove its feasibility and assess the performance against BSC's minimum Design Standards, at both the existing and ultimate planning horizons. H2One Pty Ltd was engaged to undertake this analysis with the outcomes presented in this report.

EXISTING WATER SUPPLY SYSTEM

The potable water supply system for the township of Mullumbimby is serviced by the Mullumbimby WTP, located on Wilson Creek Road, Mullumbimby. The WTP supplies the entire potable water network and all reservoirs servicing Mullumbimby, with an alternative "security of supply" connection to RCC's network, via an existing DN250 along Mullumbimby Road. The DN250 main is connected to RCC's existing DN150 main, located at the intersection of Tandys Lane and Mullumbimby Road, Brunswick Heads.

Note, the existing PRV at this location was not modelled as it shall be relocated as part of any proposed works.

Refer to Appendix 1 and Appendix 2 for RCC's boundary conditions and proposed water supply system upgrades, respectively.

NETWORK DESIGN CRITERIA

The Design Standards of BSC's *Development Design Specification D11 Water Supply, Version 1.9 (2020)* were adopted for the project. Where assessment criteria was not available within BSC's Design Standards, the Water Services Association of Australia (WSAA) *Water Supply Code of Australia, WSA 03* (2011) was assumed. A summary of the relevant provisions is presented in Table 1 below.

Table 1. Design specifications adopted for the analysis

Provision	Specification
Minimum standard flow network pressure	20 m
Maximum standard flow network pressure	78 m
Maximum pipe velocity	3.0 m/s
Maximum head loss	5 m head/km for <=DN150 3 m head/km >=DN200
Minimum fire flow network pressure	12m at the building pad for office and residential buildings not exceeding 25 m in height for fire fighting at peak hour demand
Fire flow at hydrant	11 L/s
Hazen Williams pipe friction co-efficient	<= 150 diameter, 100 >150 <300 diameter, 110 >=300 diameter, 120
Reservoir storage and trunk system capacity	1 x peak day (PD) demand

RESULTS

BSC's latest water supply hydraulic model ("*MERCATO*") was adopted for the hydraulic assessment, with modelling undertaken on the 2016 and 2046 (PD demand) planning horizons. The proposed DN300 pipe extensions were introduced to the model, as described earlier, and allocated a Hazen William pipe roughness coefficient of 110. Flow and pressure boundary conditions, for connection to RCC's existing DN375 main, were obtained from RCC and added to the hydraulic model as a fixed head reservoir. The minimum pressure advised by RCC was approximately 55 m at RL 16.5 m, at 26-46 L/s. This was therefore assumed for all planning horizons.

Note, BSC's original model had the Azalea Street and Left Bank reservoirs simulated as a fixed head reservoir. H2One obtained the reservoir dimensions via Planit Consulting, and adjusted all reservoirs to a variable head reservoir, to allow for dynamic volume and reservoir level modelling to be undertaken. All reservoirs were assumed to have an initial water level of 70%, at midnight, for the hydraulic assessment.

With the WTP decommissioned, the proposed DN300 trunk main extensions and booster pump station "generally" presented sufficient capacity to service the Azalea Street and Left Bank reservoirs, across all planning horizons. *It is noted that the service reservoir known as Azalea Street Reservoir A was treated as being offline during modelling.*

The following changes to BSC's existing pipework, at the intersection of Tristran Parade, were required to service the Left Bank reservoir, via BSC's existing DN250/200 trunk mains.

- Open the closed valve on existing pipe **W-MBY-PWM-1894**.
- Install closed valves on the existing pipes **W000013797** and **W-MBY-TMN-1469**.

- Install a DN150 cross connection between the existing DN150 and DN100 pipes, **W000013797** and **W-MBY-RMN-1470** respectively.

Refer to Appendix 3 for proposed pipe configuration.

BSC's design criteria stipulates that the reservoir/pump capacity should maintain a 1 x PD demand event. Based on RCC's boundary conditions at the existing DN375 trunk main, and a DN250 main extension to the Azalea Street reservoir, the pipeline has an approximate flow capacity of 31 L/s, while the average peak day outflow was 30.5 L/s and 47.5 L/s, at 2016 and 2046 respectively. This means that the pipeline was unable to maintain peak day demands beyond the 2016 planning horizon.

However, even with the hydraulic model simulating the Azalea Street reservoir with an initial water level of 70%, the 2046 planning horizon presented a minimum storage level of 35%, with the reservoir filling after peak hour. This was therefore deemed to be acceptable, as a peak day demand event is rare, and still able to maintain reservoir levels above the Minimum Operating Level (MOL). If BSC would prefer to meet their Design Criteria, and maintain reservoir levels at or above operating levels (e.g. 70-95%), a dedicated DN300 pipeline would be required from the DN375 connection, along the entire alignment to the Azalea Street reservoir.

Note, BSC also requested a sensitivity analysis of the DN250 main extensions mentioned above, using DN300 pipework, with the existing DN250 along Mullumbimby Road in place. This resulted in a flow rate of approximately 39 L/s, at the 2046 (PD demand) planning horizon. While this is an improvement in the flow rate from the proposed DN250 extension, this does not achieve the required 47.5 L/s, at the 2046 planning horizon.

A summary of the proposed trunk infrastructure is presented in Table 2 below. Refer to Appendix 4 for detailed modelling results.

Table 2. Summary of proposed new water supply infrastructure

Description	Location	Size	Length (m)
Potable water trunk pipe	Tandys Ln – Pacific Hwy to Mullumbimby Rd	DN300	900
	Mullumbimby Rd to Azalea St reservoir via Argyle St and Jubilee Ave		3,050
	Azalea St reservoir bypass to booster pump station		40
	Tristran Pde intersection	DN150	20
Booster pump station	Azalea St reservoir	43 m @ 4.5 L/s	N/A

Note: The proposed Azalea St booster pump was based on a surface level of RL 49 m, Azalea St reservoir at MOL (15%) and Left Bank reservoir at TWL (95%).

The sizing of above infrastructure was based on the existing demands and water supply zones presented in BSC's hydraulic model. Changes to these model inputs would therefore have an impact on the size/feasibility of the proposed service strategy, in particular, the booster pump and pipeline between Azalea Street reservoir and Left Bank reservoir.

Modelling showed that Council could have the proposed booster pump station serviced directly from the proposed DN300 trunk pipe servicing the Azalea Street reservoir, or from a separate pipe outlet from the Azalea Street reservoir. It is recommended however that Council installs the booster pumps with a connection to both the outlet of the Azalea Street reservoir, and a closed bypass from the proposed DN300 trunk pipeline. This allows for operational and maintenance flexibility for the tank/trunk system, where the booster pumps could draw water from either the Azalea Street reservoir or upstream DN300 pipeline.

Note a supplementary analysis was undertaken with a dedicated DN250 supply main or a DN150 supply main (with a larger booster pump) from the booster pump station to the Left Bank reservoir. This servicing option complied with BSC's design standards, however this was disregarded as the existing DN200 pipework can supply the reservoir with minimal infrastructure upgrades required *to BSC's water supply network.*

In summary, the results presented in this report demonstrate that, theoretically, the proposed service strategy "generally" has sufficient capacity to meet BSC's minimum design standards, across all planning horizons. It is recommended the results presented in this report are verified by both BSC and RCC, including review of available SCADA/field records, a capacity assessment of RCC's upstream trunk network, and a flow and pressure test at the proposed DN375 connection point, to confirm the boundary conditions provided by RCC. All infrastructure sizing should be confirmed at the detailed design stage of the project.

Yours Sincerely,

Joshua May
BEng (hon) RPEQ
Principal Water Supply and Sewer Planning Engineer
H2One Pty Ltd

E JoshuaMay@H2One.com.au
P 0423 264 390
W h2one.com.au

PO Box 290 Ipswich, QLD 4305

Appendix 1. Rous County Council - DN375 Trunk Main Boundary Conditions

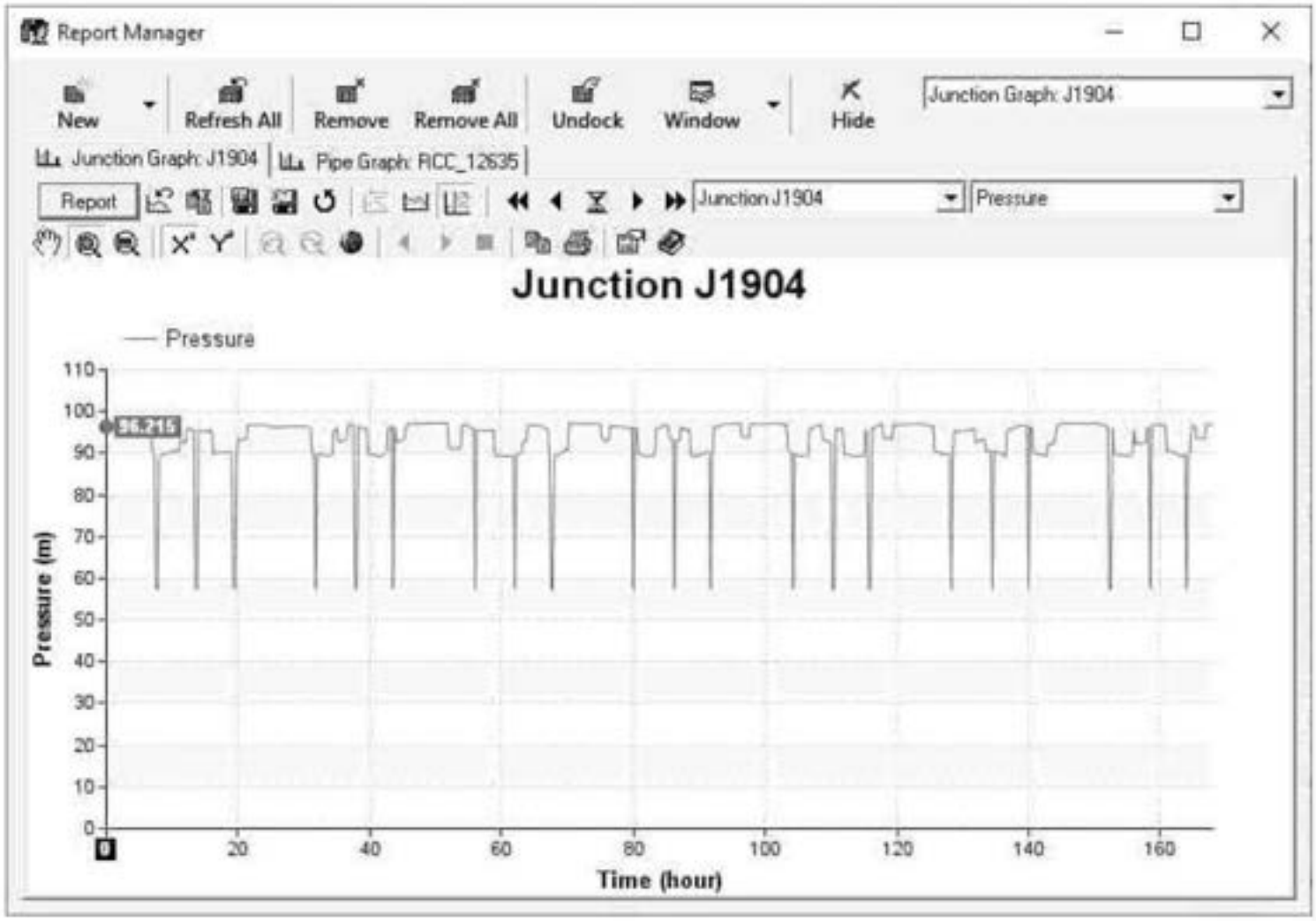
From: Samuel Curran <Samuel.Curran@rous.nsw.gov.au>
Sent: Friday, 24 September 2021 10:37 AM
To: Rob Wise <rob@planitconsulting.com.au>
Cc: Simon Millichamp <SimonM@planitconsulting.com.au>
Subject: RE: Modelling Requests - Tandy's Lane

Hi Rob,

Feast your eyes on these…

Please note these outputs are from our model run under average day conditions. Under peak day conditions the pressure drop to about 55-58m would likely be the same but would occur much more often, particularly in the 2046 scenario.
So 55m is probably your design minimum pressure. These pressure are based on a takeoff elevation point of 16.5mAHD

Pressure at new takeoff our 375mm pipe at 26L/s (note pressure drops when our pipe is feeding Brunswick Heads reservoirs)

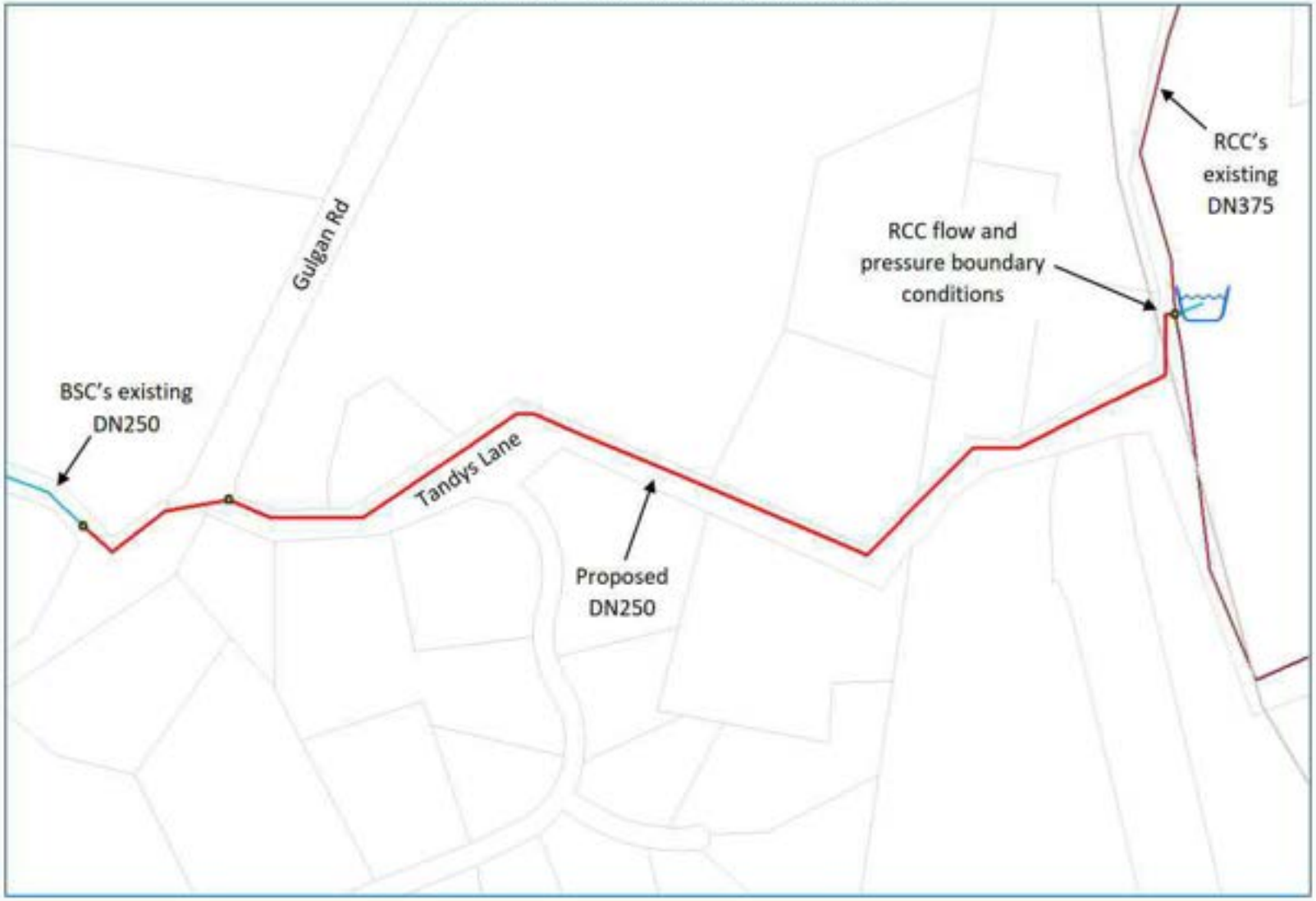


Pressure at new takeoff our 375mm pipe at 46L/s (note pressure drops when our pipe is feeding Brunswick Heads reservoirs)

Samuel Curran
Planning & Development Engineer
Rous County Council
PO Box: 230, Level 4, 218-232 Molesworth Street LISMORE NSW 2480 | 02 6623 3800 | 0407 858 409 | Samuel.Curran@rous.nsw.gov.au |

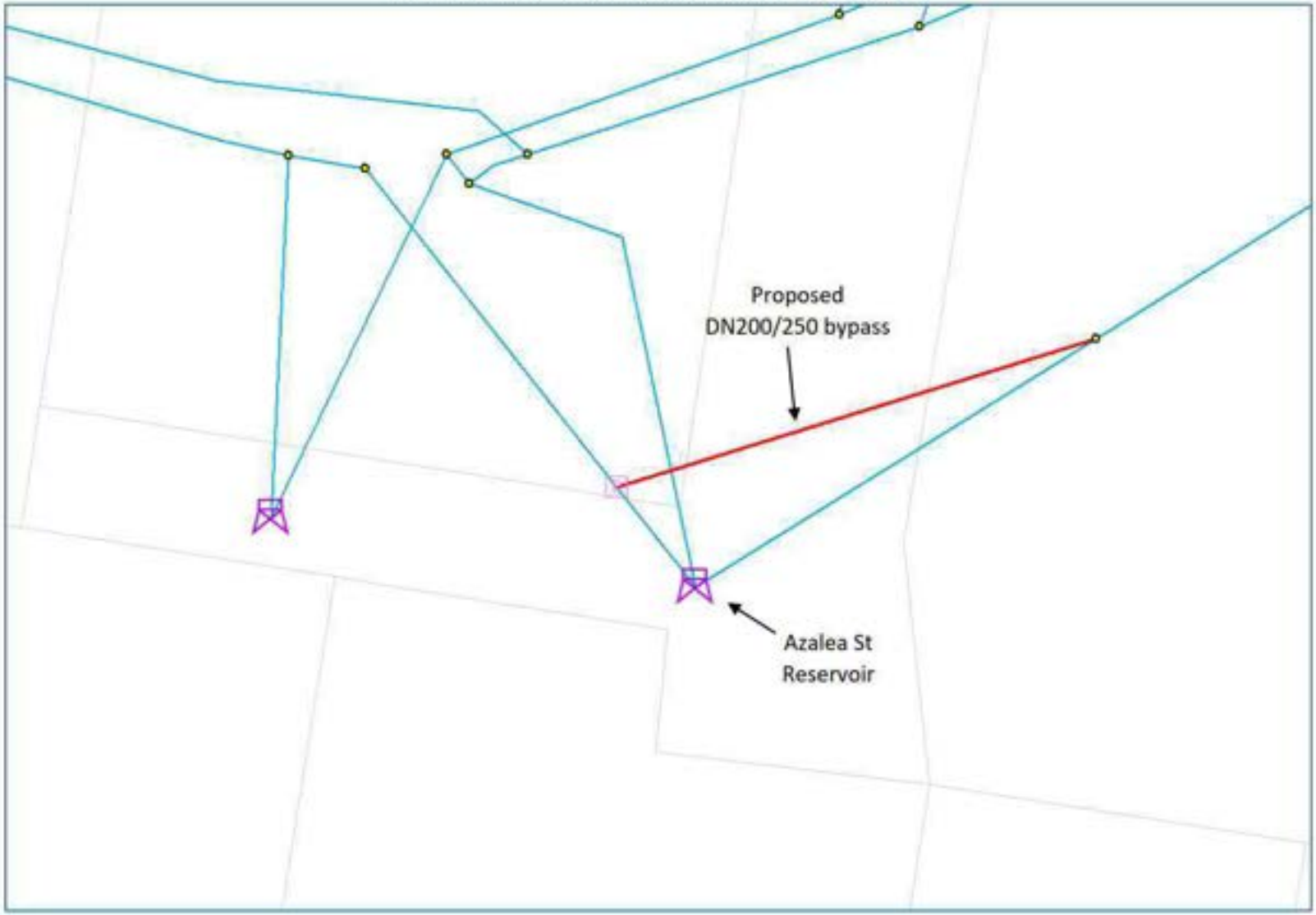
Appendix 2. Potable water supply model layout and proposed upgrades

Proposed DN250 - Tandys Lane, Brunswick Heads NSW



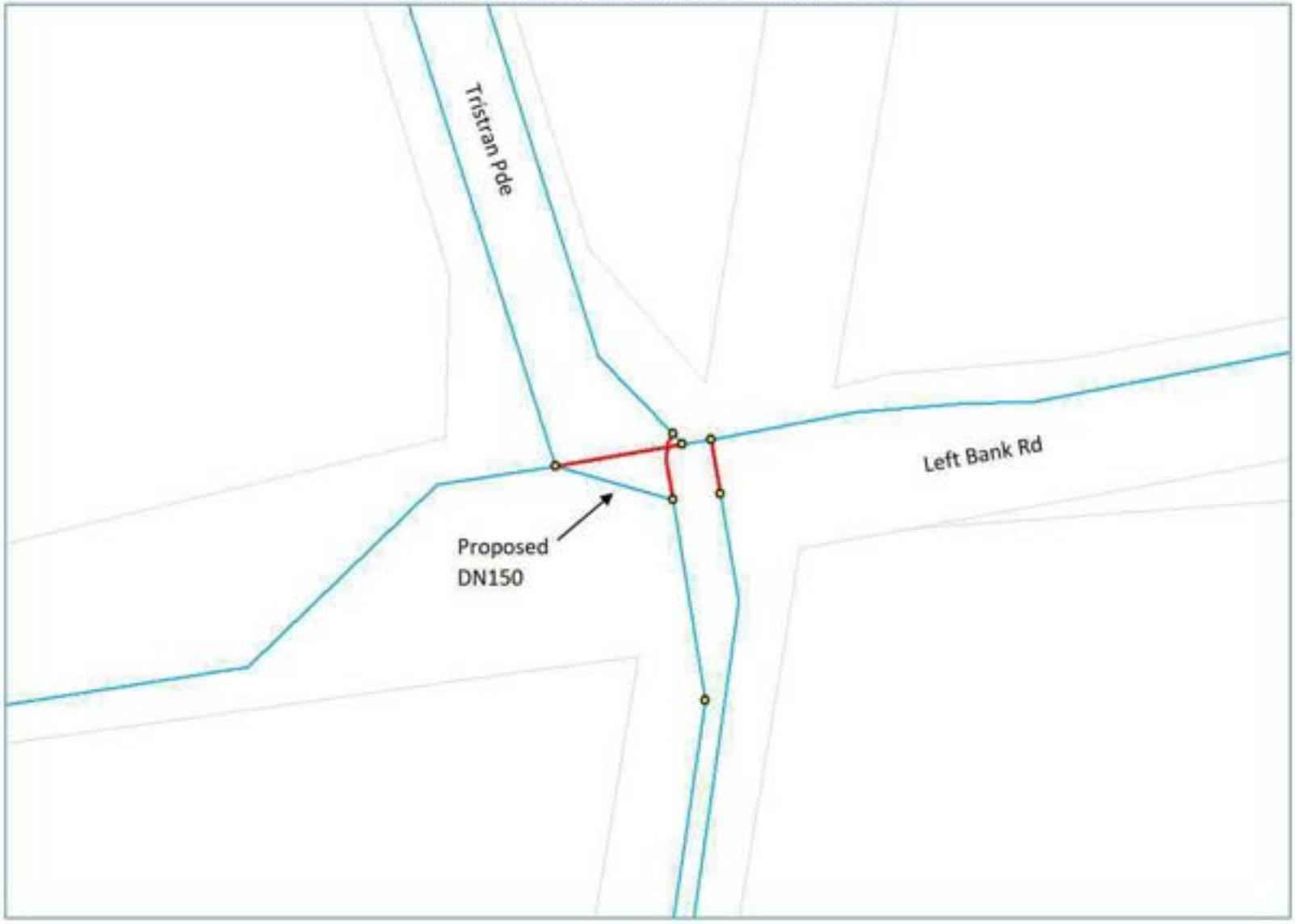
Proposed DN250 - Azalea St Reservoir Dedicated Supply Main

Proposed DN250 – Closed Bypass of Azalea Street Reservoir



Appendix 3. Proposed pipe configuration

Proposed Changes to Existing Network - Tristran Parade

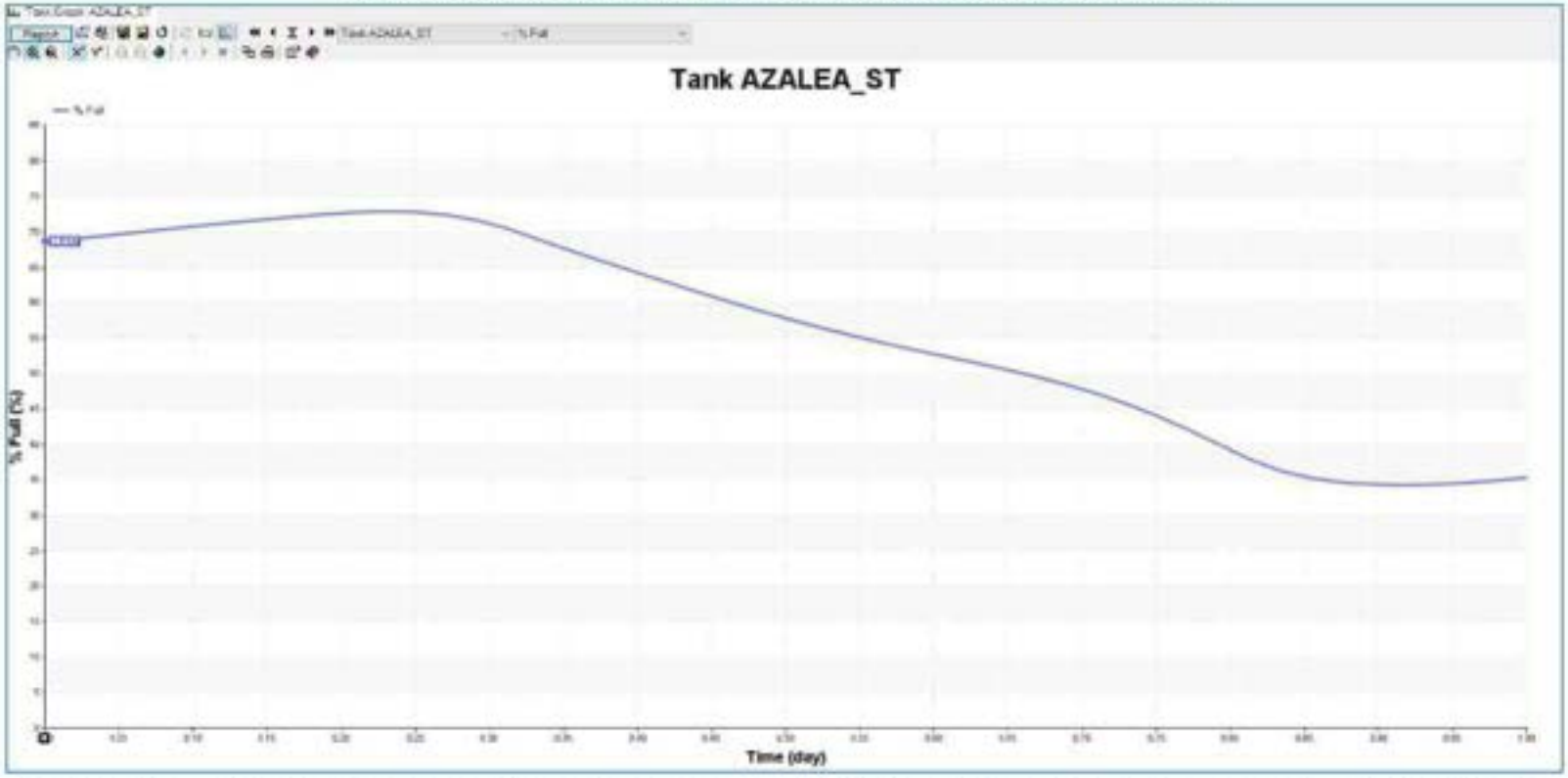


Appendix 4. Modelling results for reservoirs and pumps (2046)

Location	ID	Diameter (DN)	HW Co-efficient	Length (m)	SF PH Flow Rate (L/s)	SF PH Velocity (m/s)	SF PH Head Loss (m/km)
Tandys Ln	P51	250	110	790.3	33.5	0.7	2.8
	P53	250	110	103.9	33.5	0.7	2.8
Azalea St, Reservoir Feed	P15	250	110	39.8	33.5	0.7	2.8
	P17	250	110	1,026.7	33.5	0.7	2.8
	P19	250	110	1,466.4	33.5	0.7	2.8
	P49	250	110	515.4	33.5	0.7	2.8
Azalea St, Reservoir bypass	P77	250	110	42.4	4.6	0.1	0.1
Azalea St to Left Bank	MULLUMBIMBY_B_CHK	200	110	6.6	4.6	0.1	0.0
	P43	200	110	215.8	4.6	0.1	0.0
	P73	250	110	10.8	4.6	0.1	0.0
	P75	250	110	34.3	4.6	0.1	0.0
	W-MBY-PWM-1894	200	110	1.0	4.6	0.1	0.0
	W-MBY-TMN-0200	200	110	497.3	4.6	0.1	0.1
	W-MBY-TMN-1287	200	110	661.3	3.4	0.1	0.1
	W-MBY-TMN-1471	200	110	474.6	4.6	0.1	0.1
	W-MBY-TMN-1472	200	110	4.1	4.6	0.1	0.0
	W-MBY-TMN-1474	200	110	538.1	4.6	0.1	0.1

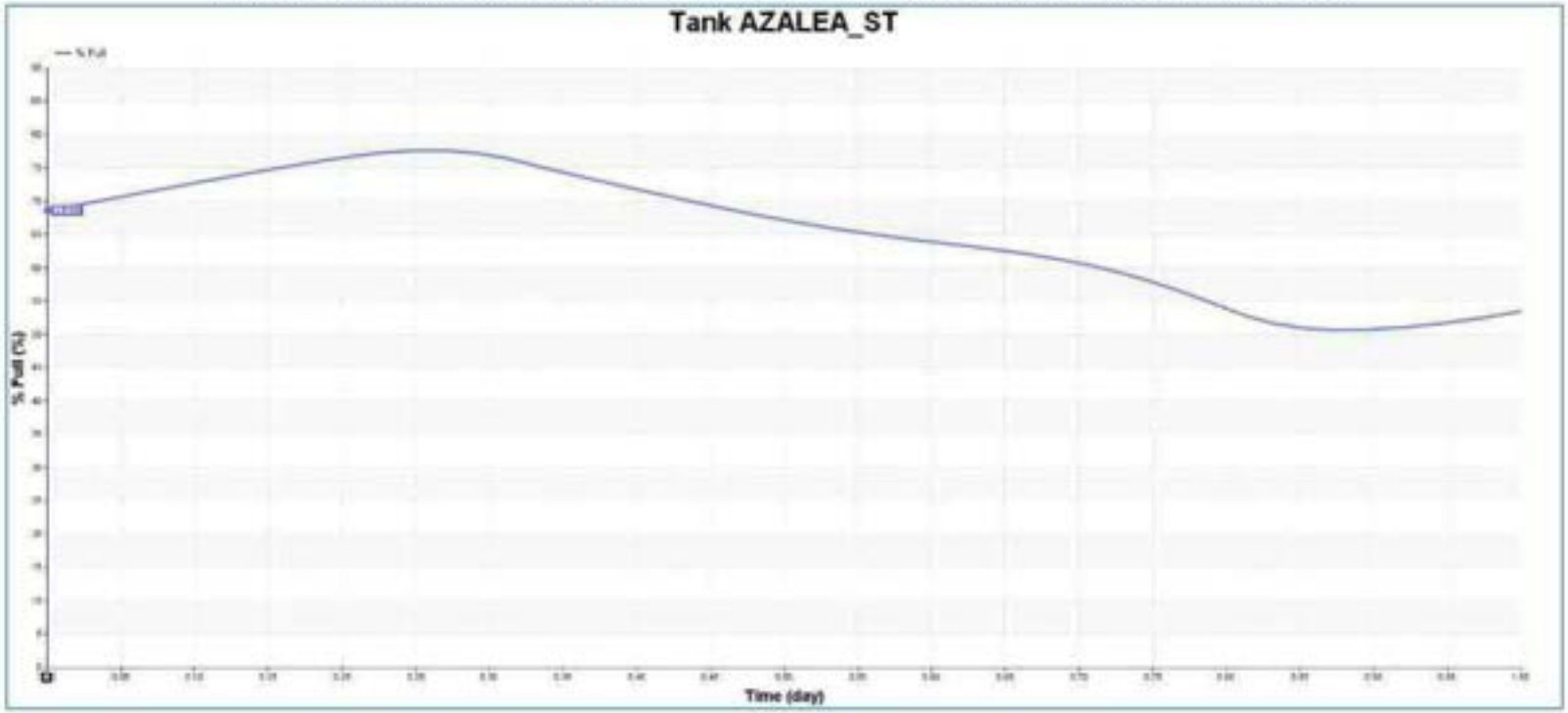
Note: "SF" = "standard flow", "PH" = "peak hour" and "HW" = "Hazen-Williams".

Azalea St Reservoir Water Level Profile - With Proposed DN250 Supply Main (2046)



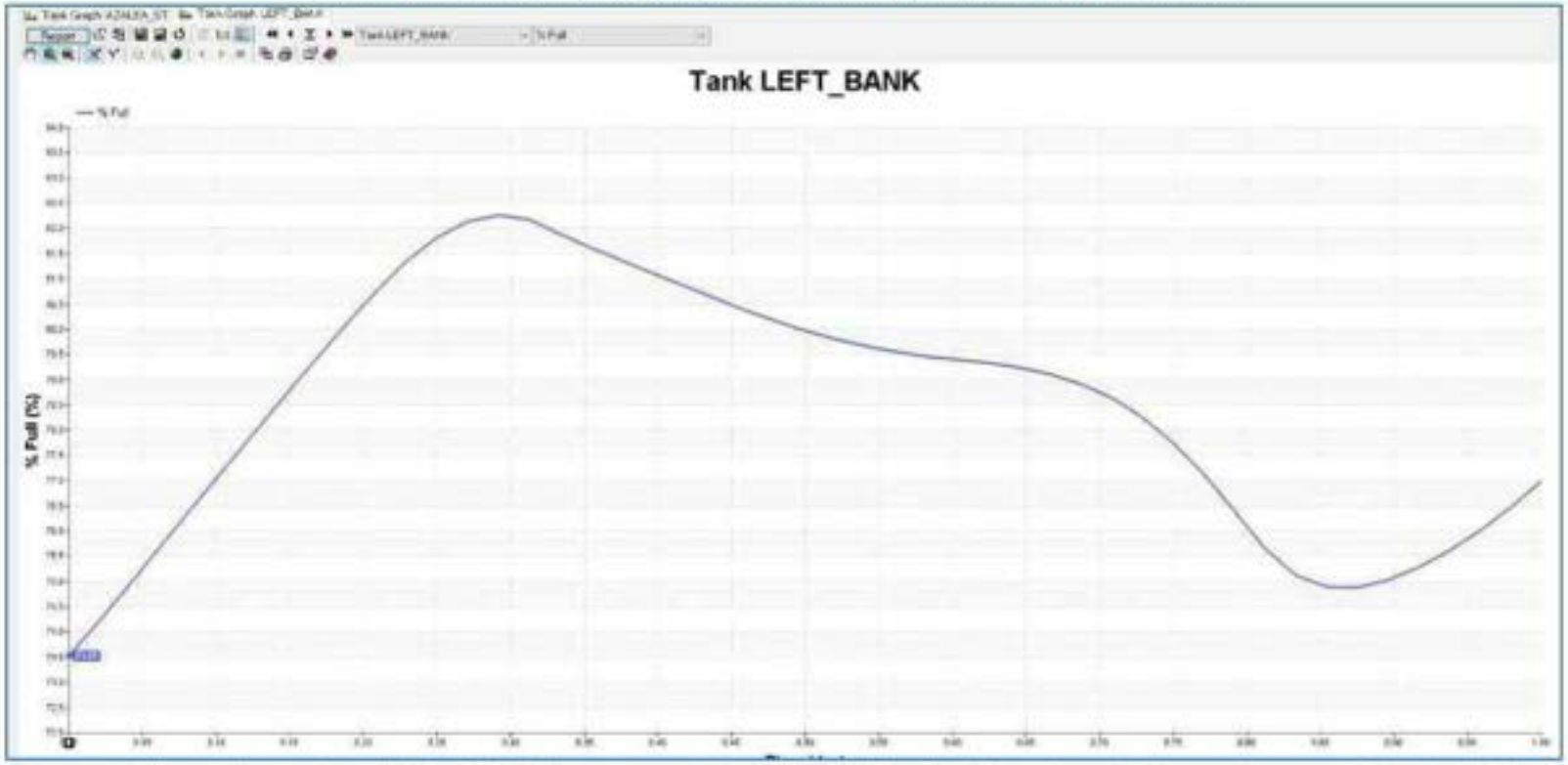
Note: Modelling results were almost identical with the booster pumps drawing supply either directly from the Azalea St reservoir or proposed DN250 pipeline.

Azalea St Reservoir Water Level Profile - With Proposed DN300 Supply Main, Sensitivity Analysis (2046)



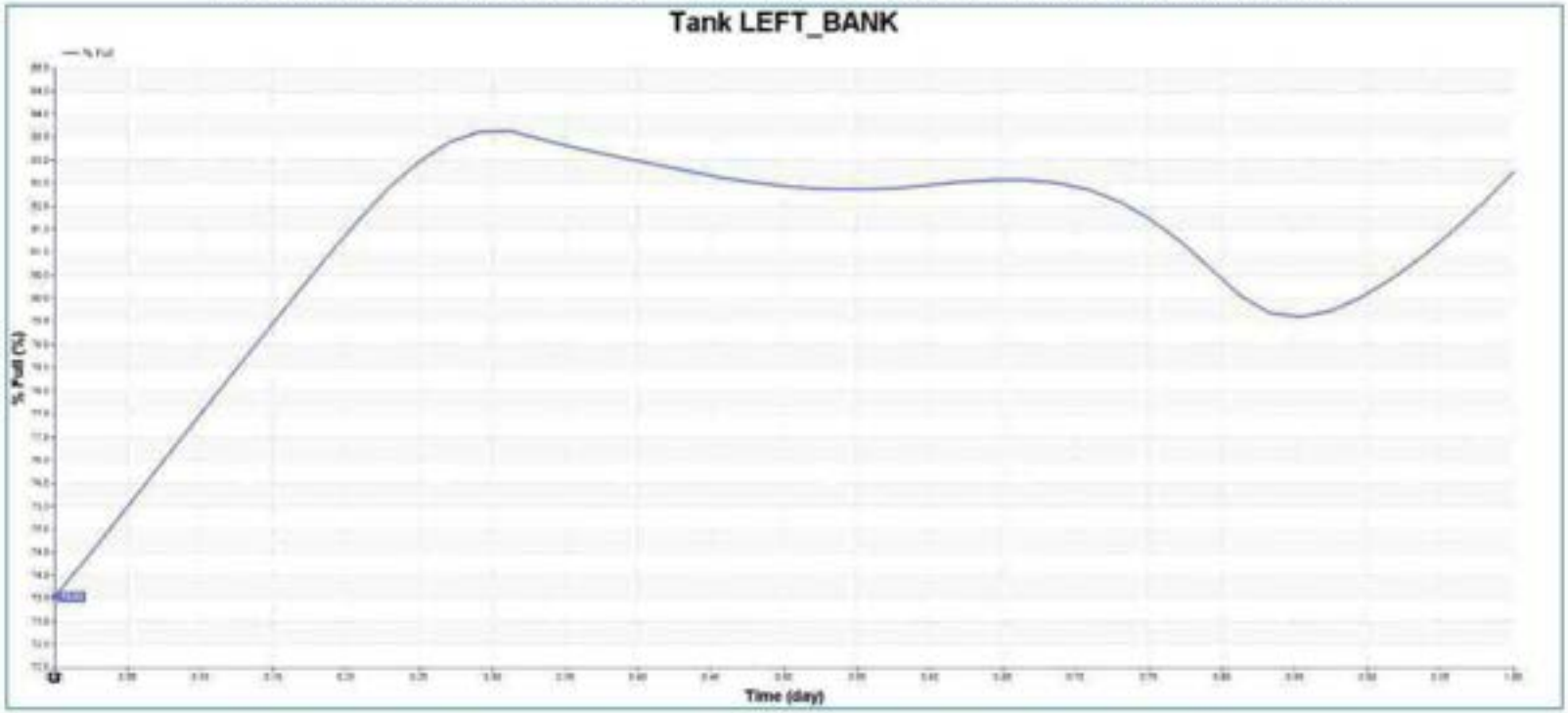
Note: Results above show the Azalea St reservoir level with the proposed pipe extensions as DN300 pipework.

Left Bank Reservoir Water Level Profile - With Existing DN250/200 Supply Main (2046)



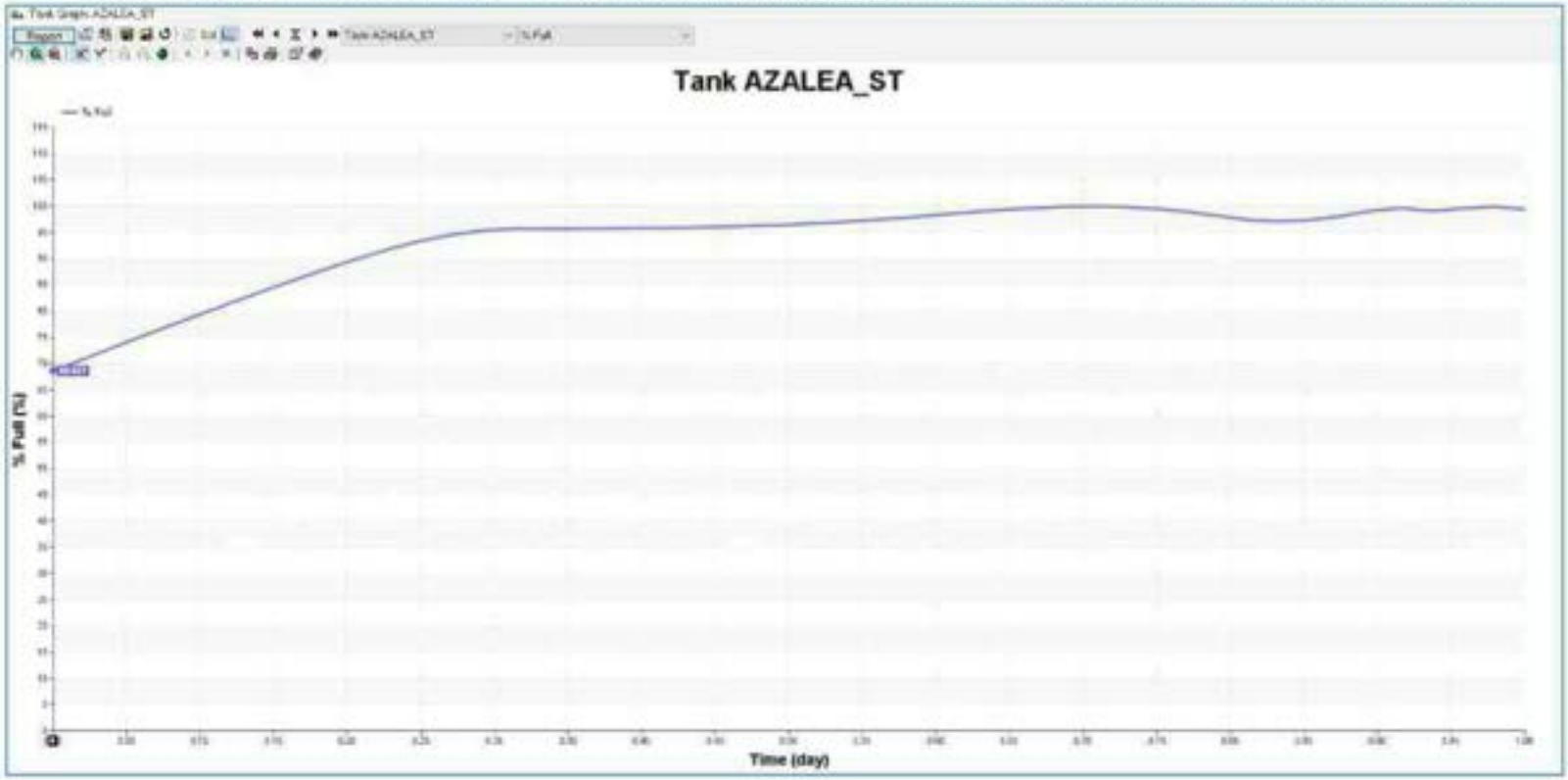
Note: Modelling results were almost identical with the booster pumps drawing supply either directly from the Azalea St reservoir or proposed DN250 pipeline.

Left Bank Reservoir Water Level Profile - With Proposed DN300 Supply Main, Sensitivity Analysis (2046)

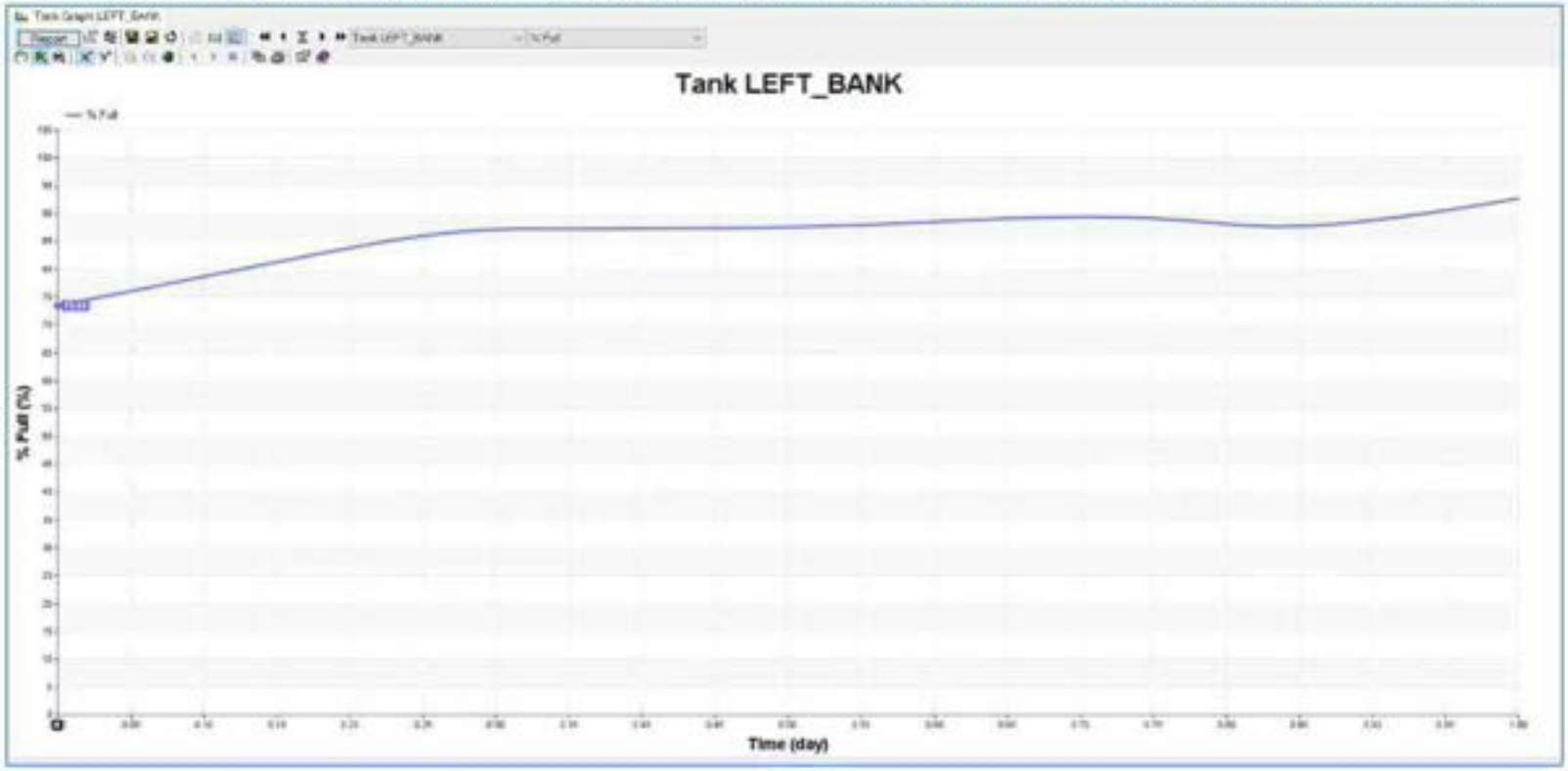


Note: Results above show the Left Bank reservoir level with the proposed pipe extensions modelled as DN300 pipework.

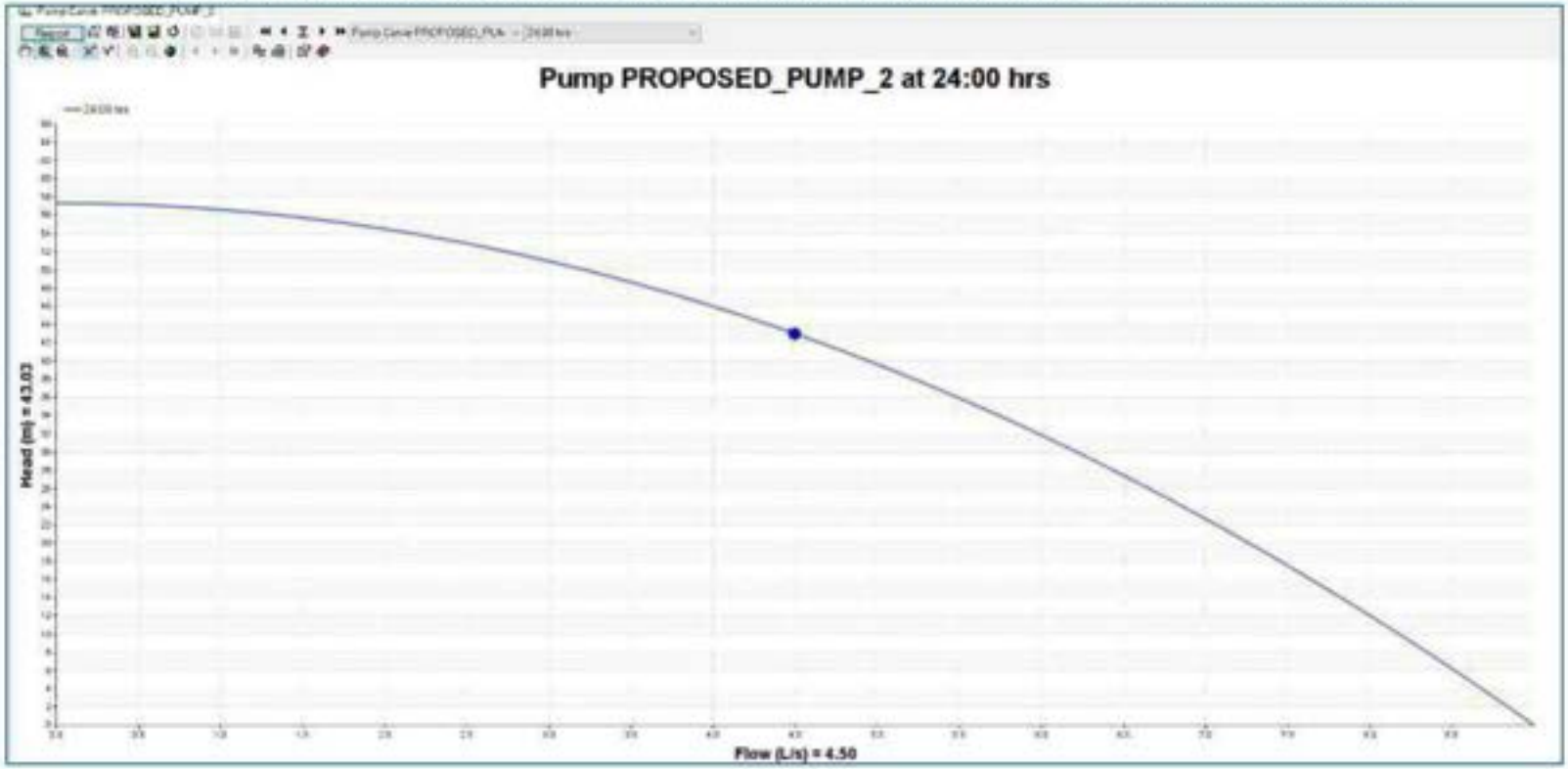
Azalea St Reservoir Water Level Profile - With Proposed DN300 Supply Main from DN375 Connection to Azalea St Reservoir (2046)



Left Bank Reservoir Water Level Profile - With Proposed DN300 Supply Main from DN375 Connection to Azalea St Reservoir (2046)



Proposed Booster Pump Duty Point - With Existing DN250/200 from Azalea St Reservoir to Left Bank Reservoir (2046)



Appendix B

Preliminary Design Drawings

N

LEFT BANK RESERVOIR

AZALEA STREET RESERVOIRS

EXISTING 200mm MAIN

PROPOSED 300mm MAIN

EXISTING 375mm MAIN

EXISTING 250mm MAIN

PROPOSED 300mm MAIN

LEGEND

PROPOSED MAINS

EXISTING MAINS

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	12/11/21	RW	RW	SM	SM
B	PRELIMINARY ISSUE	23/02/22	RW	RW	SM	SM

SCALES: 0 100 200 400 800

Full Size 1:10000 ; Half Size 1:20000

Scale (m)

DO NOT SCALE FROM DRAWING

DRAWN BY: R. WISE

DESIGN BY: R. WISE

APPROVED BY:

DATE:

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED

PLANIT CONSULTING
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PO BOX 161
LENNOX HEAD NSW 2478

TELEPHONE: 02 6687 4666
ABN: 20 099 261 711
EMAIL: administration@planitconsulting.com.au

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK WATER SUPPLY

DRAWING TITLE: CONCEPT WATER MAIN UPGRADE LAYOUT

ORIGINAL SIZE	PLANIT JOB No.	DRAWING No.	REV
A1	J7232	0001	B

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	12/11/21	RW	RW	SM	SM
B	PRELIMINARY ISSUE	23/02/22	RW	RW	SM	SM

SCALES:
0 10 20 40 80
Full Size 1:1000 : Half Size 1:2000
Scale (m)

DO NOT SCALE FROM DRAWING

DRAWN BY: R. WISE
DESIGN BY: R. WISE
APPROVED BY:
DATE:
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EMAIL: administration@planitconsulting.com.au

CLIENT:
BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK WATER SUPPLY

DRAWING TITLE:
PROPOSED RCC TRUNK SUPPLY UPGRADES

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.	REV.
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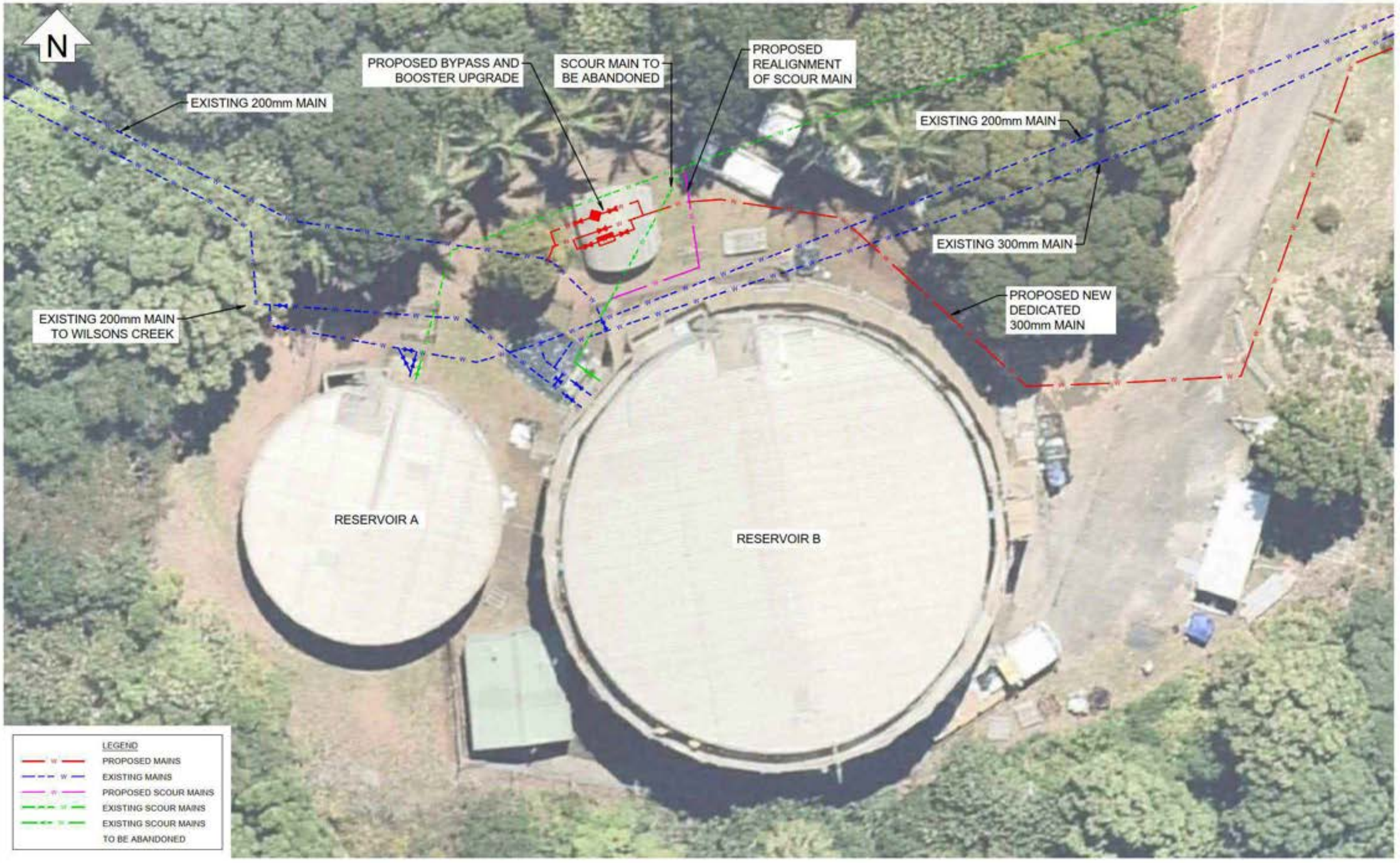

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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B	PRELIMINARY ISSUE	23/02/22	RW	RW	SM	SM

SCALES:
0 1 2 4 8
Full Size 1:100 ; Half Size 1:200
Scale (m)

DO NOT SCALE FROM DRAWING

DRAWN BY: R. WISE
DESIGN BY: R. WISE
APPROVED BY:
DATE:
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED

PLANIT CONSULTING
SUITE 9A, 80-84 BALLINA STREET
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CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK WATER SUPPLY

DRAWING TITLE: AZALEA ST RESERVOIR BYPASS UPGRADES

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7232	0003	B

CAD FILE: I:\J7232 - MULLUMBIMBY TRUNK WATER MAIN ASSESSMENT\7 - ENGINEERING\7.4 DRAFTING\MULLUMBIMBY TRUNK MAIN ASSESSMENT DWG PLOTTED BY: ROB WISE PLOT DATE: 23/02/2022 4:03:04 PM

N

EXISTING 200mm MAIN

EXISTING BOUNDARY VALVES

EXISTING SLUICE VALVE

EXISTING SLUICE VALVE

NEW SLUICE VALVE

NEW DN150 MAIN

DN200 MAIN TO BE ABANDONED

DN150 MAIN TO WILSONS CREEK

LEGEND

PROPOSED MAINS

EXISTING MAINS

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	11/02/22	RW	RW	SM	SM
B	PRELIMINARY ISSUE	23/02/22	RW	RW	SM	SM

SCALES: 0 5 10 20 30 — Full Size 1:500 ; Half Size 1:1000 Scale (m)

DO NOT SCALE FROM DRAWING

DRAWN BY: R. WISE

DESIGN BY: R. WISE

APPROVED BY:

DATE:

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS ISSUED AS APPROVED

PLANIT CONSULTING
SUITE 9A, 80-84 BALLINA STREET
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TELEPHONE: 02 6687 4666
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EMAIL: administration@planitconsulting.com.au

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK WATER SUPPLY

DRAWING TITLE: CONCEPT WATER MAIN UPGRADE TRISTRAN PDE / LEFT BANK RD INTERSECTION

ORIGINAL SIZE	PLANIT JOB No.	DRAWING No.	REV.
A1	J7232	0004	B

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Appendix C

Recommended Booster Pump Station Specifications

LOWARA
a xylem brand

GHV20/15SV04F040T/4

Technical data

Company name
Contact
Phone number
e-mail address

Operating data

1	Pumpe type	Single-/Multi-pump set		Fluid			Water, pure
2	No. of pumps / Reserve		4 / 1	Operating temperature t A		°C	4
3	Nominal flow	l/s	4.5	pH-value at t A			7
4	Nominal head	m	44	Density at t A		kg/m³	1000
5	Static head	m	43	Kin. viscosity at t A		mm²/s	1.569
6	Inlet pressure	kPa	0	Vapor pressure at t A		kPa	100
7	Environmental temperature	°C	20	Solids			0
8	Available system NPSH	m	0	Altitude		m	0

Pump data

9	Pump designation				Max.	mm	105	
10	GHV20/15SV04F040T/4			Impeller Ø	designed	mm	105	
11	Design	Variable speed sets			Min.	mm	105	
12	Make				Nominal	l/s	4.9	(4.9)
13				Flow	Max-	l/s	6.7	
14	Speed	rpm	2900		Min-	l/s		
15					Nominal	m	44.2	
16	Max. working pressure	kPa	572.7	Head	at Qmax	m	28.7	
17	Head H(Q=0)	m	58.4		at Qmin	m	58.4	
18	Weight	kg	On demand	Shaft power		kW	2.9	(2.9)
19	Weight data include external package			Max. shaft power		kW	3	
20	NPSH 3%	m	1.7	Efficiency		%	73.53	

Materials

21	Manifolds	Stainless steel, 1.4301, AISI 304
22	BRACKET	Galvanized steel/painted steel
23	Non-return valves	Brass
24	Pressure switches	Galvanized steel/AISI 301
25	Pressure trasmitters	AISI 304L & AISI 316L
26	Caps/plugs	AISI 304 or superior
27	Sliding/Blind flanges	Galvanized steel
28	Welded flanges	Stainless steel, 1.4301, AISI 304
29	Fittings	Stainless steel, 1.4401, AISI 316
30	On-off valves ball type	Nickel-plated brass
31	Base	Painted steel
32		

Motor data

Manufacturer	Lowara		
Specific design	IE3 Three phase surface motor		
Type	PLM112 /340 E3		
Rated power	4 kW	Electric current	7.7 A
Speed	2885 rpm	Electric voltage	380 V
Frame size	112	Insulation class	F
Weight	29 kg	Degree of protection	IP 55
RAL 5010			

Standard options

33	Non return valve position		Non return valve in delivery side
34	Set certificate		
35	Hydrovar model	/4	3~ 400V HVL 4.040
36	Control panel power supply	/4	Three-phase, 3 x 400 V
37	Additional Card		No card
38	Material Combination		GHV 3-22 SV Standard materials
39	Control Panel Clean Contacts		Standard
40	Protection Against Dry Running		Without protection against dry running
41	High pressure protection		Without high pressure protection on delivery
42	Suction side		Standard suction
43	Delivery Side		Standard delivery
44	Pump Test		Set without certified pumps
45	Control Panel		Standard
46	Control Panel Position		Standard position
47	Control Panel Protection Degree		Standard

Remarks

LOWARA
a xylem brand

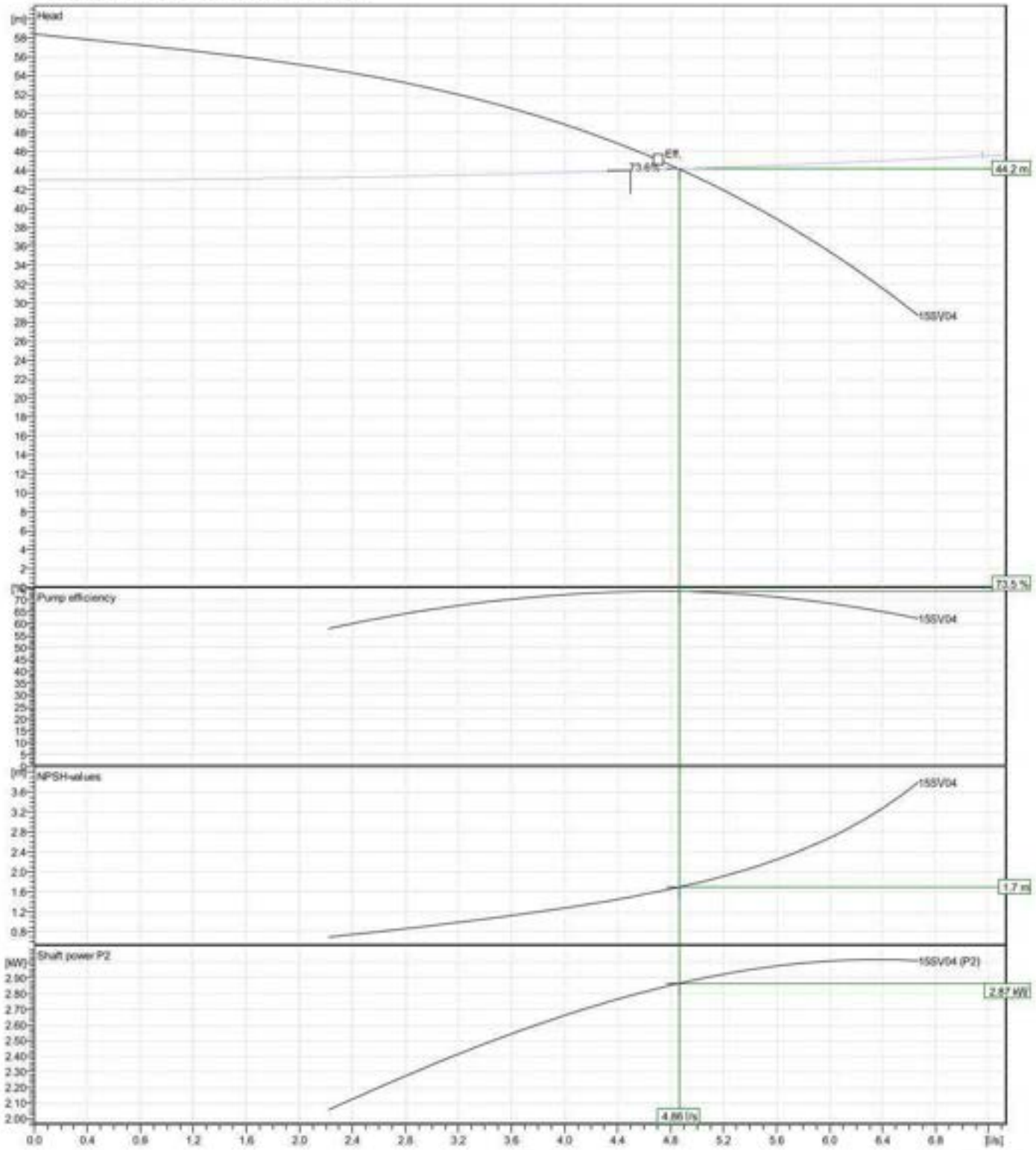
GHV20/15SV04F040T/4

Performance curve

Company name
Contact
Phone number
e-mail address

Operating Data Specification		Hydraulic data (duty point)		Impeller design	
Flow	4.5 l/s	Flow	4.86 l/s	Impeller R	105 mm
Head	44 m	Head	44.2 m	Frequency	50 Hz
Static head	43 m	MEI: >=0,70 - according to Ecodesign Directive 2009/125/EC and Regulation (EU) No 547/2012		Speed	2900 rpm

Power datas referced to:
Water, pure [100%] ; 4°C; 1000kg/m³; 1.57mm²/s
Performance according to ISO 9906:2012 – Grade 3B



Project		Created by		Last update	11/10/2021
Block	GHV20/15SV04F040T/4	Created on	11/10/2021		

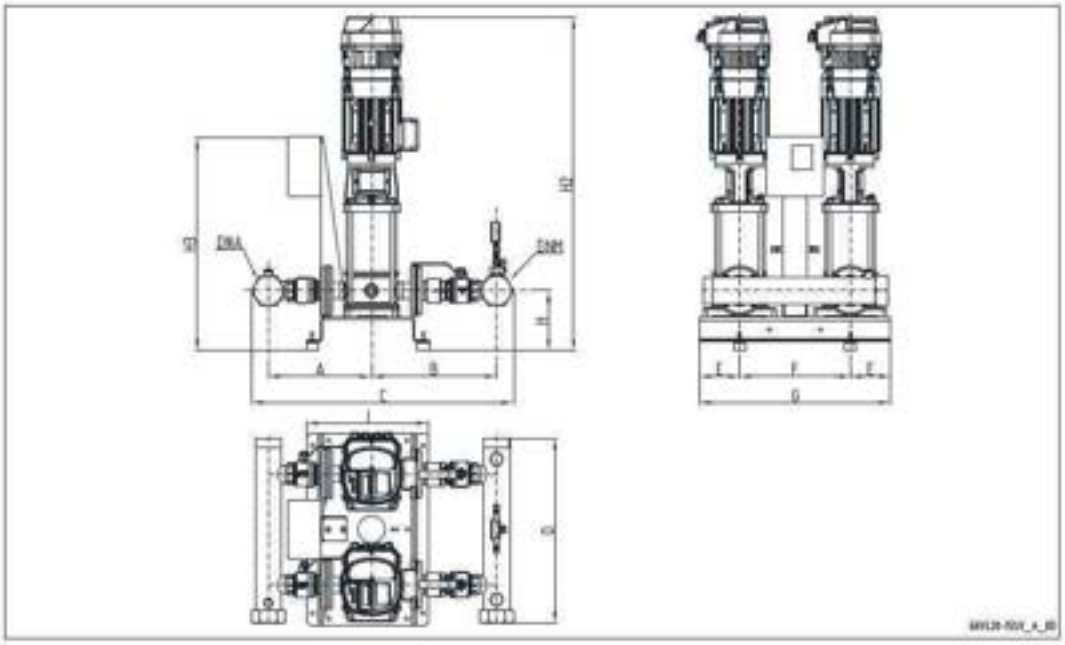
Program version: 8.0.0 - 08/10/2021 (Build 225)
Data version: 03/11/2021 16:37
User group(s): Xylem Australia - EST

LOWARA
a xylem brand

GHV20/15SV04F040T/4

Dimensions

Company name
Contact
Phone number
e-mail address



PLEASE NOTE:

Dimensions mm

A	344.5	H	200			Weight (include external package)
B	417.5	H2	1114			On demand kg
C	851	H3	748			
D	610	I	406			
DNA	R 3"					
DNM	R 3"					
E	135					
F	370					
G	640					

Project **Created by** **Last update** 11/10/2021
Block GHV20/15SV04F040T/4 **Created on** 11/10/2021

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Appendix D

Cost Estimate

Mullumbimby Trunk Water Supply Project - Mullumbimby, NSW (Byron Shire Council)
Cost Estimate

Item	Description	Quantity	Unit	Rate	Total	Comments
1.0 Design, Approvals and Project Management Services						
1.01	Consultation with Rous County Council	1	Item	$ 2,400.00	$ 2,400.00	
1.02	Consultation with TfNSW (and rail corridor manager – United Group) and APA for crossing of electrical mains	1	Item	$ 2,400.00	$ 2,400.00	
1.03	Planning and Approval Process including Planning Pathways and Review of Envrionmental Factors	1	Item	$ 12,800.00	$ 12,800.00	
1.04	Options assessment of water main alignment + Summary Report	1	Item	$ 3,500.00	$ 3,500.00	
1.05	Concept Design of Water Main Works	1	Item	$ 5,000.00	$ 5,000.00	
1.06	Detailed field survey of alignment	1	Item	$ 19,500.00	$ 19,500.00	
1.07	Underground Services Location Surveying	1	Item	$ 10,000.00	$ 10,000.00	
1.08	Detailed Design of Water Main Works and associated reporting	1	Item	$ 60,000.00	$ 60,000.00	
1.09	Prepare and obtain Traffic Control Plan approvals.	1	Item	$ 5,000.00	$ 5,000.00	
1.10	Tender Assessment	1	Item	$ 10,000.00	$ 10,000.00	
1.11	Works-As-Executed Drawings	1	Item	$ 5,000.00	$ 5,000.00	
				Subtotal	**$ 135,600.00**	
2.0 GENERAL						
2.01	Site establishment, demobilisation and clean up - includes site security fencing, signage, safety items etc	1	Item	$ 23,855.70	$ 23,855.70	Assumed 1% of total construction cost
2.02	Site establishment and implementation of environmental management controls, including tree and vegetation protection requirements, sediment and erosion controls and other requirements. Includes inductions, pre-start meeting with Council - PROVISIONAL ITEM	1	Item	$ 23,855.70	$ 23,855.70	Assumed 1% of total construction cost
2.03	Construction Project management, incl program, meetings etc	1	Item	$ 35,000.00	$ 35,000.00	
2.04	Management Plans including construction methodology (CEMP, WHS Plan, Quality Plan, ITPs, SWMS, etc.)	1	Item	$ 5,963.93	$ 5,963.93	Assumed 0.25% of total construction cost
2.05	During works implement, maintain and update as required all traffic management and control measures.	1	Item	$ 45,000.00	$ 45,000.00	
2.06	Provision of Work As Executed (WAE) documentation to Byron Shire Council specification requirements (Including but not limited to: WAE pick up by registered surveyor, provision of signed WAE drawings (3d DWG or DWF format and PDF), red pen mark-ups of contract drawings, certifications, records and manuals).	1	Item	$ 10,000.00	$ 10,000.00	
				Subtotal	**$ 143,675.33**	
3.0 Roads and Earthworks						
3.01	Reinstatement of roads from trenching, including compaction, compaction testing and all other testing.	1	Item	$ 45,000.00	$ 45,000.00	
				Subtotal	**$ 45,000.00**	
4.0 Potable Water Main Installation						
Pacific Highway to Tandy's Lane						
4.01	Supply, Lay, Install and backfill (including driveway reinstatement) 250mm DICL pipe via trenching inclusive of all bends, fittings, air valves, scour valves and thrust blocks. [To include 1xDN375xDN300 tee and 1xDN300xDN250 reducer]	790	m	$ 580.00	$ 458,200.00	
Manns Road/Mullumbmby Road to Azalea St Reservoir						
4.02	Supply, Lay, Install and backfill (including driveway reinstatement) 250mm DICL pipe via trenching inclusive of all bends, fittings, air valves, scour valves and thrust blocks. [To include 1xDN250xDN300 reducer]	3,046	m	$ 580.00	$ 1,766,680.00	
Azalea Street Reservoir Bypass						
4.03	Supply, Lay, Install and backfill (including driveway reinstatement) 250mm DICL pipe via trenching inclusive of all bends, fittings, air valves, scour valves and thrust blocks. [To include 1xDN300xDN200 tee]	40	m	$ 580.00	$ 23,200.00	
4.04	Supply, Lay and Install DN300xDN300 tee	4	Item	$ 1,500.00	$ 6,000.00	
4.05	Supply, Lay and Install sluice valves for bypass	5	Item	$ 884.00	$ 4,420.00	
4.06	Supply, Lay and Install Booster Pump + Standby booster pump (44m @ 6L/s)	1	Item	$ 18,070.00	$ 18,070.00	
4.07	Supply and construct Booster Pump Station Control Shed	1	Item	$ 15,000.00	$ 15,000.00	
4.08	Supply, Lay and Install DN300 Pressure Reducing Valve	1	Item	$ 7,500.00	$ 7,500.00	
Tristran Parade Intersection						
4.09	Supply, Lay, Install and backfill (including driveway and pavement reinstatement) 150mm DICL pipe via trenching inclusive of all bends, fittings, air valves, scour valves and thrust blocks. [To include 1xDN100xDN150 Tee and 1xDN150xDN150 Tee	20	m	$ 1,200.00	$ 24,000.00	
4.10	Supply, Lay and Install flanged boundary valve to existing 150mm DICL main in Left Bank Road	1	Item	$ 2,500.00	$ 2,500.00	
				Subtotal	**$ 2,325,570.00**	
5.0 Miscellaneous						
5.01	Pressure testing of all mains.	1	Item	$ 15,000.00	$ 15,000.00	
				Subtotal	**$ 15,000.00**	
TOTAL (EXCL GST)					**$ 2,664,845.33**	
Contingency					**$ 532,969.07**	
				TOTAL (EXCL GST)	**$ 3,197,814.39**	

Appendix C – Biodiversity Assessment Report

PLANIT CONSULTING

Biodiversity Assessment Report

Mullumbimby Trunk Water Main

Prepared for Byron Shire Council
By Planit Consulting Pty Ltd

V2 - June 2024
Job No: J7708A

Company Details

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Website	www.planitconsulting.com.au

Document Control

Document	J7708A-Biodiversity Assessment-V1.docx
Project Name	Mullumbimby Trunk Water Main
Client	Byron Shire Council
Planit Reference	J7708A
Revision Number	V2

Revision History

Revision	Date	Prepared By	Reviewed By	Approved By
V1	5/02/2024	AF	SC / TR	AF
V2	25/06/2024	AF	SC	AF

Approval Details

Approved By	Ash Folster
Email	ash@planitconsulting.com.au
Signature	

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Contents

Appendices

List of Tables

List of Figures

1 Executive Summary

Planit Consulting Pty Ltd has been engaged by Byron Shire Council (BSC) to prepare a Biodiversity Assessment Report for a proposed trunk water reticulation system to meet the 2046 planning horizon network demand within the localities of Mullumbimby and Brunswick Heads.

The site comprises areas of road reserve and Crown Land that will accommodate the proposed trunk water main. The development envelope is the proposed trunk water main pipe plus a four (4) metre wide construction buffer.

This report outlines the results of flora and fauna investigations and describes vegetation types, habitat associations and ecological values within the proposed development envelope and surrounding areas.

A flora survey was carried out on 12 December 2023 and six (6) vegetation communities were identified within road reserve and Crown Land that will accommodate the proposed trunk water main.

1. Cleared and Modified
2. Planted Landscaping
3. Camphor Laurel
4. Riparian Vegetation
5. Coastal Cypress Pine
6. Rainforest + Camphor Laurel

The proposed trunk water main predominately traverses 'Vegetation Community 1 - Cleared and Modified' areas in the road verge and therefore vegetation clearing will be minor.

Eight (8) trees will be impacted by the proposed trunk water main and associated construction buffer. The impacted trees include three (3) Weeping Bottlebrush (*Melaleuca viminalis*), one (1) Bangalow Palm (*Archontophoenix cunninghamiana*), one (1) Wheel of Fire (*Stenocarpus sinuatus*), one (1) Golden Shower Tree (*Cassia fistula*), one (1) Silky Oak (*Grevillea robusta*) and one (1) Hoop Pine (*Araucaria cunninghamii*). None of the impacted trees are threatened species.

'Vegetation Community 5 – Coastal Cypress Pine' on Tandy's Lane is representative of 'Coastal Cypress Pine Forest in the NSW North Coast Bioregion' which is listed as 'Endangered' under Schedule 2, Part 2 of the *Biodiversity Conservation Act 2016* (BC Act).

'Vegetation Community 6 – Rainforest + Camphor Laurel' on Tandy's Lane is representative of the EEC 'Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions'. This rainforest community is also representative of 'Lowland Rainforest of Subtropical Australia' which is listed as 'Critically Endangered' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

It is noted that these threatened ecological communities (TECs) occur outside the proposed trunk water main footprint including the associated 4m wide construction buffer and therefore will not be adversely impacted.

Two (2) threatened flora species were observed on the site during the ecological survey. Four (4) planted specimens of Coolamon (*Syzygium moorei*) occur in the road verge of Tandy's Lane proximate to the highway overpass, one (1) planted specimen occurs at the far eastern end of the alignment on Tandy's lane, and one (1) planted specimen occurs at the water reservoir in Mullumbimby. Coolamon is listed as 'Vulnerable' under the BC Act 2016. One (1) Macadamia Nut (*Macadamia integrifolia*) occurs at the eastern end of the alignment on Tandy's Lane and is listed as 'Vulnerable' under the EPBC Act 1999.

The alignment of the trunk water main and associated 4m wide construction footprint has been designed to avoid these threatened species and therefore they will not be adversely impacted.

Two (2) Fig trees on Jubilee Avenue and one (1) Fig tree on Stuart Street contribute to streetscape character and should be avoided and protected.

No species of threatened fauna was observed on the site during the survey, and a likelihood of occurrence assessment finds that potentially occurring threatened fauna is unlikely to occupy the

site as it comprises predominately road reserve. Similarly, a habitat assessment finds that the habitat value within the site is low to negligible as it predominately comprises maintained verge areas within road reserve.

The trunk water main will be attached to the Azalea Street bridge over Mullumbimby Creek alongside existing pipes. The water main will traverse Saltwater Creek on Myokum Street via a new pipe bridge structure comprising two concrete piles either side of the waterway connected by a steel beam to which the water main pipe will be attached. The new bridge structure will occur on disturbed land adjacent to the roadway and culvert over Saltwater Creek, and no concrete piles will be located within the waterway, therefore adverse impacts on the riparian environment will be avoided.

The proposed development will not impact on any matters of national environmental significance (MNES) under the EPBC Act.

The trunk water main is not located within nor will adversely impact an area of Outstanding Biodiversity Value. The water main alignment and associated construction buffer does not occur within Biodiversity Values (BV) mapped areas except for a negligible portion in the cleared road reserve of Left Bank Road.

2 Background

2.1 Proposed Development

Byron Shire Council (BSC) propose to construct a trunk water reticulation system to meet the 2046 planning horizon network demand within the localities of Mullumbimby and Brunswick Heads.

The proposed trunk water main will involve:

- Area of works:
  - New dedicated DN400 HDPE water main within the road reserve of Tandy's Lane between Pacific Highway and Gulgan Road
  - New dedicated DN400 HDPE water main within the road reserve from Mullumbimby Road to Azalea Street Reservoirs
  - Installation of Booster Pump Station and Bypass at Azalea Street reservoir site
  - Minor water main upgrades at Left Bank Road/Tristran Road intersection including DN150 water main and sluice valves
- Additional work areas of interest:
  - The proposed trunk water main alignment includes two creek crossings, Mullumbimby Creek at Azalea Street and Saltwater Creek at Myokum Street. The water main pipe will be strapped to the existing Azalea Street bridge over Mullumbimby Creek. The water main will traverse Saltwater Creek via a new pipe bridge structure located adjacent to the existing culvert on the southern side of Myokum Street. The bridge will comprise two concrete piles either side of the waterway connected by a steel beam to which the trunk water main pipe will be attached.
  - Construction (underboring) of the water main through the Byron Shire Council office site and library carpark in Station Street, Mullumbimby.
  - Construction (underboring) of the water main across the existing railway corridor and APA electrical mains.
  - Construction (underboring) of the water main along Jubilee Avenue.
  - Construction of the water main adjacent to residential and commercial premises.
  - Construction of the water main across Lot 392 DP724577 (Crown Land), Lot 187 DP 728514 (Crown Land) and Mullumbimby Creek (Crown Waterway).
- Construction specifications:
  - 1350mm deep trench (approx. 600-800mm wide).
  - 135mm trench base lining (crusher dust).
  - 400mm (DN400) HDPE pipe.
  - 800mm soil cover over water main pipe.

The proposed trunk water main alignment is illustrated on the engineering plans in Appendix 1.

Plate 2-1 | Trunk water main pipe (DN400 HDPE) and construction machinery.

2.2 Aims & Objectives

The aim of this biodiversity assessment is to identify the flora, fauna, habitat elements and other ecological values on the site including any threatened species, populations, or communities, and assess the likely impact of the proposed development on those ecological values. The associated objectives are to:

- Identify the flora and fauna species occurring on the site and within the footprint of the proposed trunk water main.
- Determine the vegetation communities occurring on the site and their location/extent.
- Record important habitat features including any hollow-bearing trees and forage trees for threatened species.
- Identify any fauna corridors and waterways / riparian areas on the site and proximate to the proposed development.
- Determine the impacts of the proposed development on identified flora, fauna, and habitat values, including the removal of trees.
- Address relevant statutory requirements including State and Federal legislation pertaining to the protection and conservation of ecological values on the site.
- Recommend mitigation measures to minimise the ecological impact of the proposed development.

2.3 Legislative Framework

State Environmental Planning Policy (Transport and Infrastructure) 2021

In accordance with Division 24 (water supply systems) and Clause 2.159 (1) of State Environmental Planning Policy (Transport and Infrastructure) 2021, development consent is not required for the proposed water reticulation system. The proposal becomes an 'activity' for the purposes of Part 5 of the *Environmental Planning and Assessment Act 1979*.

Environmental Planning and Assessment Act 1979.

The environmental impact of the proposed development will be assessed in a Review of Environmental Factors (REF) and take into consideration the requirements of Section 171 (2) of the *Environmental Planning and Assessment Regulation 2021*. This biodiversity assessment informs the REF and in particular:

c) *the environmental impact on the ecosystems of the locality.*

f) *the impact on the habitat of protected animals, within the meaning of the Biodiversity Conservation Act 2016.*

g) *the endangering of a species of animal, plant, or other form of life, whether living on land, in water or in the air.*

Biodiversity Conservation Act 2016

Activities that may allow proponents to voluntarily opt into the Biodiversity Offsets Scheme include activities assessed and determined under Part 5 of the Environmental Planning and Assessment Act 1979 (generally, proposals by government entities).

2.4 Definitions, Terminology & Nomenclature

For the purposes of this assessment the following definitions apply:

Site: the areas of road reserve and Crown Land that will accommodate the proposed trunk water main.

Proposed development: the new trunk water main pipe and associated works.

Development footprint/envelope: the proposed trunk water main pipe alignment plus a four (4) metre wide buffer for construction machinery.

Tree Protection Zone (TPZ): 12 x DBH as per AS4970.1 Protection of trees on development sites.

Additional terminology associated with significance assessments (i.e. threatened species, populations, communities, threatening process, direct impacts, indirect impacts etc) and the factors of such assessments (i.e. 5-part test) are taken to be those existing within the *Environmental Planning and Assessment Act 1979*, the *Biodiversity Conservation Act 1995* and the *'Threatened Species Test of Significance Guidelines'* (2018) published by the Office of Environment and Heritage (OEH). Additional terms within the report which warrant the source of the definition have been specifically referenced in the text.

Nomenclature for all plant species contained within this document follow Harden (1992, 1993, 2000 & 2003) The Flora of NSW Volumes 1-4. Nomenclature for all animal species follow those utilised by the Office of Environment and Heritage and NSW National Parks and Wildlife Service (NPWS), in association with the NSW BioNet Wildlife Atlas. Scientific names for flora and fauna are primarily used in the document to avoid any confusion associated with use of common or descriptive names.

3 Site Description

3.1 Location

The general locality of the proposed trunk water main is Mullumbimby with the eastern extent linking into the coastal suburb of Brunswick Heads. Mullumbimby and Brunswick Heads are situated on the Far North Coast of NSW within the Byron Shire Local Government Area.

The proposed water reticulation systems are primarily located within public road reserves including the Gulgan Road, Tandys Lane, Mullumbimby Road, King Street, Ann Street, Station Street, Stuart Street, Myokum Street, Jubilee Avenue, Azalea Street, Reservoir Road, and Left Bank Road. The proposed water reticulation systems also traverse land outside the public road corridor including Lot 23 DP 1002810 and Lot 2 DP 1121508 (rail corridor), Lot 2 DP 1227659 (BSC Operational Land), Lot 392 DP724577 (Crown Land), Lot 187 DP 728514 (Crown Land), Lot 1 DP 342369 (BSC Operational Land),

The eastern extent of the proposed works along Tandy's Lane adjoins rural residential properties located between Gulgan Road and the Pacific Highway. The works also occur within the township of Mullumbimby adjoining low rise residential properties. Lot 1 DP 342369 (BSC Operational Land) features the existing water reservoirs.

3.2 Zoning & Land Use

The proposed trunk water main is located predominately within road reserve but also traverses Crown Land rail corridor, waterway and BSC Operational Land. The alignment is largely within the R2 Low Density Residential and R5 Large Lot Residential zones according to Byron LEP 2014 mapping.

3.3 Topography & Soils

The alignment of the proposed trunk water main has variable topography. The Tandys Lane portion is moderately sloping between 10-30m AHD. The Mullumbimby portion is relatively flat and low-lying at 2-4m AHD with the exception of Azalea Street which is moderately sloping between 4-10m AHD. The topography of the reservoir portion is sloping between 40-50m AHD, and the Left Bank Road portion is flat at 10m AHD.

The proposed trunk water main traverses the Mullumbimby (9540mu), Billinudgel (9540bi) and Myocum (9540my) soil landscapes according to NSW eSPADE mapping.

3.4 Hydrology

The proposed trunk water main traverses Saltwater Creek and Mullumbimby Creek according to NSW Hydrography mapping.

3.5 Vegetation

The vegetation along the proposed trunk water main alignment predominately comprises maintained grassy verge and planted landscaping street trees within the road reserve. A detailed description of the vegetation circumstances on the site is provided in Section 5.

3.6 Fauna Corridors

The site does not contain a mapped fauna corridor. The proposed trunk water main is located predominately within road reserve where fauna movement is not likely or encouraged. The water main traverses Mullumbimby Creek via the existing bridge on Azalea Street and Saltwater Creek via a new minor bridge structure to which the water main pipe will be attached. It has been determined through this biodiversity assessment that adverse impacts on the riparian environment will be avoided and fauna movement in these riparian areas will not be impeded.

4 Desktop Assessment

4.1 Methodology

A desktop analysis was carried out to determine the flora circumstances on the site and comprised a review of:

i. Environmental mapping provided by Byron Shire Council and Plant Community Type (PCT) mapping published by the NSW Office of Environment and Heritage (OEH).

ii. Threatened flora and fauna species, populations and vegetation communities occurring within the Burringbar-Conondale Ranges IBRA sub- region. Accessed at https://threatenedspecies.bionet.nsw.gov.au/cmaSearchResults?SubCmaId=368

iii. NSW BioNet Wildlife Atlas database records of threatened flora and fauna within 10km of the site.

iv. EPBC Protected Matters of National Environmental Significance (MNES) database records of threatened flora and fauna species, populations, and ecological communities within 10km of the site.

v. State Environmental Planning Policy (SEPP) mapping to determine the presence of potential and/or core koala habitat, littoral rainforests and/or coastal wetlands on the site.

vi. Ecological surveys previously undertaken in the locality.

vii. Threatened species determinations published by the NSW Threatened Species Scientific Committee.

viii. Species Profile and Threats Database (SPRAT) for information about species and ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999*. Accessed at http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

ix. Threatened species conservation advice, recovery plans, threat abatement plans, and key threatening processes published by the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW).

x. State and Commonwealth environmental legislation including the *Biodiversity Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.

4.2 Vegetation Mapping

Byron Shire Council (BSC) vegetation mapping 2023

Council vegetation mapping (Figures 4.1 to 4.4) identifies the following vegetation communities within and adjacent to the proposed trunk water main footprint:

- Rainforest +10-50% Camphor
- Camphor 51-80%
- Camphor >80%
- Planted Rainforest
- Planted Sclerophyll
- Planted Landscaping

Council mapping also identifies High Conservation Value (HCV) vegetation within the Tandy's Lane portion of the proposed water main alignment.

NSW State Vegetation Type Mapping (SVTM)

State vegetation mapping (Figures 4.1 to 4.4) identifies the following Plant Community Types (PCT) within and adjacent to the proposed trunk water main footprint:

- Lower Richmond Hills Dry Subtropical Rainforest (PCT 3002)
- Far North Bangalow Palm Swamp Forest (PCT 3004)
- Far North Lowland Subtropical Rainforest (PCT 3011)
- Far North Sands Tuckeroo-Banksia Littoral Rainforest (PCT 3124)
- Far North Paperbark Fern Swamp Forest (PCT 3989)

The Council and State vegetation mapping was ground-truthed during the field survey (refer to Section 5).

4.3 Fauna Mapping

The site does not contain a Flying Fox camp or Koala habitat according to Byron Shire Council mapping.

4.4 Database Searches

4.4.1 Flora

Forty-three (43) species of threatened flora occur within 10km of the site according to the NSW BioNet Wildlife Atlas database (Appendix 2).

Forty-eight (48) species of threatened flora and eight (8) threatened ecological communities occur within 10km of the site according to the EPBC Protected Matters of National Environmental Significance (MNES) database (Appendix 3).

A likelihood of occurrence assessment has been carried out for these threatened species and ecological communities (Appendix 4) as discussed in Section 6.

4.4.2 Fauna

Sixty-three (63) species of threatened fauna occur within 10km of the site according to the NSW BioNet Wildlife Atlas database (Appendix 2).

Sixty-four (64) species of threatened fauna occur within 10 km of the site according to the EPBC Protected Matters of National Environmental Significance (MNES) database (Appendix 3).

A likelihood of occurrence assessment has been carried out for these threatened fauna species (Appendix 4) as discussed in Section 6.

Figure 4-1 | Vegetation mapping – Line 01 Tandy's Lane

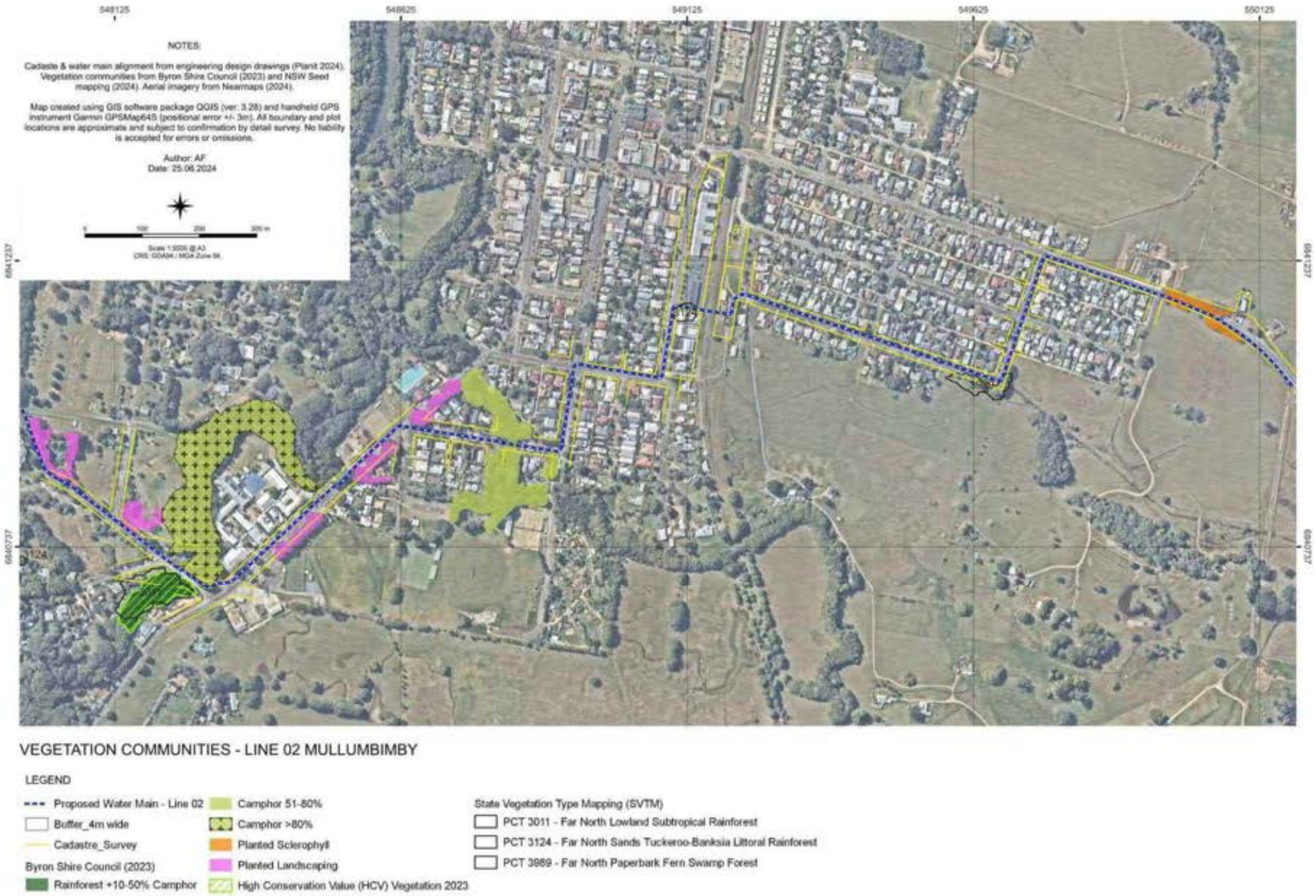


Figure 4-2 | Vegetation mapping – Line 02 Mullumbimby

Figure 4-3 | Vegetation mapping – Line 03 Reservoir

Figure 4-4 | Vegetation mapping – Line 03 Left Bank Road

5 Field Assessment

5.1 Flora Survey

5.1.1 Methodology

The cadastral boundaries and trees along the proposed trunk water main alignment were located by a licenced surveyor and imported into GIS software (QGIS ver. 3.28). The alignment was imported from engineering plans (Appendix 1), overlaid on the tree survey plan and a four (4) metre wide construction buffer was applied to ascertain vegetation impacts. A comprehensive targeted meander survey was then carried out to:

- Inspect impacted trees within the trunk water main footprint including 4m wide construction buffer and record their attributes (i.e. species, DBH, height, canopy spread).
- Identify vegetation communities and record their structural formation, species composition and condition. Only those vegetation communities traversed by or adjacent to the trunk water main were surveyed.
- Identify threatened species and/or communities within the development footprint as listed under the *Biodiversity Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation Act 1999*.

A plot-based survey approach was not adopted due to the narrow linear development footprint of the proposed trunk water main and its location within maintained verge areas of the road reserve and Crown Land railway corridor.

The height of the dominant stratum (shrub or tree) was determined via clinometer or estimated ocularly by an experienced observer. Height classes were then selected from the classifications provided by Walker & Hopkins (1998). The crown cover (%) of the dominant stratum was estimated by an experienced observer and measured via crown intercept method (Nelder et al, 2004 & EPA, 2005). Structural formation classes were determined via an assessment of growth form and crown cover as per Walker & Hopkins (1998).

The ecological survey was performed under NSW Scientific Licence SL100142 (exp. 31.05.2024). The adopted flora survey methodology is generally consistent with the following guidelines:

- DEC (2004) Biodiversity Survey and Assessment: Guidelines for developments and activities (working draft). NSW Department of Environment and Conservation, Hurstville NSW.
- DPIE (2020) Surveying threatened plants and their habitats. NSW survey guide for the Biodiversity Assessment Method. NSW Department of Planning, Industry and Environment, Parramatta.
- Hnatiuk, R.J., Thackway, R. & Walker, J. (2009) Australian Soil and Land Survey: Field Handbook Third Edition. CSIRO Publishing, Canberra.
- Nelder, V. J., Wilson, B.A., Thompson, E. J. & Dillewaard, H.A. (2004) Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland. EPA, Brisbane.
- NSW National Parks and Wildlife Service (1999) Forest Ecosystem Classification and mapping for the upper and lower northeast Comprehensive Regional Assessment. NSW National Parks and Wildlife Service, Coffs Harbour.
- NSW National Parks and Wildlife Service (2001) The Community Biodiversity Survey Manual. New South Wales National Parks & Wildlife Service.
- Sivertsen, D. (2009) Native Vegetation Interim Type Standard. NSW Department of Environment, Climate Change and Water, Sydney.

5.1.2 Survey Limitations

The duration and methodology of flora survey is considered appropriate for the site circumstances. However, additional undetected flora species may be present. Seasonal surveys may also be necessary to detect flora species that are dormant or inconspicuous for part of the year. Some dormant or non-flowering species may have been undetected or under-represented within the survey period. Furthermore, ungerminated seed of various species may have been present within the soil seed bank.

5.1.3 Vegetation Communities

The flora survey was carried out on 12 December 2023 and six (6) vegetation communities were identified within road reserve and Crown Land that will accommodate the proposed trunk water main.

1. Cleared and Modified
2. Planted Landscaping
3. Camphor Laurel
4. Riparian Vegetation
5. Coastal Cypress Pine
6. Rainforest + Camphor Laurel

The Byron Shire Council (BSC) vegetation community mapping was ground truthed during the flora survey and the following corrections are noted:

- A portion of 'Planted Landscaping' shown on the BSC mapping within Left Bank Road is 'Cleared and Modified'.
- A portion of 'Planted Landscaping' shown on the BSC mapping to the north of the water reservoir is 'Rainforest'.
- A portion of 'Camphor >80%' shown on BSC mapping on the northern side of the Azalea Street bridge adjacent to Mullumbimby Creek is 'Riparian Vegetation'.
- A portion of 'Camphor >80%' shown on BSC mapping at the corner of Azalea Street and Jubilee Avenue is 'Planted Landscaping'.
- A portion of 'Camphor 51-80%' shown on BSC mapping on the southern side of Myokum Street at Saltwater Creek is 'Riparian Vegetation'.
- The 'Planted Landscaping' shown on BSC mapping at the western end of Tandy's Lane is 'Camphor Laurel'.
- A patch of unmapped vegetation on the corner of Gulgan Road and Tandy's Lane is 'Planted Landscaping'.
- A patch of unmapped vegetation on Tandy's Lane to the east of Hyrama Crescent is 'Coastal Cypress Pine'.
- The patch of 'Planted Rainforest' shown on BSC mapping at the eastern end of Tandy's Lane adjacent to the highway overpass is 'Cleared and Modified'.

The surveyed vegetation communities incorporating above-mentioned corrections are illustrated in Figures 5.1 to 5.5 and described as follows:

Vegetation Community 1: Cleared and Modified

Equivalent vegetation communities

Byron Shire Council Vegetation Communities 2023: N/A

NSW Plant Community Type (PCT): N/A

This vegetation community occurs within cleared areas of road reserve and Crown Land rail corridor (Plate 5-1 and Plate 5-2).

The vegetation community is characterised by low grassland (approx. 0.1m in height) with a 'closed' structural formation (>80% foliage cover) and predominately comprises Couch Grass (Elymus repens), Buffalo Grass (*Bouteloua dactyloides*) and Broad-leaved Paspalum (*Paspalum mandiocanum*).

Exotic weeds in this vegetation community predominately comprise common grasses (above-mentioned) and herbaceous groundcover species including Fleabane (*Conyza sp.*), Ragweed (*Ambrosia artemisiifolia*), Blue Billy Goat Weed (*Ageratum houstonianum*), Flatweed (*Hypochaeris radicata*) and Cobbler Pegs (*Bidens pilosa*).

No threatened flora species were observed in this vegetation community.

Plate 5-1 | Cleared and modified areas in maintained verge of public road reserve.

Plate 5-2 | Cleared and modified areas in Crown Land rail corridor.

Vegetation Community 2: Planted Landscaping

Equivalent vegetation communities

Byron Shire Council Vegetation Communities 2023: Planted Landscaping

NSW Plant Community Type (PCT): N/A

This vegetation community occurs in vegetated areas of road reserve (Plate 5-3) and comprises native and exotic street trees typically planted in rows adjacent to the road pavement.

The canopy stratum is tall (approx. 12-20m in height) with an 'isolated trees' structural formation (0.2-20% foliage cover).

The native street tree species include Silky Oak (*Grevillea robusta*), Weeping Bottle Brush (*Melaleuca viminalis*), Bangalow Palm (*Archonotphoenix cunninghaminana*), and Figs (*Ficus sp.*). The exotic street tree species include Poplar (*Populus sp.*), South African Tulip (Spathodea campanulata), Jacaranda (*Jacaranda mimosifolia*), Poinciana (*Delonix regia*), and Golden Rain Tree (*Koelreuteria paniculata*).

The mid stratum is absent. The ground stratum comprises predominately exotic grasses including Couch Grass (*Elymus repens*), Buffalo Grass (*Bouteloua dactyloides*), Broad-leaved Paspalum (*Paspalum mandiocanum*) and Molasses Grass (*Melinis minutiflora*). Ornamental and weed species also occur sporadically and include Frangipani (*Plumeria sp.*), Bromeliads, Easter Cassia (*Senna pendula var. glabrata*), Mickey Mouse Plant (*Ochna serrulata*), Brazilian Cherry (*Eugenia uniflora*), Fishbone Fern (*Nephrolepis cordifolia*), Ground Asparagus (*Asparagus aethiopicus*), Mother in Laws Tongue (*Dracaena trifasciata*), Arrowhead Vine (*Syngonium sp.*) and Blue Morning Glory (*Ipomoea indica*).

Two (2) planted Figs on Jubilee Street (Plate 5) and one (1) planted Fig on Stuart Street contribute to the streetscape character (Plate 5-4).

It is also noted that four (4) planted specimens of Coolamon (*Syzygium moorei*) occur in the road verge of Tandy's Lane proximate to the highway overpass (Figure 5-6), one (1) planted specimen occurs at the far eastern end of the alignment on Tandy's lane, and one (1) planted specimen occurs at the water reservoir in Mullumbimby (Figure 5-9). Coolamon is listed as 'Vulnerable' under the BC Act 2016. One (1) Macadamia Nut (*Macadamia integrifolia*) occurs at the eastern end of the alignment on Tandy's Lane (Figure 5-6) and is listed as 'Vulnerable' under the EPBC Act 1999.

Plate 5-3 | Planted landscape street trees Silky Oak (*Grevillea robusta*) and Poplar (*Populus sp.*).

Plate 5-4 | Planted landscape Figs (*Ficus sp.*) on Jubilee Avenue.

Plate 5-5 | Planted specimens of 'vulnerable' rainforest tree Coolamon (*Syzygium moorei*) on Tandy's Lane.

Vegetation Community 3: Camphor Laurel

Equivalent vegetation communities

Byron Shire Council Vegetation Communities 2023: Camphor Laurel

NSW Plant Community Type (PCT): N/A

This vegetation community occurs within vegetated areas of the road reserve (Plate 5-6) particularly along Tandy's Lane but also at the junction between Ann Street and King Street in Mullumbimby.

The canopy stratum is mid-high (approx. 12-20m in height) with a 'closed forest' structural formation (>80% foliage cover) and comprises Camphor Laurel (Cinnamomum camphora) as the dominant species in the canopy interspersed with a mix of native and exotic species such as Blackwood (*Acacia melanoxylon*), Cheese Tree (*Glochidion ferdinandi*), Guioa (*Guioa semiglauca*), Umbrella Tree (*Schefflera actinophylla*), and South African Tulip (*Spathodea campanulata*).

The mid stratum comprises a mix of native and exotic trees and shrubs including Cheese Tree (*Glochidion ferdinandi*), Guioa (*Guioa semiglauca*), Macaranga (*Macaranga tanarius*), Red Kamala (*Mallotus philippensis*), Tuckeroo (*Cupaniopsis anacardioides*), Brush Box (*Lophostemon confertus*), Umbrella Tree (*Schefflera actinophylla*), Cherry Guava (*Psidium cattleianum var. cattleianum*), Oleander (*Nerium oleander*), Easter Cassia (*Senna pendula var. glabrata*), Mickey Mouse Plant (*Ochna serrulata*), Brazilian Cherry (*Eugenia uniflora*), and Green Cestrum (*Cestrum parqui*).

The ground stratum consists of predominately exotic grasses including South African Pigeon Grass (*Setaria sphacelata*), Broad-leaved Paspalum (*Paspalum mandiocanum*) and Rhodes Grass (*Chloris gayana*). Herbaceous weeds are also common and include Blue Billy Goat Weed (*Ageratum houstonianum*), Ragweed (*Ambrosia artemisiifolia*), and Cobbler Pegs (*Bidens pilosa*)

No threatened flora species were observed in this vegetation community.

Plate 5-6 | Patches of Camphor Laurel on King Street and Tandy's Lane.

Vegetation Community 4: Riparian Vegetation

Equivalent vegetation communities

Byron Shire Council Vegetation Communities 2023: N/A

NSW Plant Community Type (PCT): N/A

The riparian vegetation community occurs on the margins of Mullumbimby Creek at the Azalea Street bridge and Saltwater Creek at the Myokum Street bridge/ culvert (Plate 5-7).

The canopy stratum is low to mid-high (approx. 3-12m in height) with an 'isolated trees' to 'open forest' structural formation (0.2 - 80% foliage cover) and comprises Brown Myrtle (*Backhousia leptopetala*),

Creek Sandpaper Fig (*Ficus coronata*), Red Kamala (*Mallotus philippensis*), Cheese Tree (*Glochidion ferdinandi*) and Black Bean (*Castanospermum australe*).

The mid stratum comprises a mix of native and exotic trees and shrubs including Creek Sandpaper Fig (*Ficus coronata*), Guioa (*Guioa semiglauca*), Foambark (*Jagera pseudorhus*), Blackwood (*Acacia melanoxylon*), Hoop Pine (*Araucaria cunninghamii*), Camphor Laurel (*Cinnamomum camphora*), Golden Rain Tree (*Koelreuteria paniculata*) and Easter Cassia (*Senna pendula var. glabrata*).

The ground stratum consists of native and exotic grasses and groundcovers including Spiny-headed Matt Rush (*Lomandra longifolia*), Guinea Grass (*Megathyrsus maximus*), Broad-leaved Paspalum (*Paspalum mandiocanum*), Trad (*Tradescantia fluminensis*), Fishbone Fern (*Nephrolepis cordifolia*), Morning Glory Vine (*Ipomoea indica*) and Madeira Vine (*Anredera cordifolia*).

Aquatic vegetation within the waterway of Saltwater Creek includes Knotweed (*Persicaria sp.*), Black Taro (*Alocasia nigrescens*) and Water Primrose (*Ludwigia grandiflora*).

No threatened flora species were observed in this vegetation community.

Plate 5-7 | Riparian vegetation proximate to Mullumbimby Creek and Saltwater Creek.

Vegetation Community 5: Coastal Cypress Pine

Equivalent vegetation communities

Byron Shire Council Vegetation Communities 2023: Coastal Cypress Pine

NSW Plant Community Type (PCT): Far North Sands Coastal Cypress Littoral Rainforest (PCT 3123)

This vegetation community occurs on Tandy's Lane approx. 20m to the east of Hyrama Crescent (Plate 5-8).

The canopy stratum is low (approx. 3-6m in height) with a 'closed forest' structural formation (>80% foliage cover) and predominately comprises immature Coastal Cypress Pine (*Callitris columellaris*) with infrequent Small-fruited Grey Gum (*Eucalyptus propinqua*), Blackwood (*Acacia melanoxylon*) and Cadaghi (*Corymbia torelliana*).

The understorey predominately consists of leaf litter with sporadic Bootlace Bush (Wikstroemia indica), and exotic Broad-leaved Paspalum (Paspalum mandiocanum) on the margins.

No individual species of threatened flora were observed in this vegetation community during the field survey.

The community is representative of 'Coastal Cypress Pine Forest in the NSW North Coast Bioregion' which is listed as 'Endangered' under Schedule 2, Part 2 of the *Biodiversity Conservation Act 2016* (BC Act).

Plate 5-8 | Patch of Coastal Cypress Pine on Tandy's Lane approx. 20m east of Hyrama Crescent.

Vegetation Community 6: Rainforest + Camphor Laurel

Equivalent vegetation communities

Byron Shire Council Vegetation Communities 2023: Rainforest + 10-50% Camphor Laurel

NSW Plant Community Type (PCT): Far North Bangalow Palm Swamp Forest (PCT 3004)

This vegetation community occurs as established planted rainforest around the water reservoir (Plate 5-9) and as naturally occurring palm gully rainforest on Tandy's Lane (Plate 5-10).

The canopy stratum is tall (approx. 12-20m in height) with a 'closed forest' structural formation (>80% foliage cover) and comprises Bangalow Palm (*Archonotphoenix cunninghaminana*), Red Bean (*Dysoxylum mollissimum subsp. molle*), Hard Quandong (*Elaeocarpus obovatus*) and Camphor Laurel (*Cinnamomum camphora*).

The mid stratum comprises small trees including Cheese Tree (*Glochidion ferdinandi*), Guioa (*Guioa semiglauca*), Macaranga (*Macaranga tanarius*), Red Kamala (*Mallotus philippensis*), Creek Sandpaper Fig (*Ficus coronata*) and Umbrella Tree (*Schefflera actinophylla*), as well as exotic shrubs such as Coffee (*Coffee arabica*), Easter Cassia (*Senna pendula var. glabrata*) and Green Cestrum (*Cestrum parqui*).

The ground stratum comprises a mix of native and exotic grasses and groundcovers including Broad-leaved Paspalum (*Paspalum mandiocanum*), Coral Berry (*Ardisia crenata*), Native Ginger (*Alpinia caerulea*) and Crow's Nest Fern (*Asplenium australasicum*).

No individual species of threatened flora were observed in this vegetation community during the field survey.

This vegetation community is representative of 'Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions' which is listed as 'Endangered' under Schedule 2, Part 2 of the *Biodiversity Conservation Act 2016* (BC Act).

Plate 5-9 | Established planted rainforest adjacent to the Mullumbimby water reservoir.

Plate 5-10 | Far North Bangalow Palm Swamp Forest (PCT 3004) on Tandy's Lane.

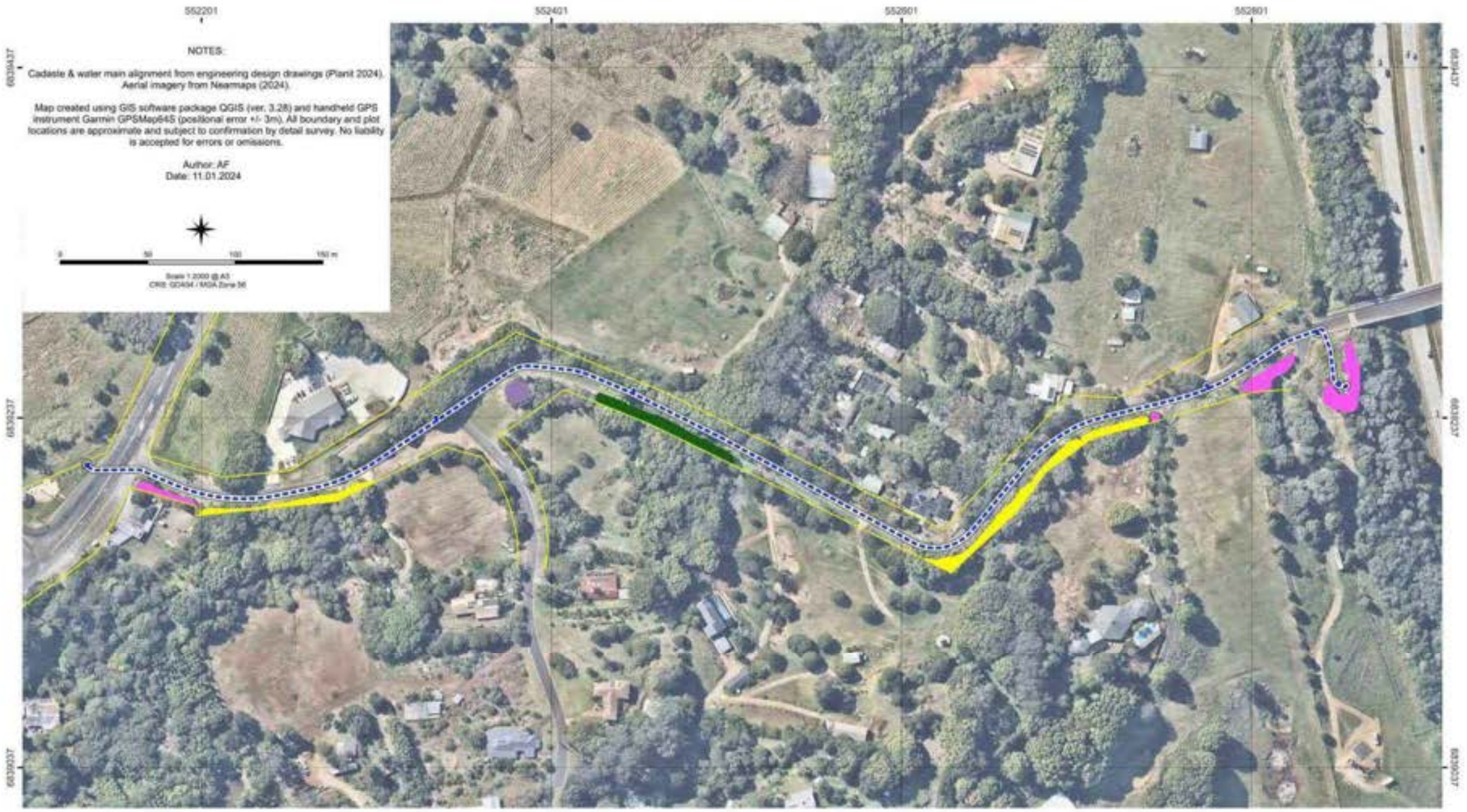


Figure 5-1 | Surveyed vegetation communities – Line 01 Tandy's Lane

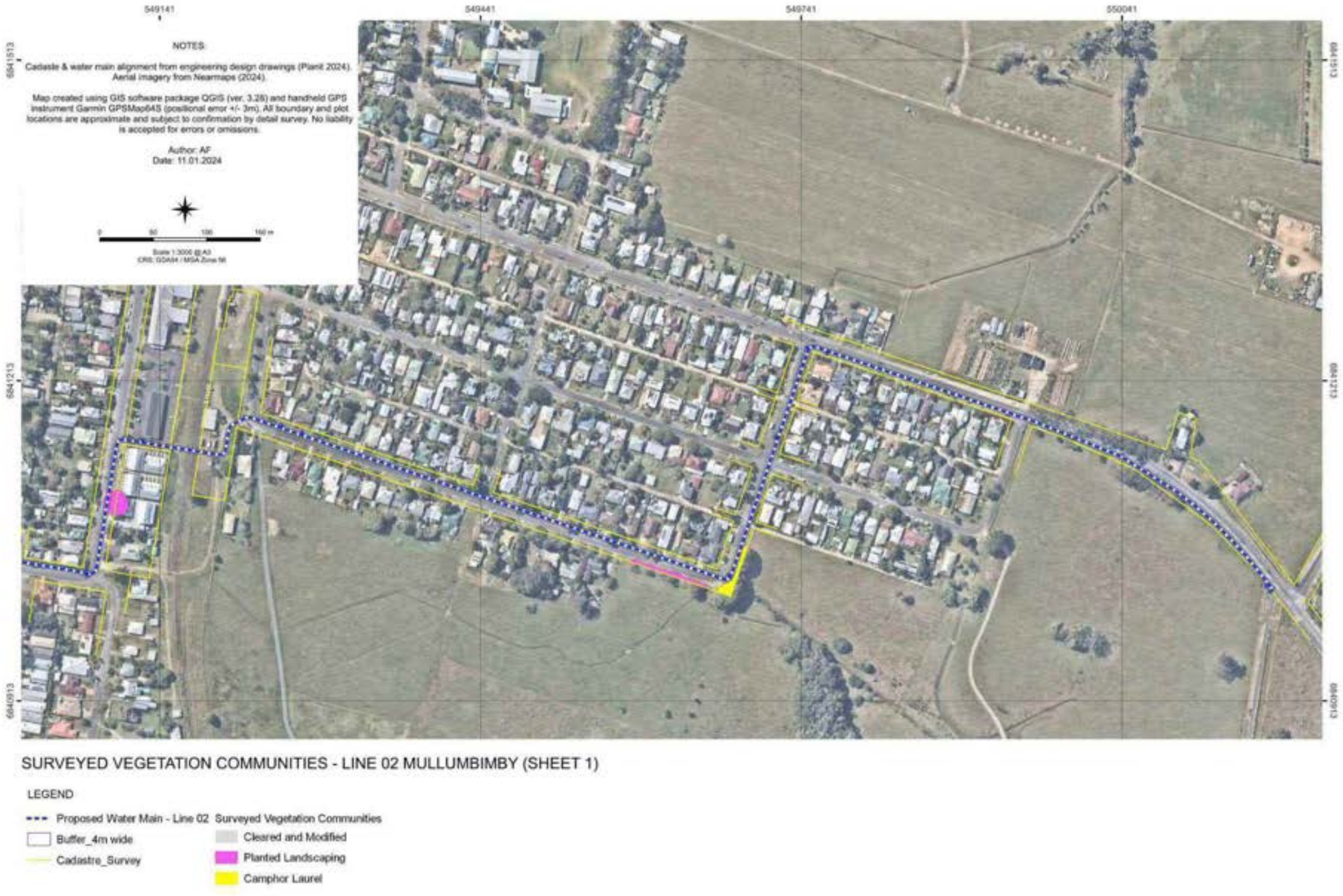


Figure 5-2 | Surveyed vegetation communities – Line 02 Mullumbimby (Sheet 1)

Figure 5-3 | Surveyed vegetation communities – Line 02 Mullumbimby (Sheet 2)

Figure 5-4 | Surveyed vegetation communities – Line 03 Reservoir

Figure 5-5 | Surveyed vegetation communities – Line 04 Left Bank Road

5.1.4 Tree Survey

A tree survey was carried out on 12 December 2023 to identify trees that will be impacted by the proposed trunk water main pipe including those within the 4m wide construction buffer.

The alignment of the trunk water main has been carefully designed to avoid vegetation impacts and conflicts with existing services, such that the majority of the alignment is located within cleared verge areas of the road reserve. Nevertheless, a total of eight (8) trees will be impacted, including seven (7) native species and one (1) exotic species (Table 5-1). None of the impacted native trees are threatened species.

Table 5-1 | Schedule of impacted trees

Tree No.	Common Name	Scientific Name	Easting	Northing	DBH (m)	Height (m)
1	Silky Oak	*Grevillea robusta*	552856	6839255	0.24	14
2	Weeping Bottlebrush	*Melaleuca viminalis*	549884	6841198	0.22	3
3	Weeping Bottlebrush	*Melaleuca viminalis*	549854	6841208	0.19	3
4	Bangalow Palm	*Archontophoenix cunninghamiana*	549684	6841059	0.21	12
5	Golden Shower Tree*	*Cassia fistula*	549242	6841174	0.13	5
6	Hoop Pine	*Araucaria cunninghamii*	548819	6840914	Sapling	1.5
7	Weeping Bottlebrush	*Melaleuca viminalis*	548286	6840668	0.25	7
8	Wheel of Fire	*Stenocarpus sinuatus*	547809	6840778	0.39	12

* Denotes exotic species.

5.1.5 Declared Weeds

The site contains garden escapee and environmental weeds such as Camphor Laurel (*Cinnamomum camphora*), Umbrella Tree (*Schefflera actinophylla*), Golden Rain Tree (*Koelreuteria paniculata*), Easter Senna (*Senna pendula*), Lantana (*Lantana camara*), Chinese Celtis (*Celtis sinensis*), Green Cestrum (*Cestrum parqui*), Ground Asparagus (*Asparagus aethiopicus*), Madeira Vine (*Anredera cordifolia*), Arrowhead Plant (*Syngonium podophyllum*), and Fishbone Fern (*Nephrolepis cordifolia*) among others.

Ground Asparagus (*Asparagus aethiopicus*) and Madeira Vine (*Anredera cordifolia*) are Weeds of National Significance (WoNS) and State priority weeds requiring containment under the *North Coast Regional Strategic Weed Management Plan 2023-2027*.

Chinese Celtis (*Celtis sinensis*) and Green Cestrum (*Cestrum parqui*) are regional priority weeds requiring containment in the Byron Shire under the *North Coast Regional Strategic Weed Management Plan 2023-2027*. Land managers have a general biosecurity duty under the NSW *Biosecurity Act 2015* to mitigate the spread of these plants from their land.

Figure 5-6 | Tree survey – Line 01 Tandy's Lane

Figure 5-7 | Tree survey – Line 02 Mullumbimby (Sheet 1)

Figure 5-8 | Tree survey – Line 02 Mullumbimby (Sheet 2)

Figure 5-9 | Tree survey – Line 03 Reservoir

Figure 5-10 | Tree survey – Line 04 Left Bank Road

5.2 Fauna Survey

5.2.1 Methodology

A detailed fauna survey incorporating trapping and call playback was not undertaken due to the location of the proposed trunk water main within maintained verge areas of the road reserve and Crown Land railway corridor.

A basic fauna survey was carried out on 12 December 2023 to:

- Record all detected native and exotic fauna species on the site.
- Identify fauna habitat including key habitat elements.
- Identify threatened fauna species and/or populations listed under the *Biodiversity Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation Act 1999*.

The fauna survey was performed under NSW Animal Research Approval TRIM 14/1971 (exp. 30.06.2024) and Animal Research Authority TRIM 14/1971 (exp. 30.06.2028). The adopted fauna survey methodology is generally consistent with the following guidelines:

- DEC (2004) Biodiversity Survey and Assessment: Guidelines for developments and activities (working draft). NSW Department of Environment and Conservation, Hurstville NSW.
- Department of Environment, Water, Heritage, and the Arts (2010) Survey guidelines for Australia's threatened bats. Guidelines for detecting bats listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*. Australian Government.
- Department of Environment, Water, Heritage, and the Arts (2010) Survey guidelines for Australia's threatened birds. Guidelines for detecting birds listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*. Australian Government.
- Department of Environment, Water, Heritage, and the Arts (2010) Survey guidelines for Australia's threatened frogs. Guidelines for detecting frogs listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*. Australian Government.
- Department of Sustainability, Environment, Water, Population and Communities (2011) Survey guidelines for Australia's threatened mammals. Guidelines for detecting mammals listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*. Australian Government.
- NSW National Parks and Wildlife Service (2001) The Community Biodiversity Survey Manual. New South Wales National Parks & Wildlife Service.

5.2.2 Survey Limitations

The duration and methodology of fauna survey is considered appropriate for the site circumstances. However, it is acknowledged that the entire seasonal fauna assemblage is unlikely to be recorded. It is further acknowledged that assessment of habitat and species ecology provides an additional measure to anticipate the presence of species (as a surrogate for actual observation), however there is no absolute certainty to the absence of a species from marginal or potential habitat. Additionally, there may be some species that utilise the habitats within the site but have remained undetected due to their rarity, elusive nature, or the sporadic utilisation of the habitats.

5.2.3 Fauna Survey Results

The following fauna species were recorded on the site during survey on 12 December 2023. The results are grouped by Class and the method of identification is noted.

Survey Method Codes:

CODE	METHOD	CODE	METHOD
A	Stranding/beached	O	Observed
AR	Acoustic recording	OW	Observed and Heard call
B	Burnt	P	Scat
C	Cat kill	Q	Camera
D	Dog kill	R	Road kill
E	Nest/roost	S	Shot
F	Tracks, scratchings	T	Trapped or netted
FB	Burrow	U	Ultrasonic recording
G	Crushed Cones	V	Fox kill
H	Hair, feathers, or skin	W	Heard call
I	Subfossil/Fossil Remains	X	In scat
K	Dead	Y	Bone, teeth, or shell
P	Scat	Z	In raptor/owl pellet

5.2.3.1 Birds

Fourteen (14) species of bird were recorded on the site during the fauna survey (Table 5-2) including 13 native and 1 exotic. The native aves are all common species.

Table 5-2 | Birds recorded during fauna survey.

Family	Scientific Name	Exotic	Common Name	NSW Status	Method
Alcedinidae	*Dacelo novaeguineae*		Laughing Kookaburra	P	OW
Anatidae	*Anas superciliosa*		Pacific Black Duck	P	O
Artamidae	*Cracticus nigrogularis*		Pied Butcherbird	P	O
Artamidae	*Gymnorhina tibicen*		Australian Magpie	P	OW
Artamidae	*Strepera graculina*		Pied Currawong	P	O
Charadriidae	*Vanellus miles*		Masked Lapwing	P	O
Columbidae	*Columba leucomela*		White-headed Pigeon	P	O
Columbidae	*Geopelia humeralis*		Bar-shouldered Dove	P	O
Corvidae	*Corvus orru*		Torresian Crow	P	OW
Megapodiidae	*Alectura lathami*		Australian Brush-turkey	P	O
Meliphagidae	*Manorina melanocephala*		Noisy Miner	P	O
Psittacidae	*Trichoglossus haematodus*		Rainbow Lorikeet	P	O
Rhipiduridae	*Rhipidura leucophrys*		Willie Wagtail	P	O
Sturnidae	*Acridotheres tristis*	*	Common Myna		O

5.2.3.2 Mammals

Two (2) species of mammal were recorded on the site during the fauna survey (Table 5-3) both introduced and domesticated.

Table 5-3 | Mammals recorded during fauna survey.

Family	Scientific Name	Exotic	Common Name	NSW Status	Method
Canidae	*Canis familiaris*	*	Dog		O
Felidae	*Felis catus*	*	Cat		O

5.2.3.3 Reptiles

Three (3) species of reptile were recorded on the site during the fauna survey (Table 5-4) all common native species.

Table 5-4 | Reptiles recorded during fauna survey.

Family	Scientific Name	Exotic	Common Name	NSW Status	Method
Agamidae	*Intellagama lesueurii*		Eastern Water Dragon	P	O
Varanidea	*Varanus varius*		Lace Monitor	P	O
Scincidae	*Lampropholis delicata*		Dark-flecked Garden Sunskink	P	O

5.2.3.4 Amphibians

One (1) species of amphibian was recorded on the site during the fauna survey (Table 5-5), the exotic pest Cane Toad.

Table 5-5 | Amphibians recorded during fauna survey.

Family	Scientific Name	Exotic	Common Name	NSW status	Method
Bufonidae	*Rhinella marina*	*	Cane Toad		O

5.2.4 Habitat Assessment

A comprehensive ground search was undertaken during the field survey on 12 December 2023 to determine habitat elements / attributes on the site. The assessment of habitat elements (Table 5-6) includes those noted in Byron DCP Chapter B1 – Biodiversity.

In general, the habitat value within the site is low to negligible as it predominately comprises maintained verge areas within road reserve. Nevertheless, habitat elements found to occur along the proposed trunk water main alignment include native canopy trees, potential microchiropteran bat species habitat beneath Azalea Street bridge, riparian vegetation, and permanent water sources at Mullumbimby Creek (Azalea Street) and Saltwater Creek (Myokum Street), and fruiting/flowering flora species which are likely to support a range of common native fauna and avifauna species.

Inspection beneath the Azalea Street bridge revealed no evidence of roosting activity by microcheropteran bat species (Plate 14). The riparian vegetation at Mullumbimby Creek and Saltwater Creek comprises common native and exotic species.

Table 5-6 | Habitat elements recorded during survey.

Habitat Element	Comment
Hollow bearing trees	No.
Koala habitat and/or favoured koala trees	No.
Caves, culverts, or disused buildings suitable for roosting of microchiropteran bat species	Yes. Beneath Azalea Street Bridge over Mullumbimby Creek
Scratches or feeding scars on tree trunks	No.
Megabat roosting sites	No.
Creeks, estuaries, mudflats, mangroves and/or riparian vegetation	Yes. Riparian vegetation on the margins of Mullumbimby Creek and Saltwater Creek.
Dams, ponds, lakes and/or other natural or constructed permanent water sources	Yes. Mullumbimby Creek and Saltwater Creek.
Dense understorey and ground cover vegetation	Yes. In Camphor Laurel and rainforest vegetation communities.

Deep leaf litter layer and/or debris (fallen logs etc.)	Yes. In rainforest vegetation on Tandy's Lane.
Fruiting flora species	Yes. Rainforest species including Cheese Tree (*Glochidion ferdinandi*)
Flowering species	Yes. Rainforest species including Brown Myrtle (*Backhousia leptopetala*) at Mullumbimby Creek.
Large stick nests indicative of raptor presence	No.
Rocky outcrops and/or extensive exposed rocky areas favoring reptile populations	No.

Plate 14 | No evidence of roosting by microchiropteran bats under Azalea Street bridge (Mullumbimby Creek).

5.2.5 Pest Animals

Several species of pest animal were observed during the survey including Common Myna (Acridotheres tristis), Cat (*Felis catus*) and Cane Toad (*Rhinella marina*). The proposed trunk water main development is not expected to exacerbate existing pest animal occurrence or result in the introduction of new pest animal species.

6 Significant Ecological Features

6.1 Threatened Ecological Communities

Two (2) threatened ecological communities (TECs) listed as 'Endangered' under Schedule 2, Part 2 of the *Biodiversity Conservation Act 2016* (BC Act) were observed on the site during the ecological survey:

1. Coastal Cypress Pine Forest in the NSW North Coast Bioregion.

   The juvenile patch of 'Far North Sands Coastal Cypress Littoral Rainforest' (PCT 3123) on Tandy's Lane approximately 20m to the east of Hyrama Crescent (Figure 5-1) is representative of the EEC 'Coastal Cypress Pine Forest in the NSW North Coast Bioregion'.

2. Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions.

   The 'Far North Bangalow Palm Swamp Forest' (PCT 3004) on Tandy's Lane (Figure 4-1) is representative of the EEC 'Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions'. This rainforest community is also representative of 'Lowland Rainforest of Subtropical Australia' which is listed as 'Critically Endangered' under the EPBC Act.

It is noted that both TECs occur outside the proposed trunk water main footprint including the associated 4m wide construction buffer and therefore will not be adversely impacted.

It is considered unlikely that potentially occurring endangered ecological communities (Appendix 4) not observed during the field survey would occur on the site as it predominately comprises maintained verge within road reserve.

6.2 Threatened Flora Species

Two (2) threatened flora species were observed on the site during the ecological survey.

Four (4) planted specimens of Coolamon (*Syzygium moorei*) occur in the road verge of Tandy's Lane proximate to the highway overpass, one (1) planted specimen of Coolamon occurs at the far eastern end of the alignment on Tandy's lane (Figure 5-6) and one (1) planted specimen of Coolamon occurs at the Mullumbimby Reservoir (Figure 5-9). Coolamon is listed as 'Vulnerable' under the BC Act 2016. One (1) Macadamia Nut (*Macadamia integrifolia*) occurs at the eastern end of the alignment on Tandy's Lane (Figure 5-6) and is listed as 'Vulnerable' under the EPBC Act 1999.

The alignment of the trunk water main and associated 4m wide construction footprint has been designed to avoid these threatened species and therefore they will not be adversely impacted.

It is considered unlikely that potentially occurring threatened flora (Appendix 4) not observed during the field survey would occur on the site as it predominately comprises maintained verge within road reserve.

6.3 Threatened Fauna Species and/or Populations

No threatened fauna species were observed on the site during the ecological survey. It is considered unlikely that potentially occurring threatened fauna (Appendix 4) not observed during the field survey would utilise the site as it predominately comprises maintained verge within road reserve.

6.4 Fauna Habitat and Corridors

In general, the habitat value within the site is low to negligible as it predominately comprises maintained verge within road reserve. The water main traverses Mullumbimby Creek via the bridge on Azalea Street and Saltwater Creek via a new minor bridge structure to which the water main pipe will be attached. Adverse impacts on the riparian environment will be avoided, and fauna movement in these riparian areas will not be impeded.

7 Legislative Assessment

7.1 Environmental Protection and Biodiversity Conservation Act 1999

The matters of national environmental significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) include:

- listed threatened species and communities.
- listed migratory species.
- Ramsar wetlands of international importance.
- Commonwealth marine environment.
- world heritage properties.
- national heritage places.
- the Great Barrier Reef Marine Park.
- nuclear actions.
- a water resource, in relation to coal seam gas development and large coal mining development.

The proposed development will not impact on the above MNES.

Four (4) planted specimens of Coolamon (*Syzygium moorei*) in the road verge of Tandy's Lane proximate to the highway overpass, one (1) planted specimen of Coolamon at the far eastern end of the alignment on Tandy's lane (Figure 5-6) and one (1) planted specimen of Coolamon at the Mullumbimby Reservoir (Figure 5-9) are listed as 'Vulnerable' under the EPBC Act. One (1) Macadamia Nut (*Macadamia integrifolia*) occurs at the eastern end of the alignment on Tandy's Lane (Figure 5-6) and is listed as 'Vulnerable' under the EPBC Act.

The 'Far North Bangalow Palm Swamp Forest' (PCT 3004) on Tandy's Lane (Figure 4-1) is representative of 'Lowland Rainforest of Subtropical Australia' which is listed as 'Critically Endangered' under the EPBC Act.

These threatened flora and endangered ecological community occur outside the proposed trunk water main footprint and associated 4m wide construction buffer and therefore will not be adversely impacted.

7.2 Biodiversity Conservation Act 2016

The 'Far North Bangalow Palm Swamp Forest' (PCT 3004) on Tandy's Lane is representative of 'Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions' which is a threatened ecological community (TEC) listed as 'Endangered' under the *Biodiversity Conservation Act 2016* (BC Act).

The juvenile patch of 'Far North Sands Coastal Cypress Littoral Rainforest' (PCT 3123) on Tandy's Lane approx. 20m to the east of Hyrama Crescent is representative of 'Coastal Cypress Pine Forest in the NSW North Coast Bioregion' which is a threatened ecological community (TEC) listed as 'Endangered' under the BC Act.

The planted specimens of Coolamon (*Syzygium moorei*) in the road verge and far eastern end of the alignment on Tandy's lane (Figure 5-6), and at the Mullumbimby Reservoir (Figure 5-9) are listed as 'Vulnerable' under the BC Act.

The alignment of the trunk water main and associated 4m wide construction buffer has been designed to avoid these threatened species and endangered ecological communities and therefore they will not be adversely impacted.

Furthermore, the trunk water main is not located within nor will adversely impact an area of Outstanding Biodiversity Value. The water main alignment and associated construction buffer does not occur within Biodiversity Values (BV) mapped areas except for a negligible portion in the cleared road reserve of Left Bank Road (Figure 7-1).

BIODIVERSITY VALUES MAP - LINE 04 LEFT BANK ROAD

LEGEND

- Proposed Water Main - Line 04
- Buffer_4m wide
- Cadastre_Survey
- Biodiversity Values Map (OEH)

Figure 7-1 | Biodiversity Values (BV) map – Line 04 Left Bank Road.

7.3 State Environmental Planning Policy (Biodiversity and Conservation) 2021

Chapter 3 'Koala Habitat Protection 2020' within *State Environmental Planning Policy (Biodiversity and Conservation) 2021* aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for the Koala (Phascolarctos cinereus) to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.

The SEPP does not apply to the site in regard to koala habitat protection since the relevant criteria are not met (Table 7-1).

Table 7-1 | Koala Habitat Protection criteria in SEPP (Biodiversity and Conservation) 2021.

SEPP Criteria	Assessment
1. Does the Policy apply? Is the land greater than 1ha in size and located within one of the Local Government areas listed within Schedule 2 of the SEPP?	Yes. The site is greater than 1ha in size and is located within the Byron LGA.
2. Is the land potential koala habitat? The SEPP defines 'potential koala habitat' as 'areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component'.	No. The site does not contain trees of the type listed in Schedule 2 and therefore is not potential koala habitat.
3. Is the land core koala habitat? The SEPP defines 'core koala habitat' as 'an area of land with a resident population of koalas, evidenced by attributes such as breeding females, being females with young, and recent sightings of and historical records of a population'.	No. The site is predominately road reserve with minor portions of Crown Land railway and waterway and therefore is not core koala habitat.

7.4 State Environmental Planning Policy (Resilience and Hazards) 2021

The site does not contain mapped littoral rainforest or coastal wetlands under the SEPP (Resilience and Hazards) 2021.

Portions of the proposed trunk water main are within the coastal environment and coastal use area. According to Part 2.2, Division 3, Section 2.10 (1) of the SEPP with regard to development on land within the coastal environment area:

Development *consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following—*

a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,
c) the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,
d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands, and rock platforms.

The proposed trunk water main is located predominately within road reserve and therefore will not adversely impact coastal environmental values including water quality or marine vegetation.

8 Development Impacts

8.1 Threatened Species, Populations and/or Communities

The proposed trunk water main will not adversely impact a threatened species, population, or community.

The water main is located within the cleared verge of the road reserve adjacent to the threatened vegetation communities 'Coastal Cypress Pine Forest in the NSW North Coast Bioregion' and 'Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions' and therefore no clearing of these threatened communities will occur.

The alignment of the proposed trunk water main has been designed to avoid the specimens of Coolamon (*Syzygium moorei*) and Macadamia Nut (*Macadamia integrifolia*) on Tandy's Lane and therefore no clearing of these threatened flora species will occur.

8.2 Vegetation Clearing

The proposed trunk water main predominately traverses 'Vegetation Community 1 - Cleared and Modified' areas in the road verge and therefore vegetation clearing will be minor.

Eight (8) trees will be impacted by the proposed alignment and require removal (Table 8-1). The impacted trees include three (3) Weeping Bottlebrush (*Melaleuca viminalis*), one (1) Bangalow Palm (*Archontophoenix cunninghamiana*), one (1) Hoop Pine (*Araucaria cunninghamii*), one (1) Wheel of Fire (*Stenocarpus sinuatus*), and one (1) Silky Oak (*Grevillea robusta*).

The portion of 'Vegetation Community 2 – Planted Landscaping' traversed by the trunk water main on Jubilee Avenue (Figure 5-3) contains Figs which contribute to streetscape character. This vegetation will be preserved as this section of the trunk water main will be under bored.

The water main traverses 'Vegetation Community 4 – Riparian Vegetation' (Figure 5-3) at Mullumbimby Creek via the bridge on Azalea Street and Saltwater Creek on Myokum Street via a new minor bridge structure to which the water main pipe will be attached. The new bridge structure will occur on disturbed land adjacent to the roadway and culvert over Saltwater Creek, and no concrete piles will be located within the waterway, therefore adverse impacts on the riparian environment will be avoided.

Table 8-1 | Summary of proposed tree removal.

Portion of Trunk Main	Tree Removal
Line 01 – Tandy's Lane	One (1) Silky Oak tree.
Line 02 - Mullumbimby	Six (6) trees including three (3) Weeping Bottlebrush, one (1) Bangalow Palm, one (1) Hoop Pine, and one (1) Golden Shower tree.
Line 03 - Reservoir	One (1) Wheel of Fire tree.
Line 04 – Left Bank Road	No tree removal required.

8.3 Removal and/or Modification of Fauna Habitat

Potential development impacts on fauna and associated habitat may include:

- Overall loss of standing biomass and reduction in flora species abundance/diversity.
- Mortality as a result of construction activities (removal/disturbance of nests, hollows, burrows, and general habitat).
- Loss of habitat complexity from the clearance zones including loss of potential foraging and nesting/roosting resources.
- Increased potential from 'edge effects' to retained remnants (on or offsite).

- Disturbance of species behaviour (i.e. some species are less tolerant to human presence or a higher level of human activity and may abandon currently utilized habitats).
- Reduction of potential fauna movement linkages throughout the overall landscape.
- Alteration to the fauna assemblage (some species tolerant to modified habitats (i.e. rats, minors, crows etc.) may dominant the newly created niches and displace species from adjacent vegetated remnants).

The proposed trunk water main predominately traverses 'Vegetation Community 1 - Cleared and Modified' areas in the road verge and therefore vegetation clearing, and associated fauna habitat loss, will be minor.

In general, the habitat value within the site is low to negligible as it predominately comprises maintained verge within road reserve. The trunk water main will be attached to the Azalea Street bridge alongside existing pipes and attached to a new minor bridge structure over Saltwater Creek on Myokum Street. The new bridge structure will occur on disturbed land adjacent to the roadway and culvert over Saltwater Creek, and no concrete piles will be located within the waterway, therefore adverse impacts on the riparian environment will be avoided.

A significant increase in 'edge effects' (and potential associated behavioural alteration through the establishment of a new edge) or significant reduction of terrestrial fauna movement through the landscape is unlikely to occur due to the location of the trunk water main predominately within maintained road reserve and the minor extent of clearing required therein.

8.4 Fauna Injury & Mortality

Any level of vegetation clearing, construction or earthworks has the potential to kill or injure fauna. In addition, roads and traffic are widely accepted as having adverse impacts on terrestrial wildlife since they present a significant movement barrier and potential for vehicle strike.

As discussed in Section 8.3, the site provides negligible fauna habitat and therefore it is unlikely that adverse impacts on fauna will arise during construction and operation of the proposed development.

8.5 Establishment of Pest Species

Key pest animals such as the Cane Toad (*Rhinella marina*) are established within the study area and are likely to be common within the general locality. The proposed development is not expected to result in an increase or decrease in the abundance of this or other species of pest animal.

Weeds are common on the site, and it is recommended that they be controlled in association with the proposed development.

9 Management of Impacts

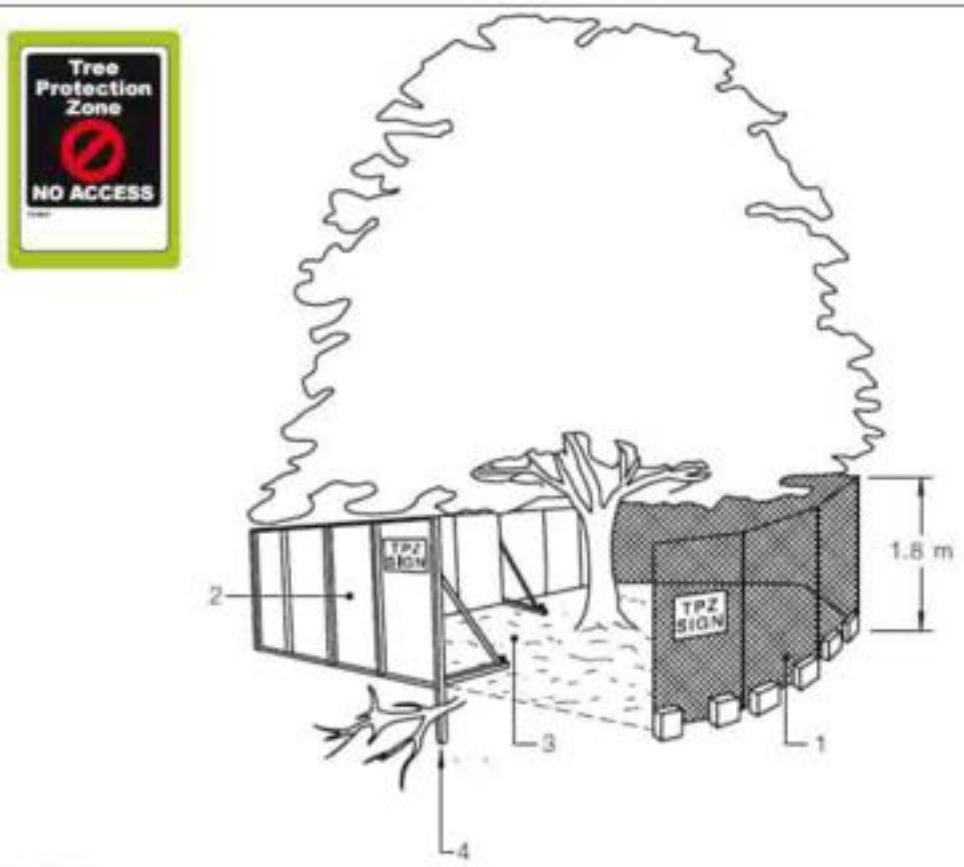
9.1 Protection and Avoidance

All vegetation outside the trunk water main alignment and associated construction zone is to be protected and avoided during clearing operations, earthworks, and construction activities. The retained vegetation must be clearly identified prior to the commencement of site works and where necessary protected by appropriate exclusion fencing and signage.

Examples of exclusion fencing include orange barrier tape attached to star pickets for copses of retained vegetation (Figure 9-1) and chain wire mesh or wood panel fencing around the perimeter of the Tree Protection Zone (TPZ) of individual retained trees (Figure 9-2) in accordance with *AS4970.1 Protection of trees on development sites*.

The planted specimens of threatened Coolamon (*Syzygium moorei*) on Tandy's Lane and at the Reservoir, the Macadamia Nut (*Macadamia integrifolia*) at the eastern end of the alignment on Tandy's Lane, and the Fig trees that contribute to streetscape character on Jubilee Avenue and Station Street are to be protected and works within their Tree Protection Zone (TPZ) is to be avoided (Table 9-1). Where incursion into the TPZ of these retained trees is necessary, an arborist should be engaged to assess the impact on the health and viability of the tree.

Figure 9-1 | Vegetation Protection Zone (VPZ) exclusion fencing.



LEGEND:

1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

Figure 9-2 | Tree Protection Zone (TPZ) fencing and signage.

Table 9-1 | Specific trees to be protected and avoided.

Common Name	Scientific Name	Easting	Northing	DBH (m)	Height (m)	Tree Protection Zone (m)*
Macadamia Nut	*Macadamia integrifolia*	552845	6839254	0.07	2	0.84
Coolamon	*Syzygium moorei*	552856	6839251	0.18	10	2.16
Coolamon	*Syzygium moorei*	552822	6839273	0.22	7	2.64
Coolamon	*Syzygium moorei*	552805	6839263	0.20	8	2.40
Coolamon	*Syzygium moorei*	552789	6839254	0.17	8	2.04
Coolamon	*Syzygium moorei*	552746	6839240	0.36	12	4.32
Coolamon	*Syzygium moorei*	547784	6840767	0.24	10	2.88
Fig	*Ficus sp.*	549098	6841099	1.81	14	21.72
Fig	*Ficus sp.*	548528	6840861	0.67	18	8.04
Fig	*Ficus sp.*	548515	6840850	1.09	18	13.08

* TPZ is 12 x DBH as per *AS4970.1 Protection of trees on development sites.*

9.2 Mitigation Measures

To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended at a ratio of 1:1 remove/replace for the seven (7) impacted native trees. The compensatory planting should occur at a suitable BSC owned offset site.

10 Conclusion

The alignment of the trunk water main has been carefully designed to avoid vegetation impacts and conflicts with existing services, such that the majority of the alignment is located within cleared verge areas of the road reserve. Nevertheless, a total of eight (8) trees will be impacted, including seven (7) native species and one (1) exotic species. None of the impacted native trees are threatened species.

Two (2) endangered ecological communities and two (2) threatened flora species listed under the *Biodiversity Conservation Act 2016* were recorded on the site. The alignment of the trunk water main and associated 4m wide construction buffer has been designed to avoid these endangered ecological communities and threatened flora species, and consequently they will not be adversely impacted.

Fig trees that contribute to streetscape character on Jubilee Avenue and Station Street are to be retained and protected.

The trunk water main is not located within nor will adversely impact an area of Outstanding Biodiversity Value. The water main alignment and associated construction buffer does not occur within Biodiversity Values (BV) mapped areas except for a negligible portion in the cleared road reserve of Left Bank Road.

The proposed development will not impact on threatened species, communities, or populations under the *Biodiversity Conservation Act 2016*, nor will it impact on any matters of national environmental significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999*.

Appendix 1 – Engineering Plans

BYRON SHIRE COUNCIL

MULLUMBIMBY TRUNK MAIN
TANDYS LANE (LINE 01)
NEW SOUTH WALES 2482

DETAILED DESIGN

PLANIT CONSULTING

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISION
10000	COVER SHEET AND DRAWING REGISTER	0
10010	GENERAL NOTES	0
10600	KEY PLAN	0
10610	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 1 OF 5	0
10611	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 2 OF 5	0
10612	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 3 OF 5	0
10613	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 4 OF 5	0
10614	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 5 OF 5	0
10620	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 1 OF 2	0
10621	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 2 OF 2	0
10622	CONSTRUCTION DETAILS - AIR VALVE AND SCOUR PIT	0
10623	CONSTRUCTION DETAILS - TYPICAL	0
10624	CONSTRCUTION DETAILS - ROAD CROSSING	0
10625	CONSTRUCTION DETAILS - TRENCH BACKFILL	0

LOCALITY PLAN
NOT TO SCALE

SOURCE: NEARMAP

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES: NOT TO SCALE — DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED

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CLIENT: BYRON SHIRE COUNCIL

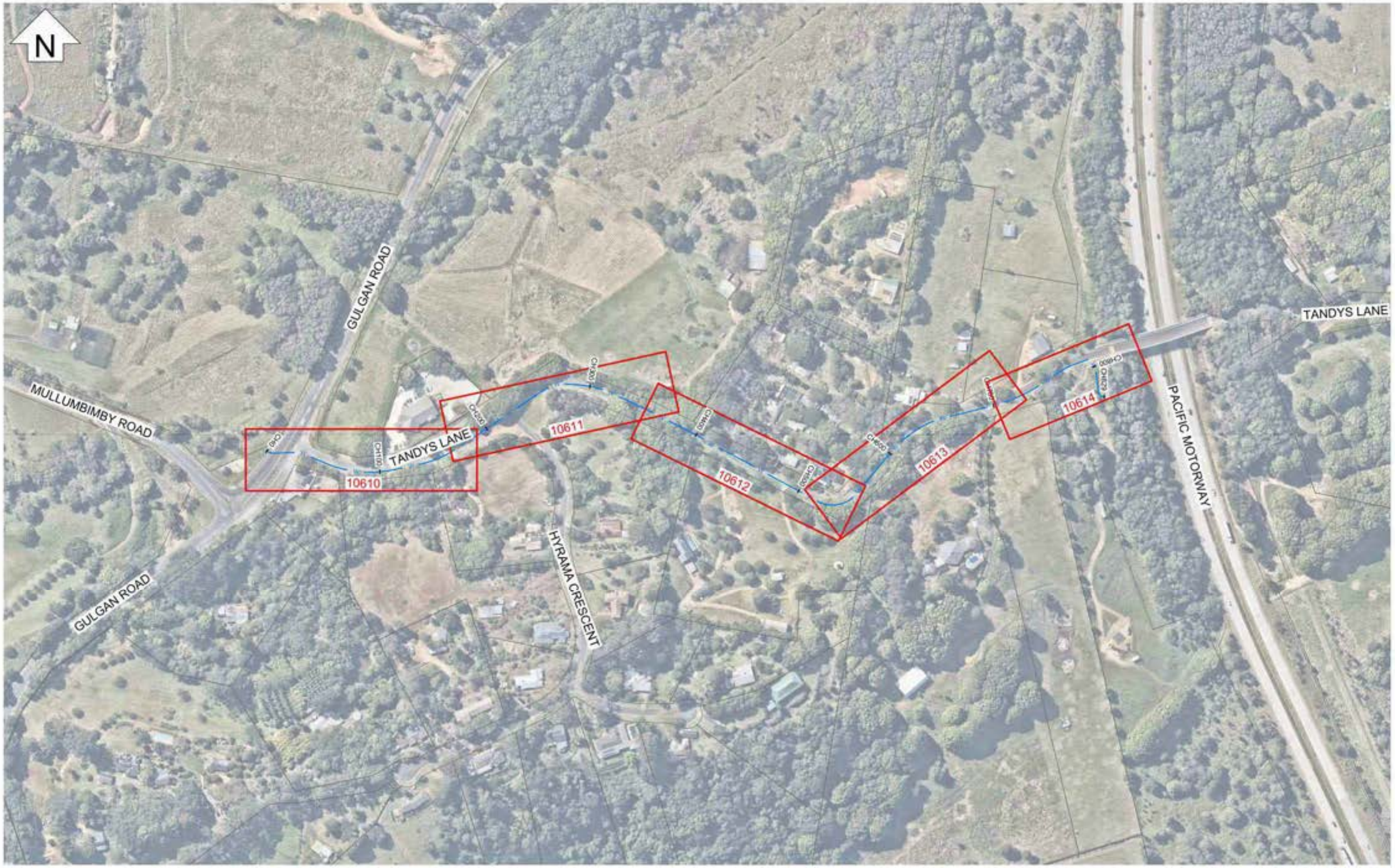
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 01 - TANDYS LANE
COVER SHEET AND DRAWING REGISTER

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	10000	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\TITLE - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMT - ENGINEERING\7.4 DRAFTING\10000 COVER SHEET.DWG PLOTTED BY: BRENDAN T PLOT DATE: 26/06/2024 8:13:10 AM



REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES:

0 20 40 80 120

Full Size 1:2000 ; Half Size 1:4000

Scale (m)

DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PLANIT CONSULTING
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administration@planitconsulting.com.au

PLANIT CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 01 - TANDYS LANE
KEY PLAN

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	10600	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDEV\AUTODE... - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMDT - ENGINEERING\7.4 DRAFTING\10600 KEY PLAN.DWG PLOTTED BY: BRENDAN T PLOT DATE: 26/06/2024 9:15:52 AM

BYRON SHIRE COUNCIL

MULLUMBIMBY TRUNK MAIN
MULLUMBIMBY TOWNSHIP (LINE 02)
NEW SOUTH WALES 2482

PLANIT CONSULTING

DETAILED DESIGN

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISION
20000	COVER SHEET AND DRAWING REGISTER	0
20010	GENERAL NOTES	0
20600	WATER ALIGNMENT KEY PLAN	0
20610	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 1 OF 16	0
20611	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 2 OF 16	0
20612	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 3 OF 16	0
20613	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 4 OF 16	0
20614	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 5 OF 16	0
20615	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 6 OF 16	0
20616	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 7 OF 16	0
20617	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 8 OF 16	0
20618	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 9 OF 16	0
20619	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 10 OF 16	0
20620	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 11 OF 16	0
20621	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 12 OF 16	0
20622	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 13 OF 16	0
20623	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 14 OF 16	0
20624	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 15 OF 16	0
20625	ALIGNMENT AND LONGITUDINAL SECTION - SHEET 16 OF 16	0
20628	LINE 02A LONGITUDINAL SECTION	0
20630	CONSTRUCTION DETAILS - CONNECTIONS	0
20631	CONSTRUCTION DETAILS - TYPICAL ROAD CROSSING	0
20632	CONSTRUCTION DETAILS - TYPICAL THRUST BLOCK	0
20633	CONSTRUCTION DETAILS - AIR VALVE AND SCOUR PIT	0
20634	CONSTRUCTION DETAILS - TRENCH BACKFILL	0
20635	CONSTRUCTION DETAILS - WATERMAIN BRIDGING SLAB	0
20636	CONSTRUCTION DETAILS - SALTWATER CREEK CROSSING	0

LOCALITY PLAN
NOT TO SCALE

SOURCE: NEARMAP

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/06/24	BT	BT	RW	RW

SCALES: NOT TO SCALE
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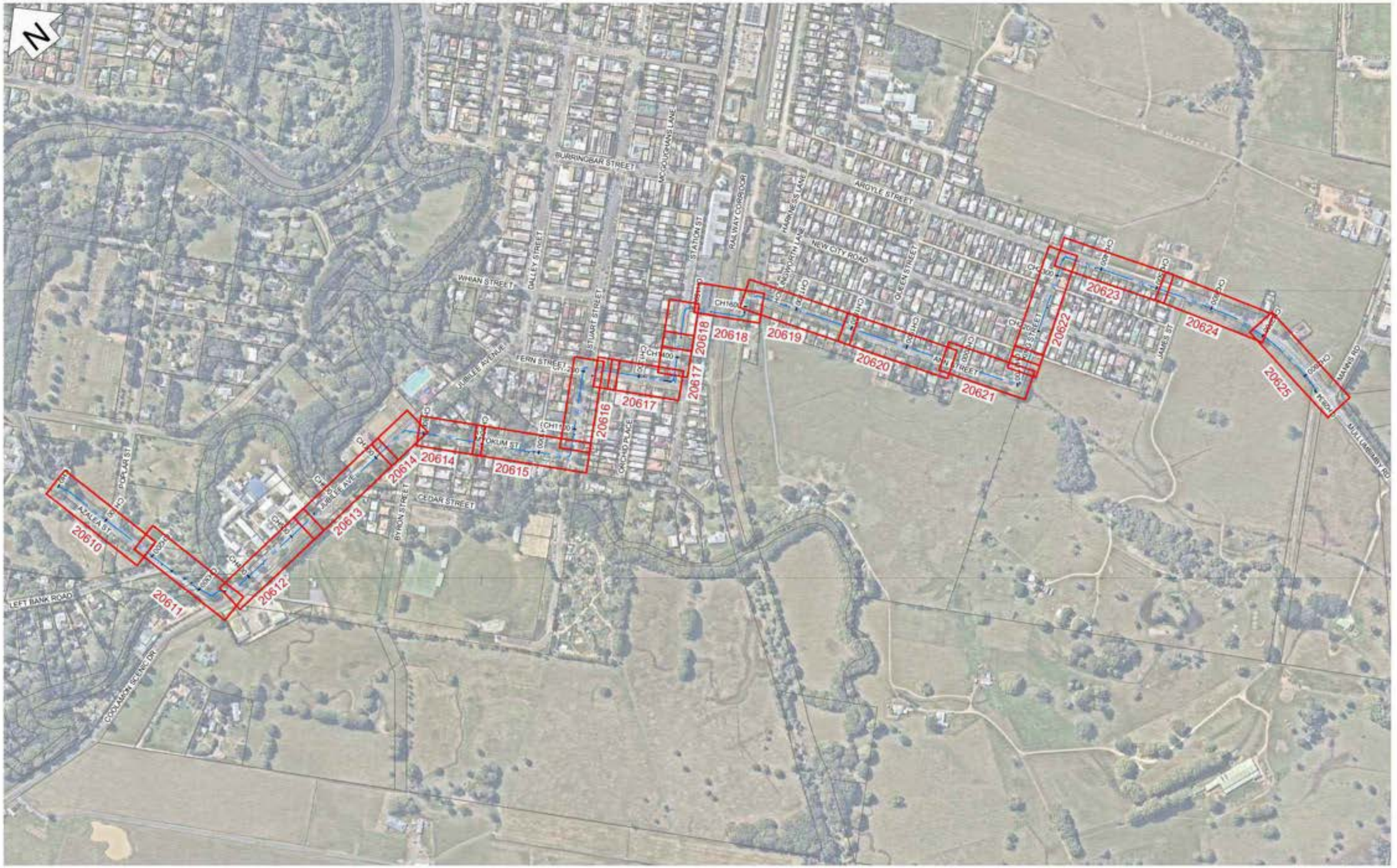
CLIENT: BYRON SHIRE COUNCIL
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 02 - MULLUMBIMBY TOWN
COVER SHEET AND DRAWING REGISTER

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	20000	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\J7708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN\04_TMT - ENGINEERING\7.4 DWG\TMD20000 COVER SHEET.DWG PLOTTED BY: BRENDAN T PLOT DATE: 30/06/2024 10:05:39 AM



REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
0 40 80 120 160
Full Size 1:3000 ; Half Size 1:6000
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PLANIT CONSULTING

CLIENT:
BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 02 - MULLUMBIMBY TOWN
WATER ALIGNMENT KEY PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	20600	0

CAD FILE: C:\USERS\BTAPLANITEVN\UTTER - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMDT - ENGINEERING\7.4 DRAWTTING\20600 KEY PLAN.DWG PLOTTED BY: BRENDAN T PLOT DATE: 28/08/2024 10:04:55 AM

BYRON SHIRE COUNCIL

MULLUMBIMBY TRUNK MAIN
RESERVOIR (LINE 03)
NEW SOUTH WALES 2482

DETAILED DESIGN

PLANIT CONSULTING

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISION
30000	COVER SHEET AND DRAWING REGISTER	0
30010	GENERAL NOTES	0
30600	WATER MAIN ALIGNMENT PLAN	0
30610	WATER MAIN LONGITUDINAL SECTIONS	0
30620	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 1 OF 3	0
30621	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 2 OF 3	0
30622	CONSTRUCTION DETAILS - CONNECTIONS - SHEET 3 OF 3	0
30623	CONSTRUCTION DETAILS - BELOW GROUND PRV	0
30624	CONSTRUCTION DETAILS - AIR VALVE AND SCOUR PIT	0
30625	CONSTRUCTION DETAILS - TYPICALS	0
30626	CONSTRUCTION DETAILS - TYPICAL ROAD CROSSING	0
30627	CONSTRUCTION DETAILS - TRENCH BACKFILL	0
30628	CONSTRUCTION DETAILS - BOOSTER PUMP STATION	0
30629	CONSTRUCTION DETAILS - BULK WATER METER	0

LOCALITY PLAN
NOT TO SCALE

SOURCE: NEARMAP

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES: NOT TO SCALE — DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR
COVER SHEET AND DRAWING REGISTER

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	30000	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\J7708 - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMP7 - 30000\REVIT\J7708 COVER SHEET.DWG PLOTTED BY: BRENDAN T PLOT DATE: 30/06/2024 4:29:24 AM

LEGEND

- PROPERTY BOUNDARY
- EXISTING SURFACE CONTOURS MINOR (0.2m)
- EXISTING SURFACE CONTOURS MAJOR (1.0m)
- EXISTING STORMWATER PIPE
- EXISTING GRAVITY SEWER
- EXISTING SEWER RISING MAIN
- EXISTING ELECTRICITY UNDERGROUND
- EXISTING ELECTRICITY OVERHEAD
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING WATER MAIN ABANDONED (DBYD)
- EXISTING SCOUR MAINS
- EXISTING SLUICE VALVE
- WATER MAIN
- SWAB INSERTION POINT
- SWAB REMOVAL POINT
- WATER QUALITY SAMPLING POINT
- AIR VALVE
- SCOUR VALVE
- SLUICE VALVE
- NON RETURN VALVE
- LIMIT OF WORKS

N

EXISTING MAIN, RECENTLY INSTALLED AND END-CAPPED UNDER SEPARATE WORKS PACKAGE (BY OTHERS).

REMOVE END CAP OF EXISTING MAIN AND ESTABLISH CONNECTION TO NEW PROPOSED TRUNK MAIN. REFER TO CONNECTION DETAIL AS PROVIDED ON DRAWING 30620.

CONSTRUCTION OF NEW CHAIN MESH FENCE 1.8m HIGH

THRUST RESTRAINT TO BE PROVIDED AT TRANSITION OF HDPE PIPE TO DICL

EXISTING SCOUR MAINS (TO REMAIN)

WATER MAIN LINE 03B

WATER MAIN LINE 03A

PRESSURE REDUCING VALVE REFER DETAIL 0 30620

PEDESTRIAN GATE TO BE INSTALLED

EXISTING SHELTER TO BE REMOVED

DN200 NON RETURN VALVE

WATER MAIN LINE 03B

THIS CUT IN IS LIVE WORKS AND SHALL REQUIRE SUPERVISION AND COORDINATION WITH BYRON SHIRE COUNCIL

DN300 NON RETURN VALVE

REFER DETAIL C 30621

GIBAULT CONNECTION

REFER DETAIL B 30621

ABB ELECTROMAGNETIC MAGFLOW METER REFER 30629

DN300 SLUICE VALVE

WATER MAIN LINE 03B

REMOVAL OF SECTION OF EXISTING CHAIN MESH FENCE

WATER MAIN LINE 03C

WATER MAIN LINE 03A

THIS CUT IN IS LIVE WORKS AND SHALL REQUIRE SUPERVISION AND COORDINATION WITH BYRON SHIRE COUNCIL

THIS CUT IN IS LIVE WORKS AND SHALL REQUIRE SUPERVISION AND COORDINATION WITH BYRON SHIRE COUNCIL

DN300xDN250 REDUCER

DN300 SLUICE VALVE (CLOSED IN NORMAL OPERATIONS)

GIBAULT CONNECTION

REFER DETAIL A 30621

DN200 SLUICE VALVE

DN300 SLUICE VALVE (OPEN IN NORMAL OPERATIONS)

BOOSTER PUMP STATION TO BE SUPPLIED BY ELITE AQUA, WITH A DUAL DUTY/STANDBY LOWARA MODEL: 22SV04F040T 4.0KW VERTICAL MULTISTAGE PUMP UNIT (OR APPROVED EQUIVALENT BY BSC).

REPLACE SECTION OF EXISTING WATERMAIN WITH DICL DN300

REFER DETAIL 1 30622

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WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR, NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THESE PLANS.

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:

0 1 2 4 6

Full Size 1:100 ; Half Size 1:200

Scale (m)

DO NOT SCALE FROM DRAWING

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DATE:

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN

DRAWING TITLE: LINE 03 - RESERVOIR WATER MAIN ALIGNMENT PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	30600	0

CAD FILE: C:\USERS\BTAYLOR\PLANITDRIVE\UTITE - MULLUMBIMBY TRUNK MAIN DETAILED DESIGN_TMOT - ENGINEERING\7.4 DRAWTING\DWG\WATER MAIN ALIGNMENT.DWG PLOTTED BY: BRENDAN T PLOT DATE: 28/08/2024 9:51:47 AM

BYRON SHIRE COUNCIL

MULLUMBIMBY TRUNK MAIN
LEFT BANK ROAD / TRISTAN PARADE (LINE 04)
NEW SOUTH WALES 2482

DETAILED DESIGN

PLANIT CONSULTING

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISION
40000	COVER SHEET AND DRAWING REGISTER	0
40010	GENERAL NOTES	0
40600	WATER MAIN ALIGNMENT PLAN	0
40610	WATER MAIN LONGITUDINAL SECTION	0
40620	CONSTRUCTION DETAILS - CONNECTIONS	0
40621	CONSTRUCTION DETAILS - TRENCH BACKFILL	0

LOCALITY PLAN
NOT TO SCALE

SOURCE: NEARMAP

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	26/06/24	BT	BT	RW	RW

SCALES: NOT TO SCALE
DO NOT SCALE FROM DRAWING

APPROVED BY:
DATE:
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CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: MULLUMBIMBY TRUNK MAIN
DRAWING TITLE: LINE 04 - LEFT BANK ROAD / TRISTRAN PARADE COVER SHEET AND DRAWING REGISTER

ORIGINAL SIZE:	PLANIT JOB No.	DRAWING No.:	REV:
A1	J7708	40000	0

N

EXISTING DN100 M-PVC MAIN FROM LEFT BANK RESERVOIR

EXISTING DN200 M-PVC MAIN TO LEFT BANK RESERVOIR

EXISTING UNDERGROUND ELECTRICAL

EXISTING GATE VALVE

EXISTING GATE VALVE

TRISTRAN PARADE

HORIZONTAL CLEARANCE OF 600mm TO TELECOMMUNICATIONS TO BE PROVIDED AT ALL TIMES (INCLUDING THRUST BLOCKS)

REFER TO DRAWING 40620 FOR CONNECTION DETAIL

INVERT RL:8.57
#150 DCIL
E 546049.11
N 6840602.72

PROPOSED DN150 GATE VALVE

EXISTING GATE VALVE (CURRENT BOUNDARY VALVE)

EXISTING GATE VALVE

EXISTING DN200 D.I.C.L MAIN TO AZALEA STREET RESERVOIR

EXISTING TELSTRA SERVICE TO BE LOCATED PRIOR TO CONSTRUCTION

PROPOSED DN100 GATE VALVE

PROPOSED DN150 GATE VALVE

WATERMAIN LINE 04

EXISTING DN100 M-PVC MAIN

INVERT RL:8.58
#150 DCIL
E 546050.65
N 6840598.50

EXISTING GATE VALVE (CURRENT BOUNDARY VALVE)

EXISTING DN200 D.I.C.L MAIN TO BE ABANDONED

EXISTING DN100 M-PVC MAIN

EXISTING DN100 M-PVC MAIN

LEFT BANK ROAD

EXISTING DN150 D.I.C.L MAIN TO WILSONS CREEK

EXISTING OVERHEAD ELECTRICAL

BENCHMARK 101
DOMY REG
E 540066.063
N 6840585.981

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WARNING

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LEGEND

- PROPERTY BOUNDARY
- EXISTING SURFACE CONTOURS MINOR (0.2m)
- EXISTING SURFACE CONTOURS MAJOR (1.0m)
- EXISTING STORMWATER PIPE
- EXISTING ELECTRICITY UNDERGROUND
- EXISTING ELECTRICITY OVERHEAD
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- WATER MAIN
- GATE VALVE

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
0	TENDER	28/08/24	BT	BT	RW	RW

SCALES:
0 0.5 1 2 3
Full Size 1:50 ; Half Size 1:100
Scale (m)
DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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CLIENT:
BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY:
BYRON SHIRE COUNCIL

PROJECT:
MULLUMBIMBY TRUNK MAIN

DRAWING TITLE:
LINE 04 - LEFT BANK ROAD / TRISTRAN PARADE
WATER MAIN ALIGNMENT PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7708	40600	0

Appendix 2 – NSW BioNet Wildlife Atlas Search

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -28.51 West: 153.46 East: 153.56 South: -28.61] returned a total of 6,012 records of 107 species.
Report generated on 1/12/2023 4:26 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Myobatrachidae	3137	*Crinia tinnula*		Wallum Froglet	V,P		96	
Animalia	Amphibia	Hylidae	3202	*Litoria olongburensis*		Olongburra Frog	V,P	V	6	
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	10	
Animalia	Reptilia	Cheloniidae	2007	*Chelonia mydas*		Green Turtle	V,P	V	2	
Animalia	Reptilia	Cheloniidae	2008	*Eretmochelys imbricata*		Hawksbill Turtle	P	V	3	
Animalia	Aves	Casuariidae	0001	*Dromaius novaehollandiae*		Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	E2,P		1	
Animalia	Aves	Anseranatidae	0199	*Anseranas semipalmata*		Magpie Goose	V,P		1	
Animalia	Aves	Anatidae	0214	*Stictonetta naevosa*		Freckled Duck	V,P		6	
Animalia	Aves	Columbidae	0025	*Ptilinopus magnificus*		Wompoo Fruit-Dove	V,P		13	

Animalia	Aves	Columbidae	0021	*Ptilinopus regina*	Rose-crowned Fruit-Dove	V,P		72
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*	Superb Fruit-Dove	V,P		4
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*	White-throated Needletail	P	V,C,J,K	115
Animalia	Aves	Procellariidae	0072	*Ardenna carneipes*	Flesh-footed Shearwater	V,P	J,K	1
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1,P		13
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E	3
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*	Black Bittern	V,P		19
Animalia	Aves	Accipitridae	0218	*Circus assimilis*	Spotted Harrier	V,P		2
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P		21
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*	Little Eagle	V,P		54
Animalia	Aves	Accipitridae	8739	*^^Pandion cristatus*	Eastern Osprey	V,P,3		24
Animalia	Aves	Falconidae	0238	*Falco subniger*	Black Falcon	V,P		3
Animalia	Aves	Gruidae	0177	*Grus rubicunda*	Brolga	V,P		2
Animalia	Aves	Rallidae	0053	*Amaurornis moluccana*	Pale-vented Bush-hen	V,P		4
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*	Bush Stone-curlew	E1,P		24
Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*	Beach Stone-curlew	E4A,P		7
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P		6
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1,P		43

Animalia	Aves	Jacanidae	0171	*Irediparra gallinacea*	Comb-crested Jacana	V,P		4
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*	Eastern Curlew	P	CE,C,J,K	25
Animalia	Aves	Laridae	0972	*Gygis alba*	White Tern	V,P		1
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1,P	C,J,K	9
Animalia	Aves	Cacatuidae	8862	*^Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	V,P,2	V	25
Animalia	Aves	Psittacidae	8028	*^Cyclopsitta diophthalma coxeni*	Coxen's Fig-Parrot	E4A,P,2	E	1
Animalia	Aves	Psittacidae	0309	*Lathamus discolor*	Swift Parrot	E1,P	CE	1
Animalia	Aves	Strigidae	0246	*^^Ninox connivens*	Barking Owl	V,P,3		5
Animalia	Aves	Tytonidae	0252	*^^Tyto longimembris*	Eastern Grass Owl	V,P,3		3
Animalia	Aves	Tytonidae	0250	*^^Tyto novaehollandiae*	Masked Owl	V,P,3		1
Animalia	Aves	Tytonidae	9924	*^^Tyto tenebricosa*	Sooty Owl	V,P,3		2
Animalia	Aves	Alcedinidae	0327	*Todiramphus chloris*	Collared Kingfisher	V,P		6
Animalia	Aves	Meliphagidae	0610	*Lichenostomus fasciogularis*	Mangrove Honeyeater	V,P		3
Animalia	Aves	Campephagidae	0428	*Coracina lineata*	Barred Cuckoo-shrike	V,P		1
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		1
Animalia	Aves	Monarchidae	0376	*Carterornis leucotis*	White-eared Monarch	V,P		10
Animalia	Aves	Petroicidae	0380	*Petroica boodang*	Scarlet Robin	V,P		3
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	1

Animalia	Mammalia	Dasyuridae	1045	*Planigale maculata*	Common Planigale	V,P		11	
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	E1,P	E	1760	
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P		3	
Animalia	Mammalia	Potoroidae	1175	*Potorous tridactylus*	Long-nosed Potoroo	V,P	V	8	
Animalia	Mammalia	Pteropodidae	1290	*Nyctimene robinsoni*	Eastern Tube-nosed Bat	V,P		1	
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	140	
Animalia	Mammalia	Pteropodidae	1294	*Syconycteris australis*	Common Blossom-bat	V,P		16	
Animalia	Mammalia	Molossidae	1329	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	V,P		2	
Animalia	Mammalia	Vespertilionidae	1354	*Chalinolobus nigrogriseus*	Hoary Wattled Bat	V,P		1	
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P		188	
Animalia	Mammalia	Vespertilionidae	1336	*Nyctophilus bifax*	Eastern Long-eared Bat	V,P		47	
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		1	
Animalia	Mammalia	Miniopteridae	1346	*Miniopterus australis*	Little Bent-winged Bat	V,P		120	
Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		21	
Animalia	Mammalia	Muridae	1455	*Pseudomys novaehollandiae*	New Holland Mouse	P	V	3	
Animalia	Mammalia	Dugongidae	1558	*Dugong dugon*	Dugong	E1,P		1	

Animalia	Insecta	Noctuidae	I021	*Phyllodes imperialis southern subspecies*	Southern Pink Underwing Moth	E1	E	1	
Animalia	Gastropoda	Camaenidae	I002	*Thersites mitchellae*	Mitchell's Rainforest Snail	E1	CE	3	
Plantae	Flora	Acanthaceae	10847	*Harnieria hygrophiloides*	Native Justicia	E1		67	
Plantae	Flora	Apocynaceae	1226	*Cynanchum elegans*	White-flowered Wax Plant	E1	E	1	
Plantae	Flora	Apocynaceae	1233	*Marsdenia longiloba*	Slender Marsdenia	E1	V	14	
Plantae	Flora	Apocynaceae	1176	*Ochrosia moorei*	Southern Ochrosia	E1	E	2	
Plantae	Flora	Apocynaceae	1245	*Tylophora woollsii*	Cryptic Forest Twiner	E1	E	1	
Plantae	Flora	Argophyllaceae	3224	*Corokia whiteana*	Corokia	E1	E	4	
Plantae	Flora	Cunoniaceae	10943	*^Davidsonia jerseyana*	Davidson's Plum	E1,2	E	176	
Plantae	Flora	Ebenaceae	2564	*Diospyros mabacea*	Red-fruited Ebony	E1	E	5	
Plantae	Flora	Elaeocarpaceae	2575	*^^Elaeocarpus williamsianus*	Hairy Quandong	E1,3	E	7	
Plantae	Flora	Fabaceae (Caesalpinioideae)	8772	*Senna acclinis*	Rainforest Cassia	E1		3	
Plantae	Flora	Fabaceae (Faboideae)	2833	*Desmodium acanthocladum*	Thorny Pea	V	V	3	
Plantae	Flora	Fabaceae (Mimosoideae)	3711	*Acacia bakeri*	Marblewood	V		442	

Plantae	Flora	Fabaceae (Mimosoideae)	7757	*Archidendron hendersonii*	White Lace Flower	V		99	
Plantae	Flora	Flacourtiaceae	3114	*Xylosma terrae-reginae*	Queensland Xylosma	E1		47	
Plantae	Flora	Lauraceae	3477	*Cryptocarya foetida*	Stinking Cryptocarya	V	V	868	
Plantae	Flora	Lauraceae	8948	*Endiandra floydii*	Crystal Creek Walnut	E1	E	113	
Plantae	Flora	Lauraceae	3491	*Endiandra hayesii*	Rusty Rose Walnut	V	V	27	
Plantae	Flora	Lauraceae	8480	*Endiandra muelleri subsp. bracteata*	Green-leaved Rose Walnut	E1		142	
Plantae	Flora	Lindsaeaceae	8126	*^^Lindsaea brachypoda*	Short-footed Screw Fern	E1,3		5	
Plantae	Flora	Menispermaceae	3691	*Tinospora tinosporoides*	Arrow-head Vine	V		50	
Plantae	Flora	Myrtaceae	15211	*^^Backhousia subargentea*	Giant Ironwood	E1,3		65	
Plantae	Flora	Myrtaceae	11894	*Gossia fragrantissima*	Sweet Myrtle	E1	E	42	
Plantae	Flora	Myrtaceae	4282	*Rhodamnia maideniana*	Smooth Scrub Turpentine	E4A		13	
Plantae	Flora	Myrtaceae	4283	*Rhodamnia rubescens*	Scrub Turpentine	E4A	CE	29	
Plantae	Flora	Myrtaceae	4284	*Rhodomyrtus psidioides*	Native Guava	E4A	CE	7	
Plantae	Flora	Myrtaceae	4290	*Syzygium hodgkinsoniae*	Red Lilly Pilly	V	V	33	
Plantae	Flora	Myrtaceae	4292	*Syzygium moorei*	Durobby	V	V	170	
Plantae	Flora	Myrtaceae	4298	*Uromyrtus australis*	Peach Myrtle	E1	E	1	
Plantae	Flora	Orchidaceae	6672	*^Geodorum densiflorum*	Pink Nodding Orchid	E1,P,2		12	

Plantae	Flora	Orchidaceae	4479	*^Peristeranthus hillii*	Brown Fairy-chain Orchid	V,P,2		13	
Plantae	Flora	Orchidaceae	4480	*^Phaius australis*	Southern Swamp Orchid	E1,P,2	E	1	
Plantae	Flora	Phyllanthaceae	9833	*Phyllanthus microcladus*	Brush Sauropus	E1		9	
Plantae	Flora	Polypodiaceae	8154	*Belvisia mucronata*	Needle-leaf Fern	E1		4	
Plantae	Flora	Polypodiaceae	8156	*^^Drynaria rigidula*	Basket Fern	E1,3		2	
Plantae	Flora	Proteaceae	5354	*Floydia praealta*	Ball Nut	V	V	6	
Plantae	Flora	Proteaceae	5372	*Grevillea hilliana*	White Yiel Yiel	E1		122	
Plantae	Flora	Proteaceae	5432	*Hicksbeachia pinnatifolia*	Red Boppel Nut	V	V	9	
Plantae	Flora	Proteaceae	9680	*Macadamia integrifolia*	Macadamia Nut		V	2	
Plantae	Flora	Proteaceae	5446	*Macadamia tetraphylla*	Rough-shelled Bush Nut	V	V	42	
Plantae	Flora	Rubiaceae	8297	*Randia moorei*	Spiny Gardenia	E1	E	287	
Plantae	Flora	Rutaceae	6457	*Acronychia littoralis*	Scented Acronychia	E1	E	48	
Plantae	Flora	Rutaceae	5765	*Bosistoa transversa*	Yellow Satinheart	V	V	1	
Plantae	Flora	Rutaceae	8658	*Melicope vitiflora*	Coast Euodia	E1		33	
Plantae	Flora	Sapotaceae	11957	*Niemeyera whitei*	Rusty Plum, Plum Boxwood	V		1	

Appendix 3 – EPBC Protected Matters Search

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 01-Dec-2023

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	125
Listed Migratory Species:	64

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	10
Commonwealth Heritage Places:	None
Listed Marine Species:	97
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	9
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	5
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In feature area
Dunn's white gum (Eucalyptus dunnii) moist forest in north-east New South Wales and south-east Queensland	Endangered	Community may occur within area	In feature area
Grey box-grey gum wet forest of subtropical eastern Australia	Endangered	Community may occur within area	In feature area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In feature area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Atrichornis rufescens Rufous Scrub-bird [655]	Endangered	Species or species habitat may occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In buffer area only
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
[Turnix melanogaster](#) Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area	In feature area
CRUSTACEAN			
[Euastacus girurmulayn](#) Smooth Crayfish [83146]	Endangered	Species or species habitat known to occur within area	In buffer area only
FISH			
[Epinephelus daemelii](#) Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hippocampus whitei](#) White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Maccullochella ikei](#) Clarence River Cod, Eastern Freshwater Cod [26170]	Endangered	Species or species habitat known to occur within area	In feature area
[Seriolella brama](#) Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
[Thunnus maccoyii](#) Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
[Assa darlingtoni](#) Pouched Frog [1965]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat likely to occur within area	In feature area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In feature area
INSECT			
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petrogale penicillata			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
Xeromys myoides			
Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Acronychia littoralis			
Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area	In feature area
Allocasuarina thalassoscopica			
[21927]	Endangered	Species or species habitat may occur within area	In feature area
Amyema plicatula			
[81879]	Endangered	Species or species habitat may occur within area	In feature area
Arthraxon hispidus			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Baloghia marmorata Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat known to occur within area	In feature area
Bulbophyllum globuliforme Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat may occur within area	In feature area
Coleus nitidus listed as Plectranthus nitidus Nightcap Plectranthus, Silver Plectranthus [91380]	Endangered	Species or species habitat known to occur within area	In feature area
Corokia whiteana [17820]	Endangered	Species or species habitat known to occur within area	In feature area
Corynocarpus rupestris subsp. rupestris Glenugie Karaka [19303]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat known to occur within area	In feature area
Cyperus semifertilis [21559]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Davidsonia jerseyana Davidson's Plum [67219]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Davidsonia johnsonii Smooth Davidsonia, Smooth Davidson's Plum, Small-leaved Davidson's Plum [67178]	Endangered	Species or species habitat known to occur within area	In feature area
Diospyros mabacea Red-fruited Ebony, Silky Persimmon, Ebony [18548]	Endangered	Species or species habitat may occur within area	In feature area
Diploglottis campbellii Small-leaved Tamarind [21484]	Endangered	Species or species habitat known to occur within area	In feature area
Elaeocarpus sedentarius Minyon Quandong [83093]	Endangered	Species or species habitat known to occur within area	In buffer area only
Elaeocarpus williamsianus Hairy Quandong [8956]	Endangered	Species or species habitat known to occur within area	In feature area
Endiandra floydii Floyd's Walnut, Crystal Creek Walnut [52955]	Endangered	Species or species habitat known to occur within area	In feature area
Endiandra hayesii Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat known to occur within area	In feature area
Floydia praealta Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat known to occur within area	In feature area
Fontainea australis Southern Fontainea [24037]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gossia fragrantissima Sweet Myrtle, Small-leaved Myrtle [78867]	Endangered	Species or species habitat known to occur within area	In feature area
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Isoglossa eranthemoides Isoglossa [16663]	Endangered	Species or species habitat likely to occur within area	In feature area
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area	In feature area
Ochrosia moorei Southern Ochrosia [11350]	Endangered	Species or species habitat known to occur within area	In feature area
Owenia cepiodora Onionwood, Bog Onion, Onion Cedar [11344]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Ozothamnus vagans Wollumbin Dogwood [56207]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pedleya acanthoclada listed as Desmodium acanthocladum Thorny Pea [93275]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area	In feature area
Randia moorei Spiny Gardenia [10577]	Endangered	Species or species habitat known to occur within area	In feature area
Rhodamnia maideniana Smooth Scrub Turpentine [20665]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sarcochilus hartmannii Waxy Sarcochilus, Blue Knob Orchid [4124]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sophora fraseri [8836]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Symplocos baeuerlenii Small-leaved Hazelwood, Shrubby Hazelwood [19010]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium moorei Rose Apple, Coolamon, Robby, Durobby, Watermelon Tree, Coolamon Rose Apple [12284]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Uromyrtus australis Peach Myrtle [8830]	Endangered	Species or species habitat known to occur within area	In buffer area only
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat known to occur within area	In feature area
REPTILE			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Harrisoniascincus zia Rainforest Cool-skink [84785]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
SNAIL			
Thersites mitchellae Mitchell's Rainforest Snail [66774]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Carcharhinus longimanus			
Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In feature area
Tringa brevipes Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11267]	NSW	In feature area
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11304]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [11301]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11266]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [15508]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14482]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11265]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [15601]	NSW	In feature area
Unknown		
Commonwealth Land - [14475]	NSW	In buffer area only
Commonwealth Land - [14476]	NSW	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Fish			
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In buffer area only
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area	In buffer area only
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In buffer area only
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In buffer area only
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In buffer area only
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In buffer area only
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In buffer area only
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In buffer area only
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In buffer area only
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In buffer area only
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area	In buffer area only
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In buffer area only
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In buffer area only
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In buffer area only
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Mammal			
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area	In buffer area only
Hydrophis platurus as Pelamis platurus Yellow-bellied Sea Snake [93517]		Species or species habitat may occur within area	In buffer area only
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Sousa sahulensis Australian Humpback Dolphin [87942]		Species or species habitat may occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Billinudgel	Nature Reserve	NSW	In buffer area only
Brunswick Heads	Nature Reserve	NSW	In feature area
Cape Byron	Marine Park	NSW	In feature area
Goonengerry	National Park	NSW	In buffer area only
Inner Pocket	Nature Reserve	NSW	In buffer area only
Jinangong	Nature Reserve	NSW	In buffer area only
Marshalls Creek	Nature Reserve	NSW	In buffer area only
Mount Jerusalem	National Park	NSW	In buffer area only
Tyagarah	Nature Reserve	NSW	In feature area

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Billinudgel Nature Reserve	NSW	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Residential dwelling, 26 Shelley Drive	2004/1362	Not Controlled Action	Completed	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In buffer area only

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In buffer area only
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur	In buffer area only
Marine Turtles			
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur	In buffer area only
Sharks			
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur	In buffer area only
Whales			
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur	In buffer area only

Bioregional Assessments

SubRegion	BioRegion	Website	Buffer Status
Clarence-Moreton	Clarence-Moreton	BA website	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix 4 – Likelihood of Occurrence Assessment

VEGETATION COMMUNITIES

Community Name	NSW status	Comm. status	Description	Likelihood of Occurrence	Assessment of Significance (5-Part Test)
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community		E	The ecological community occurs in sub-tropical, sub-humid and temperate climatic zones from Curtis Island, north of Gladstone, in Queensland to Bermagui in southern New South Wales. The ecological community is found within the South Eastern Queensland (SEQ), NSW North Coast (NNC), Sydney Basin (SYB) and South East Corner (SEC) IBRA7 bioregions (Department of the Environment and Energy, 2012)	Not recorded during flora survey.	No test required.
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia		CE	The ecological community occurs from Princess Charlotte Bay, Cape York Peninsula to the Gippsland Lakes in Victoria as well as on offshore islands on the east coast. The ecological community represents a complex of rainforest and coastal vine thickets, including some that are deciduous, on the east coast of Australia. Typically, the ecological community occurs within two kilometres of the coast or adjacent to a large salt water body, such as an estuary and, thus, is influenced by the sea. The ecological community is not associated with a particular soil type and can occur on a variety of geological substrata.	Not recorded during flora survey.	No test required.
Lowland Rainforest of Subtropical Australia		CE	The ecological community primarily occurs from Maryborough in Queensland to the Clarence River (near Grafton) in New South Wales (NSW). The ecological community also includes isolated areas between the Clarence River and Hunter River such as the Bellinger and Hastings valleys. The ecological community occurs in the following Interim Biogeographic Regionalisation for Australia Version 6.1 (IBRA) Bioregions: South Eastern Queensland Bioregion and NSW North Coast Bioregion.	Recorded during survey but outside the development footprint and therefore will not be impacted.	No test required.
Dunn's white gum (Eucalyptus dunnii) moist forest in north-east New South Wales and south-east Queensland		E	Dunn's white gum moist forest occurs in the NSW North Coast bioregion and adjacent bioregions in South Eastern Queensland and New England Tablelands (DoE 2012), with a scattered distribution north from Dorrigo and Coffs Harbour in New South Wales to Warwick and Canungra in Queensland (Benson & Hager 1993). The ecological community occurs in the IBRA1 subregions of Cataract, Chaelundi, Dalmorton, Rocky River Gorge, Washpool, Woodenbong, and Scenic Rim. It also occurs to a lesser extent within the Clarence Sandstone IBRA subregion and in the Coffs Coast and Escarpment IBRA subregion, north of Bellingen River (DoE 2012).	Not recorded during flora survey.	No test required.

Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions		E	The Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions occurs in the New South Wales North Coast (NNC) and South Eastern Queensland (SEQ) IBRA bioregions and on Curtis Island in the Brigalow Belt North (BBN) IBRA Bioregion (DoE 2013). This encompasses an area from just north of Newcastle, New South Wales (around Raymond Terrace) in the south, to just north of Gladstone in Queensland.	Not recorded during flora survey.	No test required.
Grey box-grey gum wet forest of subtropical eastern Australia		E	The ecological community is limited to the New South Wales north coast and south eastern Queensland IBRA Bioregions 3 from near Coffs Harbour in NSW to the southern areas of southeast Queensland. Within these areas it occurs in the Moreton Basin, Scenic Rim, Woodenbong, Cataract, Rocky River Gorge, Washpool, Dalmorton, Clarence Sandstones and Chaelundi IBRA subregions. It occurs mainly in the Richmond and Clarence River Catchments NSW (DEC 2008) with some occurrences in other catchments.	Not recorded during flora survey.	No test required.
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland		E	The Coastal Swamp Sclerophyll Forest ecological community occurs on the mainland and islands near to the coast (within 20 km) within the following IBRA2 Bioregions: South East Queensland (SEQ); NSW North Coast (NNC); Sydney Basin (SYB); and the Bateman subregion of the South East Corner (SEC2).	Not recorded during flora survey.	No test required.
Subtropical and Temperate Coastal Saltmarsh		V	The Subtropical and Temperate Coastal Saltmarsh (hereafter Coastal Saltmarsh) ecological community occurs within a relatively narrow margin of the Australian coastline, within the subtropical and temperate climatic zones south of the South-east Queensland IBRA bioregion boundary at 23° 37' latitude along the east coast and south of (and including) Shark Bay at 26° on the west coast.	Not recorded during flora survey.	No test required.

FLORA

Scientific Name	Common Name	NSW status	Comm. status	Records	Habitat Description	Likelihood of Occurrence	Assessment of Significance (5-Part Test)
Acacia bakeri	Marblewood	V		442	Marblewood grows in or near lowland subtropical rainforest, in adjacent eucalypt forest and in regrowth of both. It usually occurs in the understorey but may occur as a large canopy tree.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Acronychia littoralis	Scented Acronychia	E1	E	48	Scented Acronychia occurs in transition zones between littoral rainforest and swamp sclerophyll forest; between littoral and coastal cypress pine communities; and margins of littoral forest. The species mainly occurs within 2km from the coast on sandy soil.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Archidendron hendersonii	White Lace Flower	V		99	White Lace Flower occurs in riverine and lowland subtropical rainforest, littoral rainforest, coastal cypress pine forest and their ecotones.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Backhousia subargentea	Giant Ironwood	E1		65	Giant Ironwood is found in dry rainforest regrowth consisting of thickets growing in steeply sloping paddocks on basalt-derived soil as well as in sub-tropical and warm temporate rainforest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Belvisia mucronata	Needle-leaf Fern	E1		4	Forms small clumps on trees or rocks in dry rainforest or along creeks in moist open forest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Bosistoa transversa	Yellow Satinheart	V	V	1	Three-leaved Bosistoa grows in wet sclerophyll forest, dry sclerophyll forest and rainforest including highly disturbed habitat up to 300 m in altitude.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Corokia whiteana	Corokia	E1	E	4	The inland populations are found at the boundaries between wet eucalypt forest and warm temperate rainforest, at altitudes up to 800 m.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Cryptocarya foetida	Stinking Cryptocarya	V	V	868	Found in littoral, warm temporate and subtropical rainforest, wet sclerophyll forest and Camphor laural forest usually on sandy soils, but mature trees are also known on basalt soils.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Cynanchum elegans	White-flowered Wax Plant	E1	E	1	The White-flowered Wax Plant usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree *Leptospermum laevigatum* – Coastal Banksia *Banksia integrifolia* subsp. *integrifolia* coastal scrub; Forest Red Gum *Eucalyptus tereticornis* aligned open forest and woodland; Spotted Gum *Corymbia maculata* aligned open forest and woodland; and Bracelet Honeymyrtle *Melaleuca armillaris* scrub to open scrub.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Davidsonia jerseyana	Davidson's Plum	E1,2	E	176	Lowland subtropical rainforest and wet eucalypt forest at low altitudes (below 300m). Many trees are isolated in paddocks and on roadsides in former rainforest habitats.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Desmodium acanthocladum	Thorny Pea	V	V	3	Dry rainforest and fringes of riverine subtropical rainforest. On basalt-derived soils at low elevations.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Diospyros mabacea	Red-fruited Ebony	E1	E	5	Usually grows as an understorey tree in lowland subtropical rainforest, often close to rivers.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Drynaria rigidula	Basket Fern	E1		2	Grows on plants, rocks or on the ground. Usually found in rainforest but also in moist eucalypt and Swamp Oak forest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Elaeocarpus williamsianus	Hairy Quandong	E1	E	7	Subtropical to warm temperate rainforest, including regrowth areas where it has apparently regrown from root suckers after clearing.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Endiandra floydii	Crystal Creek Walnut	E1	E	113	Warm temperate, subtropical rainforest or wet sclerophyll forest with Brush Box overstorey, and in and Camphor Laurel forest. The species can occur in disturbed and regrowth sites. The species generally preferres sheltered locations however it has been recorded on ridgelines, slopes, gullies and creek flats.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Endiandra hayesii	Rusty Rose Walnut	V	V	27	Sheltered moist gullies in lowland subtropical and warm temperate rainforest on alluvium or basaltic soils. The species occurs in regrowth and highly modified forms of these habitats.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Endiandra muelleri subsp. bracteata	Green-leaved Rose Walnut	E1		142	Occurs in subtropical and warm temperate rainforests and Brush Box forests, including regrowth and highly modified forms of these habitats.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Floydia praealta	Ball Nut	V	V	6	Riverine and subtropical rainforest, usually on soils derived from basalt.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Geodorum densiflorum	Pink Nodding Orchid	E1,P,2		12	Dry eucalypt forest, coastal swamp forest, and coastal dune shrublands at lower altitudes, often on sand.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Gossia fragrantissima	Sweet Myrtle	E1	E	42	Dry subtropical and riverine rainforest. As it can coppice from roots left in the ground when rainforest is cleared, it is found at several sites as isolated plants in paddocks or regrowth.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Grevillea hilliana	White Yiel Yiel	E1		122	White Yiel Yiel grows in subtropical rainforest, often on basalt-derived soils.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Harnieria hygrophiloides	Native Justicia	E1		67	The understorey of littoral rainforest, dry rainforest and wet eucalypt forest, usually in well-drained areas.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Hicksbeachia pinnatifolia	Red Boppel Nut	V	V	9	Subtropical rainforest, moist eucalypt forest and Brush Box forest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Lindsaea brachypoda	Short-footed Screw Fern	E1,3		5	Very moist habitats in subtropical or warm-temperate rainforest or palm forest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Macadamia integrifolia	Macadamia Nut		V	2	Macadamia Nut occurs from Mt Bauple, near Gympie, to Currumbin Valley in the Gold Coast hinterland, south-east Queensland. The species was known to occur in north-east New South Wales; was described from 1850-60 specimens collected from Camden Haven, and there are specimens also from Lismore. It occurs as a scattered rare to occasional tree, and population sizes are difficult to estimate (Barry & Thomas, 1994)	Recorded during survey but outside the development footprint and therefore will not be impacted.	No test required.
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V	42	Found in subtropical rainforest, usually near the coast.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Marsdenia longiloba	Slender Marsdenia	E1	V	14	Subtropical and warm temperate rainforest, lowland moist or open eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops. Associated species include Eucalyptus crebra, E. microcorys, E. acmenoides, E. saligna, E. propinqua, Corymbia intermedia and Lophostemon confertus.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Melicope vitiflora	Coast Euodia	E1		33	Coast Euodia grows in subtropical and littoral rainforest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Niemeyera whitei	Rusty Plum, Plum Boxwood	V		1	Found in gully, warm temperate or littoral rainforests and the adjacent understorey of moist eucalypt forest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Ochrosia moorei	Southern Ochrosia	E1	E	2	Southern Ochrosia is found in riverine and lowland subtropical rainforest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Peristeranthus hillii	Brown Fairy-chain Orchid	V,P,2		13	Restricted to coastal and near-coastal environments, particularly Littoral Rainforest and the threatened ecological community Lowland Rainforest on Floodplain. The species is an epiphyte, growing in clumps on tree trunks and thick vines.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Phaius australis	Southern Swamp Orchid	E1,P,2	E	1	Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Phyllanthus microcladus	Brush Sauropus	E1		9	Usually found on banks of creeks and rivers, in streamside rainforest or dry rainforest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Randia moorei	Spiny Gardenia	E1	E	287	Spiny Gardenis occurs in subtropical, riverine, littoral and dry rainforest. In NSW, Hoop Pine and Brush Box are common canopy species. It is found along moist scrubby water courses at altitudes up to 360 m asl, with most records below 100 m asl.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Rhodamnia maideniana	Smooth Scrub Turpentine	E4A		13	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Rhodamnia rubescens	Scrub Turpentine	E4A	CE	29	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Rhodomyrtus psidioides	Native Guava	E4A	CE	7	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Senna acclinis	Rainforest Cassia	E1		3	Grows on the margins of subtropical, littoral and dry rainforests.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Syzygium hodgkinsoniae	Red Lilly Pilly	V	V	33	Usually found in riverine and subtropical rainforest on rich alluvial or basaltic soils.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Syzygium moorei	Durobby	V	V	170	Durobby is found in subtropical and riverine rainforest at low altitude. It often occurs as isolated remnant paddock trees.	Recorded during survey but outside the development footprint and therefore will not be impacted.	No test required.
Tinospora tinosporoides	Arrow-head Vine	V		50	Wetter subtropical rainforest, including littoral rainforest, on fertile, basalt-derived soils.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Tylophora woollsii	Cryptic Forest Twiner	E1	E	1	This species grows in moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Uromyrtus australis	Peach Myrtle	E1	E	1	Warm temperate rainforest on less fertile soils derived from rhyolite rock. Often associated with Coachwood (*Ceratopetalum apetalum*).	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Xylosma terrae-reginae	Queensland Xylosma	E1		47	Littoral and subtropical rainforest on coastal sands or soils derived from metasediments.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

1. Indicates the conservation status of each taxon under the NSW *Biodiversity Conservation Act 2016*. The codes are Critically Endangered (E4A, E4B), Endangered (E1, E2, E3), Vulnerable (V, V2) and Protected (P, P2).

2. Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*. The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

FAUNA

Scientific Name	Common Name	NSW status	Comm. status	Records	Habitat Description	Likelihood of Occurrence	Assessment of Significance (5-Part Test)
Litoria olongburensis	Olongburra Frog	V	V	6	The Olongburra Frog is an "acid" frog confined to the coastal sandplain wallum swamps. Their life-cycle is adapted to the acidic pH (2.8-5.5) of these wetlands. Frogs are highest in abundance in relatively undisturbed wallum swamps.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Caretta caretta	Loggerhead Turtle	E1	E	10	Loggerhead Turtles are ocean-dwellers, foraging in deeper water for fish, jellyfish and bottom-dwelling animals. The female comes ashore to lay her eggs in a hole dug on the beach in tropical regions during the warmer months.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Chelonia mydas	Green Turtle	V	V	2	Ocean-dwelling species spending most of its life at sea	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Dromaius novaehollandiae	Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	E2		1	On the NSW north coast, Emus occur in a range of predominantly open lowland habitats, including grasslands, heathland, shrubland, open and shrubby woodlands, forest, and swamp and sedgeland communities, as well as the ecotones between these habitats. They also occur in plantations of tea-tree and open farmland, and occasionally in littoral rainforest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Anseranas semipalmata	Magpie Goose	V		1	Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Stictonetta naevosa	Freckled Duck	V		6	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Ptilinopus magnificus	Wompoo Fruit-Dove	V		13	Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Ptilinopus regina	Rose-crowned Fruit-Dove	V		72	Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Ptilinopus superbus	Superb Fruit-Dove	V		4	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Hirundapus caudacutus	White-throated Needletail	P	V	115	In Australia, the White-throated Needletail is mostly aerial, from heights of less than 1 m up to more than 1000 m above the ground (Coventry 1989; Tarburton 1993). Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings (Higgins 1999).	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Ardenna carneipes	Flesh-footed Shearwater	V		1	Marine	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Ephippiorhynchus asiaticus	Black-necked Stork	E1		13	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Botaurus poiciloptilus	Australasian Bittern	E1	E	3	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.).	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Crinia tinnula	Wallum Froglet	V		96	Wallum Froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Ixobrychus flavicollis	Black Bittern	V		19	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Circus assimilis	Spotted Harrier	V		2	Occurs in grassy open woodland including *Acacia* and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Haliaeetus leucogaster	White-bellied Sea-Eagle	V		21	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Hieraaetus morphnoides	Little Eagle	V		54	Occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
^^Pandion cristatus	Eastern Osprey	V		24	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Falco subniger	Black Falcon	V		3	The black falcon's habitat is usually in the arid and semi arid zones. It is usually found near watercourses or utilizing patches of isolated trees. It hunts over open wooded grasslands, saltbush plains, bluebush plains and other low vegetation. In arid areas it will hunt over wetlands or near artificial or temporary water bodies – areas which tend to attract the most abundant birdlife	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Grus rubicunda	Brolga	V		2	Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Amaurornis moluccana	Pale-vented Bush-hen	V		4	The Pale-vented Bush-hen inhabits tall dense understorey or ground-layer vegetation on the margins of freshwater streams and natural or artificial wetlands, usually within or bordering rainforest, rainforest remnants or forests.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Burhinus grallarius	Bush Stone-curlew	E1		24	Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Esacus magnirostris	Beach Stone-curlew	E4A		7	Beach Stone-curlews are found exclusively along the coast, on a wide range of beaches, islands, reefs and in estuaries, and may often be seen at the edges of or near mangroves. They forage in the intertidal zone of beaches and estuaries, on islands, flats, banks and spits of sand, mud, gravel or rock, and among mangroves. Beach Stone-curlews breed above the littoral zone, at the backs of beaches, or on sandbanks and islands, among low vegetation of grass, scattered shrubs or low trees; also among open mangroves.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Haematopus fuliginosus	Sooty Oystercatcher	V		6	Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Haematopus longirostris	Pied Oystercatcher	E1		43	Favours intertidal flats of inlets and bays, open beaches and sandbanks.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Irediparra gallinacea	Comb-crested Jacana	V		4	Inhabit permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Numenius madagascariensis	Eastern Curlew		CE	25	It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Gygis alba	White Tern	V		1	Marine	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Sternula albifrons	Little Tern	E1		9	Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records).	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
^Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	25	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
^Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	E4A	E	1	Usually recorded from drier rainforests and adjacent wetter eucalypt forest but rarely seen due to its small size and cryptic habits. Also found in the wetter lowland rainforests that are now largely cleared in NSW.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Lathamus discolor	Swift Parrot	E1	CE	1	Migrates to the Australian south-east mainland between February and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Forest Red Gum E. tereticornis, Mugga Ironbark E. sideroxylon, and White Box E. albens.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
^^Ninox connivens	Barking Owl	V		5	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
^^Tyto longimembris	Eastern Grass Owl	V		3	Eastern Grass Owls are found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
^^Tyto novaehollandiae	Masked Owl	V		1	Lives in dry eucalypt forests and woodlands from sea level to 1100 m.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
^^Tyto tenebricosa	Sooty Owl	V		2	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Todiramphus chloris	Collared Kingfisher	V		6	Collared Kingfishers are virtually restricted to mangrove associations of estuaries, inlets, sheltered bays and islands, and the tidal flats and littoral zone bordering mangroves. They sometimes occur in terrestrial forests or woodlands bordering mangroves, where they will nest in holes in trees or in arboreal termitaria. They are sometimes seen in streets or gardens in built-up areas bordering mangrove vegetation.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Lichenostomus fasciogularis	Mangrove Honeyeater	V		3	The primary habitat of the species is mangrove woodlands and shrublands but Mangrove Honeyeaters also range into adjacent forests, woodlands and shrublands, including casuarina and paperbark swamp forests and associations dominated by eucalypts or banksias. They occasionally forage in parks and gardens of coastal towns and villages	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Coracina lineata	Barred Cuckoo-shrike	V		1	Rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses. They are usually seen in pairs or small flocks foraging among foliage of trees for insects and fruit.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V		1	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Carterornis leucotis	White-eared Monarch	V		10	In NSW, White-eared Monarchs occurs in rainforest, especially drier types, such as littoral rainforest, as well as wet and dry sclerophyll forests, swamp forest and regrowth forest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Petroica boodang	Scarlet Robin	V		3	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	1	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Quolls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Planigale maculata	Common Planigale	V		11	Common Planigales inhabit rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Phascolarctos cinereus	Koala	E1	E	1760	Inhabit eucalypt woodlands and forests.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Petaurus norfolcensis	Squirrel Glider	V		3	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Potorous tridactylus	Long-nosed Potoroo	V	V	8	Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Nyctimene robinsoni	Eastern Tube-nosed Bat	V		1	Favour streamside habitats within coastal subtropical rainforest and moist eucalypt forests with a well-developed rainforest understorey.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	140	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Syconycteris australis	Common Blossom-bat	V		16	Common Blossom-bats often roost in littoral rainforest and feed on nectar and pollen from flowers in adjacent heathland and paperbark swamps. They have also been recorded in a range of other vegetation communities, such as subtropical rainforest, wet sclerophyll forest and other coastal forests.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V		2	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Chalinolobus nigrogriseus	Hoary Wattled Bat	V		1	In NSW the Hoary Wattled Bat occurs in dry open eucalypt forests, favouring forests dominated by Spotted Gum, boxes and ironbarks, and heathy coastal forests where Red Bloodwood and Scribbly Gum are common. Because it flies fast below the canopy level, forests with naturally sparse understorey layers may provide the best habitat. Roosts in hollows and rock crevices. Will occupy urban areas with suitable habitat.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Myotis macropus	Southern Myotis	V		188	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Nyctophilus bifax	Eastern Long-eared Bat	V		47	Lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Coastal rainforest and patches of coastal scrub are particularly favoured. Roosts in tree hollows, the hanging foliage of palms, in dense clumps of foliage of rainforest trees, under bark and in shallow depressions on trunks and branches, among epiphytes, in the roots of strangler figs, among dead fronds of tree ferns and less often in buildings.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Scoteanax rueppellii	Greater Broad-nosed Bat	V		1	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Miniopterus australis	Little Bent-winged Bat	V		120	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.

Miniopterus orianae oceanensis	Large Bent-winged Bat	V		21	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Pseudomys novaehollandiae	New Holland Mouse		V	3	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Dugong dugon	Dugong	E1		1	Major concentrations of Dugongs occur in wide shallow protected bays, wide shallow mangrove channels and in the lee of large inshore islands.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Phyllodes imperialis southern subspecies	Southern Pink Underwing Moth	E1	E	1	The Southern Pink Underwing Moth is found in subtropical rainforest below about 600 m elevation. Potential breeding habitat is restricted to areas where the caterpillar's food plant, a native rainforest vine, Carronia multisepalea, occurs in subtropical rainforest.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.
Thersites mitchellae	Mitchell's Rainforest Snail		CE	3	Remnant areas of lowland subtropical rainforest and swamp forest on alluvial soils. Slightly higher ground around the edges of wetlands with palms and fig trees are particularly favoured habitat. Typically found amongst leaf litter on the forest floor, and occasionally under bark in trees.	Not recorded during flora survey. Unlikely to occur on the site and surrounds as favoured habitat is considered to be generally absent.	No test required.


PLANIT
CONSULTING

Appendix D – Environmental Searches

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : J7708

Client Service ID : 784532

Sean Cochran

Date: 23 May 2023

17A Beech Drive
Suffolk Park New South Wales 2481

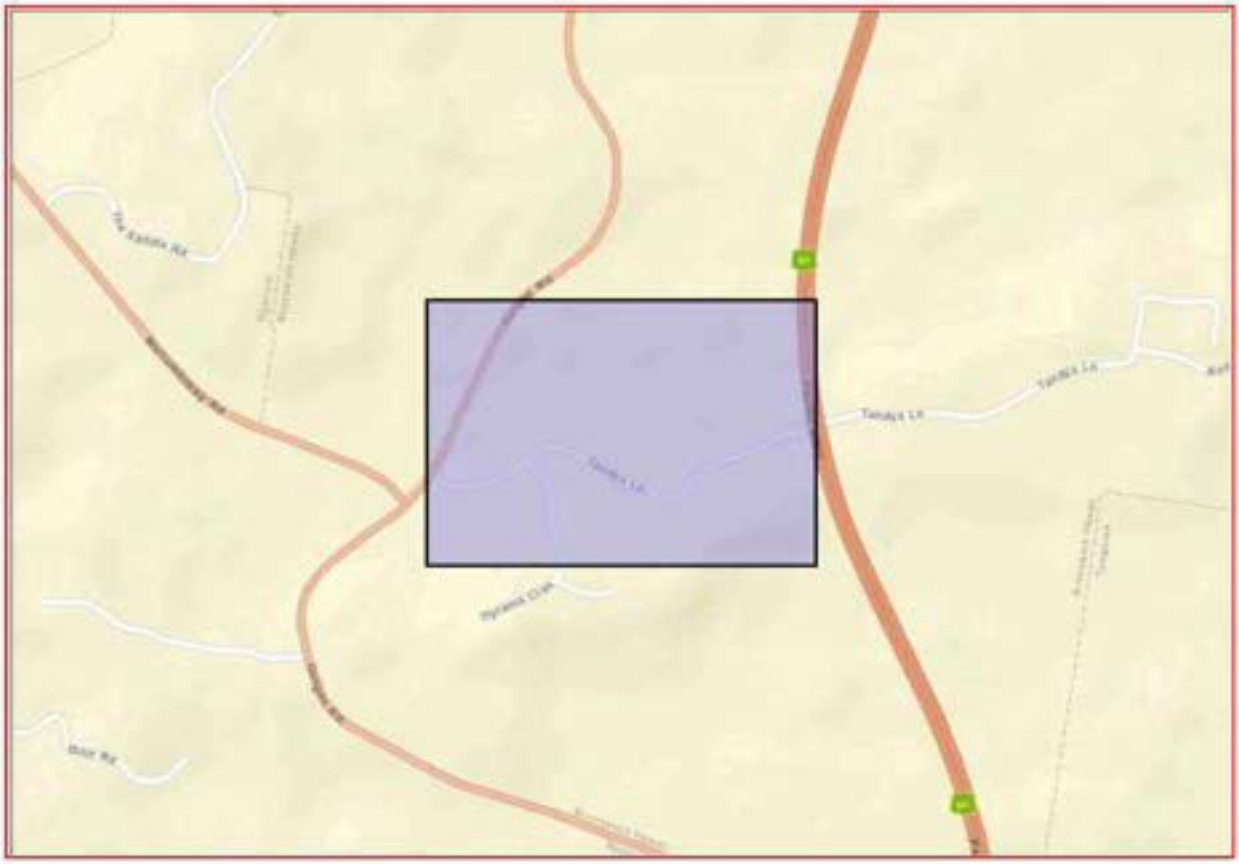
Attention: Sean Cochran

Email: sean@planitconsulting.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -28.5745, 153.5332 - Lat, Long To : -28.5698, 153.5409, conducted by Sean Cochran on 23 May 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : J7708

Client Service ID : 784534

Sean Cochran

Date: 23 May 2023

17A Beech Drive
Suffolk Park New South Wales 2481

Attention: Sean Cochran

Email: sean@planitconsulting.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -28.5593, 153.4959 - Lat, Long To : -28.5499, 153.5113, conducted by Sean Cochran on 23 May 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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0	Aboriginal places have been declared in or near the above location. *

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- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

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Web: www.heritage.nsw.gov.au

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : J7708

Client Service ID : 784539

Sean Cochran

Date: 23 May 2023

17A Beech Drive
Suffolk Park New South Wales 2481

Attention: Sean Cochran

Email: sean@planitconsulting.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -28.5609, 153.4874 - Lat, Long To : -28.5562, 153.4951, conducted by Sean Cochran on 23 May 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : J7708

Client Service ID : 784550

Sean Cochran

Date: 23 May 2023

17A Beech Drive
Suffolk Park New South Wales 2481

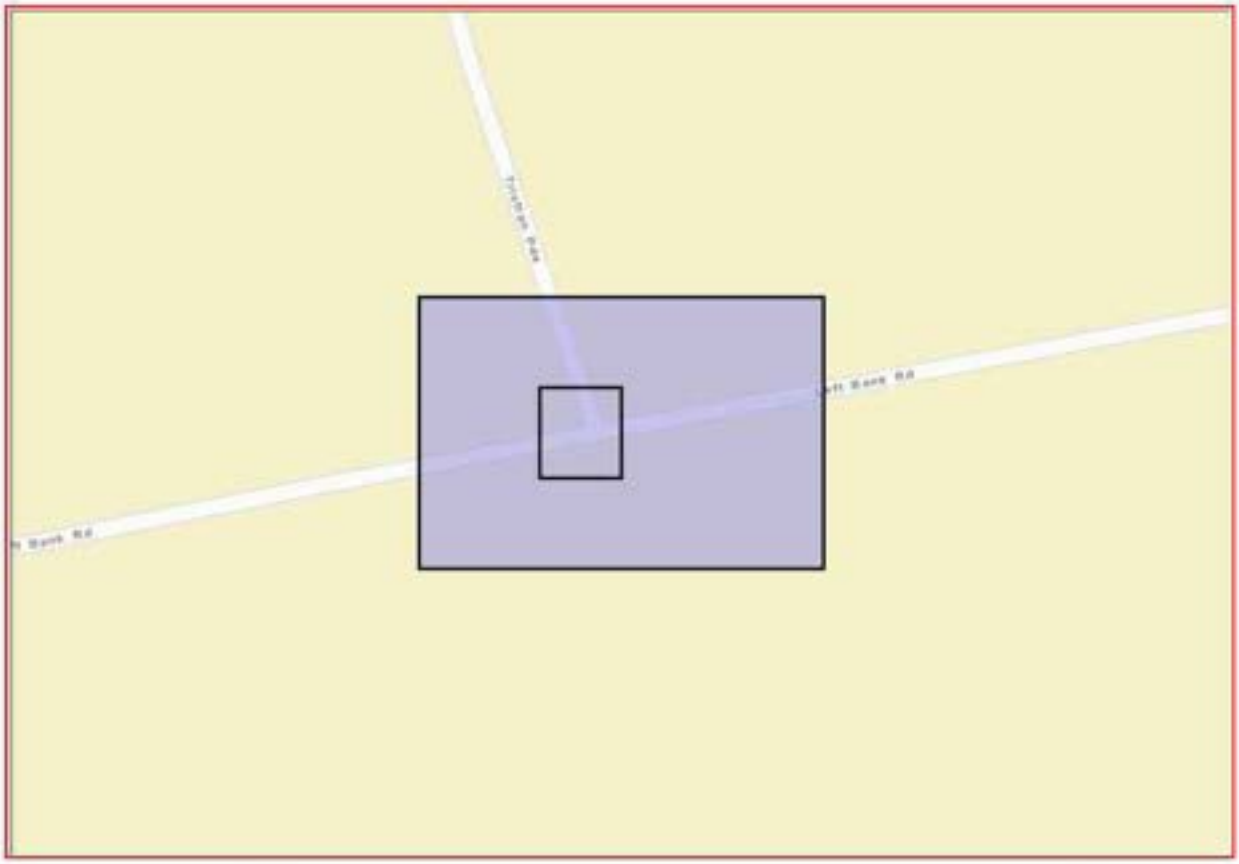
Attention: Sean Cochran

Email: sean@planitconsulting.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -28.561, 153.4703 - Lat, Long To : -28.5604, 153.4713, conducted by Sean Cochran on 23 May 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

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- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
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- This search can form part of your due diligence and remains valid for 12 months.

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Search Results

39 results found.

Allanby Area		Eureka, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Andrew Johnston Memorial Scrub and Adjacent Areas	Beacoms Rd	Eureka, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Beavys Creek Scrub	Beacoms Rd	Clunes, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Blackbutt Plateau		Mullumbimby, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Booyong Scrub	Booyong Rd	Nashua, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Broken Head Marine Reserve Proposal		Broken Head, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Broken Head Nature Reserve (1977 boundary)		Broken Head, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Broken Head and Adjacent Areas		Broken Head, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Brunswick Heads Nature Reserve (1979 boundary)		Brunswick Heads, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Byron Bay Post Office	61 Jonson St	Byron Bay, NSW, Australia	(Listed place) Commonwealth Heritage List
Cape Byron Lighthouse	Lighthouse Rd	Byron Bay, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Cape Byron Lighthouse	Lighthouse Rd	Byron Bay, NSW, Australia	(Listed place) Commonwealth Heritage List
Cape Byron Lighthouse and Residences	Lighthouse Rd	Byron Bay, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Cod Hole - Julian Rocks Grey Nurse Shark Habitat		Byron Bay, NSW, Australia	(Place rejected for Emergency Listing) National Heritage List

Courthouse Including Police Station and Lockup 61 Dalley St	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Emerys Scrub Nashua Rd	Fernleigh, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Farmhouse including Fence and Garden Main Arm Rd	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Gondwana Rainforests of Australia	Lismore, NSW, Australia	(Declared property) World Heritage List
Gondwana Rainforests of Australia	Lismore, NSW, Australia	(Listed place) National Heritage List
Hayters Hill Scrub Bangalow Rd	Byron Bay, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Indigenous Place	Bangalow, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Indigenous Place	Billinudgel, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Indigenous Place	Broken Head, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Indigenous Place	Byron Bay, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Inverary including Front Fence Main Arm Rd	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Julian Rocks Aquatic Reserve	Byron Bay, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Julian Rocks Nature Reserve	Byron Bay, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Midden Flat Scrub	Bangalow, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Minyon Falls Scrub Minyon Dr	Goonengerry, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)

Mortons Scrub Beacoms Rd		Eureka, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Mullumbimby Post Office (original) Myocum St		Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Mullumbimby Power Station Wilsons Creek Rd		Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Myocum Downs Ornithological Area Coolamon Scenic Rd		Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Nightcap National Park Crofton Rd		Nimbin, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
North Ocean Shores - Natural Area Jones Rd		Billinudgel, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Snows Gully Scrub Upper Coopers Creek Rd		Goonengerry, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Wilsons River Scrub Sheaffes Rd		Goonengerry, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Wilsons and Coopers Creek		Lismore, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Yelgun - Wooyung National Heritage Place New Brighton Rd		South Golden Beach, NSW, Australia	(Nomination now ineligible for EPAL) National Heritage List

Report Produced: Tue May 23 13:28:28 2023

Byron Shire Heritage Inventory

State Heritage Inventory

SHI Number
1260198
Study Number
9.150

Item Name: Mullumbimby Conservation Area

Location: Mullumbimby

Address:		**DUAP Region:**	Northern
Suburb / Nearest Town:	Mullumbimby 2481	**Historic region:**	North Coast
Local Govt Area:	Byron	**Parish:**	
State:	NSW	**County:**	
Other/Former Names:			
Area/Group/Complex:	Mullumbimby Heritage precinct	**Group ID:**	
Aboriginal Area:			
Curtilage/Boundary:	Refer to attached map		
Item Type:	Landscape	**Group:** Urban Area	**Category:** Townscape
Owner:	Multiple Owners		
Admin Codes:	9.150	**Code 2:**	**Code 3:**
Current Use:	Mixed		
Former Uses:	Mixed		
Assessed Significance:	Local	**Endorsed Significance:**	

Statement of Significance: The township of Mullumbimby is unusual in having a uniform scale and character of traditional buildings laid out in an historic grid. The township exists in a very beautiful setting in the lee of the distinctive Mount Chincogan.

Historical Notes or Provenance: The town of Mullumbimby is built substantially on a reserve of one square mile that was created in 1872 as a site for a village at the confluence of the Brunswick River and Mullumbimby Creek. The village was proclaimed in 1887 and the first land sales in the village occurred in the following year. The first signs of commerce appeared in the village in the late 1880s. However the impetus for growth occurred in 1894 when the Tweed Railway was built and a station was constructed on the eastern side of the village. The town developed on both sides of the railway although most commercial activities and the preponderance of housing was built in the area bounded by the railway on the east and the Brunswick River and Mullumbimby Creek on the north, west and south.

In 1908 Mullumbimby was incorporated as an area Local Government. The population of the town was then 907 people. Over the following decades the place grew into a substantial town with two storey hotels and banks on the principal corners. By WWII, when the town had its own power and water supplies, the population had grown to 2000.

Timber and dairying were the commercial mainstays of the town. Bananas and sugar cane have contributed also to the primary output. As a rural centre and seat of local government, selling power and water to nearby communities outside the town boundaries, the town has maintained steady prosperity which is reflected in the building stock of the town, despite periodic fires that have been responsible for the destruction of some of the former buildings of note.

Item Name: Mullumbimby Conservation Area

Location: Mullumbimby

Substantial development occurred in the town after WWII, including the construction of many houses and commercial buildings, sometimes as replacements of timber buildings that were destroyed by fire, with uninspiring brick structures. Notwithstanding these modern intrusions of poor quality the town maintains a high standard of uniformity in the built structures and a highly attractive small town character with rich subtropical vegetation and ordered street plantings.

Themes:

National Theme	State Theme	Local Theme
4. Settlement	Towns, suburbs and village	(none)

Designer: Various

Maker / Builder: Various

Year Started: 1890 **Year Completed:** 1960 **Circa:** No

Physical Description: An area of Mullumbimby township bounded to the North and West by the Brunswick River, to the South by Byron, Myokum, Stuart, and Fern Streets to the railway line, and to the East by Prince Street to the old Foley's Butter Factory at the end of Station Street, and characterised by a commercial centre of mixed building forms dating to the early Twentieth Century with a group of freestanding residential dwellings of mostly traditional character featuring pitched gable roofs and sub-tropical gardens. The town has wide streets in which most are planted with shades trees, some in avenues and there is a network of rear lanes. The principal building materials are weatherboard and thye buildings are built on timber stumps,with sharply pitched corrugated iron roofs, with brick chimneys and fireplaces, and traditional fenestration styles.
Lots are developed with setbacks from the street, uniform property size, rear access from laneways, front and side boundary fences.
Items that contribute to the heritage significance and character of the precinct include:
* Stationmaster's Cottage, Argyle Street (at crossing)
* Railway Station, Prince Street
* House, 3 Station Street
* 'St Albans', 5 Station Street
* House, 7 Station Street
* House, 14 Station Street
* House, 23 Station Street
* House, 33 Station Street
* House, 35 Station Street
* House, 37 Station Street
* House, 53 Station Street
* 'Poinciana', 55 Station Street
* Public Lavatory, Station Street
* House, 87 Station Street
* House, 93 Station Street

* House, 101 Station Street
* 'Rose Cottage', 105 Station Street
* House, 5 Fern Street
* Brunswick Valley Historical Society Museum, Myocum Street
* The Yellow Church Yoga and Natural Therapies Centre, 9 Myocum Street
* Ross Industrial Complex, Mill Street
* House, 24 Mill Street
* House, 7 Mill Street
* House, 9 Mill Street
* House, 1 Train Street
* House, 10 Train Street
* House, 7 Whian Street
* House, 11 Whian Street
* House, 14 River Terrace
* Heritage Park, Brunswick River Terrace
* House, 6 Brunswick River Terrace
* House, 1 Tyagarah Street
* House, 4 Tyagarah Street
* House, 2 Tincogan Street
* House, 14 Tincogan Street
* House, 18 Tincogan Street
* Avenue of trees, Tincogan St between Dalley St and River Terrace
* Drill Hall Theatre, 2 Jubilee Avenue
* House, 6 Jubilee Ave
* House, 8 Jubilee Ave
* House, 14 Jubilee Ave
* House, 2/232513
* Bowling Club, Jubilee Ave (west side)
* Avenue of fig trees, Jubilee Ave between Myocum St and Co-op
* House, 1 Stuart St
* House, 3 Stuart St
* House, 5 Stuart St
* House, 11 Stuart St
* House, 12 Stuart St
* House, 14 Stuart St
* House, 17 Stuart St
* House, 18 Stuart St
* House, 19 Stuart St
* House, 21 Stuart St
* House, 23 Stuart St
* House, 24 Stuart St
* House, 25 Stuart St
* House, 26 Stuart St
* House, 27 Stuart St
* Collection of worker's cottages, 28, 30, 32 & 34 Stuart St
* House 'Botany', 31 Stuart St
* House, 39 Stuart St
* House, 41 Stuart St
* Rectory C of E, 42 Stuart St

Item Name: **Mullumbimby Conservation Area**

Location: **Mullumbimby**

* Church C of E, 42 Stuart St
* Collection of worker's cottages, 46, 48, 50, 52, 54, 56 & 58 Stuart St
* House, 107 Stuart St
* House, 110 Stuart St
* House, 112 Stuart St
* House, 126 Stuart St
* House, 127 Stuart St
* House, 1 Dalley St
* House, 3 Dalley St
* House, 4 Dalley St
* House, 6 Dalley St
* House, 10-12 Dalley St
* House, 17 Dalley St
* Collection of worker's cottages, 18, 20, 22 & 24 Dalley St
* House, 25 Dalley St
* House, 28 Dalley St
* House, 34 Dalley St
* Civic Centre Block, Dalley St between Burringbar & Tincogan Sts
* Police Residence, ??
* Court House & Lockup, Dalley St
* Clerk of Court's office, Dalley St
* Fire Station, Dalley St
* War Memorial, Dalley St
* Civic Memorial Hall, Dalley St
* Civic Centre, Dalley St
* Waterfall fountain, Dalley St
* Surrounding parklands, Dalley St
* Offices, 108-110 Dalley St
* Stewart Motors, 112 Dalley St
* House, 124 Dalley St
* House, 126 Dalley St
* House, 127 Dalley St
* House, 131 Dalley St
* House, 134 Dalley St
* House, 136 Dalley St
* House, 138 Dalley St
* 'Cedar House', 140 Dalley St
* ANZ Bank, Burringbar St
* Commercial buildings, Burringbar St
* Westpac Bank, Burringbar St
* 'Hang It Pot It', Burringbar St
* 'Simpsons Building', Burringbar St
* 'Mallams' art deco facade over bottle shop, Burringbar St
* Commercial Hotel, Burringbar St
* National Bank, Burringbar St
* House, 16 Gordon St
* House, 21 Gordon St
* House, 22 Gordon St
* House, 23 Gordon St

Item Name: Mullumbimby Conservation Area

Location: Mullumbimby

* House, 25 Gordon St

Physical Condition: Various, from unrenovated and poorly maintained to renovated and altered. While the integrity of some of the individual buildings comprising the group may have been compromised, the group as a whole retains a character consistent with early settlers' buildings and dwellings in Mullumbimby, and with further research, have the potential to reveal a diversity of social structure in the Mullumbimby community of the period.

Modification Dates: Various

Recommended Management: List as an item of local heritage significance

Management:

Further Comments:

Criteria a) The town is laid out in a pattern that was surveyed in 1888. The pattern of wide streets and narrow rear laneways has been preserved intact in a visible form.

Criteria b) Is associated with leading settler families, civic officials, farmers prominent people of Mullumbimby and surrounding district, including police, Shire Councillors, Court officials, teachers, doctors and nurses, as well as business and tradespersons.

Criteria c) The setting of the township is outstanding with is key vistas often framing views of the exceptionally beautiful peak of Mt Chincogan.

Criteria d) Shows evidence of community achievement in shelter, law, health, public order, recreation and landscape development.

Criteria e)

Criteria f) A rarely intact town character showing evidence of a town way of life largely lost. Dwellings are of a modest style and standard, which pre-date by several decades current domestic architecture. Lot sizes as a group indicate a lifestyle in which value was placed on the ability to be self-supporting (space to maintain vegetable patches and/or market gardens, and domestic animals such as milch cows and fowls, which are now a rare feature of urban settlement).

Criteria g)

Integrity / Intactness: The quality and cohesion of the built environment in this area is variable, but the precinct retains a character (such as in traditional plot sizes and setbacks, roofing pitch, building materials such as corrugated sheet metal, horizontal weatherboards, timber framed window joinery and low fences, setbacks on all four sides of new or existing buildings and extensions, and scale and bulk), identifiable with early settlement of Mullumbimby.

References:

Author	Title	Year
Brett Stubbs	Publication: Byron Shire Thematic History	2005
J. Brokenshire	Publication: The Brunswick: another river and its people	

Byron Shire Heritage Inventory

State Heritage Inventory

SHI Number
1260198
Study Number
9.150

Item Name: Mullumbimby Conservation Area

Location: Mullumbimby

Studies:

Author	Title	Number	Year
Donald Ellsmore (and community representatives)	Byron Shire Community Based Heritage Study	9.150	2005

Parcels:

Latitude: **Longitude:**

Location validity: **Spatial Accuracy:**

Map Name: **Map Scale:**

AMG Zone: **Easting:** **Northing:**

Listings:

Name:	Title:	Number:	Date:
Heritage study			

Heritage Listings:

Themes: National: Building settlements, towns and cities State: Towns, suburbs and villages

Type/Group/Category: Type: Area/Group/Complex Group: Mullumbimby township Category:

Owner: Multiple

Completed By: D Ellsmore, P Stolz 26/6/06

Custom Field Six:

Data Entry: **Date First Entered:** 14/03/2008 **Date Updated:** 26/11/2008 **Status:** Completed

Search results

Your search for:LGA: BYRON SHIRE COUNCIL

Matched 12 notices relating to 7 sites.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
BANGALOW	Ashton STREET	Dip 4057 Bangalow Saleyards	1 current
BYRON BAY	Butler STREET	Butler Street Reserve Byron Bay	4 former
BYRON BAY	Corner Beachcomber Drive and Cooper STREET	Dip 4207 Byron Bay	1 current
FEDERAL	3-6 Federal DRIVE	Federal General Store	2 former
MAIN ARM	Upper Main Arm ROAD	Dip 5393 Tooland	1 current
MULLUMBIMBY	Left Bank ROAD	Dip 4944 Mooyabil	1 former
SUFFOLK PARK	Cnr Broken Head Road & Beech DRIVE	Suffolk Park dip site	2 former

23 May 2023

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -28.51 West: 153.46 East: 153.56 South: -28.61] returned a total of 6,012 records of 107 species.
Report generated on 1/12/2023 4:26 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Myobatrachidae	3137	*Crinia tinnula*		Wallum Froglet	V,P		96	
Animalia	Amphibia	Hylidae	3202	*Litoria olongburensis*		Olongburra Frog	V,P	V	6	
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	10	
Animalia	Reptilia	Cheloniidae	2007	*Chelonia mydas*		Green Turtle	V,P	V	2	
Animalia	Reptilia	Cheloniidae	2008	*Eretmochelys imbricata*		Hawksbill Turtle	P	V	3	
Animalia	Aves	Casuariidae	0001	*Dromaius novaehollandiae*		Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	E2,P		1	
Animalia	Aves	Anseranatidae	0199	*Anseranas semipalmata*		Magpie Goose	V,P		1	
Animalia	Aves	Anatidae	0214	*Stictonetta naevosa*		Freckled Duck	V,P		6	
Animalia	Aves	Columbidae	0025	*Ptilinopus magnificus*		Wompoo Fruit-Dove	V,P		13	

Animalia	Aves	Columbidae	0021	*Ptilinopus regina*	Rose-crowned Fruit-Dove	V,P		72
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*	Superb Fruit-Dove	V,P		4
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*	White-throated Needletail	P	V,C,J,K	115
Animalia	Aves	Procellariidae	0072	*Ardenna carneipes*	Flesh-footed Shearwater	V,P	J,K	1
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1,P		13
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E	3
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*	Black Bittern	V,P		19
Animalia	Aves	Accipitridae	0218	*Circus assimilis*	Spotted Harrier	V,P		2
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P		21
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*	Little Eagle	V,P		54
Animalia	Aves	Accipitridae	8739	*^^Pandion cristatus*	Eastern Osprey	V,P,3		24
Animalia	Aves	Falconidae	0238	*Falco subniger*	Black Falcon	V,P		3
Animalia	Aves	Gruidae	0177	*Grus rubicunda*	Brolga	V,P		2
Animalia	Aves	Rallidae	0053	*Amaurornis moluccana*	Pale-vented Bush-hen	V,P		4
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*	Bush Stone-curlew	E1,P		24
Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*	Beach Stone-curlew	E4A,P		7
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P		6
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1,P		43

Animalia	Aves	Jacanidae	0171	*Irediparra gallinacea*	Comb-crested Jacana	V,P		4
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*	Eastern Curlew	P	CE,C,J,K	25
Animalia	Aves	Laridae	0972	*Gygis alba*	White Tern	V,P		1
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1,P	C,J,K	9
Animalia	Aves	Cacatuidae	8862	*^Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	V,P,2	V	25
Animalia	Aves	Psittacidae	8028	*^Cyclopsitta diophthalma coxeni*	Coxen's Fig-Parrot	E4A,P,2	E	1
Animalia	Aves	Psittacidae	0309	*Lathamus discolor*	Swift Parrot	E1,P	CE	1
Animalia	Aves	Strigidae	0246	*^^Ninox connivens*	Barking Owl	V,P,3		5
Animalia	Aves	Tytonidae	0252	*^^Tyto longimembris*	Eastern Grass Owl	V,P,3		3
Animalia	Aves	Tytonidae	0250	*^^Tyto novaehollandiae*	Masked Owl	V,P,3		1
Animalia	Aves	Tytonidae	9924	*^^Tyto tenebricosa*	Sooty Owl	V,P,3		2
Animalia	Aves	Alcedinidae	0327	*Todiramphus chloris*	Collared Kingfisher	V,P		6
Animalia	Aves	Meliphagidae	0610	*Lichenostomus fasciogularis*	Mangrove Honeyeater	V,P		3
Animalia	Aves	Campephagidae	0428	*Coracina lineata*	Barred Cuckoo-shrike	V,P		1
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		1
Animalia	Aves	Monarchidae	0376	*Carterornis leucotis*	White-eared Monarch	V,P		10
Animalia	Aves	Petroicidae	0380	*Petroica boodang*	Scarlet Robin	V,P		3
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	1

Animalia	Mammalia	Dasyuridae	1045	*Planigale maculata*	Common Planigale	V,P		11	
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	E1,P	E	1760	
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P		3	
Animalia	Mammalia	Potoroidae	1175	*Potorous tridactylus*	Long-nosed Potoroo	V,P	V	8	
Animalia	Mammalia	Pteropodidae	1290	*Nyctimene robinsoni*	Eastern Tube-nosed Bat	V,P		1	
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	140	
Animalia	Mammalia	Pteropodidae	1294	*Syconycteris australis*	Common Blossom-bat	V,P		16	
Animalia	Mammalia	Molossidae	1329	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	V,P		2	
Animalia	Mammalia	Vespertilionidae	1354	*Chalinolobus nigrogriseus*	Hoary Wattled Bat	V,P		1	
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P		188	
Animalia	Mammalia	Vespertilionidae	1336	*Nyctophilus bifax*	Eastern Long-eared Bat	V,P		47	
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		1	
Animalia	Mammalia	Miniopteridae	1346	*Miniopterus australis*	Little Bent-winged Bat	V,P		120	
Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		21	
Animalia	Mammalia	Muridae	1455	*Pseudomys novaehollandiae*	New Holland Mouse	P	V	3	
Animalia	Mammalia	Dugongidae	1558	*Dugong dugon*	Dugong	E1,P		1	

Animalia	Insecta	Noctuidae	I021	*Phyllodes imperialis southern subspecies*	Southern Pink Underwing Moth	E1	E	1	
Animalia	Gastropoda	Camaenidae	I002	*Thersites mitchellae*	Mitchell's Rainforest Snail	E1	CE	3	
Plantae	Flora	Acanthaceae	10847	*Harnieria hygrophiloides*	Native Justicia	E1		67	
Plantae	Flora	Apocynaceae	1226	*Cynanchum elegans*	White-flowered Wax Plant	E1	E	1	
Plantae	Flora	Apocynaceae	1233	*Marsdenia longiloba*	Slender Marsdenia	E1	V	14	
Plantae	Flora	Apocynaceae	1176	*Ochrosia moorei*	Southern Ochrosia	E1	E	2	
Plantae	Flora	Apocynaceae	1245	*Tylophora woollsii*	Cryptic Forest Twiner	E1	E	1	
Plantae	Flora	Argophyllaceae	3224	*Corokia whiteana*	Corokia	E1	E	4	
Plantae	Flora	Cunoniaceae	10943	*^Davidsonia jerseyana*	Davidson's Plum	E1,2	E	176	
Plantae	Flora	Ebenaceae	2564	*Diospyros mabacea*	Red-fruited Ebony	E1	E	5	
Plantae	Flora	Elaeocarpaceae	2575	*^^Elaeocarpus williamsianus*	Hairy Quandong	E1,3	E	7	
Plantae	Flora	Fabaceae (Caesalpinioideae)	8772	*Senna acclinis*	Rainforest Cassia	E1		3	
Plantae	Flora	Fabaceae (Faboideae)	2833	*Desmodium acanthocladum*	Thorny Pea	V	V	3	
Plantae	Flora	Fabaceae (Mimosoideae)	3711	*Acacia bakeri*	Marblewood	V		442	

Plantae	Flora	Fabaceae (Mimosoideae)	7757	*Archidendron hendersonii*	White Lace Flower	V		99	
Plantae	Flora	Flacourtiaceae	3114	*Xylosma terrae-reginae*	Queensland Xylosma	E1		47	
Plantae	Flora	Lauraceae	3477	*Cryptocarya foetida*	Stinking Cryptocarya	V	V	868	
Plantae	Flora	Lauraceae	8948	*Endiandra floydii*	Crystal Creek Walnut	E1	E	113	
Plantae	Flora	Lauraceae	3491	*Endiandra hayesii*	Rusty Rose Walnut	V	V	27	
Plantae	Flora	Lauraceae	8480	*Endiandra muelleri subsp. bracteata*	Green-leaved Rose Walnut	E1		142	
Plantae	Flora	Lindsaeaceae	8126	*^^Lindsaea brachypoda*	Short-footed Screw Fern	E1,3		5	
Plantae	Flora	Menispermaceae	3691	*Tinospora tinosporoides*	Arrow-head Vine	V		50	
Plantae	Flora	Myrtaceae	15211	*^^Backhousia subargentea*	Giant Ironwood	E1,3		65	
Plantae	Flora	Myrtaceae	11894	*Gossia fragrantissima*	Sweet Myrtle	E1	E	42	
Plantae	Flora	Myrtaceae	4282	*Rhodamnia maideniana*	Smooth Scrub Turpentine	E4A		13	
Plantae	Flora	Myrtaceae	4283	*Rhodamnia rubescens*	Scrub Turpentine	E4A	CE	29	
Plantae	Flora	Myrtaceae	4284	*Rhodomyrtus psidioides*	Native Guava	E4A	CE	7	
Plantae	Flora	Myrtaceae	4290	*Syzygium hodgkinsoniae*	Red Lilly Pilly	V	V	33	
Plantae	Flora	Myrtaceae	4292	*Syzygium moorei*	Durobby	V	V	170	
Plantae	Flora	Myrtaceae	4298	*Uromyrtus australis*	Peach Myrtle	E1	E	1	
Plantae	Flora	Orchidaceae	6672	*^Geodorum densiflorum*	Pink Nodding Orchid	E1,P,2		12	

Plantae	Flora	Orchidaceae	4479	*^Peristeranthus hillii*	Brown Fairy-chain Orchid	V,P,2		13	
Plantae	Flora	Orchidaceae	4480	*^Phaius australis*	Southern Swamp Orchid	E1,P,2	E	1	
Plantae	Flora	Phyllanthaceae	9833	*Phyllanthus microcladus*	Brush Sauropus	E1		9	
Plantae	Flora	Polypodiaceae	8154	*Belvisia mucronata*	Needle-leaf Fern	E1		4	
Plantae	Flora	Polypodiaceae	8156	*^^Drynaria rigidula*	Basket Fern	E1,3		2	
Plantae	Flora	Proteaceae	5354	*Floydia praealta*	Ball Nut	V	V	6	
Plantae	Flora	Proteaceae	5372	*Grevillea hilliana*	White Yiel Yiel	E1		122	
Plantae	Flora	Proteaceae	5432	*Hicksbeachia pinnatifolia*	Red Boppel Nut	V	V	9	
Plantae	Flora	Proteaceae	9680	*Macadamia integrifolia*	Macadamia Nut		V	2	
Plantae	Flora	Proteaceae	5446	*Macadamia tetraphylla*	Rough-shelled Bush Nut	V	V	42	
Plantae	Flora	Rubiaceae	8297	*Randia moorei*	Spiny Gardenia	E1	E	287	
Plantae	Flora	Rutaceae	6457	*Acronychia littoralis*	Scented Acronychia	E1	E	48	
Plantae	Flora	Rutaceae	5765	*Bosistoa transversa*	Yellow Satinheart	V	V	1	
Plantae	Flora	Rutaceae	8658	*Melicope vitiflora*	Coast Euodia	E1		33	
Plantae	Flora	Sapotaceae	11957	*Niemeyera whitei*	Rusty Plum, Plum Boxwood	V		1	

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 01-Dec-2023

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	125
Listed Migratory Species:	64

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	10
Commonwealth Heritage Places:	None
Listed Marine Species:	97
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	9
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	5
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In feature area
Dunn's white gum (Eucalyptus dunnii) moist forest in north-east New South Wales and south-east Queensland	Endangered	Community may occur within area	In feature area
Grey box-grey gum wet forest of subtropical eastern Australia	Endangered	Community may occur within area	In feature area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In feature area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Atrichornis rufescens Rufous Scrub-bird [655]	Endangered	Species or species habitat may occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In buffer area only
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
[Turnix melanogaster](#) Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area	In feature area
CRUSTACEAN			
[Euastacus girurmulayn](#) Smooth Crayfish [83146]	Endangered	Species or species habitat known to occur within area	In buffer area only
FISH			
[Epinephelus daemelii](#) Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hippocampus whitei](#) White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Maccullochella ikei](#) Clarence River Cod, Eastern Freshwater Cod [26170]	Endangered	Species or species habitat known to occur within area	In feature area
[Seriolella brama](#) Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
[Thunnus maccoyii](#) Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
[Assa darlingtoni](#) Pouched Frog [1965]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat likely to occur within area	In feature area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In feature area
INSECT			
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petrogale penicillata			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
Xeromys myoides			
Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Acronychia littoralis			
Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area	In feature area
Allocasuarina thalassoscopica			
[21927]	Endangered	Species or species habitat may occur within area	In feature area
Amyema plicatula			
[81879]	Endangered	Species or species habitat may occur within area	In feature area
Arthraxon hispidus			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Baloghia marmorata Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat known to occur within area	In feature area
Bulbophyllum globuliforme Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat may occur within area	In feature area
Coleus nitidus listed as Plectranthus nitidus Nightcap Plectranthus, Silver Plectranthus [91380]	Endangered	Species or species habitat known to occur within area	In feature area
Corokia whiteana [17820]	Endangered	Species or species habitat known to occur within area	In feature area
Corynocarpus rupestris subsp. rupestris Glenugie Karaka [19303]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat known to occur within area	In feature area
Cyperus semifertilis [21559]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Davidsonia jerseyana Davidson's Plum [67219]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Davidsonia johnsonii Smooth Davidsonia, Smooth Davidson's Plum, Small-leaved Davidson's Plum [67178]	Endangered	Species or species habitat known to occur within area	In feature area
Diospyros mabacea Red-fruited Ebony, Silky Persimmon, Ebony [18548]	Endangered	Species or species habitat may occur within area	In feature area
Diploglottis campbellii Small-leaved Tamarind [21484]	Endangered	Species or species habitat known to occur within area	In feature area
Elaeocarpus sedentarius Minyon Quandong [83093]	Endangered	Species or species habitat known to occur within area	In buffer area only
Elaeocarpus williamsianus Hairy Quandong [8956]	Endangered	Species or species habitat known to occur within area	In feature area
Endiandra floydii Floyd's Walnut, Crystal Creek Walnut [52955]	Endangered	Species or species habitat known to occur within area	In feature area
Endiandra hayesii Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat known to occur within area	In feature area
Floydia praealta Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat known to occur within area	In feature area
Fontainea australis Southern Fontainea [24037]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gossia fragrantissima Sweet Myrtle, Small-leaved Myrtle [78867]	Endangered	Species or species habitat known to occur within area	In feature area
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Isoglossa eranthemoides Isoglossa [16663]	Endangered	Species or species habitat likely to occur within area	In feature area
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area	In feature area
Ochrosia moorei Southern Ochrosia [11350]	Endangered	Species or species habitat known to occur within area	In feature area
Owenia cepiodora Onionwood, Bog Onion, Onion Cedar [11344]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Ozothamnus vagans Wollumbin Dogwood [56207]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pedleya acanthoclada listed as Desmodium acanthocladum Thorny Pea [93275]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area	In feature area
Randia moorei Spiny Gardenia [10577]	Endangered	Species or species habitat known to occur within area	In feature area
Rhodamnia maideniana Smooth Scrub Turpentine [20665]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sarcochilus hartmannii Waxy Sarcochilus, Blue Knob Orchid [4124]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sophora fraseri [8836]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Symplocos baeuerlenii Small-leaved Hazelwood, Shrubby Hazelwood [19010]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium moorei Rose Apple, Coolamon, Robby, Durobby, Watermelon Tree, Coolamon Rose Apple [12284]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Uromyrtus australis Peach Myrtle [8830]	Endangered	Species or species habitat known to occur within area	In buffer area only
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat known to occur within area	In feature area
REPTILE			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Harrisoniascincus zia Rainforest Cool-skink [84785]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
SNAIL			
Thersites mitchellae Mitchell's Rainforest Snail [66774]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Carcharhinus longimanus			
Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In feature area
Tringa brevipes Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11267]	NSW	In feature area
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11304]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [11301]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11266]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [15508]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14482]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11265]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [15601]	NSW	In feature area
Unknown		
Commonwealth Land - [14475]	NSW	In buffer area only
Commonwealth Land - [14476]	NSW	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Fish			
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In buffer area only
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area	In buffer area only
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In buffer area only
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In buffer area only
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In buffer area only
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In buffer area only
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In buffer area only
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In buffer area only
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In buffer area only
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In buffer area only
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area	In buffer area only
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In buffer area only
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In buffer area only
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In buffer area only
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Mammal			
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area	In buffer area only
Hydrophis platurus as Pelamis platurus Yellow-bellied Sea Snake [93517]		Species or species habitat may occur within area	In buffer area only
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Sousa sahulensis Australian Humpback Dolphin [87942]		Species or species habitat may occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Billinudgel	Nature Reserve	NSW	In buffer area only
Brunswick Heads	Nature Reserve	NSW	In feature area
Cape Byron	Marine Park	NSW	In feature area
Goonengerry	National Park	NSW	In buffer area only
Inner Pocket	Nature Reserve	NSW	In buffer area only
Jinangong	Nature Reserve	NSW	In buffer area only
Marshalls Creek	Nature Reserve	NSW	In buffer area only
Mount Jerusalem	National Park	NSW	In buffer area only
Tyagarah	Nature Reserve	NSW	In feature area

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Billinudgel Nature Reserve	NSW	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Residential dwelling, 26 Shelley Drive	2004/1362	Not Controlled Action	Completed	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In buffer area only

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In buffer area only
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur	In buffer area only
Marine Turtles			
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur	In buffer area only
Sharks			
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur	In buffer area only
Whales			
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur	In buffer area only

Bioregional Assessments

SubRegion	BioRegion	Website	Buffer Status
Clarence-Moreton	Clarence-Moreton	BA website	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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