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Karabar Water Mains Upgrade Review of Environmental Factors

Queanbeyan-Palerang Regional Council

DOCUMENT TRACKING

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Project Manager	Skye OBrien
Prepared by	Charlotte de Wolff
Reviewed by	David Coombes
Approved by	Skye O'Brien
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Template 2.8.1

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1. Introduction

Eco Logical Australia Pty Ltd (ELA) has been engaged by the Queanbeyan-Palerang Regional Council (herein Council) to undertake a Review of Environmental Factors (REF) under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The REF addresses Council's proposal to upgrade water mains infrastructure in Karabar, Queanbeyan, NSW.

Council owns, maintains and operates the water supply network within the Queanbeyan-Palerang Local Government Area (LGA). The water network in the vicinity of Cooma Street between Bulbar Street and Southbar Road in Karabar is increasingly failing and requires renewal. The majority of the proposed works are located within existing highly modified urban areas, within public road reserves and other public areas. Streets affected include Cooma Street, Alanbar Street, Kenneth Place, Lily Place, Montebarr Row, Sunnybar Parade and Oleria Street. The study area is shown in Figure 1.

A draft design has been prepared for Council and the objective of this REF is to assess the environmental impact of the proposed work, to inform construction tender documentation and to meet Council's legislative requirements. The REF included a field and desktop assessment and has been prepared by ELA on behalf of Council to assess the potential impacts associated with the proposal in accordance with Clause 171 of the *Environmental Planning and Assessment Regulation 2022* (EP&A Regulation).



Figure 1: Proposal location overview

2. Project Details

Table 1 details key project elements of the project.

Table 1: Key project details

Background	
Definitions	The <i>'impact area'</i> refers to the area in which the proposal, once constructed, would be located and includes construction related impacts within site fencing as shown on Figure 1, as referenced in the design package included in Appendix C. The <i>'study area'</i> reflects the extent of works as shown in the design package included in Appendix C. The study area comprises the impact area and sufficient space for construction areas for ancillary works, facilities and access. This study area has been adopted for the purposes of carrying out the investigations detailed in this REF, being the broadest possible area within which construction works are proposed.
Location	The proposed activity will occur within the southern area of Karabar, a suburb of Queanbeyan in NSW. The study area is predominantly urban residential, with a number of educational establishments located within or in proximity to the study area Figure 1. The study area is predominantly zoned R2 (Low density residential) and R3 (Medium density residential) with small areas of RE1 (Public recreation) and B1 (Neighbourhood centre). The Karabar Supermarket and 7-Eleven are adjacent to the impact area in the south of the study area, shown as 'commercial precinct on Figure 1.
Project and site description	A field inspection was undertaken by ELA Ecologists on the 11 May 2023 to identify any representative flora species on site and identify and map any fauna habitat. The study area comprises roads, the adjacent footpath / road verge, and the site compound which is proposed within the carpark areas adjacent to the commercial precinct in the south. The proposed activity is located in a trafficked and residential area. The study area is predominantly cleared with exotic urban vegetation comprised of exotic street trees and lawns, with some planted native trees and shrubs also present in the area. The key project goals are to repair and renew the water supply network within the study area. It is expected that renewing the water supply will also meet the demand for the existing and future infill development of the area. The proposed works are to upgrade the water mains to pipe diameters of 100 mm, 150 mm and 250 mm, over approximately 780 m of Cooma Street, 340 m of Alanbar Street, 200 m of Kenneth Place, 170 m of Lily Place, 260 m of Montebarr Row, Sunnybar Parade and 200 m of Oleria Street. Key elements of the proposed works include: • Site establishment including construction compound parking and materials storage area • Earthworks for trenching • Horizontal Directional Drilling (HDD) / underboring underneath Cooma Street road pavement • Construction of reconfigured water mains, valves, hydrants • Connection into existing pipes and ties • Road repair, sealing of road surface • Testing and commissioning • Ancillary works, sediment and erosion controls, traffic management, site stabilisation and clean-up of site The proposed works subject to this REF will occur within the existing road reserves and within some adjacent landholdings for connection. Although the majority of the work is

Background

within existing road pavement area, there is potential for impact to planted shrubs and trees in the verge.

The detailed design plans have been prepared and area attached as Appendix C. This REF has been based on the scope of work and methodology presented in the above design packages. Changes to the alignment outside of the assessed study area, changes to proposal scope and/or methodology may require a reassessment of potential impacts, both direct and indirect and a revision of this REF.

Land zoning

R2 (Low density residential),
R3 (Medium density residential),
RE1 (Public Recreation).
B1: Neighbourhood Centre

Land ownership

The works will be located within land owned by Queanbeyan-Palerang Regional Council. Connection of water meters to the replacement line will require entry onto private property and the Council will manage these under the Powers of Entry provisions of the *Local Government Act 1993*.

Timeframe

Works are expected to commence by December 2023 and all works are expected to be completed within 32 weeks of commencement (weather permitting).

While there will be general disturbance in the area throughout the construction period, construction of the pipeline will cause more significant impacts for a short period of time. More significant impacts, such as excavating and laying new pipeline in front of houses, will only affect any single area for a short period of time.

The NSW Interim Construction Guideline (DECC, 2009) includes recommended standard hours for construction work. However, the hours are not mandatory. The Queanbeyan Palerang Regional Council Development Construction Specification C101 General (QPRC, 2019) is written in accordance with the NSW Interim Construction Guideline, and states that operational hours of plant, including the entry and/or departure of heavy vehicles, shall be restricted to 7:00 am to 6:00 pm Monday to Friday, 7:00 am to 1:00 pm on Saturday and at no times on Sundays or Public Holidays. Work outside of the hours specified shall not be undertaken without the prior approval of Queanbeyan City Council.

In general, works will only occur between 6:00 am and 6:00 pm on weekdays, and 7:00 am to 2:00 pm on Saturdays. Works undertaken prior to 7:00 am on weekdays and on Saturdays will be restricted to activities that do not create significant levels of noise. No works would occur on Sundays or public holidays. However, it is likely that some overnight works will be required to ensure the safety of the public and workers and minimise impacts on the wider road network.

Work Equipment and Machinery

The works equipment and machinery would be determined by the construction contractor but are expected to include the following:

- Bobcat or small excavator to clear vegetation
- Small trucks carrying construction materials, and large trucks to transport excavated material from the project site
- Grader
- Roller
- Water cart
- Truck and dog trucks
- Compressor, concrete vibrator, whacker packer, jumping jacks, concrete mixer
- Backhoe equipment to excavate trenches and lay pipeline
- HDD equipment
- Passenger vehicles to transport workers

Background

- Cranes

Alternatives

The proposal is justified for the following reasons:

- It addresses site specific water supply issues, associated with the aged and at capacity water main.
- Upsizing mains will increase the capacity and allow for future growth
- The upgrade will reduce the long-term maintenance costs to Council and rate payers.

The 'do nothing' option will compromise reliable water supply to the existing local community, including residents, businesses and schools and future growth.

Approval Pathway

Clause 2.159 (1) of the State Environmental Planning Policy (Transport and Infrastructure) 2021) provides that development for the purpose of water reticulation systems may be carried out by or on behalf of a public authority without consent on any land.

The proposal would be carried out by Council, which is a public authority for the purposes of cl 2.159 (1) of the Transport and Infrastructure SEPP.

On that basis, development consent is not required, and the proposal is required to be assessed by Council as the proponent and determining authority under Division 5.1 of Part 5 of the EP&A Act.

In particular:

1. section 5.5 of the EP&A Act requires that in considering the proposal, Council must 'examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment' by reason of the proposal; and
2. clause 171 of the EP&A Regulation requires that when considering the likely environmental impact of the proposal on the environment under section 5.5, Council is required to take the factors specified in clause 171 into account.

3. Statutory and Planning Context

Table 2 provides a description of the legislative context for the project. Where an approval or consideration is required, this report addresses the objectives and requirements of the legislation.

Table 2: Legislative Context

Name	Relevance to the Project
Commonwealth	
<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	The EPBC Act's aims include to protect Matters of National Environmental Significance (MNES) including wetlands of international importance, threatened species and communities and listed migratory species. An action that may or is likely to have a significant impact on MNES must be referred to the Commonwealth to determine whether it is a Controlled Action that requires approval from the Commonwealth. Potential impacts to Matters of National Environmental Significance (MNES) have been assessed in this report. No MNES are considered likely to be adversely affected by the proposed development.
State	
<i>NSW Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulation 2021</i>	The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals. The project is development permitted without consent under the NSW State Environmental Planning Policy (Infrastructure) 2007 and is therefore to be assessed under Division 5.1 of Part 5 of the EP&A Act. Additionally, the EP&A Regulation, clause 171 refers to 18 factors for consideration as part of an environmental assessment. These have been addressed in Section 6.
<i>NSW National Parks and Wildlife Act 1974</i> (NPW Act)	The NPW Act is administered by the Director-General of the National Parks and Wildlife Services (NPWS), who is responsible for the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas (among others). The main aim of the Act is to conserve the natural and cultural heritage of NSW. The Act aims to conserve the natural and cultural heritage of NSW. Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required. A requirement of Clause 2.15 of the Transport and Infrastructure SEPP is for consultation with the NPWS where the proposed works occur on or adjacent to National Parks Estate. The proposed works are not within or adjacent to national park and therefore consultation is not required. There are no previously recorded Aboriginal sites or objects within the study area and the study area has previously undergone extensive ground disturbance related to urban development and road construction, indicating a low to nil potential for <i>intact</i> subsurface archaeological deposits.
<i>NSW Biodiversity Conservation Act 2016</i> (BC Act)	The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. In determining whether the proposal is likely to significantly affect threatened species or ecological communities, or their habitats, the matters set out in s7.3 of the BC Act have been taken into account. The proposal, including the mitigation measures described in this report, is not considered likely to have a significant impact.
<i>NSW Biosecurity Act 2015</i> (BS Act).	The BS Act provides a framework for the prevention, elimination and minimisation of biosecurity risks posed by a biosecurity matter, dealing with a biosecurity matter, carriers

Name	Relevance to the Project
	and potential carriers, and other activities that involve biosecurity matter. Priority weeds were not identified in the study area. For general weed management, the mitigation measures outlined in Section 7 would allow the works to meet the objectives of this Act, which are to: • Prevent the establishment of new significant weeds • Restrict the spread of existing significant weeds • Provide for the monitoring of and reporting on the management of significant weeds.
NSW <i>Water Management Act 2000</i> (WM Act)	The closest waterway from construction work is the Queanbeyan River, situated approximately 440 m (as measured in a straight line) from the study area. Works within 40 m of a waterway trigger a Controlled Activity Approval under Section 91E(1) of the WM Act. However, under Clause 41 of the <i>Water Management (General) Regulation 2018</i>, public authorities, including Councils, are exempt from Section 91E of the WM Act. Therefore, the works do not require approvals for controlled activities on waterfront land.
NSW <i>Heritage Act 1977</i> (Heritage Act)	The Heritage Act provides protection of the environmental and cultural heritage of the State which includes places, buildings, works, relics, movable objects, or precincts that are of State or local heritage significance. The NSW State Heritage Register (SHR) is the statutory register under Part 3A of the Heritage Act. Listing on the SHR means that any proposed works or alterations (unless exempted) to listed items must be approved by the Heritage Council or its delegates under section 60 of the Act. No historic heritage items were recorded on these databases as being within or adjacent the study area, and the proposed works will not impact on any known historical sites or objects.
NSW <i>Protection of the Environment Operations Act 1997</i> (POEO Act)	The POEO Act establishes a licensing regime for waste, air, water and pollution to authorise carrying out of scheduled development work at any premises, scheduled activities at any premises, or to control carrying out of non-scheduled activities for the purposes of regulating water pollution resulting from the activity. The proposed development does not involve carrying out of scheduled development under s43 of the POEO Act and therefore does not require an Environmental Protection Licence.
NSW <i>Roads Act 1993</i>	Consent under section 138 of the Act from the appropriate roads authority is required for development involving, amongst other things, the carrying out of work on a public road or connection to a classified road. Road management between Transport for NSW and Councils in NSW provides for three categories of road: State, Regional and Local. The proposed works will be located in the road reserve of Cooma Street which is a classified road under the <i>Roads Act 1993</i>. Cooma Street is part of Main Road (MR) Number 584 and is a Regional Road, as described in the Schedule of Classified Roads and Unclassified Regional Roads (Transport for NSW, 2023). Regional Roads perform an intermediate function between the main arterial network of State Roads and council controlled Local Roads. Due to their network significance Transport for NSW provides financial assistance to councils for the management of their Regional Roads. The Regional Road category comprises two subcategories: those Regional Roads that are classified pursuant to the <i>Roads Act 1993</i>, and those Regional Roads that are unclassified. The proposal will involve carrying out work in, on or over a public road in accordance with the <i>Roads Act 1993</i>, and concurrence from the roads authority is required under section 138 of the Act for physical works associated with the construction. Section 7(4) of the Roads Act declares that the Council of a local government area is the roads authority for all public

Name	Relevance to the Project
	roads, however, prior to approving a section 138 application, the roads authority must receive concurrence from TfNSW for a classified road. The draft REF will be provided to TfNSW as part of the consultation process prior to finalising this REF
Planning Instruments	
<i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i> (T&I SEPP)	The aim of the T&I SEPP is to facilitate the effective delivery of infrastructure across NSW by identifying whether certain types of infrastructure require consent, can be carried out without consent or are exempt development. Pursuant to Division 24, clause 2.159(1) of the T&I SEPP, development for the purpose of water reticulation systems may be carried out by or on behalf of a public authority without consent on any land.
Queanbeyan -Palering Regional Local Environmental Plan 2022	The study area is within predominantly residential zoning. The study area is not mapped by the Terrestrial Biodiversity overlay which requires consideration of matters listed in clause 7.2 of the LEP. Clause 5.12 of the LEP states that the LEP does not restrict or prohibit, or enable the restriction or prohibition of, the carrying out of any development, by or on behalf of a public authority, that is permitted to be carried out with or without development consent, or that is exempt development, under State Environmental Planning Policy (Transport and Infrastructure) 2021, Chapter 2. Clause 2.7 of the Transport and Infrastructure SEPP states that should there be any inconsistency between the SEPP and other EPI (including LEP) then the SEPP prevails. Therefore, the LEP provisions do not apply to the works however, they should be considered. This REF will consider the consistency of the proposal with the LEP.

4. Consultation

4.1 Transport and Infrastructure SEPP

Part 3.2 Division 1 of the Transport and Infrastructure SEPP identifies situations where consultation needs to be undertaken by public authorities with local councils or other government agencies prior to the commencement of some forms of development. In this case, consultation with Council is not required as Council is the proponent and therefore Clauses 3.8 and 3.9 do not apply.

The study area is not within flood liable land, therefore notification of the State Emergency Service in accordance with Clause 3.10 is not required. Further, consideration of Planning for Bush Fire Protection is not required in accordance with Clause 3.11 as the proposed works are not for the purposes of an educational establishment or school-based childcare and are not in an area that is bushfire prone land.

Clause 3.12 identifies consultation triggers for consultation with public authorities other than local councils, however following review of this Clause it can be concluded that there is no requirement for Council to consult with public authorities in terms of the Transport and Infrastructure SEPP.

4.2 Transport for NSW

The proposed works will be located in the road reserve of Cooma Street which is a classified road under the *Roads Act 1993*. Cooma Street is part of Main Road (MR) Number 584 and is a Regional Road, as described in the Schedule of Classified Roads and Unclassified Regional Roads (Transport for NSW, 2023).

Regional Roads perform an intermediate function between the main arterial network of State Roads and council controlled Local Roads. Due to their network significance Transport for NSW provides financial assistance to councils for the management of their Regional Roads. The Regional Road category comprises two subcategories: those Regional Roads that are classified pursuant to the *Roads Act 1993*, and those Regional Roads that are unclassified. Cooma Street is a classified regional road.

The proposal will involve carrying out work in, on or over a public road in accordance with the *Roads Act 1993*, and concurrence from the roads authority is required under section 138 of the Act for physical works associated with the construction. Section 7(4) of the *Roads Act 1993* declares that the Council of a local government area is the roads authority for all public roads, however, prior to approving a section 138 application, the roads authority must receive concurrence from TfNSW for a classified road.

The draft REF will be provided to TfNSW as part of the consultation process prior to finalising this REF.

5. Impact Assessment

This section of the report provides an assessment of the potential environmental impacts of the proposal. Table 3 describes the existing characteristics and potential impacts for environmental factors considered in this REF. Avoidance, mitigation and management measures are presented in Section 7.

Table 3: Potential environmental impacts

Environmental Factor	Description	Negative Impact
Noise and Vibration	The proposed works are situated in an urban setting. The main source of existing noise in the study area would typically be from traffic along Cooma St and Alanbar St, especially on weekdays and during school terms. The construction works would temporarily increase the noise level in the immediate area. The closest sensitive receivers are the residences within study area; particularly those directly fronting the impact area. The project is situated in the vicinity of a number of educational establishments, with the Waratah Preschool within the study area and Queanbeyan South Public School & Karabar High School on the west side of study area (Figure 1). Construction requiring nightworks is only considered likely on Cooma Street. Any scheduled overnight works would have a greater impact than dayworks due to lower background noise levels at night. The vibration levels during construction would vary depending on the type of activity being carried out. Construction equipment most likely to cause significant vibration includes: • Excavators / graders • Compactors • Vibratory rollers • Truck traffic. In general, the risk of structural damage during construction is generally assessed as being very low. However, due to overnight works expected to occur for the safety of the public and workers, the risk of human disturbance is expected to be high. Specific recommendations have been provided to minimise impact to the residences nearby. The impact is not expected to be significant or long-term and would be typical of urban construction. Noise impacts would be mitigated by restricting workdays to 6:00 am – 6:00 pm on weekdays and 8:00 am – 1:00 pm on Saturdays and with no works on Sundays and public holidays. Works undertaken prior to 7:00am on weekdays and 8:00am on Saturdays will be restricted to activities that do not create significant levels of noise to minimise the construction impact on the public. There is no long-term negative impact on noise or vibration levels expected from operation of the works.	☐ n/a ☐ Low ☐ Medium ☒ High
Air Quality and Odour	Air quality has the potential to be impacted during construction due to dust generation and greenhouse gas emissions from construction machinery. During construction, temporary reductions in air quality are likely to occur due to elevated particulate matter from dust generating activities and exhaust emissions from diesel-powered construction equipment. Potential sources of dust and pollutant generation may include: • Clearing and grubbing of turf and vegetation • Excavation and trenching • Uncovered loads of materials during transportation • Unloading materials from trucks and placement • Aeolian transport from overburden (if any) during dry and windy conditions.	☐ n/a ☒ Low ☐ Medium ☐ High

Environmental Factor	Description	Negative Impact
	Significant impacts on sensitive receivers from elevated particulate matter and dust deposition are not anticipated given that the study area is predominantly asphalt and the works will be staged. Impacts would be temporary and should only arise during dry weather with the wind blowing towards a receptor, at a time when dust is being generated and mitigation measures are not fully effective. Similarly, relevant emissions generating activities include the general operation of plant equipment as well as stationary and idling local traffic because of the impositions of traffic controls and land closures. It is considered that the resulting additional exhaust emissions and associated odour from this activity will be negligible. This determination considered that any additional impacts are negligible when compared to the emissions associated with other activities in the locality i.e. urban road traffic. The anticipated impact on local residents is low given the short-term duration of the project. There is no long-term negative impact to air quality and odour levels expected from operation of the works.	
Water	The closest watercourse is the Queanbeyan River, located approximately 440 m to the east of the study area. The proposed construction work will not affect the water and therefore there is limited potential for erosion and sediment impacts. The site is not mapped as a flood risk. However, the works will result in ground disturbance during construction and is within road corridors and stormwater infrastructure. As such, there is potential for erosion and movements of disturbed/excavated materials and spoil into the stormwater and off-site during construction. Erosion and sediment controls will be required during construction, and stabilisation works will be required following the works to prevent any future/ongoing impacts off-site, including sedimentation of drainage lines and waterbodies. The potential for pollution of stormwater as a result of the works is considered minimal if mitigation measures are implemented, such as ceasing work and packing up the site when there is a high rainfall event expected. There is no long-term negative impact to watercourses expected from operation of the works.	☐ n/a ☐ Low ☒ Medium ☐ High
Visual Amenity	The proposed construction phase works have the potential to present a minor temporary reduction in the visual amenity of the study area due to the presence of construction plant and materials and any construction compound areas that will be required. Untidy work practices, haphazard storage of machinery and areas of bare earth all contribute to a reduction in visual amenity. However, it is considered unlikely that the decline in visual amenity at the site-specific scale would extend to a decline in the broader landscape. Based on the current design, the water main will impact a mature native tree on the corner of Kenneth Parade and Cooma Street. Council has committed to the retention of this tree and will amend the construction route to remain outside the Tree Protection Zone (TPZ) of this tree. Construction of the works will require a number of surface markers and valve/hydrant covers to be installed. These will be level with surrounding pavements and/or footpaths and will replace existing markers/covers that will be removed as part of the works. The impact on visual amenity of these is negligible and in keeping with an urban environment. There is no long-term negative impact to visual amenity expected from operation of the works.	☐ n/a ☐ Low ☒ Medium ☐ High

Environmental Factor	Description	Negative Impact
Traffic and Access	The proposed works are located within an urban environment and within road and road verges. Roads impacted include Cooma Street, Alanbar Street, Kenneth Place, Lily Place, Montebarr Row, Sunnybar Parade and Oleria Street. Cooma Street is a classified Regional Road classified under the <i>Roads Act 1993</i>. Expected impacts from the construction works include: • Loss of off-street commercial parking in areas required for site compounds and materials storage for the duration of the works. • Loss of on-street parking during certain construction activities • Full and/or partial road closures and traffic detours during certain construction activities • Increase in heavy vehicles and construction traffic for the duration of the works • Full and/or partial closure of pedestrian footpaths and detours during certain construction activities • Intermittent short-term loss of vehicle access to properties • Impacts to access to and/or temporary relocation of bus stops (shown on Figure 1) • Impacts to cycling routes (although no formal on or off-road cycle paths are present in the area) Impacts are likely to be particularly prevalent on Cooma Street. There is a public school, a high school and two preschools in close proximity. It is therefore considered likely that there will be a higher than usual proportion of vulnerable road users around the works. There is existing traffic in the area, specifically in the morning and afternoon. The construction work will affect traffic already occurring in the area, and this is likely to be increased during peak hours. As such, it is recommended that a Traffic Management Plan (TMP) be developed as part of the construction contract. The TMP should give consideration to the timing of works and appropriate signage to limit the impact on local traffic and vulnerable road users and minimise traffic incidents. Traffic impact would be temporary, localised and minor if proper measures are in place. There is no long-term negative impact to traffic and access expected from operation of the works.	☐ n/a ☐ Low ☐ Medium ☒ High
Socio Economic and Human Health Risk	<i>Construction</i> The proposed works will have a temporary, negative impact on the affected roads, the residents who use the road and footpaths regularly, as well as intermittent users, resulting from traffic management delays and noise, air quality, and visual amenity impacts. Conversely, some local expenditure would occur during the construction phase potentially resulting in some economic benefit to the local community. This may be through the contracting and purchasing of local supplies and services as well as ad hoc visitation to local businesses by project employees and site personnel, including the Karabar Supermarket and local 7-Eleven. Slips/ trips and falls Impact on pedestrian traffic can also occur, with potential of trip hazards as construction sites potentially have tripping hazards present in many forms such as power tool cords, protruding existing services pits, and scattered debris, equipment and materials (e.g., removed existing fence posts/sections) and uneven surface. Electrical Cables and high pressurised gas services	☐ n/a ☒ Low ☐ Medium ☐ High

Environmental Factor	Description	Negative Impact
	Existing underground high voltage electrical cables are present along the study area. Contact or close to contact with the live cables will lead to electrocution causing injury and fatalities. Overhead electrical cables are present throughout the works. It is very important that the contractor is fully aware of the location of the cables and have appropriate duty of care when undertaking the work (Indesco, 2023). Existing underground high pressure gas lines are also present along the southern verge of Alanbar Street including the Oleria Street Intersection (Indesco, 2023). Accordingly, there is a risk of high-pressure gas ignition and incidents with exposure to gas which would be highly disruptive to surrounding residences, other services and personnel. It is very important that the contractor is fully aware of the location of the pipelines and have appropriate duty of care when undertaking the work. Excavation by non mechanical means to be conducted under authority supervision. <i>Operation</i> The proposed works are likely to have a minor but long term positive socio-economic impact, with benefits resulting from decreasing maintenance and emergency repair costs to Council and ratepayers through the upgrading of infrastructure.	
Historic Heritage	Searches of the Australian Heritage Database, State Heritage Inventory (SHI) and the Queanbeyan-Palerang Regional Local Environmental Plan (LEP) 2022 were conducted on 16 May 2023 to determine if any places of historic archaeological significance were located within, or adjacent to, the study area. No historic heritage items were recorded on these databases as being within or adjacent the study area, and the proposed works will not impact on any known historical sites or objects.	☒ n/a ☐ Low ☐ Medium ☐ High
Aboriginal Heritage	The following section regarding Aboriginal heritage has been conducted in accordance with the <i>Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales</i> (hereafter referred to as 'CoP') (DECCW 2010). This due diligence process aims to determine whether Aboriginal objects will be harmed by the proposed works, as required under Part 6 of the NPW Act. The CoP sets out the reasonable and practicable steps which individuals and organisations need to take to: - Identify whether or not Aboriginal objects are, or are likely to be, present in an area; - Determine whether or not their activities are likely to harm Aboriginal objects (if present); and, - Determine whether an Aboriginal Heritage Impact Permit (AHIP) from Heritage NSW or further assessment is required.	☐ n/a ☒ Low ☐ Medium ☐ High
Steps Assessment for site		
1. Will the activity disturb the ground surface or any culturally modified trees? Excavations for the proposed water main replacement and the associated installation of services will disturb the ground surface, however, the study area has already been extensively disturbed by urban development and the construction of roads. The proposed study area has been extensively cleared of native vegetation and no culturally modified trees will be impacted by the proposed works.		

Environmental Factor	Description	Negative Impact
	2a, 2b. Search the AHIMS database and any other relevant sources of information. c. Determine if the activity is in area where landscape features indicate the presence of Aboriginal objects. According to the <i>Due Diligence Code of Practice</i> (DECCW 2010a), archaeologically sensitive landscapes can include areas: - Within 200m of waters; or - Located within a sand dune system; or - Located on a ridge top, ridge line, headland; or - Located within 200m below or above a cliff face; or - Within 20m of or in a cave, rock shelter, or a cave mouth and is on land that is not disturbed land. The Due Diligence Code of Practice (DECCW 2010a:18) defines disturbed land as areas that have any land that: <i>“Has been the subject of a human activity that has changed the land’s surface, being changes that remain clear and observable. Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or</i>	A, b) AHIMS Database Search An extensive search of the AHIMS database, which is maintained by Heritage NSW and regulated under Section 90Q of the NPW Act, was conducted on 11 May 2023 to identify if any registered Aboriginal sites were present within, or adjacent to, the study area. The AHIMS search represents 2km around the study area and was conducted within the following coordinates: GDA Zone 55, Eastings 700788 – 704788, Northings 6081498 – 6085498, with a buffer of 0 m. The search resulted in the identification of seventy-one (71) Aboriginal sites within the vicinity of the study area (Figure 10). AHIMS ID 57-2-0673 and AHIMS ID 57-2-0672 are listed as ‘duplicate sites’. The AHIMS search results are presented in full in Appendix B. No sites have previously been recorded as being within the study area (Figure 10). The majority of sites within the vicinity of the study area have been recorded as artefacts and isolated finds (94.29%). Heritage Database Search Searches of the Australian Heritage Database, State Heritage Inventory (SHI) and the Queanbeyan-Palerang Regional LEP 2022 were conducted on 16 May 2023 to determine if any places of archaeological significance were located within the study area. No Aboriginal archaeological sites or heritage items were recorded on these databases as being within the study area. c) The study area does not contain landscape features that indicate the presence of Aboriginal objects. Aerial imagery (Figure 1) and photographs enclosed, shows that the study area has undergone extensive ground disturbance indicating a low to nil potential for <i>intact</i> archaeological deposits.

Environmental Factor	Description	Negative Impact
	<i>below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks."</i>	
	3. Can you avoid harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or disturbance of the landscape feature?	The proposed study area does not contain any sensitive archaeological features, and no Aboriginal sites are expected to be harmed by the proposed works.
	4. Does the desktop assessment/visual inspection confirm the presence of Aboriginal objects, or indicate the likelihood of Aboriginal objects being present?	No visual inspection was undertaken as part of this assessment. The desktop assessment has identified that the study area has been extensively disturbed in relation to urban developments, clearing of vegetation and the construction of roads, indicating a low to nil potential for <i>intact</i> subsurface archaeological deposits.
	5. Further investigation and impact assessment.	Aboriginal objects are unlikely to be present in the study area and the proposed works will not impact sites and objects. As such, no further assessment and mitigation measures will be required to ensure no harm will occur and works can proceed with caution.

Flora and Fauna	<u>A review of relevant literature, databases and aerial photography was undertaken on the 30 March 2023, prior to conducting the field surveys. This included:</u>	☐ n/a
	• NSW BioNet database search (5 km search radius) (DPE 2023b) • Protected Matters Search Tool (5 km search radius) (DCCEEW 2023) • Biodiversity Values Map (DPE 2023c) • NSW State Vegetation Type Map (DPE 2023a)	☒ Low
		☐ Medium
		☐ High

A field survey was undertaken on 11 May 2023 to assess:

- vegetation (including assessment of floristic structure and composition, and of vegetation communities against key listing criteria for relevant Threatened Ecological Communities (TECs))
- the presence of, or potential habitat for, threatened flora and fauna (including hollow-bearing trees and other important habitat features)
- opportunistic fauna sightings

Flora

The site is surrounded by scattered Urban Exotic/Native vegetation (Appendix A). There are no threatened vegetation communities listed under the BC Act or EPBC Act or

Environmental Factor	Description	Negative Impact
	Terrestrial Biodiversity (Queanbeyan-Palerang Local Environmental Plan 2022) mapped within or surrounding the site (Figure 8). Two threatened flora species, Hoary Sunray (<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>) and the Small Purple-pea (<i>Swainsona recta</i>), have been previously recorded within 1 km of the study area, however, there are no records or observations within the study area (Figure 9). Indirect impacts would be mitigated by measures in Section 7. No threatened flora species were recorded during the field survey. ELA's preliminary field survey determined vegetation within the study area was predominantly exotic lawn (Figure 2 and Figure 4) and planted exotic trees (Figure 3), with six planted native shrubs recorded within the impact area (). One planted native tree (<i>Eucalyptus globulus</i>) containing a nest was recorded within the impact area (located on the corner of Kenneth Place and Cooma Street) (Figure 5 and Figure 7). The bird nest appeared inactive at the time of the site visit. Council has committed to the retention of this tree and will amend the construction route to remain outside the TPZ of this tree. As part of the redesign in this area, it is recommended that the tree is assessed by a Level 5 AQF Arborist to determine the Tree Protection Zone (TPZ) prior to any construction commencing. The field survey found several planted Bottlebrush (<i>Melaleuca</i> spp.) within or near the proposed pipeline works, that could be considered potential feed trees for native wildlife. However, as they are planted the risks associated with this habitat removal is low. The pipeline should be installed with minimal removal or impacts to the roots within the dig area. <u>Fauna</u> The planted exotic trees and native shrubs recorded within the impact area may provide a small amount of generic foraging habitat for highly mobile bird and bat species. One nest was recorded within the study area in the <i>E.globulus</i>, adjacent to the impact area. No hollow-bearing trees were recorded during the field survey. Five threatened fauna species have previously been recorded within 1 km of the study area (DPE 2023b), however, there are no records within the study area (Figure 9). The study area may provide some generic foraging habitat for the Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>) which can utilise a variety of habitats for foraging. No camps are located within the study area, however a camp has been recorded along the Queanbeyan River 1 km north east of the study area. Grey-headed Flying-foxes are highly mobile and the study area is considered unlikely to provide important habitat for the species. There is no suitable habitat for Pink-tailed Legless Lizard (<i>Aprasia parapulchella</i>) and Rosenberg's goanna (<i>Varanus rosenbergi</i>) within the study site and very little habitat that could be used by the Little Eagle (<i>Hieraaetus morphnoides</i>) and Hooded Robin (<i>Melanodryas cucullate cucullate</i>) so the likelihood these will be impacted is very low.	
Geology and Soils	The topography of the study area is characterised by gently undulating rises, with most of the study area located at elevations of 578 – 608 m. The soil and underlying geomorphology of the study areas is characterised by kurosoils associated with the Queanbeyan Soil Landscape. This Landscape is characterised by low hills on Ordovician metasediments, with moderately inclined slopes (10 – 25%). Soils are usually shallow, well drained hallow (<40 cm), well-drained Rudosols (Lithosols) on crests and upper slopes. Moderately deep (<100 cm), moderately well-drained Red Kurosols (Red Podzolic Soils) on sideslopes. Moderately deep to deep (<130 cm), imperfectly drained Magnesic Brown Chromosols (Yellow Podzolic Soils) in drainage lines (Jenkins, 2000). Although there is no mapped acid sulfate soil risk, the Queanbeyan soil landscape is limited by strongly acid shallow soils (localised) of moderate aluminium toxicity potential, with	☐ n/a ☒ Low ☐ Medium ☐ High

Environmental Factor	Description	Negative Impact
	low fertility and low available waterholding capacity. There is risk of sheet erosion; gully erosion; imperfect drainage; rock outcrop and surface stone (localised) and seasonal waterlogging (localised) (Jenkins, 2000).	
Priority Weeds	Mitigation measures outlined in Section 7 would allow the works to meet the objectives of the BS Act, which are to: - Prevent the establishment of new significant weeds - Restrict the spread of existing significant weeds.	☐ n/a ☒ Low ☐ Medium ☐ High
Contamination	A search of the Queanbeyan-Palerang LGA on the contaminated land sites register maintained by the NSW EPA under the <i>Contaminated Land Management Act 1997</i> identified no contaminated land sites within a 10 km radius of the study area. This does not eliminate the risk of contaminated soils occurring within the site. Given the site is within an urban area, it is unlikely that gross contamination exists or that any existing contamination would pose a risk to human health or the environment. The proposed works have the potential to introduce contaminants to soils via construction machinery and associated earthworks. These include the following: - Hydrocarbons, lubricants, oils or other chemical pollutants, particularly at the site compound where vehicle, machinery and other equipment may be stored. - Spillage, dust or leachate from concrete or concrete wash. - Compaction of soils can retard the natural regeneration of ground cover and adversely affect soil stability. The works are unlikely to disturb acid sulphate soils, which are not mapped for the area. The works are not proposing to impact on factors that are likely to change salinity levels such as altering water tables and therefore salinity is not likely to be impacted by the proposed works. The works will involve working near and on asbestos cement water mains. The works will also require the removal and safe disposal of asbestos cement water mains. This material must be handled, managed and disposed of in accordance with the Code of Practice how to safely remove asbestos (SafeWork NSW, 2022), available through SafeWork NSW.	☐ n/a ☒ Low ☐ Medium ☐ High
Waste Management and Resource Use	The proposed works are not expected to generate a significant volume of waste. However, some may be produced during the construction phase, potentially including: - Existing Road Surface i.e. asphalt - Existing drainage infrastructure i.e. concrete - Domestic waste - Excess spoil from earthworks - Vegetation waste from clearing of vegetation - Construction packaging materials - Asbestos contaminated waste To ensure that waste is minimised, a CEMP will be implemented which will detail the proper avenues for the removal of waste on-site. Where possible, excavated material should be reused and replaced from where it was removed. Only the minimum amount of vegetation required to facilitate the works should be removed. Asbestos containing waste will need to be considered as part of the CEMP and will require management in accordance with the Code of Practice how to safely remove asbestos (SafeWork NSW, 2022). Management in accordance with these will ensure that public safety is maintained. No further impact is expected to occur during the operational phase, provided the site is managed in accordance with the waste management procedures set out in the CEMP and	☐ n/a ☒ Low ☐ Medium ☐ High

Environmental Factor	Description	Negative Impact
	all waste is removed. Maintenance activities and appropriate design considerations will minimise the risk of water seepage from the pipeline once it is in operation.	
Cumulative	Clause 171(2) of the EPA&A Regulations requires that cumulative impacts of the proposed works with other existing or planned future activities are considered. The potential negative impacts identified by this report are unlikely to have significant effects at the local or regional scale since they will be minor and site-specific. The small-scale potential impacts are not envisaged to have substantial adverse effects on the environment including threatened and migratory species, cultural heritage, microclimate, greenhouse gas emissions, air, water, or soils or the community, as the upgrade works are in the urban area. The proposed works are being delivered by the Council. Given that the Council are responsible for associated infrastructure and road projects, it is assumed that works have been appropriately scheduled to minimise any effects of the proposal on other projects occurring or set to occur in the area. However, there remains potential for other local and/or regional development projects to occur in the vicinity which may lead to cumulative impacts. Prior to construction works, the Council should confirm that other local development near the works would not coincide with the proposed development; and if such occurs, ensure that they can occur simultaneously without further impacts. It is also recommended that due consideration is given to these projects when determining the CEMP, particularly with respect to traffic movement and access.	☐ n/a ☒ Low ☐ Medium ☐ High



Figure 2: Typical image of impact area. Exotic lawn and path



Figure 3: Planted exotic trees



Figure 4: Typical road verge vegetation (exotic grass)



Figure 5: Surrounding vegetation (large exotic trees (left) and large native *E. globulus* tree with nest (right))

6. Clause 171 Consideration

In accordance with Part 5 of the EP&A Act the factors cited in Section 171 (2) of the *Environmental Planning and Assessment Regulation 2021* have been considered as follows:

Table 4: Clause 171 Consideration

Clause Regulation	171	EP&A	Consideration
Factor A: the environmental impact on a community			There are not expected to be any adverse environmental impacts on the community. Noise and other impacts associated with the proposed works including excavation, installation of pipe and backfilling would be temporary and mitigation measures have been provided in Section 7. Council would notify adjacent residential houses prior to works commencing and conduct works in accordance with mitigation measures outlined in this REF. Traffic management measures will be implemented during works to ensure minimal disruption to local traffic.
Factor B: the transformation of a locality			Being in an urban area, the study area is highly modified and the impact area is within existing road and road reserve. The works undertaken will only affect the visual and functional transformation of the locality temporarily during construction. Disturbed areas will be restored to original condition following completion of the works. Long-term, transformation of the locality would be positive, through the renewal and replacement of assets.
Factor C: the environmental impact on the ecosystems of the locality			The proposed works are within the road pavement and in some cases the road verge. Road verges in the impact area are comprised of exotic lawn, planted exotic trees and six planted native shrubs. No threatened flora or fauna species were recorded during the field survey and the impact area is considered unlikely to provide important habitat resources for any threatened species. One planted native tree (<i>Eucalyptus globulus</i>) containing a nest was recorded within the impact area (located on the corner of Kenneth Place and Cooma Street. The works will be conducted in accordance with the mitigations outlined in this REF in section 5 outlining that the Council has committed to the retention of this tree and will amend the construction route to remain outside the tree protection zone for this tree. As part of the redesign in this area, it is recommended that the tree is assessed by a Level 5 AQF Arborist to determine the Tree Protection Zone (TPZ) prior to any construction commencing. No hollow bearing trees were recorded within the study area. The impacts to the surrounding ecosystem are expected to be negligible. No direct adverse impacts on threatened flora, habitat trees, or the ecosystems surrounding the site are anticipated. Indirect impacts, such as sedimentation, would be mitigated using measures outlined in Section 7.
Factor D: the reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality			Temporary impacts to aesthetic values would be confined to construction and would be short term. No substantial long-term impacts to the environment are anticipated. The water mains will be underground and trenched impact areas will be stabilised and rehabilitated.
Factor E: effects on a locality, place or building that has –			There are no known Aboriginal sites within the study area, and the desktop assessment identified the study area had previously been extensively disturbed, indicating there is a low to nil potential for Aboriginal objects to be impacted by the proposed works.
a) aesthetic, anthropological, archaeological, architectural,			The proposed works will not have any effect upon a building/s having aesthetic, architectural, cultural, historical, scientific, or social significance or any other special value for present or future generations. Construction works may have a temporary reduction of the aesthetic

Clause Regulation	171	EP&A	Consideration
	cultural, historical, scientific or social significance, or b) other special value for present or future generations		values of the locality, however once works are completed, the aesthetic values of the locality would be restored.
Factor F: the impact on the habitat of protected animals, within the meaning of the Biodiversity Conservation Act 2016 ,			Five threatened fauna species have previously been recorded within 1 km of the study area (DPE 2023b); however, none have been recorded within the study area. The study area may provide some low-quality generic foraging habitat for the Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>). No camps have been recorded within the study area, however a camp has been recorded 1 km to the north east, along the Queanbeyan River. The study area is considered unlikely to provide important habitat for this highly mobile species. There is no suitable habitat for Pink-tailed Legless Lizard (<i>Aprasia parapulchella</i>) and Rosenberg's goanna (<i>Varanus rosenbergi</i>) within the study area and very little habitat that could be used by the Little Eagle (<i>Hieraaetus morphnoides</i>) and Hooded Robin (<i>Melanodryas cucullate cucullate</i>) so the likelihood these will be impacted is very low. Whilst the project is unlikely to impact threatened fauna, all native mammals, birds, reptiles and amphibians and many species of native plants are protected in NSW, even if they are not threatened species (BC Act and Schedules 5 and 6 of the BC Regulation). As such mitigation measures should be implemented in accordance with Section 7
Factor G: the endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air			Two threatened flora species, Hoary Sunray (<i>Leucochrysum albicans</i>) and the Small Purple-pea (<i>Swainsona recta</i>), and five threatened fauna species, Pink-tailed Legless Lizard (<i>Aprasia parapulchella</i>), Rosenberg's goanna (<i>Varanus rosenbergi</i>), Little Eagle (<i>Hieraaetus morphnoides</i>), Hooded Robin (<i>Melanodryas cucullate cucullate</i>) and Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>) have been previously recorded within 1 km of the study area. No threatened flora species or threatened fauna species were recorded during the field survey. With the exception of the Grey-headed Flying-fox which may utilise the study area for occasional foraging habitat, no threatened species are considered likely to occur within the study area. The existing scope of works includes minimal native vegetation removal or trimming. Strict no-go areas should be established around vegetation to be retained to prevent accidental clearing. Indirect impacts would be mitigated using measures outlined in Section 7. The field survey identified several planted Bottlebrush (<i>Melaleuca</i> spp.) and a mature Blue gum (<i>Eucalyptus globulus</i>) within or near the proposed water main works. The water main should be installed without any trimming or removal or impacts to the roots within the impact area, unless assessed by or undertaken under supervision of a Level 5 AQF Arborist. No long-term impacts on any species of animal, plant or other life form are anticipated as a result of the proposed works.
Factor H: long-term effects on the environment			No negative long-term change to the study is expected. Excavation and construction impacts would be of short duration and the long-term operation of the water mains will be as per the existing use.
Factor I: degradation of the quality of the environment			Temporary degradation may occur during works due to trench excavation and noise dust emissions however works will be contained within the existing disturbed areas and avoiding native vegetation, large individual trees, and habitat trees. Disturbed construction areas will be stabilised and rehabilitated upon completion.
Factor J: risk to the safety of the environment			A low risk to the environment may be associated with the works, with the potential for the spread of waste materials, weeds and possible chemical spills (oil or petrol) during construction. Section 7 recommends safeguards and if these are adopted the risk is low.

Clause Regulation	171	EP&A	Consideration
Factor K: reduction in the range of beneficial uses of the environment			There would be no long-term reduction in the range of beneficial uses of the environment as the water mains upgrade works undertaken will only temporarily affect the area and is within existing road and road verge already utilised for water main infrastructure.
Factor L: pollution of the environment			It is considered that the proposed works can be carried out without causing water pollution potentially associated with construction activities, provided that erosion and sedimentation mitigation measures are implemented. In relation to testing and commissioning, water used for testing and commissioning will not be discharged to the environment.
Factor M: environmental problems associated with the disposal of waste			Waste will be classified in accordance with the NSW EPA Waste classification guidelines. Where possible, reuse of waste, on site or off site will be considered in accordance with the <i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act). As a last resort, waste would be taken offsite and disposed of at a suitably licensed facility. Asbestos containing waste will need to be considered as part of the CEMP and will require management in accordance with the Code of Practice how to safely remove asbestos (SafeWork NSW, 2022). Management in accordance with these will ensure that public safety is maintained. With mitigation measures, the risks are minimal and mitigation measures have been recommended in Section 7.
Factor N: increased demands on natural or other resources that are, or are likely to become, in short supply			No resources that would be used as part of these works are, or likely to become, in short supply because common products would be used.
Factor O: the cumulative environmental effect with other existing or likely future activities			There are no cumulative environmental effects expected to result from these works, provided that the works are appropriately scheduled and that Council confirms that other local development near the works would not coincide with the proposed development. If such occurs, ensure that they can occur simultaneously without further impacts. It is also recommended that due consideration is given to any other projects when determining the CEMP, particularly with respect to traffic movement and access.
Factor P: The impact on coastal processes and coastal hazards, including those under projected climate change conditions			The works are not in a coastal environment and would not impact coastal processes or hazards.
Factor Q: applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1			The proposed works are in accordance with the Queanbeyan-Palerang Regional LEP and the Queanbeyan- Palerang Regional Council Local Strategic Planning Statement. The proposed works will not impact mapped Terrestrial Biodiversity areas, and further planning context is detailed in section 3 of this report.
Factor R: other relevant environmental factors			No other environmental factors have been identified.

7. Safeguards

This section of the report provides mitigation measures relating to each of the aspects considered in Section 5. A CEMP will be prepared by the construction contractor, to include all the mitigation measures listed in this REF, as well as any relevant conditions under any permits, licenses or other approvals obtained for the project.

Table 5: Safeguards

Category	Measures
Noise and Vibration	• Develop a noise mitigation plan that also specifically considers the impact of any noise on adjoining properties outside of the hours specified in Section 2 works. • Consider scheduling noisy activities for the least sensitive times of the day such as mid-morning or mid-afternoon. • Vehicles and machinery should not be left idling when not in use. • Equipment, machinery and vehicles should be regularly maintained (documented). • All machinery and equipment to be used will comply with the relevant Australian standard for noise attenuation (e.g., have noise mufflers and be well maintained). • Well planned site layout to ensure where practical that noisy plant and machinery and overnight parking locations are located away from nearby residences with reversing also minimised in these locations. • Organise earthmoving and ground impacting operations so as not to occur in the same time period. • Community consultation and notification is undertaken for potentially noise and vibration affected residences detailing timing of noisy activities. • Mechanism to provide noise complaints using signage and usage of a complaints register with relevant triggers for noise monitoring if required. • Where possible, avoid the simultaneous operation of two or more noisy plant items in close vicinity to sensitive noise receivers. • Where possible, orientate equipment such that offensive noise carries away from potential receivers. • Neighbouring residents are to be notified before works commence and if there are to be any significant noise impacts or noise anticipated outside the proposed work hours.
Air Quality and Odour	• Dust-generating works must be stopped during high wind periods. • Employ dust suppression techniques to both areas of earthworks and stockpiles, if conditions are dry or windy and there is dust emitting from excavation areas. i.e. water cart, water sprays • Cover all loads when transporting material on or off the study area. • Cover all stockpiles and locate where protected from the wind. • Areas of impact to be stripped progressively and only where it is necessary for works to occur. • Engines and equipment must be regularly inspected to ascertain that fitted emission controls are operating efficiently. • Engines and equipment must be maintained in accordance with manufacturer's specifications to ensure that it is in a proper and efficient condition. • Do not have engines or equipment running while not in use. • Minimise use of machinery to required activity only. • Areas of completed earthworks shall be progressively rehabilitated and fenced off as soon as practicable to prevent further erosion.
Water	• Develop and implement a construction Erosion and Sediment Control Plan which will outline a range of general erosion and sediment controls in accordance with the Blue Book (DECC 2008). These general controls will be designed to control and manage erosion and sediment and may include the following:

Category	Measures
	○ install erosion and sediment control measures as the first step in the process for land disturbance ○ minimise all disturbed areas and stabilisation by progressive stabilisation and surface treatment (i.e., grassing and/or sealing) disturbed land as soon as practicable ○ clearly identifying and delineating areas required to be disturbed and ensuring that disturbance is limited to those areas ○ construction of other ESC works such as filter rolls and sediment fences prior to works commencing within the area ○ placement of kerbside filter rolls to sumps/stormwater inlets adjacent to the site and such to be removed, cleaned and reinstated on a weekly basis at a minimum. ○ Cleaning of filter rolls to be undertaken immediately after periods of rain and any trapped sediment removed. ○ All service trenches to be backfilled within 24 hours of inspection. ○ inspection and maintenance of all sedimentation controls and rehabilitation areas after storm events (greater than 25 mm of rainfall in 24 hours) to ensure ESCs are performing adequately; and follow up repair or redesign of ESCs that are not performing adequately. ○ Temporary stockpiles are regularly checked for erosion and sediment control failures. ● All water should be contained on the site, with no run-off towards the watercourse. ● When high rainfall events are expected, cease work on activities likely to contaminate stormwater. ● Adequate procedures will be established and detailed in the CEMP, including notification requirements to the EPA, for incidents that cause material harm to the environment. ● A site-specific spill management plan will be prepared and include the following requirements: ○ Emergency spill kits are to be kept at the site (vehicle kits). ○ Refuelling of machinery to be undertaken in a dedicated area within the construction compound appropriately protected as outlined in the spill management plan. ○ Any chemicals and fuels are to be stored in a bunded area at least 50 m from any waterway or drainage line. ○ Follow product labels and directions for use. ○ Ensure safety data sheets are available for all substances present on-site ○ Ensure spill kit is on-site (including absorptive material, broom, shovel and bags) and staff trained in its use ○ Ensure fire extinguisher is on-site ● To control substance leak: ○ Conduct prestart checks ○ Do not operate plant if leak is detected ○ Inform Project Manager if leak, spill or escape occurs ● Equipment, machinery and vehicles should be regularly maintained (and documented) ● Workers will be trained in the spill management plan and the use of the spill kits. ● A rehabilitation plan should be prepared for all areas disturbed by construction works proposal and would include the following: ○ Ensure areas disturbed during construction (including laydown areas and ancillary sites) are stabilised progressively during construction and restored back to original condition or re-vegetated with appropriate species (native in native dominated areas) as soon as practical. ○ Include monitoring to meet clear targets, regarding vegetation establishment and stabilisation of bare areas of soil.
Visual Amenity	● During the work period, the site and storage area (carpark) should be maintained in a neat and tidy condition. ● Site no-go zones should be visually cordoned off to prevent accidental access.

Category	Measures
	- Site should be visually delineated from the adjoining recreational facilities/public open space during works to reduce disturbance to the public. - All disturbed areas shall be rehabilitated and maintained until established; this includes replacement of any street tree / shrub and reinstating grass. - Contain all work within the boundaries designated on the design plans. - Identify vegetation that may be cleared on site plans. Keep vegetation clearance and disturbance to a minimum (e.g., trim rather than remove branches)
Traffic and Access	- Ensure that a best practice TMP is prepared prior to works commencing to ensure traffic is safely managed and that residents with local properties continue to have road access during the implementation of the proposal. - Construction traffic movements associated with the proposal will be kept to the minimum necessary to implement the proposal efficiently and safely. - Isolation of the work zone for pedestrians through fencing along with PPEs controls to further reduce the risk of accidents. . - Consultation with residents regarding access, closures and work scheduling prior to works commencing. - Undertake early community engagement, early notification / advertisement of construction period through both local and regional channels to avoid traffic delays. - Fencing and other safety options should be put into place to minimize tripping and falling. - Haulage routes for trucks to be confirmed and verified for suitability prior to works. Briefing of any routes to be provided to sub-contractors and suppliers. - Maintain ongoing consultation with local bus companies regarding changes to traffic and bus stop access.
Socio Economic and Human Health Risk	- Specific waste, equipment, plant and material storage areas to be nominated and followed. No materials or equipment are to be stored in areas accessible to the public. - Contractor to manage quantities of materials on site and deliveries due to confined area available. - Equipment should be at all times stored away from pedestrians to reduce the potential of hazards. - Carry out community and stakeholder consultation before works start. - Locate existing services on a Dial-Before-You-Dig search and peg out no-go areas to avoid service-disruption.
Aboriginal and Historic Heritage	Aboriginal objects are protected under the NPW Act regardless of whether they are registered on AHIMS. If suspected Aboriginal objects, such as stone artefacts or concentrations of shell material are located in the works area, works must cease in the affected area and an archaeologist contacted to assess the finds. If the finds are found to be Aboriginal objects, Heritage NSW must be notified under Section 89A of the NPW Act. Appropriate management and avoidance or approval under a Section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed.
Flora/Fauna	- Avoid clearing and modification of native vegetation wherever possible, particularly the <i>E. globulus</i> specimen on the corner of Kenneth Place and Cooma Street. - it is recommended that potential retention of <i>E. globulus</i> in the impact area be assessed by an AQF Level 5 Arborist prior to works commencing to determine the Tree Protection Zone (TPZ) and advise on measures to ensure protection and retention of this tree. - Tree protection measures must be taken to protect native species along the construction works. This encompasses: - Tree protection fencing for native trees to be retained. - Level 5 AQF arborist to be on site at all times during any construction works within the TPZ of the <i>E. globulus</i>, during tree removals / works directly under trees. Assessment to be

Category	Measures
	undertaken by arborist prior to works and pruning etc to occur as recommended, including deadwood prior to commencement. - Workers to be informed of appropriate safeguards to limit impacts on vegetation to be retained and to limit impacts on vegetation beyond the impact area during site induction and toolbox talks. - Works adjacent to trees to cease in high winds. - Internal fencing of trees to exclude branch fall zones from work areas. - Qualified fauna handlers are required to conduct pre-clearing surveys and undertake fauna removal if the clearing of the <i>E. globulus</i> is required following arborist assessment. - Tree Protection general information: - TPZ is calculated by measuring the trunk diameter at 1.4m above the ground and multiply by 12. The TPZ value gives a radius measured from the centre of the tree trunk - If encroachment into TPZ is greater than 10% the Project Arborist must be contacted (encroachment includes, excavation, parking, soil contamination, soil level changes and activities that may cause compaction of the soil) - The Structural Root Zone (SRZ) is different to TPZ and is an area around the base of the tree required for the tree's stability, encroachment must not occur in this zone as disturbance to the root zone in this area could potentially compromise the stability of the tree. For help determining the SRZ, please read AS 4970–2009 or contact the Project Arborist. - If unavoidable to cut a tree root (outside SRZ), only roots smaller than the following diameters may be cut: 30mm for trees <5m tall, 50mm for trees 5-15m tall, 70mm for trees >15m tall. All root cutting must be completed by using sharp cutting equipment – do not rip with excavating machinery or tools. - Where branches are obstructing works – prune as per AS 4373—2007 instead of damaging branches. Branch pruning must not be greater than 10% of total canopy cover. - Any occupied nests located or any fauna which are inadvertently injured should be reported to Wildcare Queanbeyan or a similar organisation and relocated from the works area by a suitably qualified fauna handler. - Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until Council has provided written approval to do so. - The site extent should be clearly delineated prior to works, sediment controls in place and no-go areas to be taped off. - A site-specific Construction Environmental Management Plan (CEMP) must be prepared for the works and include: - Locations of vegetation that would be retained and not disturbed - Instructions for dealing with orphaned or injured native animals and include the contact details for Wildcare Queanbeyan or the NSW Wildlife Information, Rescue and Education Service Inc (WIRES). - Wash down equipment and vehicles before and after use, to manage the introduction and spread of weed propagules into the surrounding area.
Geology and Soils	As per mitigations listed under 'Water'
Contamination	- An unexpected finds protocol should be made for the site and included in the Construction Environmental Management plan outlining the reporting process for contaminated soils, wastes or other materials found on site. - Contractor should sweep site prior to commencement inspection for syringes etc. Unexpected finds protocol should be in place and adhered to.

Category	Measures
	• Store all chemicals (e.g. fuel, oil) in appropriate bunding/storage systems within the approved storage facility. • All stockpiles, chemicals and storage areas must be away from the drainage line, with appropriate bunding. • Ensure appropriate spill kits are carried with the equipment. • All hazardous material to be disposed of at a licenced waste facility.
Waste Management and Resource Use	• Maintain tidy work practices with the site kept clean of general litter. Refer to measures relating to waste management mitigation measures. • All disturbed areas shall be rehabilitated and maintained until established. • Contain all work within the boundaries designated on the site plan. • Consider the application of the NSW Resource Recovery orders to the wastes generated. • Construction staff are to be briefed on their responsibility for the removal of their general waste. • All contaminated waste must be disposed of in accordance with EPA guidelines. • Provide appropriate receptacles to store all general waste, empty immediately at the completion of works. Consideration must be given to the source separation of recyclable and re-usable materials. • Transport and disposal dockets will be kept as proof of correct disposal for everything that leaves site. • Secure all wastes to avoid pollutants escaping. • Implementation of waste management strategy documented within the CEMP. The strategy should include details of the type of waste material likely to be generated, and how it would be managed (including sorting, storage and disposal), materials to be recycled, as well as measures to reduce or avoid waste generation. • Construction staff are to be briefed on their responsibility for removal of their own general waste. • Apply best practice management and disposal to asbestos containing materials. • Consider Use NSW EPA WasteLocate if consigning, transporting or accepting more than 100 kilograms of asbestos waste, or more than 10 square metres of waste asbestos sheeting, in any single load

8. Conclusion

This REF has identified and assessed the potential environmental impacts of the proposed construction and operation of water main upgrades in Karabar, a suburb of Queanbeyan. The long-term operational impacts of the proposed works are expected to be positive.

The study area is located in an urban area and the impact area is within predominantly disturbed road reserves. No further technical assessment is required and the key considerations for this project include impacts to the community resulting from:

- Traffic impacts arising from lane closures
- Noise and vibration impacts arising from plant and machinery
- Air quality impacts resulting from dust
- Visual amenity impacts resulting from construction activities and vegetation impact and removal.

The impacts to the surrounding ecosystem are expected to be negligible provided that erosion and sediment controls are implemented and maintained for the duration of works. The proposed works are within a predominantly disturbed environment, comprising road pavement and road verges comprised of exotic lawn, planted exotic and native shrubs and trees.

One planted native tree (*Eucalyptus globulus*) containing a nest was recorded within the impact area (located on the corner of Kenneth Place and Cooma Street). Council has committed to the retention of this tree and will amend the construction route to remain outside the TPZ of this tree. As part of the redesign in this area, it is recommended that the tree is assessed by a Level 5 AQF Arborist to determine the TPZ.

Specific mitigation measures have been provided to minimise and mitigate the above impacts, and no further environmental permits or approvals have been identified as being required.

In conclusion, environmental impacts identified and addressed in this REF will not result in a significant adverse impact if the proposal is implemented as described in Section 2 and Appendix C, and including all mitigation measures as described in Section 7. These mitigation measures should be included in the site-specific Construction Environmental Management Plan (CEMP) to be developed prior to the commencement of the works. Should the scope of works, methodology or alignment be changed from that described and assessed in this REF and its conclusions should be reassessed.

The proposal is required to be assessed under Division 5.1 of Part 5 of the EP&A Act. This REF has examined and considered to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposal.

The proposal is not likely to significantly affect the environment, including threatened species or ecological communities, or their habitats. As such it is not necessary for further assessment under subdivision 3 section 5.7 of the EP&A Act.

The proposal is not likely to have a significant impact on any matters of national environmental significance or the environment on Commonwealth land for the purposes of the EPBC Act and a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water under the EPBC Act is not required.

9. References

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Appendix A Environmental Constraints Mapping



Figure 6: Vegetation Communities mapped near the Study Area



Figure 7: Field recorded trees and shrubs



Figure 8: LEP mapped Terrestrial Biodiversity near Study Area

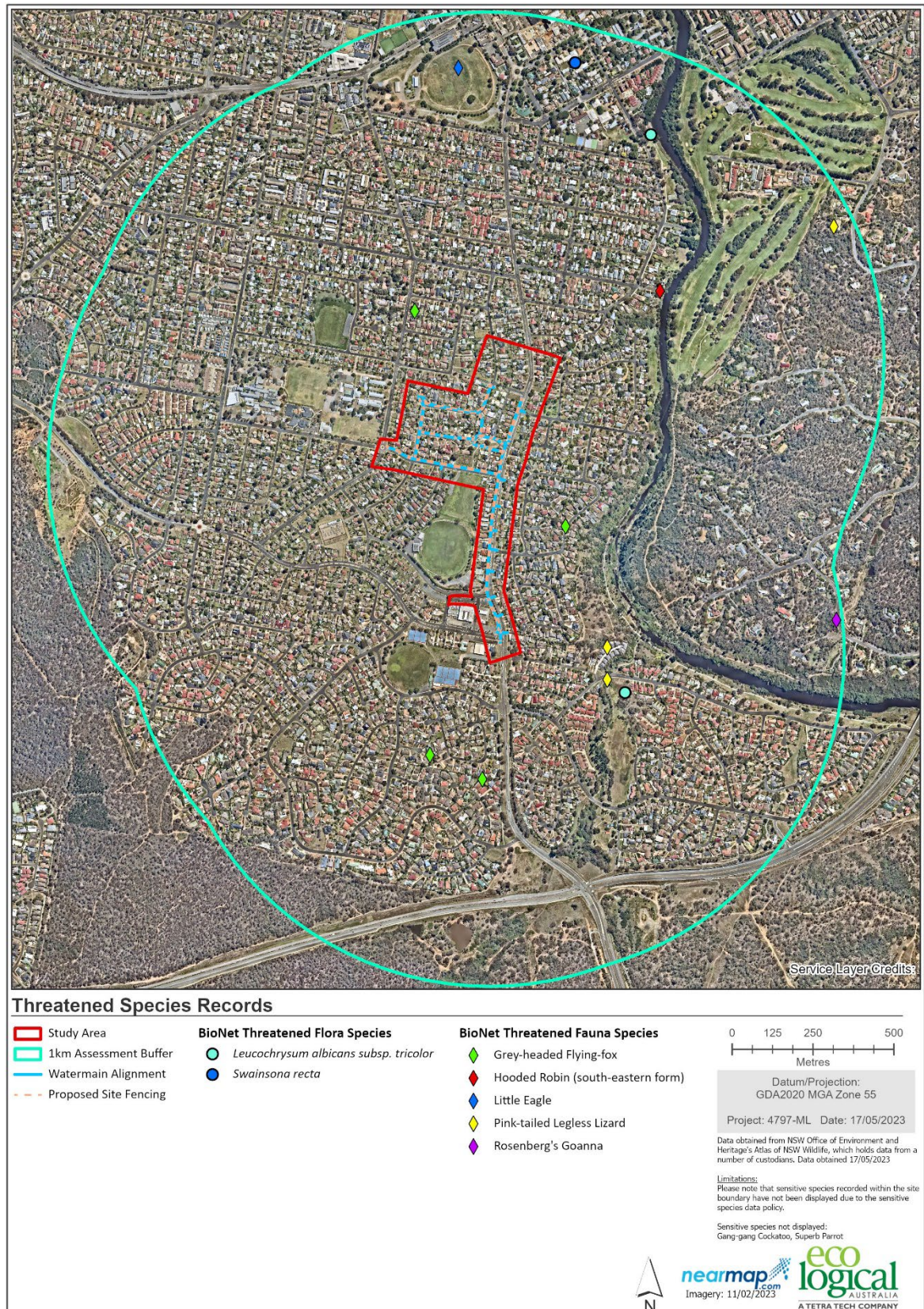


Figure 9: Threatened Species Records within 1 km of the Study Area

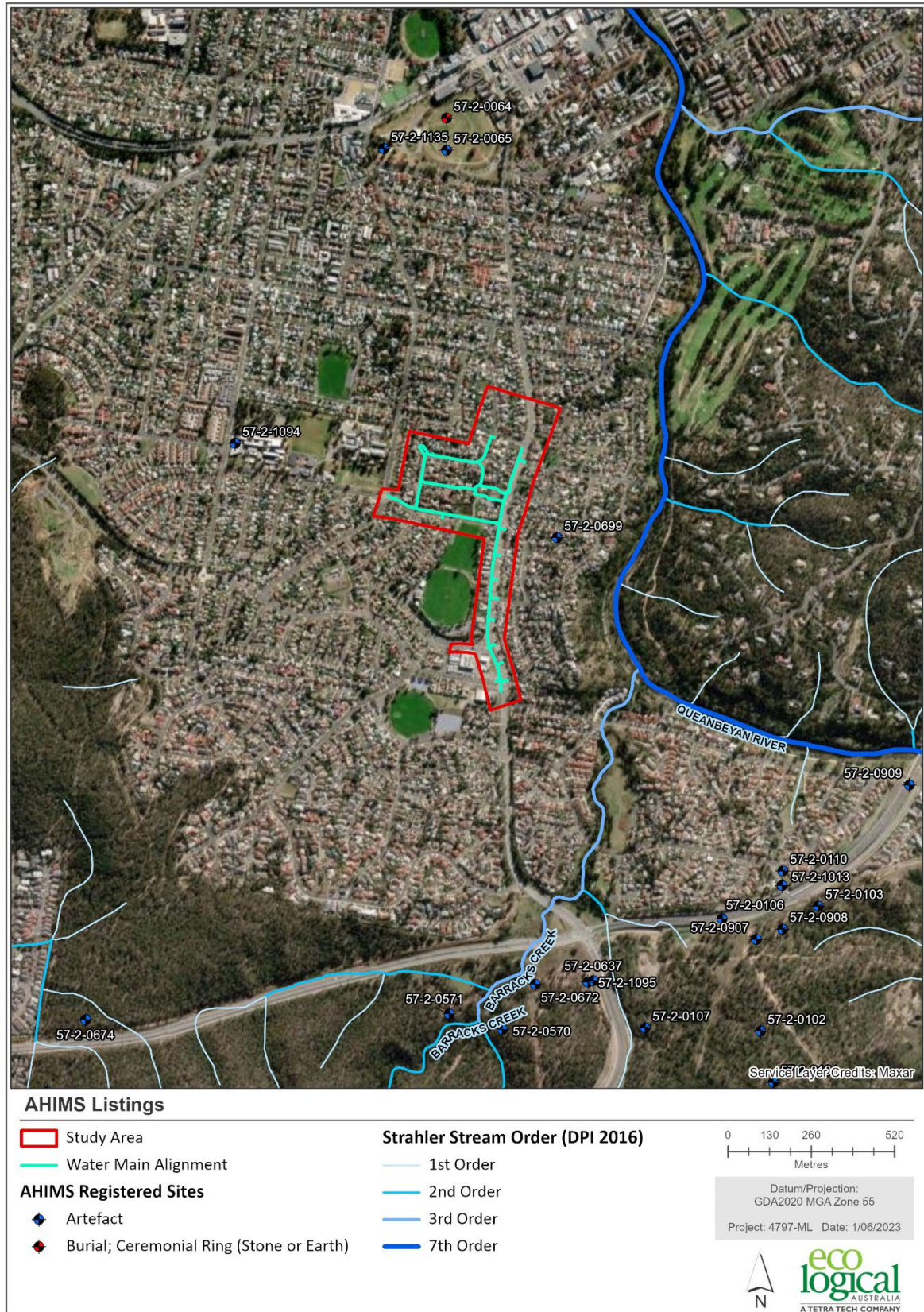


Figure 10: AHIMS sites within the vicinity of the Study Area

Appendix B AHIMS search results



AHIMS Web Services (AWS) Search Result

Your Ref/PO Number : 23CAN4797

Client Service ID : 781014

Eco Logical Australia Pty Ltd - Sydney - Individual users

Date: 11 May 2023

PO Box 12 668 Old Princes Hwy
Sutherland New South Wales 1499

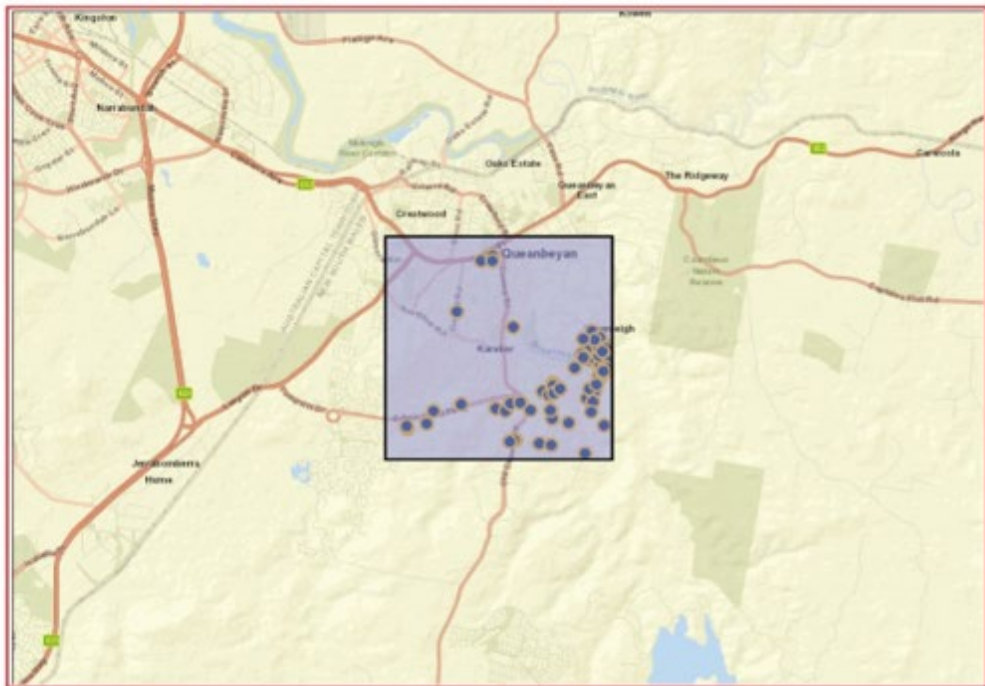
Attention: Kate Storan

Email: kate.storan@ecoaus.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 55, Eastings : 700788.0 - 704788.0, Northings : 6081498.0 - 6085498.0 with a Buffer of 0 meters, conducted by Kate Storan on 11 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:

71	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23CAN4797
Client Service ID : 781017

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
57-2-1135	Q5-1	GDA	55	702517	6085089	Open site	Valid	Artefact :-		
	Contact	Recorders						Permits		
57-2-0106	Gale Precinct 7;	AGD	55	703160	6082500	Open site	Valid	Artefact :-	Open Camp Site	2083,102775
	Contact	Recorders						Permits		
57-2-0105	Gale Precinct 6;	AGD	55	703900	6081910	Open site	Valid	Artefact :-	Open Camp Site	2083,102775
	Contact	Recorders						Permits		
57-2-0683	JCH2a	GDA	55	704421	6083312	Open site	Valid	Artefact : 3		102088,10366 7,104432
	Contact	Recorders						Permits		
57-2-0945	Ellerton Drive 7	GDA	55	704497	6083379	Open site	Valid	Artefact : 1		103667,10443 2
	Contact	Recorders						Permits	3843,4913	
57-2-0620	Jumping Creek SU15/L3	GDA	55	704505	6082657	Open site	Valid	Artefact : 1		101510,10443 2
	Contact	Recorders						Permits	4913	
57-2-0432	Jumping Creek, Queanbeyan - JCPAD1	AGD	55	704450	6083465	Open site	Valid	Potential Archaeological Deposit (PAD) :-		99378
	Contact	Recorders						Permits		
57-2-1099	OCR1 return location	GDA	55	703057	6081811	Open site	Valid	Artefact :-		
	Contact	Recorders						Permits		
57-2-0055	Jerrahomherria/1	AGD	55	701010	6081070	Open site	Valid	Artefact :-	Open Camp Site	794
	Contact	Recorders						Permits		
57-2-0100	Gale Precinct 1;	AGD	55	703370	6081550	Open site	Valid	Artefact :-	Open Camp Site	2083,102775
	Contact	Recorders						Permits		
57-2-0005	JC 20;	AGD	55	704250	6082350	Open site	Valid	Artefact :-	Open Camp Site	1579,104432
	Contact	Recorders						Permits	4913	
57-2-0910	ED6 - Ellerton Drive 6	GDA	55	704158	6083504	Open site	Partially Destroyed	Artefact :-		103667
	Contact	Recorders						Permits	3843	
57-2-0429	Jumping Creek, Queanbeyan - JCV6	AGD	55	704409	6083462	Open site	Valid	Artefact : 1		99378
	Contact	Recorders						Permits		
57-2-1092	JC 18-1	GDA	55	704599	6082898	Open site	Valid	Artefact :-		104432
	Contact	Recorders						Permits	4913	
57-2-0615	Jumping Creek SU10/L1	GDA	55	704486	6083528	Open site	Valid	Artefact : 5		101510,10443 2
	Contact	Recorders						Permits		
57-2-0616	Jumping Creek SU10/L2	GDA	55	704724	6083445	Open site	Valid	Artefact : 2		101510,10443 2

Report generated by AHIMS Web Service on 11/05/2023 for Kate Storan for the following area at Datum :GDA, Zone : 55, Eastings : 700788.0 - 701788.0, Northings : 6081498.0 - 6085498.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 71

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23CAN4797
Client Service ID : 781017

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
57-2-1086	OCR6	GDA	55	702964	6081780	Open site	Destroyed	Artefact :-	4913	104010
	Contact	Recorders						Permits		
57-2-0636	OCR4	GDA	55	703031	6081811	Open site	Destroyed	Artefact : 1	4385	101010
	Contact	Recorders						Permits		
57-2-0673	FLP 5 (duplicate of 57-2-0672)	GDA	55	702099	6082480	Open site	Destroyed	Artefact : 5	4385	
	Contact	Recorders						Permits		
57-2-0074	JCV9;	AGD	55	704263	6083335	Open site	Destroyed	Artefact :-	Open Camp Site	1579,103667
	Contact	Recorders						Permits	297,3843,4913	
57-2-0087	JCV 4;	AGD	55	704300	6083050	Open site	Valid	Artefact :-	Open Camp Site	1579,104432
	Contact	Recorders						Permits		
57-2-0618	Jumping Creek SU15/L1	GDA	55	704461	6082470	Open site	Valid	Artefact : 1		101510,10443 2
	Contact	Recorders						Permits	4913	
57-2-0086	JCV 3;	AGD	55	704600	6083050	Open site	Valid	Artefact :-	Open Camp Site	1579,104432
	Contact	Recorders						Permits	4913	
57-2-1098	OCR6 return location	GDA	55	702945	6081775	Open site	Valid	Artefact :-		
	Contact	Recorders						Permits		
57-2-0637	OCR5	GDA	55	703171	6082491	Open site	Destroyed	Artefact : 1		104010
	Contact	Recorders						Permits	4385	
57-2-1094	Karabar High School	GDA	55	702053	6084169	Open site	Valid	Artefact : 1		104120,10412 1,104122
	Contact	Recorders						Permits	4410,4411,4447,4529	
57-2-0571	FLP 4	GDA	55	702721	6082388	Open site	Valid	Artefact : 1		
	Contact	Recorders						Permits	3048	
57-2-0570	ELP 5	GDA	55	702887	6082339	Open site	Valid	Artefact : 13		
	Contact	Recorders						Permits	3048	
57-2-0104	Gale Precinct 5;	AGD	55	703580	6081520	Open site	Valid	Artefact :-	Open Camp Site	2083,102775
	Contact	Recorders						Permits		
57-2-0090	SJC 7;	AGD	55	704320	6082100	Open site	Valid	Artefact :-	Open Camp Site	1877,102775
	Contact	Recorders						Permits		
57-2-0634	JCR1	GDA	55	704589	6082951	Open site	Valid	Artefact :-		104432
	Contact	Recorders						Permits	3252,4913	
57-2-0068	JC3;	AGD	55	704200	6083450	Open site	Valid	Artefact :-	Open Camp Site	1579
	Contact	Recorders						Permits		
57-2-0573	ELP 2	GDA	55	701097	6082100	Open site	Valid	Artefact : 2		
	Contact	Recorders						Permits	3048	

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23CAN4797
Client Service ID : 781017

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
57-2-0907	ED1 - Ellerton Drive 1	GDA	55	703680	6082620	Open site	Valid	Artefact : -		103667
57-2-0110	Contact	Recorders	Doctor.Sophie Collins					Permits	3813	
	Fairlane Estate 1;	AGD	55	703650	6082650	Open site	Destroyed	Artefact : -	Open Camp Site	
57-2-0909	Contact	Recorders	Kerry Navin					Permits	294	
	ED3 - Ellerton Drive 3	GDA	55	704158	6083102	Open site	Destroyed	Artefact : -		103667
57-2-0108	Contact	Recorders	Doctor.Sophie Collins					Permits	3843	
	Gale Precinct 9;	AGD	55	704190	6081350	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2083,102775
57-2-0635	Contact	Recorders	Kerry Navin,Mr.Kelvin Officer					Permits		
	JCR2	GDA	55	704476	6083278	Open site	Destroyed	Artefact : -		103667,104432
57-2-0684	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits	3252,3843	
	JCR1a	GDA	55	704589	6082951	Open site	Valid	Artefact : 3		102088,104432
57-2-0079	Contact	Recorders	Doctor.Rebecca Parkes					Permits	4913	
	JCL4;	AGD	55	704500	6082950	Open site	Valid	Artefact : -	Open Camp Site	1579,102088,104432
57-2-0066	Contact	Recorders	H Cooke					Permits	3252,4913	
	Jumping Creek 1;	AGD	55	704200	6083200	Open site	Destroyed	Artefact : -	Open Camp Site	1579,103667
57-2-0672	Contact	Recorders	I Coates					Permits	3843	
	FLP 5 (relocated)	GDA	55	702990	6082480	Open site	Valid	Artefact : 5		101861
57-2-0101	Contact	Recorders	Mr.Charles Dearing					Permits		
	Gale Precinct 2;	AGD	55	703620	6081990	Open site	Valid	Artefact : -	Open Camp Site	2083,102775
57-2-1013	Contact	Recorders	Kerry Navin,Mr.Kelvin Officer					Permits		
	ED8 - Ellerton Drive 8	GDA	55	703761	6082788	Open site	Destroyed	Artefact : 1		103667
57-2-0908	Contact	Recorders	CHMA,Doctor.Sophie Collins					Permits		
	ED2 - Ellerton Drive 2	GDA	55	703762	6082652	Open site	Valid	Artefact : -		103667
57-2-0619	Contact	Recorders	Doctor.Sophie Collins					Permits	3843	
	Jumping Creek SU15/L2	GDA	55	704102	6082703	Open site	Valid	Artefact : 1		101510,104432
57-2-0430	Contact	Recorders	Doctor.Julie Dibden					Permits	4913	
	Jumping Creek, Queanbeyan - JC21	AGD	55	704370	6083579	Open site	Valid	Artefact : 3		99378
57-2-0621	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
	Jumping Creek SU15/L4	GDA	55	704535	6082789	Open site	Valid	Artefact : 4		101510,104432
57-2-0431	Contact	Recorders	Doctor.Julie Dibden					Permits	4913	
	Jumping Creek, Queanbeyan - JC22	AGD	55	704497	6083466	Open site	Valid	Artefact : 3		99378
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		

Report generated by AHIMS Web Service on 11/05/2023 for Kate Storan for the following area at Datum :GDA, Zone : 55, Eastings : 700788.0 - 704788.0, Northings : 6081498.0 - 6085498.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 71

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23CAN4797
Client Service ID : 781017

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
57-2-0076	JCL1;	AGD	55	704550	6082800	Open site	Valid	Artefact : -	Open Camp Site	1579,104432
57-2-0078	Contact	Recorders	H Cooke					Permits	3252,4913	
	JCL3;	AGD	55	704600	6082900	Open site	Valid	Artefact : -	Open Camp Site	1579,104432
57-2-0064	Contact	Recorders	H Cooke					Permits		
	Queanbeyan Showground Reserve	AGD	55	702600	6085000	Open site	Valid	Burial : -, Ceremonial Ring (Stone or Earth) : -	Bora/Ceremonial,Burial/s	1632,103561,103562
57-2-0103	Contact	Recorders	Doctor.Sue Peary,Mr.Douglas Williams					Permits	4185	
	Gale Precinct 4;	AGD	55	703760	6082540	Open site	Valid	Artefact : -	Open Camp Site	2083,102775
57-2-0918	Contact	Recorders	Kerry Navin,Mr.Kelvin Officer					Permits		
	ED4 - Ellerton Drive	GDA	55	704356	6083417	Open site	Destroyed	Artefact : 1		103667
57-2-0428	Contact	Recorders	Doctor.Sophie Collins					Permits	3813	
	Jumping Creek, Queanbeyan - JC1	AGD	55	704102	6083415	Open site	Destroyed	Artefact : 1		99378,103667
57-2-1091	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits	3843	
	JCL18-2	GDA	55	704599	6083317	Open site	Valid	Artefact : -		104432
57-2-0682	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					Permits	4913	
	JCR12/14	GDA	55	704638	6083018	Open site	Valid	Artefact : -		102088
57-2-0069	Contact	Recorders	Doctor.Rebecca Parkes					Permits		
	JCL4;	AGD	55	704550	6083200	Open site	Valid	Artefact : -	Open Camp Site	1579,104432
57-2-0091	Contact	Recorders	I Coates					Permits	4913	
	SJC - MP 2;	AGD	55	704550	6081850	Open site	Valid	Artefact : -	Open Camp Site	1877,102775
57-2-0919	Contact	Recorders	Jon Winstan-Gregson					Permits		
	ED5 - Ellerton Drive	GDA	55	704285	6083346	Open site	Destroyed	Artefact : 4		103667
57-2-0067	Contact	Recorders	Doctor.Sophie Collins					Permits	3843	
	Jumping Creek 2;	AGD	55	704200	6083450	Open site	Valid	Artefact : -	Open Camp Site	1579
57-2-0075	Contact	Recorders	I Coates					Permits		
	JCL10;	AGD	55	704200	6083100	Open site	Valid	Artefact : -	Open Camp Site	1579,103667,104432
57-2-1095	Contact	Recorders	H Cooke					Permits	3843	
	OCRS return location	GDA	55	703154	6082487	Open site	Valid	Artefact : -		
57-2-0065	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					Permits		
	Queanbeyan Showground (Artefact Scatter)	AGD	55	702600	6084900	Open site	Valid	Artefact : -	Open Camp Site	1632,103561,103562
57-2-0102	Contact	Recorders	H Cooke,F Bentley					Permits	4185	
	Gale Precinct 3;	AGD	55	703580	6082150	Open site	Valid	Artefact : -	Open Camp Site	2083,102775
	Contact	Recorders	Kerry Navin,Mr.Kelvin Officer					Permits		

Report generated by AHIMS Web Service on 11/05/2023 for Kate Storan for the following area at Datum :GDA, Zone : 55, Eastings : 700788.0 - 704788.0, Northings : 6081498.0 - 6085498.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 71

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 4 of 5



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 23CAN4797
Client Service ID : 781017

SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
57-2-1093	JC Scarred Tree 1	GDA	55	704650	6083040	Open site	Valid	Modified Tree (Carved or Scarred) :		104432
	Contact	Recorders						Permits		
57-2-0077	JC12;	AGD	55	704550	6082850	Open site	Valid	Artefact : -	Open Camp Site	1579,102088,104432
	Contact	Recorders						Permits		
57-2-0572	ELP 3	GDA	55	701466	6082144	Open site	Valid	Artefact : 9		3252
	Contact	Recorders						Permits		
57-2-0674	ELP 1-2-3 (relocated)	GDA	55	701586	6082369	Open site	Valid	Artefact : 23		3048
	Contact	Recorders						Permits		
57-2-0699	Lot 65 DP242927 46 Pindani Cr	AGD	55	702915	6083690	Open site	Valid	Artefact : 1		
	Contact	Recorders						Permits		
57-2-0107	Gale Precinct B;	AGD	55	703220	6082160	Open site	Valid	Artefact : -	Open Camp Site	2083,102775
	Contact	Recorders						Permits		

** Site Status

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 11/05/2023 for Kate Storan for the following area at Datum :GDA, Zone : 55, Eastings : 700788.0 - 701788.0, Northings : 6081498.0 - 6085498.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 71

This information is not guaranteed to be free from error/omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 5 of 5

Appendix C Proposed Works

CLIENT

QUEANBEYAN-PALERANG REGIONAL COUNCIL

COOMA STREET WATER MAIN REPLACEMENT

COVER SHEET AND
LOCALITY PLAN

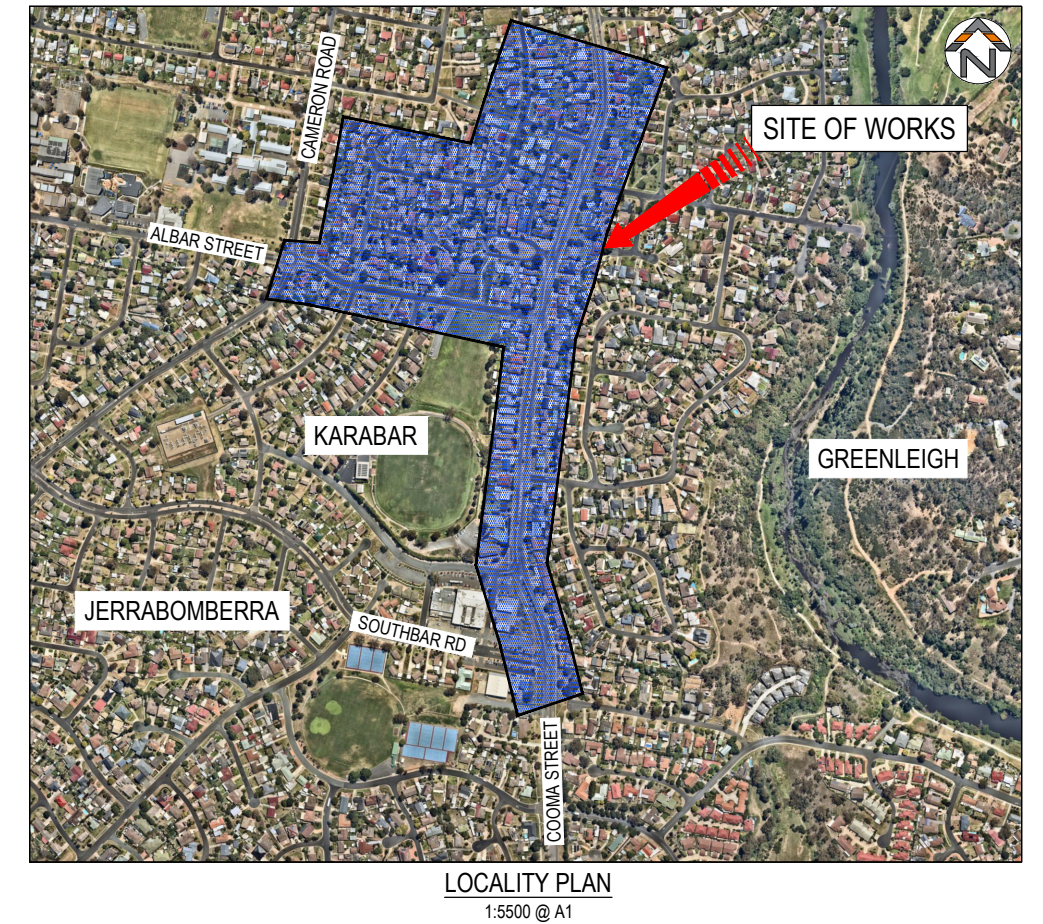
DETAILED DESIGN

JANUARY 2023

CLIENT:



LAND OWNER: QPRC



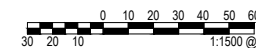
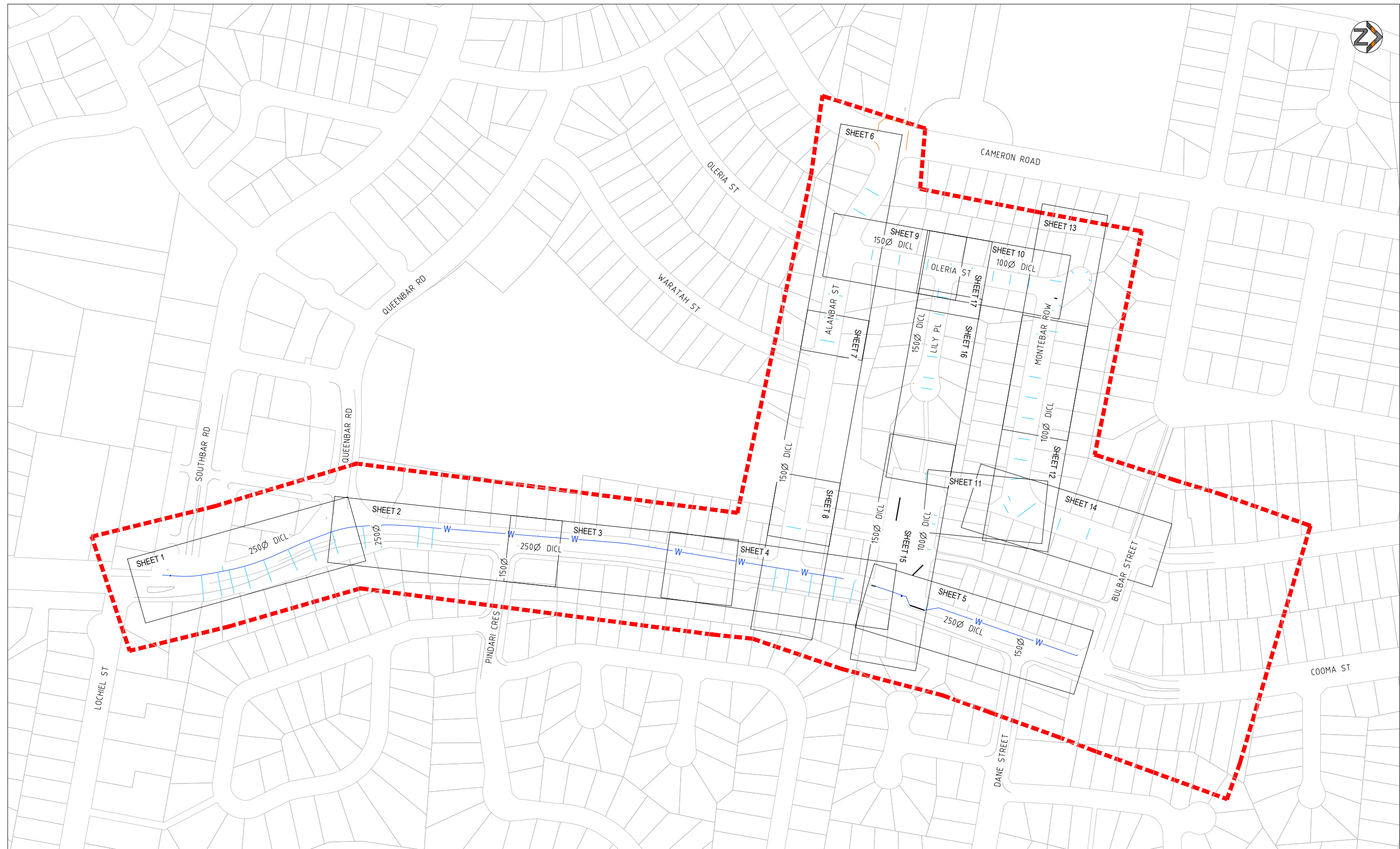
Plan number	Drawing Title
8654-01-000	COVER SHEET AND LOCALITY PLAN
8654-01-001	DRAWING SCHEDULE
8654-01-002	GENERAL NOTES AND LEGEND
8654-01-005	GENERAL ARRANGEMENT
8654-01-006	STAGING PLAN
8654-01-010	CONSTRUCTION DETAILS PLAN SHEET 1 OF 18
8654-01-011	CONSTRUCTION DETAILS PLAN SHEET 2 OF 18
8654-01-012	CONSTRUCTION DETAILS PLAN SHEET 3 OF 18
8654-01-013	CONSTRUCTION DETAILS PLAN SHEET 4 OF 18
8654-01-014	CONSTRUCTION DETAILS PLAN SHEET 5 OF 18
8654-01-015	CONSTRUCTION DETAILS PLAN SHEET 6 OF 18
8654-01-016	CONSTRUCTION DETAILS PLAN SHEET 7 OF 18
8654-01-017	CONSTRUCTION DETAILS PLAN SHEET 8 OF 18
8654-01-018	CONSTRUCTION DETAILS PLAN SHEET 9 OF 18
8654-01-019	CONSTRUCTION DETAILS PLAN SHEET 10 OF 18
8654-01-020	CONSTRUCTION DETAILS PLAN SHEET 11 OF 18
8654-01-021	CONSTRUCTION DETAILS PLAN SHEET 12 OF 18
8654-01-022	CONSTRUCTION DETAILS PLAN SHEET 13 OF 18
8654-01-023	CONSTRUCTION DETAILS PLAN SHEET 14 OF 18
8654-01-024	CONSTRUCTION DETAILS PLAN SHEET 15 OF 18
8654-01-025	CONSTRUCTION DETAILS PLAN SHEET 16 OF 18
8654-01-026	CONSTRUCTION DETAILS PLAN SHEET 17 OF 18
8654-01-027	CONSTRUCTION DETAILS PLAN SHEET 18 OF 18
8654-01-030	TYPICAL DETAILS SHEET 1 OF 5
8654-01-031	TYPICAL DETAILS SHEET 2 OF 5
8654-01-032	TYPICAL DETAILS SHEET 3 OF 5
8654-01-033	TYPICAL DETAILS SHEET 4 OF 5
8654-01-034	TYPICAL DETAILS SHEET 5 OF 5
8654-01-040	CONCEPT EROSION AND SEDIMENT CONTROL NOTES
8654-01-041	CONCEPT EROSION AND SEDIMENT CONTROL PLAN SHEET 1 OF 4
8654-01-042	CONCEPT EROSION AND SEDIMENT CONTROL PLAN SHEET 2 OF 4
8654-01-043	CONCEPT EROSION AND SEDIMENT CONTROL PLAN SHEET 3 OF 4
8654-01-044	CONCEPT EROSION AND SEDIMENT CONTROL PLAN SHEET 4 OF 4
8654-01-050	CONCEPT TEMPORARY TRAFFIC MANAGEMENT PLAN SHEET 1 OF 4
8654-01-051	CONCEPT TEMPORARY TRAFFIC MANAGEMENT PLAN SHEET 2 OF 4
8654-01-052	CONCEPT TEMPORARY TRAFFIC MANAGEMENT PLAN SHEET 3 OF 4
8654-01-053	CONCEPT TEMPORARY TRAFFIC MANAGEMENT PLAN SHEET 4 OF 4

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE	QPRC	CLIENT	INDESCO INDESCO PTY LTD CO1, Level 5, 68 Northbourne Avenue CANBERRA CITY ACT 2601 GPO Box 565 Canberra, ACT 2601 (02) 6285 1022 www.indesco.com.au ABN: 37 008 581 096	PROJECT TITLE	COOMA STREET WATER MAIN REPLACEMENT	CLIENT			DRAWING TITLE	
						QUEANBEYAN COUNCIL						DRAWING SCHEDULE				
						DRAWING STATUS										
						DETAILED DESIGN										
						SCALE						COORDINATE SYSTEM	DATUM			
						NA						GAD2020	AHD			
						SHEET SIZE						PROJECT NUMBER		DRAWING NUMBER	REVISION	
						A1						8654-01		001	A	
A	FOR CLIENT REVIEW	PGN	JP	TN	KM	20/01/2023	LAND OWNER:									

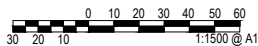
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 Last Plotted: 24/01/2023 10:20:46 AM By: EBRAHIM PELOUEH

CAD File: H:\8654 Cooma Street Water Main Replacement Design and Survey\20 Drawings\20.1 Civil01 Substage 101 Current Drawings\8654-01-002 GNL.dwg
 20/01/2023

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
A																	A
B																	B
C																	C
D																	D
E																	E
F																	F
G																	G
H																	H
I																	I
J																	J



REV.		DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE	CLIENT 	PROJECT TITLE COOMA STREET WATER MAIN REPLACEMENT	CLIENT QUEANBEYAN COUNCIL			DRAWING TITLE GENERAL ARRANGEMENT	
										DRAWING STATUS DETAILED DESIGN				
										SCALE AS SHOWN	COORDINATE SYSTEM GAD2020	DATUM AHD	DRAWING NUMBER 005	REVISION A
										SHEET SIZE A1	PROJECT NUMBER 8654-01			
A		FOR CLIENT REVIEW		PCN	IP	TN	KM	20/01/2023	LAND OWNER:					



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	DCM	ID	TAL	KLM	20/04/2022

	LAND OWNER
--	------------

CLIENT




INDESCO PTY LTD
CO1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

www.indesco.com.au
ABN: 37 008 581 066

	PROJECT TITLE
--	---------------

COOMA STREET WATER MAIN REPLACEMENT

CLIENT

HEANBEYAN COUNCIL

D

SCALE
AS SHOWN

AS SHOWN
SHEET SIZE

COORDINATE SYSTEM
GAD2021

PROJECT NUMBER	
----------------	--

8654-01

DRAWING TITLE

DRAWING TITLE

STAGING PLAN

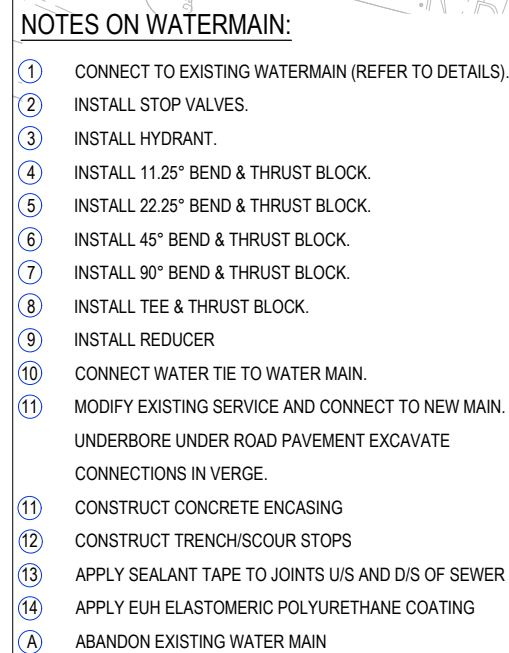
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DRAWING NUMBER

006

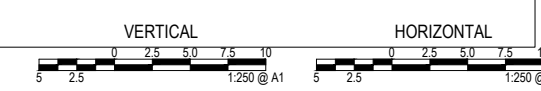
REVISION

A

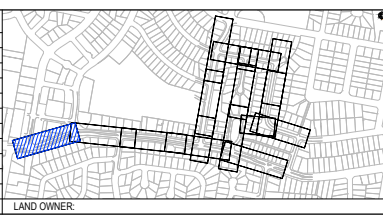


TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITID)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
UJ	STORMWATER	PIPE (375)
US	STORMWATER	PIPE(525)
UU	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
WM	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED

CHAINAGE	DESIGN SURFACE	PIPE INVERT	DEPTH TO INVERT
0.000	606.346	605.746	0.600
8.215	606.395	605.105	1.290
10.499	606.488	604.837	1.651
57.667	605.643	604.244	1.399
100.000	603.721	602.388	1.333
107.513	603.422	602.058	1.364
148.379	602.313	600.438	1.875
150.000	602.289	600.386	1.903

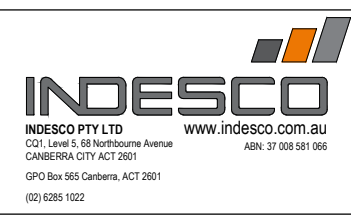


REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGN	JP	TN	KM	20/01/2023



CLIENT

QPRC

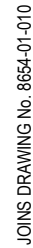
A graphic element consisting of a cluster of small, multi-colored squares (green, yellow, red, blue, purple) arranged in a roughly circular, pixelated pattern.

PROJECT TITLE

COOMA STREET
WATER MAIN
REPLACEMENT

CLIENT		
QUEANBEYAN COUNCIL		
DRAWING STATUS		
DETAILED DESIGN		
SCALE	COORDINATE SYSTEM	DATUM
AS SHOWN	GAD2020	AHD
SHEET SIZE	PROJECT NUMBER	
A1	8654-01	

DRAWING TITLE	
CONSTRUCTION DETAILS PLAN	
SHEET 1 OF 18	
DRAWING NUMBER	REVISION
010	A



- | TN | COMMS | TELEPHONE |
|-----|------------|-------------------------|
| OZ | COMMS | OPTIC FIBRE - DIGITIZED |
| OU | COMMS | OPTIC FIBRE - UNKNOWN |
| EU | ELECTRIC | LINE UNDERGROUND |
| EY | ELECTRIC | HOUSE CONNECTION |
| UE | ELECTRIC | MAJOR TRANSMISSION |
| LG | GAS | MAIN-LOW-PRESS URE |
| NG | GAS | MAIN(NYLON) |
| UP | MISC | UNIDENTIFIED PIPELINE |
| YG | GAS | POLYTHELENE |
| ZG | GAS | MAIN(DIGITIED) |
| SM | SEWER | MAIN |
| SZ | SEWER | MAIN-DIGITIZED |
| D0 | STORMWATER | BOX CULVERT (H1050) |
| DZ | STORMWATER | DIGITIZED |
| U3 | STORMWATER | PIPE (375) |
| U5 | STORMWATER | PIPE(525) |
| U9 | STORMWATER | PIPE(900) |
| UU | | PIPE (UNSPECIFIED) |
| V1 | STORMWATER | PIPE (1050) |
| V3 | STORMWATER | PIPE(1350) |
| W M | WATER | MAIN |
| WY | WATER | HOUSE CONNECTION |
| WZ | WATER | MAIN-DIGITIZED |

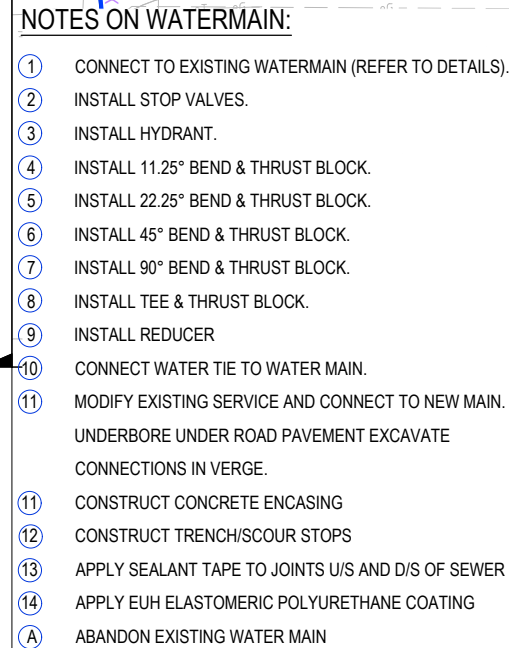
DEPTH TO INVERT
PIPE INVERT
DESIGN SURFACE
CHAINAGE



CLIENT		QUEANBEYAN COUNCIL	
DRAWING STATUS		DETAILED DESIGN	
SCALE	COORDINATE SYSTEM		
AS SHOWN	GAD2020		
SHEET SIZE	PROJECT NUMBER		
A1	8654-01		

DRAWING TITLE		5
CONSTRUCTION DETAILS PLAN SHEET 2 OF 18		
DRAWING NUMBER		REVISION
011		A

JOINS DRAWING No. 8654-01-013



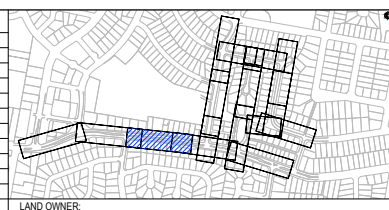
TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITIED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
U3	STORMWATER	PIPE (375)
U5	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
W M	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED

HORIZONTAL CURVE
PIPELINE GRADE (%)

		DATE: 01-11-2024	
DEPTH TO INVERT	1.535		1.199
PIPE INVERT	595.817		593.744
DESIGN SURFACE	597.352		594.943
CHAINAGE	1000.000	598.107	594.943
		1000.000	593.120
		1000.464	593.102
			592.045
			592.026
			1.074
			1.075
			1.330

COOMA ST MAIN

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PJN	ID	TN	KM	20/01/2023



CLIENT	
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INDESCO
INDESCO PTY LTD
CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
www.indesco.com.au
ABN: 37 008 581 066
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

	PROJECT TITLE
--	---------------

COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

SCALE AS SHOWN	COORDINATE SYSTEM GAD2020	DATUM AHD
SHEET SIZE A1	PROJECT NUMBER 8654-01	

DRAWING TITLE
CONSTRUCTION DETAILS PLAN
SHEET 3 OF 18

DRAWING NUMBER	REVISION
012	A



JOINS DRAWING No. 8654-01-012

JOINS DRAWING No. 8654-01-014

- ① CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS)
- ② INSTALL STOP VALVES.
- ③ INSTALL HYDRANT.
- ④ INSTALL 11.25° BEND & THRUST BLOCK.
- ⑤ INSTALL 22.25° BEND & THRUST BLOCK.
- ⑥ INSTALL 45° BEND & THRUST BLOCK.
- ⑦ INSTALL 90° BEND & THRUST BLOCK.
- ⑧ INSTALL TEE & THRUST BLOCK.
- ⑨ INSTALL REDUCER
- ⑩ CONNECT WATER TIE TO WATER MAIN.
- ⑪ MODIFY EXISTING SERVICE AND CONNECT TO NEW MAIN.
UNDERBORE UNDER ROAD PAVEMENT EXCAVATE
CONNECTIONS IN VERGE.
- ⑫ CONSTRUCT CONCRETE ENCASING
- ⑬ CONSTRUCT TRENCH/SCOUR STOPS
- ⑭ APPLY SEALANT TAPE TO JOINTS U/S AND D/S OF SEWER
- ⑮ APPLY EUH ELASTOMERIC POLYURETHANE COATING
- ⑯ ABANDON EXISTING WATER MAIN

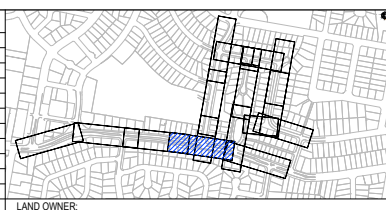
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OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITIZED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
UJ	STORMWATER	PIPE (375)
US	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
WM	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED

HORIZONTAL CURVE
PIPELINE GRADE (%)

[illegible]

LONGSECTION-COOMA STREET MAIN

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PJN	JP	TN	KM	20/01/2022



CLIENT




INDESCO
INDESCO PTY LTD
CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
www.indesco.com.au
ABN: 37 008 581 066
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

	PROJECT TITLE
--	---------------

COOMA STREET WATER MAIN REPLACEMENT

CLIENT	5	2.5
QUEANBEYAN COUNCIL		
DRAWING STATUS		
	DETAILED DESIGN	

SCALE AS SHOWN	COORDINATE SYSTEM GAD2020	DATUM AHD
SHEET SIZE A1	PROJECT NUMBER 8654-01	

DRAWING TITLE
CONSTRUCTION DETAILS PLAN
SHEET 4 OF 18

DRAWING NUMBER	REVISION
013	A



JOINS DRAWING No. 8654-01-013

- ① CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS).
- ② INSTALL STOP VALVES.
- ③ INSTALL HYDRANT.
- ④ INSTALL 11.25° BEND & THRUST BLOCK.
- ⑤ INSTALL 22.25° BEND & THRUST BLOCK.
- ⑥ INSTALL 45° BEND & THRUST BLOCK.
- ⑦ INSTALL 90° BEND & THRUST BLOCK.
- ⑧ INSTALL TEE & THRUST BLOCK.
- ⑨ INSTALL REDUCER
- ⑩ CONNECT WATER TIE TO WATER MAIN.
- ⑪ MODIFY EXISTING SERVICE AND CONNECT TO NEW MAIN.
UNDERBORE UNDER ROAD PAVEMENT EXCAVATE
CONNECTIONS IN VERGE.
- ⑫ CONSTRUCT CONCRETE ENCASING
- ⑬ CONSTRUCT TRENCH/SCOUR STOPS
- ⑭ APPLY SEALANT TAPE TO JOINTS U/S AND D/S OF SEWER
- ⑮ APPLY EUH ELASTOMERIC POLYURETHANE COATING
- ⑯ ABANDON EXISTING WATER MAIN

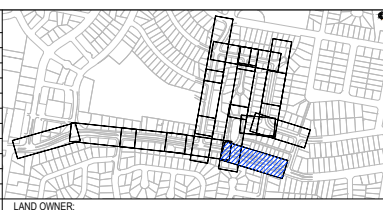
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OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYETHELENE
ZG	GAS	MAIN(DIGITIED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
U3	STORMWATER	PIPE (375)
U5	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
W	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED

HORIZONTAL CURVE
PIPELINE GRADE (%)

[illegible]

LONG SECTION: COOMA STREET MAIN

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PCN	ID	TN	KM	20/01/2023



CLIENT




INDESCO PTY LTD
CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601

GPO Box 565 Canberra, ACT 2601

(02) 6285 1022

www.indesco.com.au
ABN: 37 008 581 066

PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

SCALE AS SHOWN	COORDINATE SYSTEM GAD2020
SHEET SIZE A1	PROJECT NUMBER 8654-01

DRAWING TITLE
CONSTRUCTION DETAILS PLAN
SHEET 5 OF 18

DRAWING NUMBER
014

REVISION
A



- 1 CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS).
 - 2 INSTALL STOP VALVES.
 - 3 INSTALL HYDRANT.
 - 4 INSTALL 11.25° BEND & THRUST BLOCK.
 - 5 INSTALL 22.25° BEND & THRUST BLOCK.
 - 6 INSTALL 45° BEND & THRUST BLOCK.
 - 7 INSTALL 90° BEND & THRUST BLOCK.
 - 8 INSTALL TEE & THRUST BLOCK.
 - 9 INSTALL REDUCER
 - 10 CONNECT WATER TIE TO WATER MAIN.
 - 11 MODIFY EXISTING SERVICE AND CONNECT TO NEW MAIN.
- UNDERBORE UNDER ROAD PAVEMENT EXCAVATE CONNECTIONS IN VERGE.
- 11 CONSTRUCT CONCRETE ENCASING
 - 12 CONSTRUCT TRENCH/SCOUR STOPS
 - 13 APPLY SEALANT TAPE TO JOINTS U/S AND D/S OF SEWER
 - 14 APPLY EUH ELASTOMERIC POLYURETHANE COATING
 - A ABANDON EXISTING WATER MAIN

TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITIZED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
UJ	STORMWATER	PIPE (375)
US	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
WM	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED

HORIZONTAL CURVE
PIPELINE GRADE (%)

		DATE: 01-15-2025
DEPTH TO INVERT	1.000	1.346
PIPE INVERT	595.971	594.154
DESIGN SURFACE	596.971	595.501
CHAINAGE	0.000	37.084
		74.906
		100.000
		130.000
		160.000
		190.000
		220.000
		250.000
		280.000
		310.000
		340.000
		370.000
		400.000
		430.000
		460.000
		490.000
		520.000
		550.000
		580.000
		610.000
		640.000
		670.000
		700.000
		730.000
		760.000
		790.000
		820.000
		850.000
		880.000
		910.000
		940.000
		970.000
		1000.000

ALANBAR ST MAIN

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PJN	ID	TN	KM	20/01/2023



CLIENT




INDESCO
INDESCO PTY LTD
CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
www.indesco.com.au
ABN: 37 008 581 066
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

	PROJECT TITLE
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COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

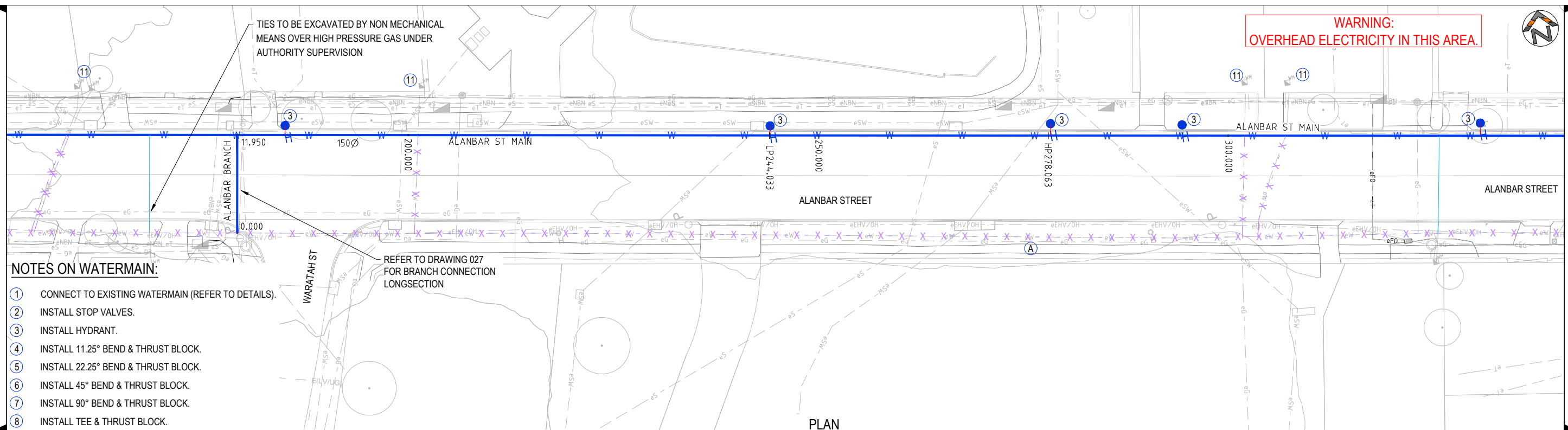
SCALE AS SHOWN	COORDINATE SYSTEM GAD2020
SHEET SIZE A1	PROJECT NUMBER 8654-01

DRAWING TITLE
CONSTRUCTION DETAILS PLAN
SHEET 6 OF 18

DRAWING NUMBER	REVISION
015	A

JOINS DRAWING No. 8654-01-015

JOINS DRAWING No. 8654-01-017



NOTES ON WATERMAIN:

- 1 CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS).
- 2 INSTALL STOP VALVES.
- 3 INSTALL HYDRANT.
- 4 INSTALL 11.25° BEND & THRUST BLOCK.
- 5 INSTALL 22.25° BEND & THRUST BLOCK.
- 6 INSTALL 45° BEND & THRUST BLOCK.
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- A ABANDON EXISTING WATER MAIN

TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
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ZG	GAS	MAIN(DIGITIZED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
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U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
WM	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED

HORIZONTAL CURVE
PIPELINE GRADE (%)

CHAINAGE	DESIGN SURFACE	PIPE INVERT	DEPTH TO INVERT
550.000	590.046	588.379	1.667
576.458	589.289	587.790	1.499
580.003	589.185	587.951	1.233
599.386	588.647	586.995	1.653
600.000	588.628	586.979	1.649
644.007	587.355	585.847	1.507
678.063	587.180	586.040	1.140
695.934	587.470	586.223	1.247
700.000	587.487	586.250	1.238

ALANBAR ST MAIN

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGN	JP	TN	KM	20/01/2023



CLIENT




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CANBERRA CITY ACT 2601 ABN: 37 008 581 066
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

CLIENT

HEANBEYAN COUNCIL

DRAWING STATUS	
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D

	SCALE
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AS SHOW

1	SHEET SIZE
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A1

COORDINATE SYSTEM

GAD2020

PROJECT NUM

8654-01

DRAWING TITLE

CONSTRUCTION DETAILS PLAN
SHEET 7 OF 18

SHEET 7

100

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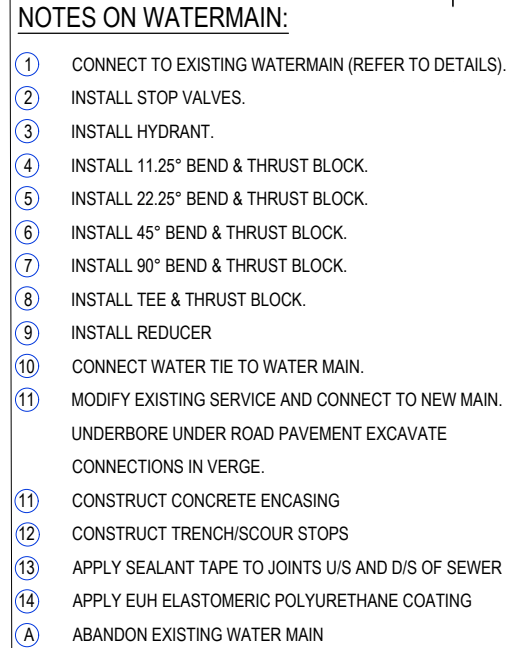
10. *Journal of the American Medical Association*, 2000; 283: 2639-2644.

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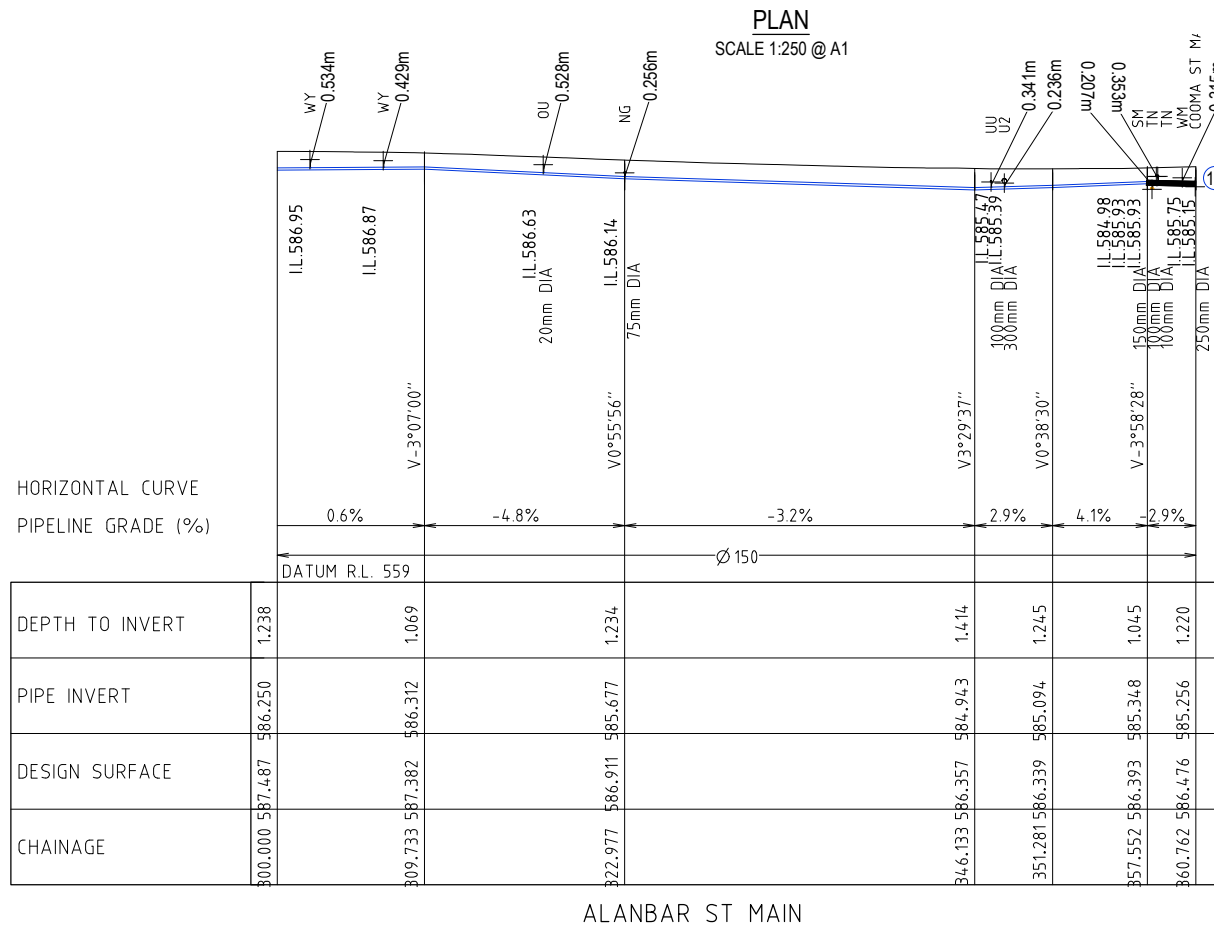
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REVISION

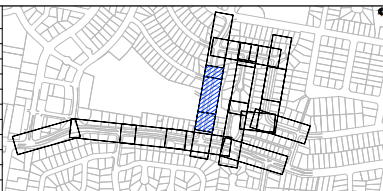
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TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYETHELENE
ZG	GAS	MAIN(DIGITIED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
DO	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
U3	STORMWATER	PIPE (375)
U5	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
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W M	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PCNI	ID	TNI	KM	20/01/2023



CLIENT



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 CANBERRA CITY ACT 2601

www.indesco.com.au
 ABN: 37 008 581 066

GPO Box 565 Canberra, ACT 2601
 (02) 6285 1022

PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

CLIENT QUEANBEYAN COUNCIL			DRAWING TITLE CONSTRUCTION DETAILS PLAN SHEET 8 OF 18
DRAWING STATUS DETAILED DESIGN			
SCALE AS SHOWN	COORDINATE SYSTEM GAD2020	DATUM AHD	
SHEET SIZE A1	PROJECT NUMBER 8654-01	DRAWING NUMBER 017	
			REVISION A

JOINS DRAWING No. 8654-01-015 & 025

TELSTRA LINE TO BE RAISED 200mm
ACHIEVE CLEARANCE TO WATER MAIN

	PROJECT TITLE COOMA STREET WATER MAIN REPLACEMENT
---	---

COOMA STREET
WATER MAIN
REPLACEMENT

DETAILED DESIGN

	COORDINATE SYSTEM
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	PROJECT NUMBER
--	----------------

CONSTRUCTION DETAILS PLAN
SHEET 9 OF 18

018

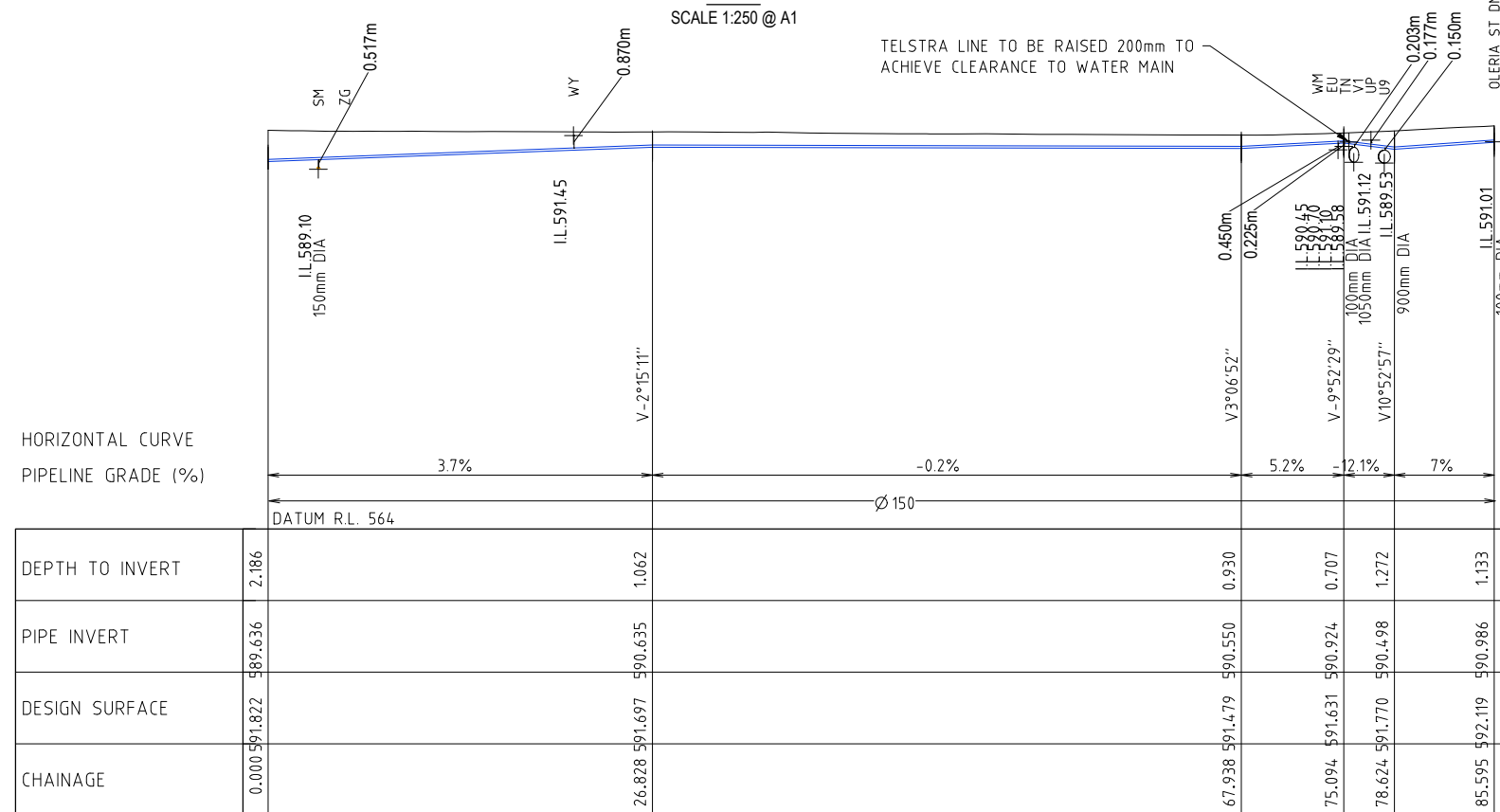
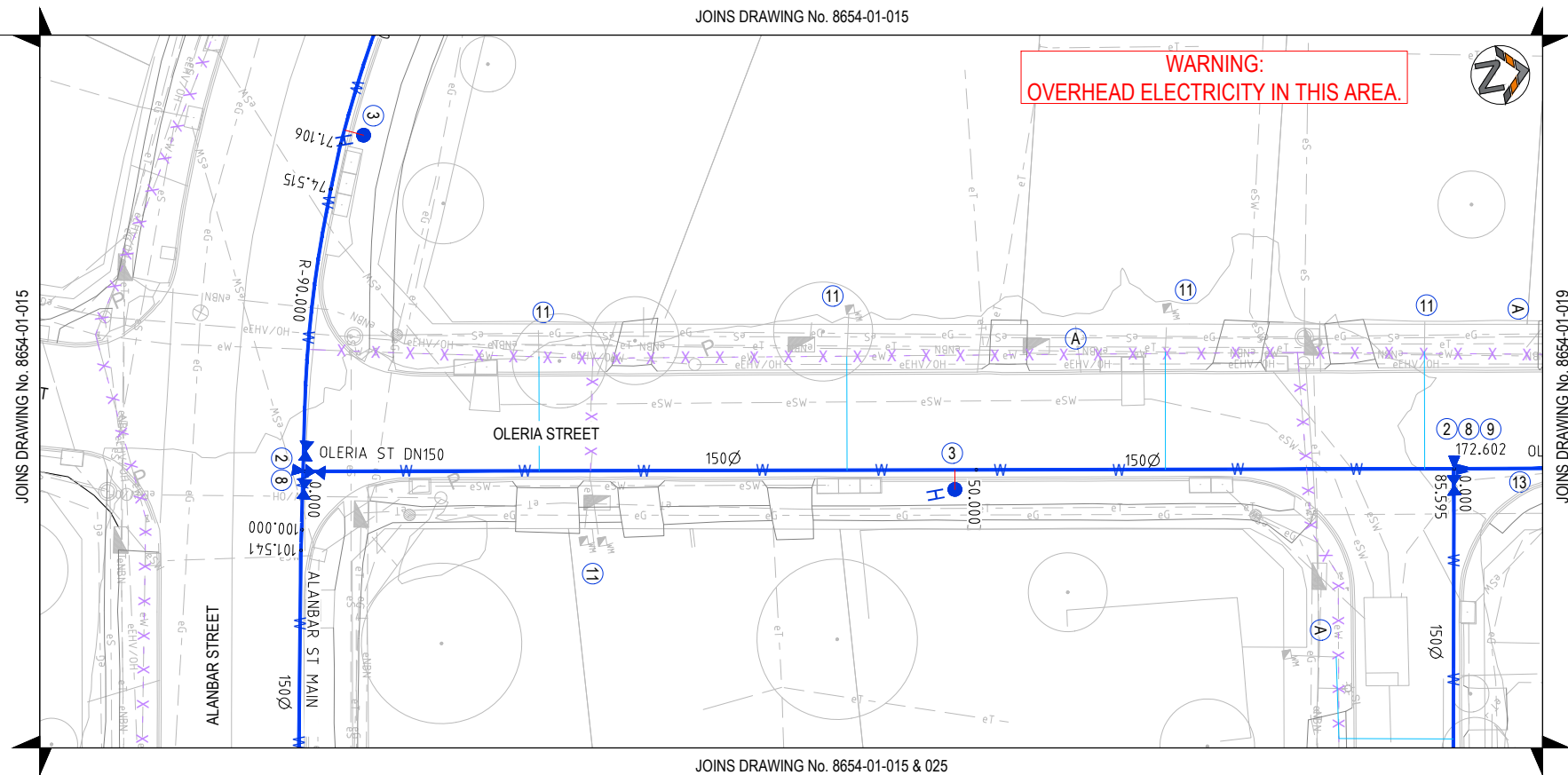
A

- ① CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS).
- ② INSTALL STOP VALVES.
- ③ INSTALL HYDRANT.
- ④ INSTALL 11.25° BEND & THRUST BLOCK.
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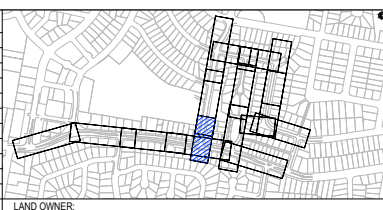
UNDERBORE UNDER ROAD PAVEMENT EXCAVATE CONNECTIONS IN VERGE.

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REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PCN	ID	TN	KM	20/01/2023



CLIENT	
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	PROJECT TITLE
--	---------------

COOMA STREET
WATER MAIN
REPLACEMENT

DETAILED DESIGN

	COORDINATE SYSTEM
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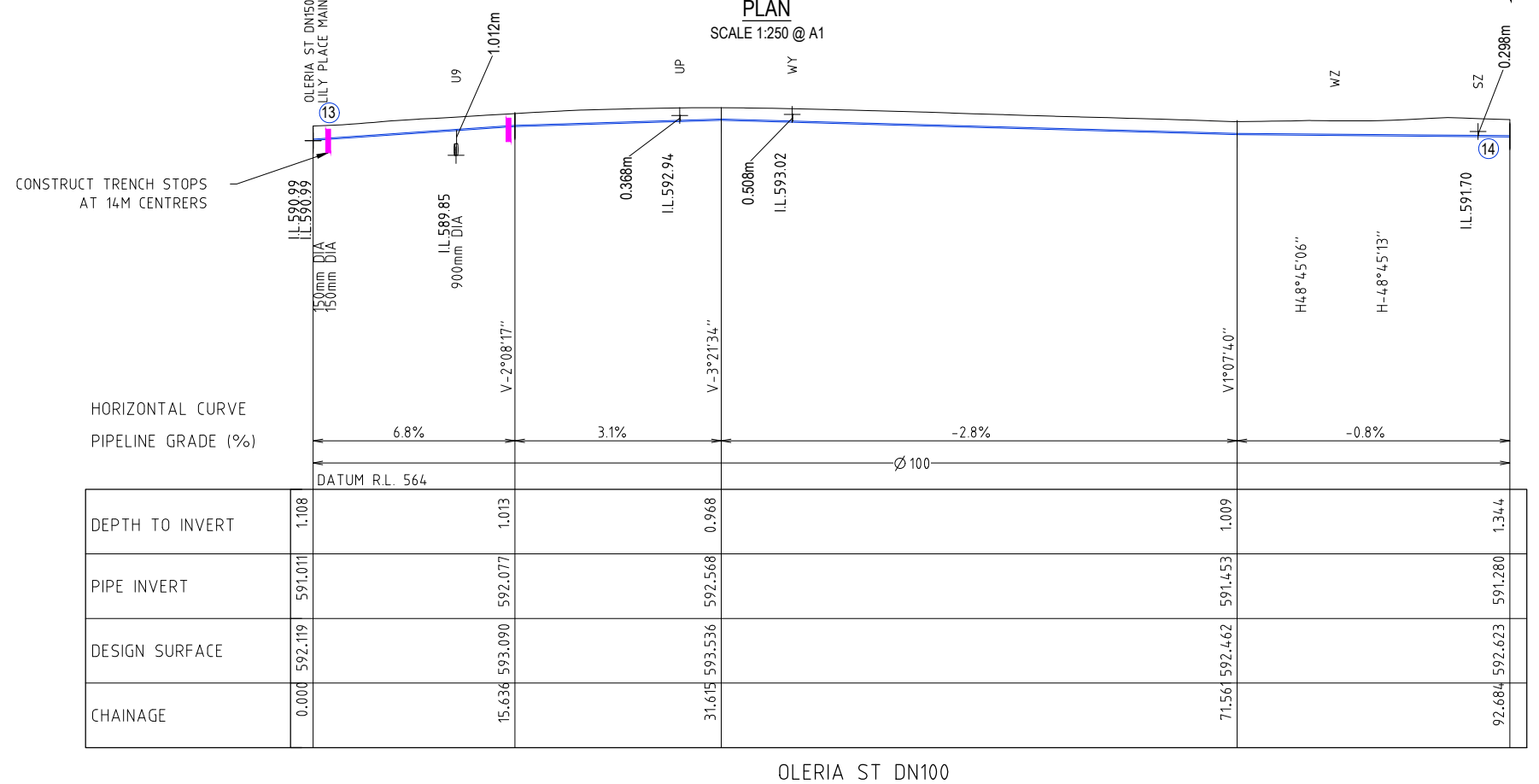
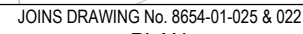
CONSTRUCTION DETAILS PLAN
SHEET 9 OF 18

018

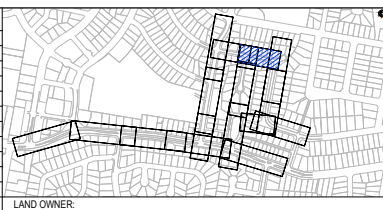
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REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGN	JP	TN	KM	20/01/2023



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PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

	CLIENT
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SEANBEYAN COUNCIL

DRAWING STATUS

DETAILED DESIGN

SCALE AS SHOWN	COORDINATE SYSTEM GAD2020
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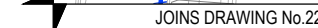
SHEET SIZE	PROJECT NUMBER
A1	8654-01

DRAWING TITLE

CONSTRUCTION DETAILS PLAN
SHEET 10 OF 18

DRAWING NUMBER
019

REVISION	
A	



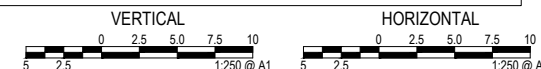
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TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
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WZ	WATER	MAIN-DIGITIZED

KENNETH MONTEBAR DN100

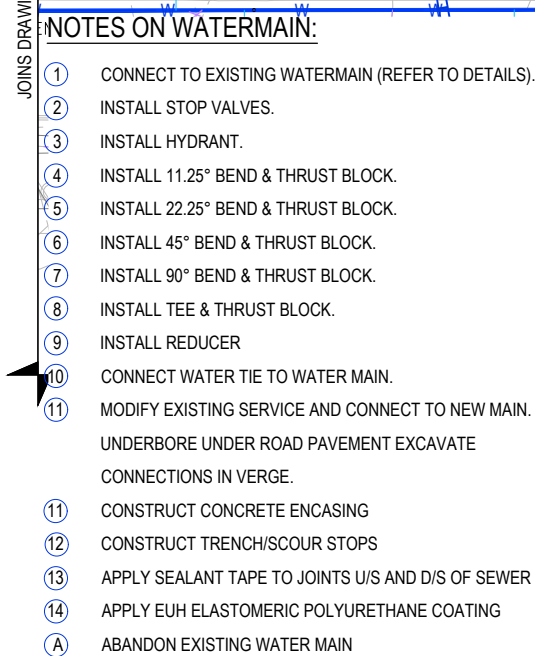
CLIENT		
QUEANBEYAN COUNCIL		
DRAWING STATUS		
DETAILED DESIGN		
SCALE	COORDINATE SYSTEM	DATUM
AS SHOWN	GAD2020	AHD
SHEET SIZE	PROJECT NUMBER	
A1	8654-01	

DRAWING TITLE		1:250 @ A1
CONSTRUCTION DETAILS PLAN SHEET 11 OF 18		
DRAWING NUMBER		REVISION
020		A



JOINS DRAWING No. 8654-01-022

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ «ОРИОН»
ИНСТИТУТ ПРОЕКТИРОВАНИЯ И КОНСТРУКЦИЙ



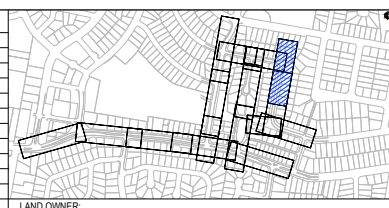
TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESSURE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITIED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
U3	STORMWATER	PIPE (375)
U5	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
WM	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED

HORIZONTAL CURVE
PIPELINE GRADE (%)

	DATE	R.L.	STATION	DEPTH TO INVERT	PIPE INVERT	DESIGN SURFACE	CHAINAGE
	1.269	1.295		1.431			
	590.684	590.952		591.511			
	591.953	592.247		592.943			
	593.381	593.675		594.057			
	594.486	594.780		595.191			
	595.281	595.575		596.266			
	596.066	596.360		597.241			
	596.841	597.135		598.116			
	597.616	597.910		598.991			
	598.391	599.185		599.866			
	599.166	600.060		600.741			
	600.000	600.934		601.616			
	600.834	601.769		602.491			
	601.669	602.604		603.366			
	602.504	603.439		604.241			
	603.339	604.274		605.116			
	604.174	605.109		605.991			
	605.009	605.944		606.866			
	605.844	606.779		607.741			
	606.679	607.614		608.616			
	607.514	608.449		609.491			
	608.349	609.284		610.366			
	609.184	610.119		611.241			
	610.019	610.954		612.116			
	610.854	611.789		612.991			
	611.689	612.624		613.866			
	612.524	613.459		614.741			
	613.359	614.294		615.616			
	614.194	615.129		616.491			
	615.029	615.964		617.366			
	615.864	616.799		618.241			
	616.699	617.634		619.116			
	617.534	618.469		620.000			
	618.369	619.304		620.875			
	619.204	620.139		621.750			
	620.039	620.974		622.625			
	620.874	621.809		623.500			
	621.709	622.644		624.375			
	622.544	623.479		625.250			
	623.379	624.314		626.125			
	624.214	625.149		627.000			
	625.049	625.984		627.875			
	625.884	626.819		628.750			
	626.719	627.654		629.625			
	627.554	628.489		630.500			
	628.389	629.324		631.375			
	629.224	630.159		632.250			
	630.059	630.994		633.125			
	630.894	631.829		634.000			
	631.729	632.664		634.875			
	632.564	633.499		635.750			
	633.399	634.334		636.625			
	634.234	635.169		637.500			
	635.069	635.994		638.375			
	635.904	636.829		639.250			
	636.739	637.664		640.125			
	637.574	638.499		641.000			
	638.409	639.334		641.875			
	639.244	640.169		642.750			
	640.079	640.994		643.625			
	640.914	641.829		644.500			
	641.749	642.664		645.375			
	642.584	643.499		646.250			
	643.419	644.334		647.125			
	644.254	645.169		648.000			
	645.089	645.994		648.875			
	645.924	646.829		649.750			
	646.759	647.664		650.625			
	647.594	648.499		651.500			
	648.429	649.334		652.375			
	649.264	650.169		653.250			
	650.099	650.994		654.125			
	650.934	651.829		655.000			
	651.769	652.664		655.875			
	652.604	653.499		656.750			
	653.439	654.334		657.625			
	654.274	655.169		658.500			
	655.109	655.994		659.375			
	655.944	656.829		660.250			
	656.779	657.664		661.125			
	657.614	658.499		662.000			
	658.449	659.334		662.875			
	659.284	660.169		663.750			
	660.119	660.994		664.625			
	660.954	661.829		665.500			
	661.789	662.664		666.375			
	662.624	663.499		667.250			
	663.459	664.334		668.125			
	664.294	665.169		669.000			
	665.129	665.994		669.875			
	665.964	666.829		670.750			
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	667.634	668.499		672.500			
	668.469	669.334		673.375			
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	671.809	672.664		676.875			
	672.644	673.499		677.750			
	673.479	674.334		678.625			
	674.314	675.169		679.500			
	675.149	675.994		680.375			
	675.984	676.829		681.250			
	676.819	677.664		682.125			
	677.654	678.499		683.000			
	678.489	679.334		683.875			
	679.324	680.169		684.750			
	680.159	680.994		685.625			
	680.994	681.829		686.500			
	681.829	682.664		687.375			
	682.664	683.499		688.250			
	683.499	684.334		689.125			
	684.334	685.169		690.000			
	685.169	685.994		690.875			
	685.994	686.829		691.750			
	686.829	687.664		692.625			
	687.664	688.499		693.500			
	688.499	689.334		694.375			
	689.334	690.169		695.250			
	690.169	690.994		696.125			
	690.994	691.829		697.000			
	691.829	692.664		697.875			
	692.664	693.499		698.750			
	693.499	694.334		699.625			
	694.334	695.169		700.500			
	695.169	695.994		701.375			
	695.994	696.829		702.250			
	696.829	697.664		703.125			
	697.664	698.499		704.000			
	698.499	699.334		704.875			
	699.334	700.169		705.750			
	700.169	700.994		706.625			
	700.994	701.829		707.500			
	701.829	702.664		708.375			
	702.664	703.499		709.250			
	703.499	704.334		710.125			
	704.334	705.169		711.000			
	705.169	705.994		711.875			
	705.994	706.829		712.750			
	706.829	707.664		713.625			
	707.664	708.499		714.500			
	708.499	709.334		715.375			
	709.334	710.169		716.250			
	710.169	710.994		717.125			
	710.994	711.829		718.000			
	711.829	712.664		718.875			
	712.664	713.499		719.750			
	713.499	714.334		720.625			
	714.334	715.169		721.500			
	715.169	715.994		722.375			
	715.994	716.829		723.250			
	716.829	717.664		724.125			
	717.664	718.499		725.000			
	718.499	719.334		725.875			
	719.334	720.169		726.750			
	720.169	720.994		727.625			
	720.994	721.829		728.500			
	721.829	722.664		729.375			
	722.664	723.499		730.250			
	723.499	724.334		731.125			
	724.334	725.169		732.000			
	725.169	725.994		732.875			
	725.994	726.829		733.750			
	726.829	727.664		734.625			
	727.664	728.499		735.500			
	728.499	729.334		736.375			
	729.334	730.169		737.250			
	730.169	730.994		738.125			
	730.994	731.829		739.000			
	731.829	732.664		739.875			
	732.664	733.499		740.750			
	733.499	734.334		741.625			
	734.334	735.169		742.500			
	735.169	735.994		743.375			
	735.994	736.829		744.250			
	736.829	737.664		745.125			
	737.664	738.499		746.000			
	738.499	739.334		746.875			
	739.334	740.169		747.750			
	740.169	740.994		748.625			
	740.994	741.829		749.500			
	741.829	742.664		750.375			
	742.664	743.499		751.250			
	743.499	744.334		752.125			
	744.334	745.169		753.000			
	745.169	745.994		753.875			
	745.994	746.829		754.750			
	746.829	747.664		755.625			
	747.664	748.499		756.500			
	748.499	749.334		757.375			
	749.334	750.169		758.250			
	750.169	750.994		759.125			
	750.994	751.829		760.000			
	751.829	752.664		760.875			
	752.664	753.499		761.750			
	753.499	754.334		762.625			
	754.334	755.169		763.500			
	755.169	755.994		764.375			
	755.994	756.829		765.250			
	756.829	757.664		766.125			
	757.664	758.499		767.000			
	758.499	759.334		767.875			
	759.334	760.169		768.750			
	760.169	760.994		769.625			
	760.994	761.829		770.500			
	761.829	762.664</					

LONGSECTION-KENNETH MONTEBAR

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	DCM	ID	TAL	KJA	06/01/2022



CLIENT




INDESCO
INDESCO PTY LTD www.indesco.com.au
C01, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
ABN: 37 008 581 066
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

	PROJECT TITLE
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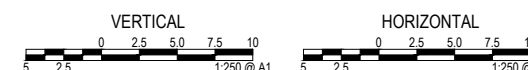
COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

SCALE AS SHOWN	COORDINATE SYSTEM GAD2020
SHEET SIZE A1	PROJECT NUMBER 8654-01

DRAWING TITLE	
CONSTRUCTION DETAILS PLAN	
SHEET 12 OF 18	

DRAWING NUMBER	REVISION
021	A



NOTES ON WATERMAIN:

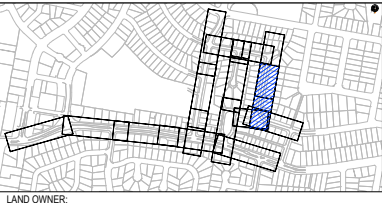
- ① CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS).
- ② INSTALL STOP VALVES.
- ③ INSTALL HYDRANT.
- ④ INSTALL 11.25° BEND & THRUST BLOCK.
- ⑤ INSTALL 22.25° BEND & THRUST BLOCK.
- ⑥ INSTALL 45° BEND & THRUST BLOCK.
- ⑦ INSTALL 90° BEND & THRUST BLOCK.
- ⑧ INSTALL TEE & THRUST BLOCK.
- ⑨ INSTALL REDUCER
- ⑩ CONNECT WATER TIE TO WATER MAIN.
- ⑪ MODIFY EXISTING SERVICE AND CONNECT TO NEW MAIN.
- ⑫ CONSTRUCT CONCRETE ENCASING
- ⑬ CONSTRUCT TRENCH/SCOUR STOPS
- ⑭ APPLY SEALANT TAPE TO JOINTS U/S AND D/S OF SEWER
- ⑮ APPLY EUH ELASTOMERIC POLYURETHANE COATING
- ⑯ ABANDON EXISTING WATER MAIN

TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITIED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
U3	STORMWATER	PIPE (375)
U5	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
W M	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED

HORIZONTAL CURVE
 PIPELINE GRADE (%)

	DEPTH TO INVERT	PIPE INVERT	DESIGN SURFACE	CHAINAGE
DATUM R.L. 565	1.079			
	0.959	591.816	592.775	322.954
	1.253	591.371	592.624	331.144
	1.822	590.963	592.785	339.476
	1.831	590.912	592.742	351.602
	1.657	591.510	593.168	360.825
	1.076	592.530	593.607	372.200
	0.863	592.700	593.563	380.194
	0.833	592.612	593.445	387.384
	1.022	592.485	593.507	400.000
	0.901	592.329	593.230	415.461
	1.519	592.175	593.695	423.434
	1.600	592.144	593.744	433.550

KENNETH MONTEBAR DN100



CLIENT



PROJECT TITLE

COOMA STREET
 WATER MAIN
 REPLACEMENT

CLIENT

QUEANBEYAN COUNCIL
 DRAWING STATUS
 DETAILED DESIGN

SCALE AS SHOWN

COORDINATE SYSTEM GAD2020

DATUM AHD

SHEET SIZE A1

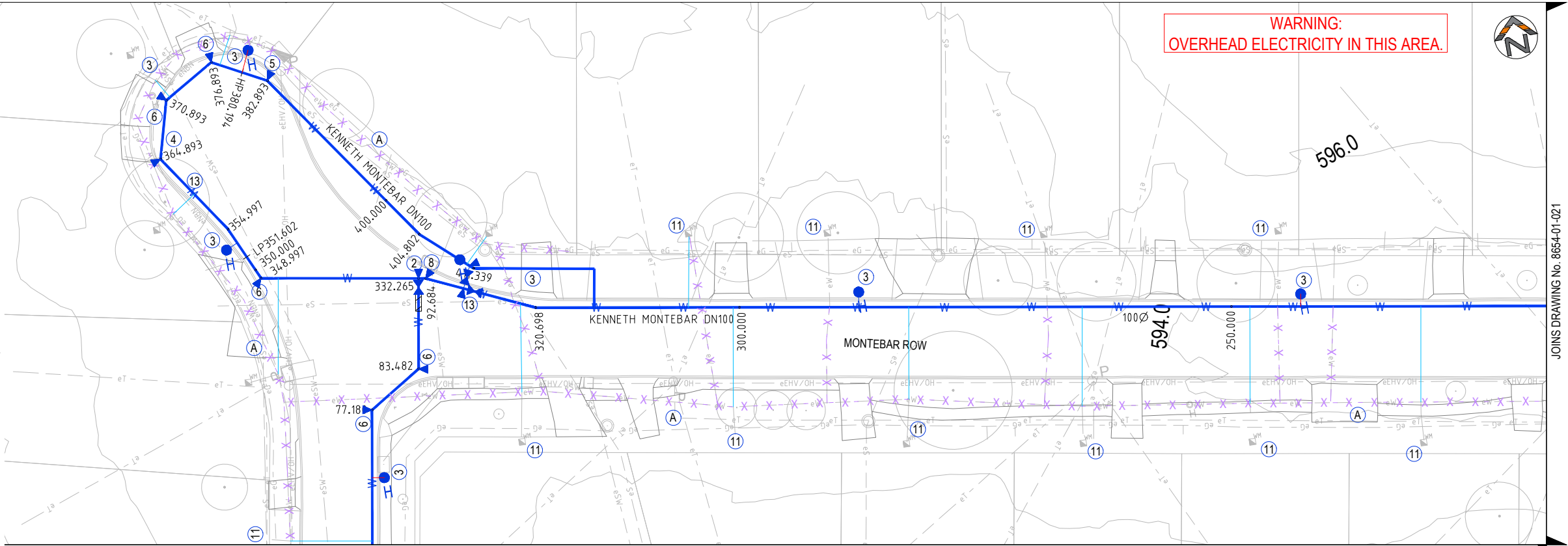
PROJECT NUMBER 8654-01

DRAWING TITLE

CONSTRUCTION DETAILS PLAN
 SHEET 13 OF 18

DRAWING NUMBER 022

REVISION A



JOINS DRAWING No.8654-01-019

PLAN

SCALE 1:250 @ A1

CONSTRUCT TRENCH STOPS AT 11M CENTRES

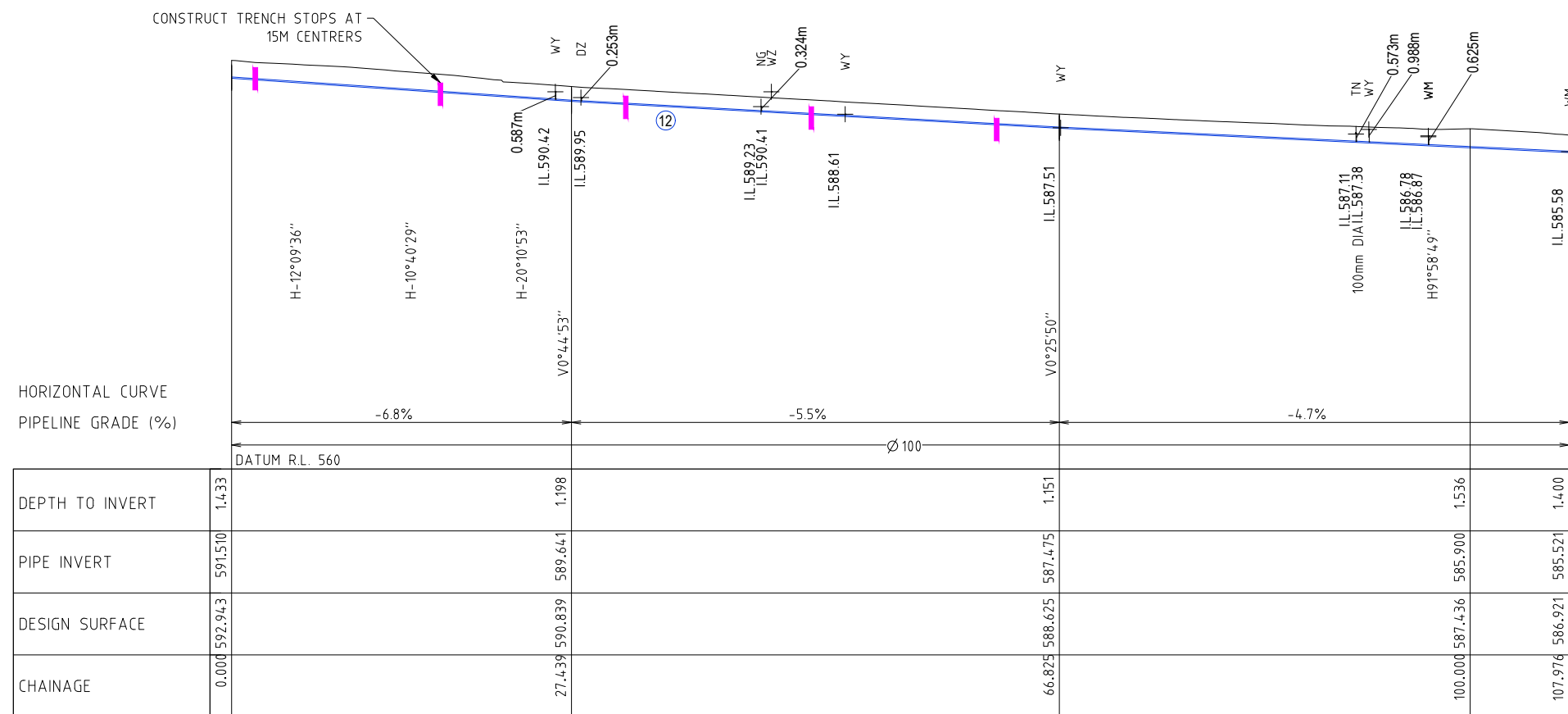
WARNING:
 OVERHEAD ELECTRICITY IN THIS AREA.

JOINS DRAWING No. 8654-01-021

NOTES ON WATERMAIN:

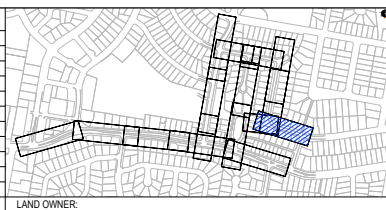
- ① CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS).
- ② INSTALL STOP VALVES.
- ③ INSTALL HYDRANT.
- ④ INSTALL 11.25° BEND & THRUST BLOCK.
- ⑤ INSTALL 22.25° BEND & THRUST BLOCK.
- ⑥ INSTALL 45° BEND & THRUST BLOCK.
- ⑦ INSTALL 90° BEND & THRUST BLOCK.
- ⑧ INSTALL TEE & THRUST BLOCK.
- ⑨ INSTALL REDUCER
- ⑩ CONNECT WATER TIE TO WATER MAIN.
- ⑪ MODIFY EXISTING SERVICE AND CONNECT TO NEW MAIN.
UNDERBORE UNDER ROAD PAVEMENT EXCAVATE
CONNECTIONS IN VERGE.
- ⑫ CONSTRUCT CONCRETE ENCASING
- ⑬ CONSTRUCT TRENCH/SCOUR STOPS
- ⑭ APPLY SEALANT TAPE TO JOINTS U/S AND D/S OF SEWER
- ⑮ APPLY EUH ELASTOMERIC POLYURETHANE COATING
- ⑯ ABANDON EXISTING WATER MAIN

TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSITION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITIZED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
U3	STORMWATER	PIPE (375)
U5	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
W M	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED



MONTEBAR ROW DN100

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGM	JP	TN	KM	20/01/2022



QPRC 


INDESCO
INDESCO PTY LTD
CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
www.indesco.com.au
ABN: 37 008 581 066
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

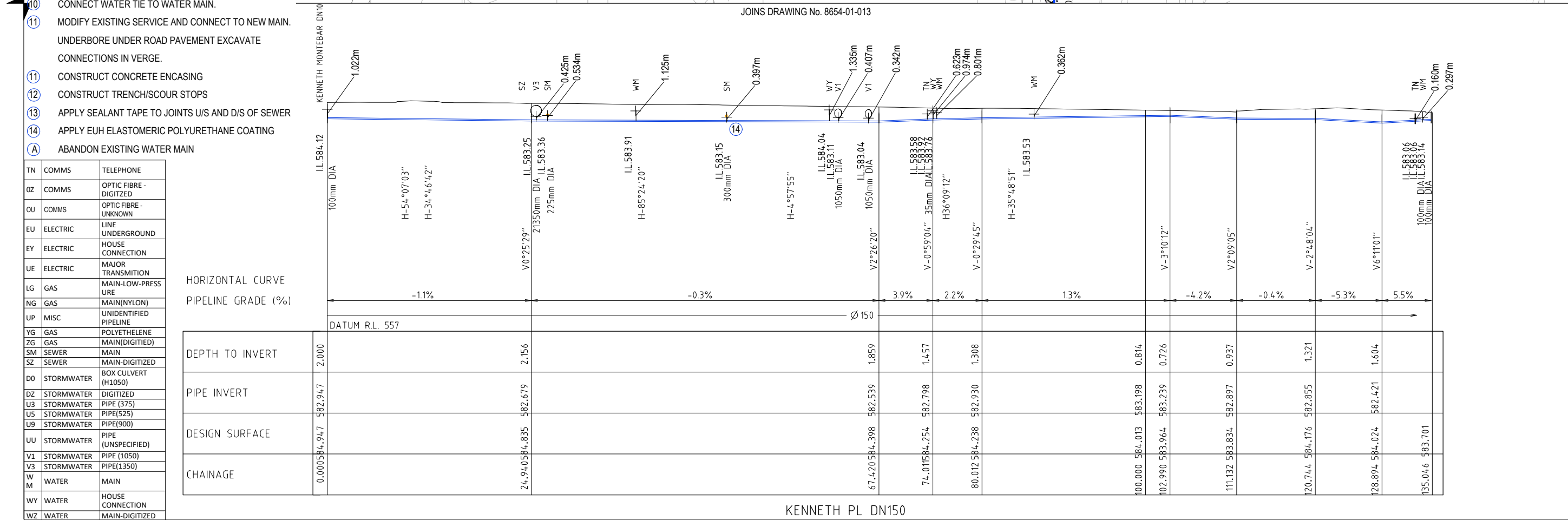
COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

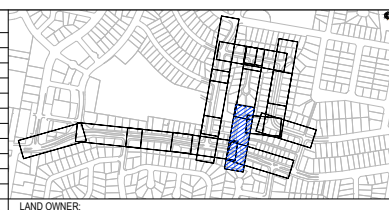
SCALE AS SHOWN	COORDINATE SYSTEM GAD2020
SHEET SIZE A1	PROJECT NUMBER 8654-01

DRAWING TITLE
CONSTRUCTION DETAILS PLAN
SHEET 14 OF 18

DRAWING NUMBER	REVISION
023	A



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PCN	ID	TN	KM	20/01/2023



CLIENT




INDESCO
INDESCO PTY LTD
C01, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
GPO Box 565 Canberra, ACT 2601
www.indesco.com.au
ABN: 37 008 581 066
(02) 6285 1022

PROJECT TITLE

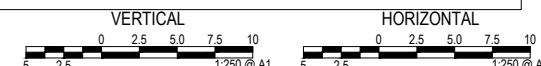
COOMA STREET
WATER MAIN
REPLACEMENT

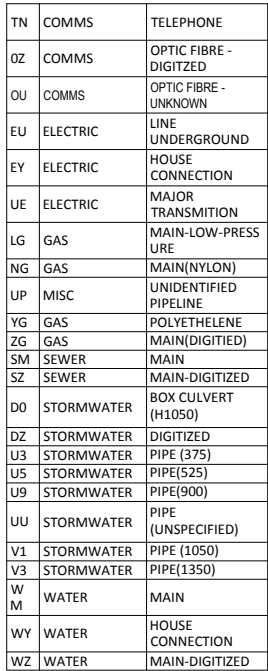
CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

SCALE AS SHOWN	COORDINATE SYSTEM GAD2020
SHEET SIZE A1	PROJECT NUMBER 8654-01

DRAWING TITLE
CONSTRUCTION DETAILS PLAN
SHEET 15 OF 18

DRAWING NUMBER
024

REVISION
A

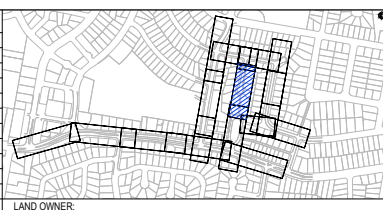


HORIZONTAL CURVE
PIPELINE GRADE (%)

[illegible]

LILY PLACE MAIN

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PCN	ID	TN	KM	20/01/2023



CLIENT	
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INDESCO

INDESCO PTY LTD
CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601

www.indesco.com.au
ABN: 37 008 581 066

GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

PROJECT TITLE

COOMA STREET
WATER MAIN
REPLACEMENT

	CLIENT
--	--------

QUEANBEYAN COUNCIL

DETAILED DESIGN

SCALE
AS SHOWN

COORDINATE SYSTEM	GAD2020
-------------------	---------

DATUM
AHD

DRAWING TITLE

CONSTRUCTION DETAILS PLAN
SHEET 16 OF 18

DRAWING NUMBER

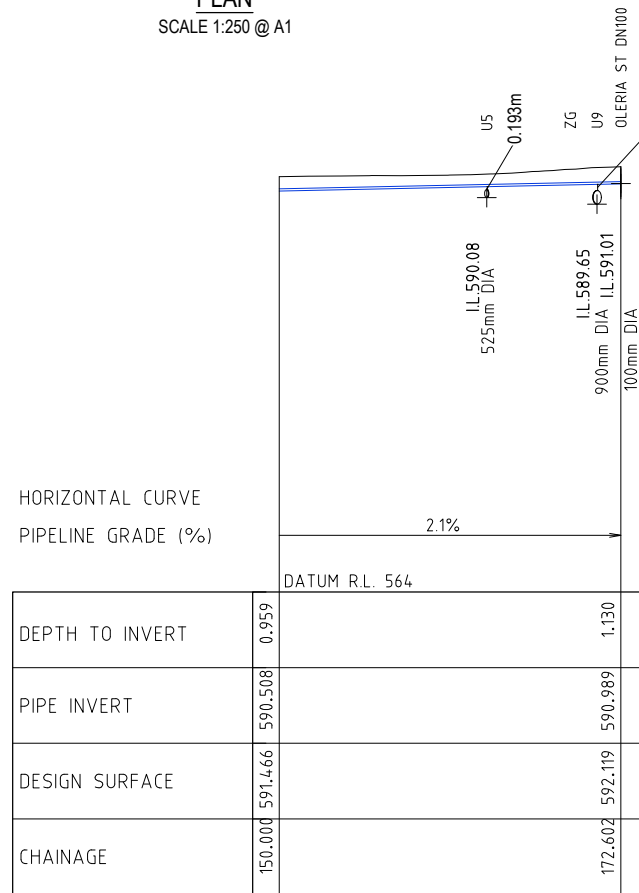
025

REVISION

A

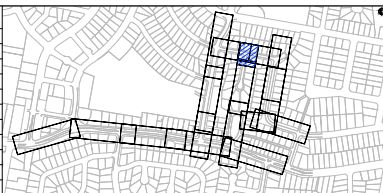
- ① CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS).
- ② INSTALL STOP VALVES.
- ③ INSTALL HYDRANT.
- ④ INSTALL 11.25° BEND & THRUST BLOCK.
- ⑤ INSTALL 22.25° BEND & THRUST BLOCK.
- ⑥ INSTALL 45° BEND & THRUST BLOCK.
- ⑦ INSTALL 90° BEND & THRUST BLOCK.
- ⑧ INSTALL TEE & THRUST BLOCK.
- ⑨ INSTALL REDUCER
- ⑩ CONNECT WATER TIE TO WATER MAIN.
- ⑪ MODIFY EXISTING SERVICE AND CONNECT TO NEW MAIN.
UNDERBORE UNDER ROAD PAVEMENT EXCAVATE
CONNECTIONS IN VERGE.
- ⑪ CONSTRUCT CONCRETE ENCASING
- ⑫ CONSTRUCT TRENCH/SCOUR STOPS
- ⑬ APPLY SEALANT TAPE TO JOINTS U/S AND D/S OF SEWER
- ⑭ APPLY EUH ELASTOMERIC POLYURETHANE COATING
- ⑮ ABANDON EXISTING WATER MAIN

TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITIZED)
SM	SEWER	MAIN
SZ	SEWER	MAIN-DIGITIZED
D0	STORMWATER	BOX CULVERT (H1050)
DZ	STORMWATER	DIGITIZED
U3	STORMWATER	PIPE (375)
U5	STORMWATER	PIPE(525)
U9	STORMWATER	PIPE(900)
UU	STORMWATER	PIPE (UNSPECIFIED)
V1	STORMWATER	PIPE (1050)
V3	STORMWATER	PIPE(1350)
W M	WATER	MAIN
WY	WATER	HOUSE CONNECTION
WZ	WATER	MAIN-DIGITIZED



LONGSECTION-LILY PLACE MAIN

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PCNJ	ID	TN	KM	20/01/2023



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INDESCO PTY LTD
 C01, Level 5, 68 Northbourne Avenue
 CANBERRA CITY ACT 2601

www.indesco.com.au
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GPO Box 565 Canberra, ACT 2601
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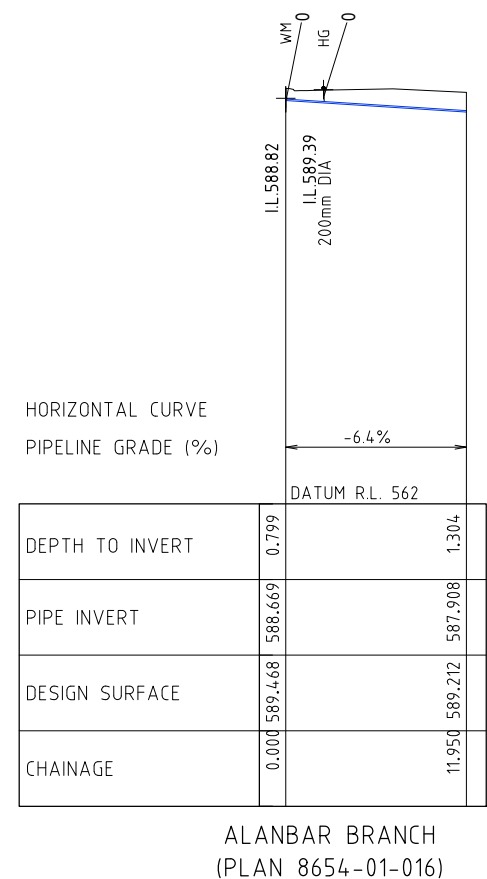
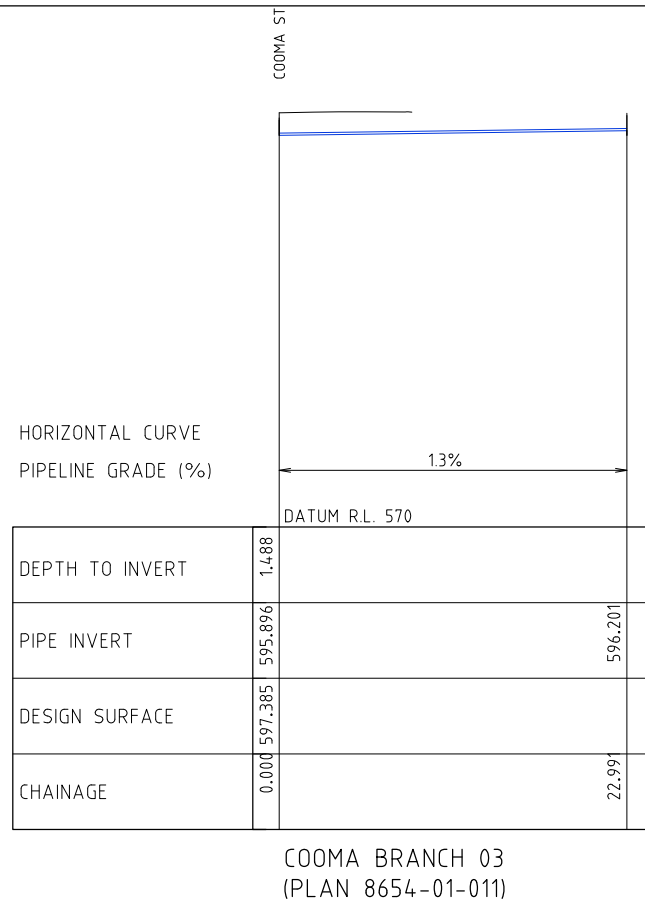
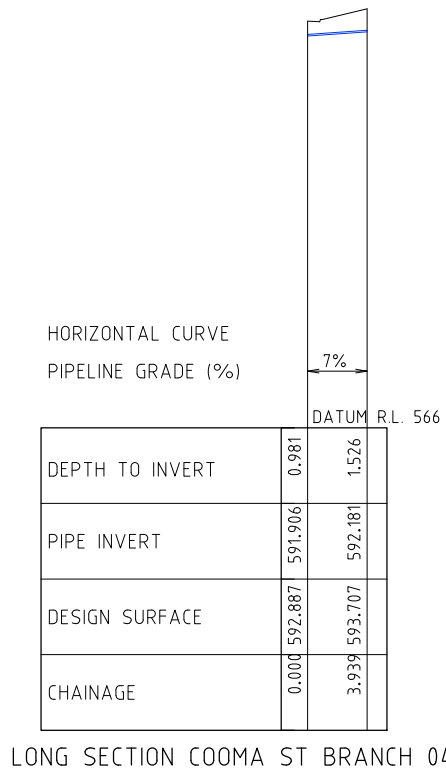
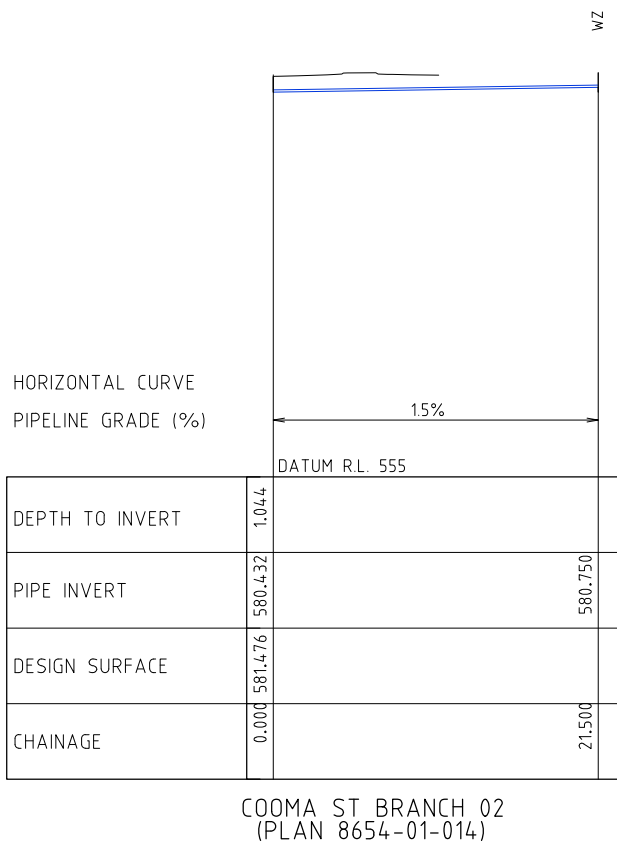
PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

CLIENT QUEANBEYAN COUNCIL			DRAWING TITLE CONSTRUCTION DETAILS PLAN SHEET 17 OF 18
DRAWING STATUS DETAILED DESIGN			
SCALE AS SHOWN	COORDINATE SYSTEM GAD2020	DATUM AHD	
SHEET SIZE A1	PROJECT NUMBER 8654-01	DRAWING NUMBER 026	
			REVISION A

- ① CONNECT TO EXISTING WATERMAIN (REFER TO DETAILS).
- ② INSTALL STOP VALVES.
- ③ INSTALL HYDRANT.
- ④ INSTALL 11.25° BEND & THRUST BLOCK.
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- ⑯ ABANDON EXISTING WATER MAIN

TN	COMMS	TELEPHONE
OZ	COMMS	OPTIC FIBRE - DIGITIZED
OU	COMMS	OPTIC FIBRE - UNKNOWN
EU	ELECTRIC	LINE UNDERGROUND
EY	ELECTRIC	HOUSE CONNECTION
UE	ELECTRIC	MAJOR TRANSMISSION
LG	GAS	MAIN-LOW-PRESS URE
NG	GAS	MAIN(NYLON)
UP	MISC	UNIDENTIFIED PIPELINE
YG	GAS	POLYTHELENE
ZG	GAS	MAIN(DIGITIZED)
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D0	STORMWATER	BOX CULVERT (H1050)
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REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PCN	JP	TN	KM	20/01/2022

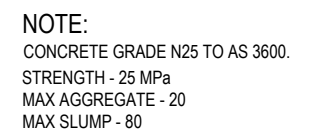



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CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
www.indesco.com.au
ABN: 37 008 581 066
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

PROJECT TITLE

COOMA STREET
WATER MAIN
REPLACEMENT

CLIENT QUEANBEYAN COUNCIL			DRAWING TITLE CONSTRUCTION DETAILS PLAN SHEET 18 OF 18
DRAWING STATUS DETAILED DESIGN			
SCALE AS SHOWN	COORDINATE SYSTEM GAD2020	DATUM AHD	
SHEET SIZE A1	PROJECT NUMBER 8654-01	DRAWING NUMBER 027	
			REVISION A



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PJN	IP	TN	KM	20/01/2023

	LAND OWNER
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INDESCO PTY LTD
CO1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
GPO Box 565 Canberra, ACT 2601
(02) 6285 1022

www.indesco.com.au
ABN: 37 008 581 066

PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

CLIENT

JEANBEYAN COUNCIL

WORKING STATUS

DETAILED DESIGN

SCALE
NA

COORDINATE SYSTEM GAD2020

DATUM
AHD

DRAWING TITLE

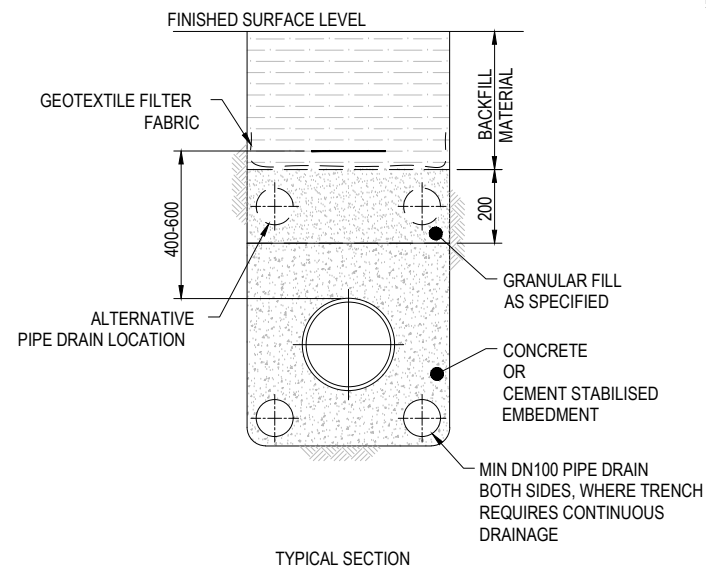
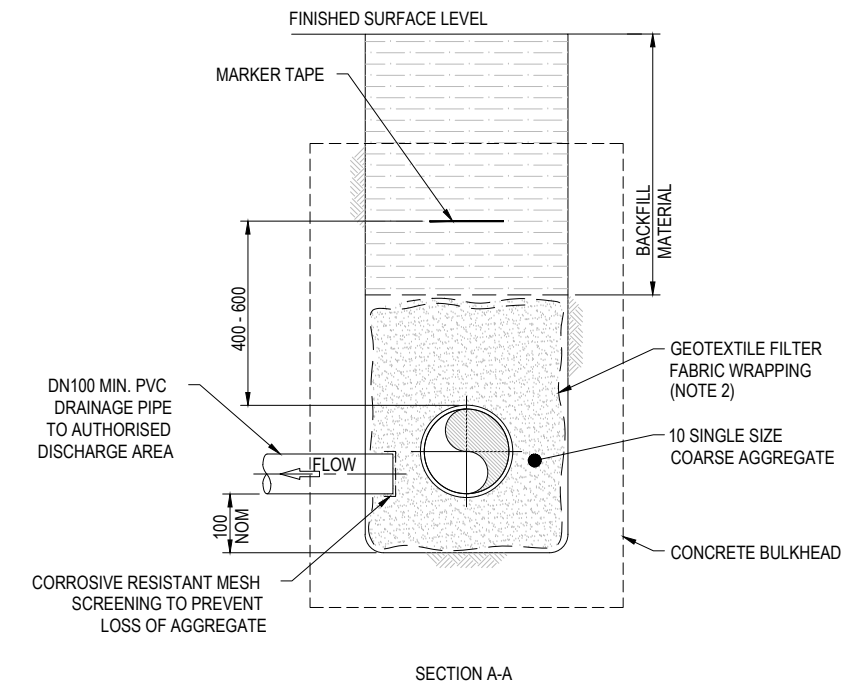
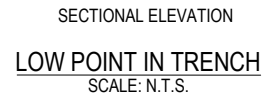
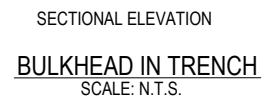
DRAWING TITLE
TYPICAL DETAILS
SHEET 1 OF 5

DRAWING NUMBER

030

REVISION	
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A



DRAINAGE FOR CONCRETE ENCASEMENT AND
CEMENT STABILISATION
SCALE: N.T.S.

1. LAY GEOTEXTILE FILTER FABRIC IN TRENCH TO FULLY ENCAPSULATE THE DRAINAGE MATERIAL (COARSE AGGREGATE). PROVIDE MINIMUM 250 LAP AT ALL FILTER FABRIC JOINTS.
2. WRAP BOTH ENDS OF DRAINAGE PIPE WITH GEOTEXTILE FILTER FABRIC AND INSTALL SUCH THAT THE PIPE PROTRUDES PAST THE CONCRETE ENCASMENT INTO THE GRANULAR EMBEDMENT.
3. PROVIDE A CONTINUOUS DRAINAGE PATH:
 - TRENCH STOPS AND
 - IN TRENCH EXCAVATIONS ACROSS ROADWAYS.

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PJN	IP	TN	KM	20/01/2023

	LAND OWNER
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	PROJECT TITLE
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COOMA STREET WATER MAIN REPLACEMENT

	CLIENT
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JEANBEYAN COUNCIL

DRAWING STATUS

1

SCALE

NA

SHEET SIZE	
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A1

DETAILED DESIGN

COORDINATE SYSTEM

GAD2020

PROJECT NUMBER	
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8654-01

DRAWING TITLE

DRAWING TITLE
TYPICAL DETAILS
SHEET 2 OF 5

[illegible][illegible][illegible]

DRAWING NUMBER

031

REVISION

A |

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PJN	JP	TN	KM	20/01/2023

REVISION

TABLE 1 : MINIMUM BLOCK VOLUME FOR ANCHORAGE OF VERTICAL COMPONENT OF THRUST

FOR VERTICAL BENDS FOR TEST PRESSURE OF 1000 kPa (SEE NOTE 6)				
PIPE DN	TYPICAL PIPE OD	CONCRETE VOLUME m³		
		11.25° BEND	22.25° BEND	45° BEND
100	122	0.14	0.28	0.49
150	177	0.28	0.56	1.05
200	232	0.49	0.98	1.75
225	259	0.63	1.19	2.24
250	286	0.77	1.47	2.73
300	345	1.05	2.20	3.92
375	426	1.68	3.22	6.02
450	507	DETAILED DESIGN REQUIRED ALTERNATIVE METHODS TO BE CONSIDERED		
500	560			
600	667			
750	826			

IN CALCULATING THE CONCRETE VOLUME NO CONTRIBUTION FROM THE PIPELINE SELF WEIGHT HAS BEEN INCLUDED.

NOTES TO TABLE 1:

- LOCATE ANCHOR BLOCK CENTRALLY AROUND BEND.
- KEY ANCHOR BLOCK INTO BASE OF UNDISTURBED TRENCH A MINIMUM DEPTH OF 250 mm.
- POUR CONCRETE AGAINST A SOLID EXCAVATION FACE.
- USE GRADE N20 CONCRETE.
- KEEP CONCRETE CLEAR OF ALL BOLTS, NUTS AND PIPE JOINTS.
- ANCHOR BLOCKS IN TABLE 1 ARE DESIGNED FOR A TEST PRESSURE OF 1000 kPa (NOMINALLY 100 m HEAD). ADJUST THE CONCRETE VOLUME TO SUIT THE ACTUAL TEST PRESSURE. REFER TABLE 2 NOTE 12.

TABLE 2 : MINIMUM THRUST AREA FOR THRUST BLOCKS

SOIL CLASSIFICATION AND ALLOWABLE HORIZONTAL BEARING PRESSURE OF GROUND (SEE NOTE 3)	FOR HORIZONTAL THRUST IN BEDS, TEES TAPERS, VALVES AND DEAD ENDS FOR TEST PRESSURE OF 1400 kPa. (SEE NOTE 6 & 12)					
	FOR HORIZONTAL THRUST ON TRENCH WALLS WHERE THE COVER PIPES 450 mm OR GREATER	90°& 60° HORIZONTAL BENDS	45°& 30 ° HORIZONTAL BENDS	22.5° HORIZONTAL BENDS	11.25° HORIZONTAL BENDS	TEES AND DEAD ENDS
		STIFF CLAY MEDIUM CLEAN SAND	STIFF CLAY MEDIUM CLEAN SAND	STIFF CLAY MEDIUM CLEAN SAND	STIFF CLAY MEDIUM CLEAN SAND	STIFF CLAY MEDIUM CLEAN SAND
	AHBP kPa	50.00	50.00	50.00	50.00	50.00
	100.00	0.46	0.25	0.13	0.1	0.33
	150.00	0.97	0.53	0.27	0.14	0.69
	250.00	2.54	1.38	0.7	0.35	1.80
	NOMINAL DIAMETER OF FITTING (DN)					

NOTES TO TABLE 2:

- 'N' DENOTES NOMINAL THRUST AREA - (SEE NOTES 4 & 5) . 'AHBP' - ALLOWABLE HORIZONTAL BEARING PRESSURE.
- CAST THE THRUST AREA OF ALL THRUST BLOCKS AGAINST A CLEAN FACE OF UNDISTURBED NATURAL SOIL. THRUST BLOCKS SHALL NOT INTERFERE WITH OTHER SERVICES.
- THE NOMINAL THRUST AREA 'N' TO BE ACHIEVED BY POURING CONCRETE THE FULL LENGTH OF THE FITTING AND EXTENDING FROM THE FLOOR OF THE TRENCH TO ABOVE THE FITTING (NOTE 7).
- DESIGN PRESSURES OTHER THAN 1400 kPa REDUCE OR INCREASE THE MINIMUM THRUST AREA BY THE RATIO OF THE DESIGN PRESSURES EXCEPT WHERE:
 - MINIMUM THRUST AREA IS = 0.1 m², AND
 - 'N' APPEARS IN THE TABLE AND DESIGN PRESSURE IS ABOVE 1000 kPa CALCULATE THE AREA.
- FINISH THRUST BLOCKS APPROXIMATELY 100 mm ABOVE THE TOP OF THE FITTING OR BEARING PAD AND EXTEND TO THE FLOOR OF THE TRENCH OR DEEPER IF NECESSARY TO ACHIEVE THE REQUIRED THRUST AREA.
- THE MINIMUM THRUST AREA FOR TAPER THRUST BLOCKS TO BE EQUAL TO THE DIFFERENCE BETWEEN THE THRUST AREAS FOR DEAD ENDS OF EQUIVALENT DIAMETER TO THOSE EACH SIDE OF TAPER. MAXIMUM PIPE ENGAGEMENT TO BE 180°.
- FOR DOWNWARD VERTICAL THRUST, THE ALLOWABLE BEARING PRESSURES FOR VARIOUS SOILS MAY BE TAKEN AS TWICE THAT FOR HORIZONTAL THRUST SHOWN.
- WHEN POURING CONCRETE AGAINST FITTINGS PLACE A MEMBRANE OF POLYETHYLENE OR PVC BETWEEN THE FITTING AND CONCRETE TO PREVENT DAMAGE TO THE FITTING. BOLTS, NUTS AND JOINTS ARE TO BE KEPT CLEAR OF CONCRETE.
- STATIC TEST PRESSURE SHALL BE 1400 kPa UNLESS NOTED OTHERWISE ON PROJECT SPECIFIC DOCUMENTATION.
- THRUST AREA IS TO BE CENTRALISED ABOUT THE PIPE CENTRELINE.

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PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

CLIENT

QUEANBEYAN COUNCIL

DRAWING STATUS

DETAILED DESIGN

SCALE

NA

COORDINATE SYSTEM

GAD2020

DATUM

AHD

SHEET SIZE

A1

PROJECT NUMBER

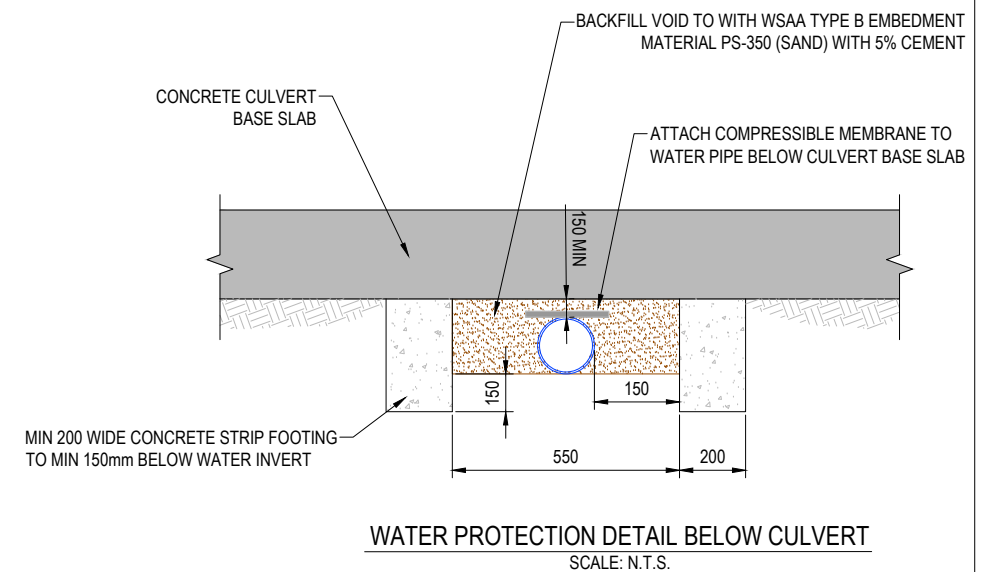
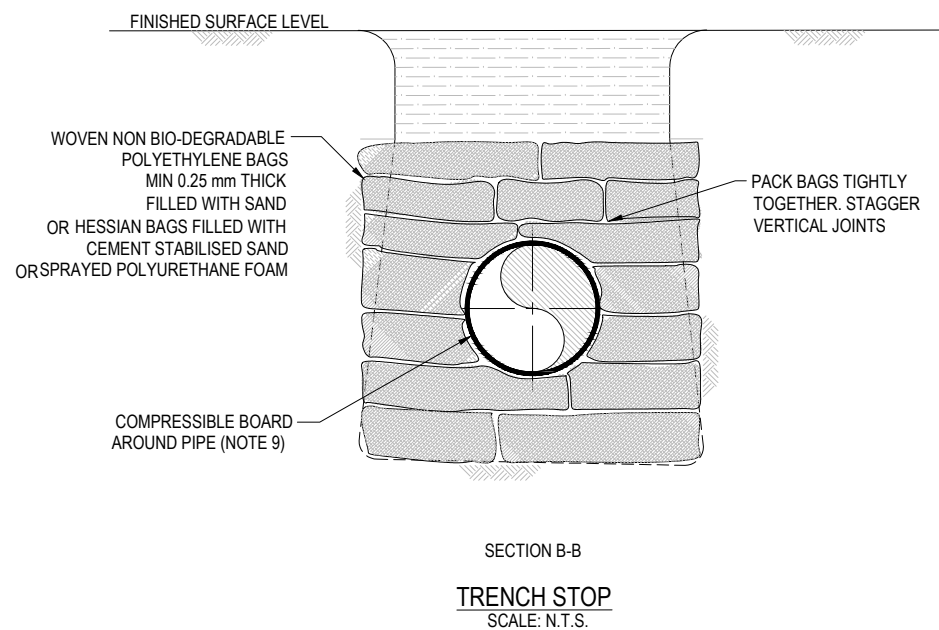
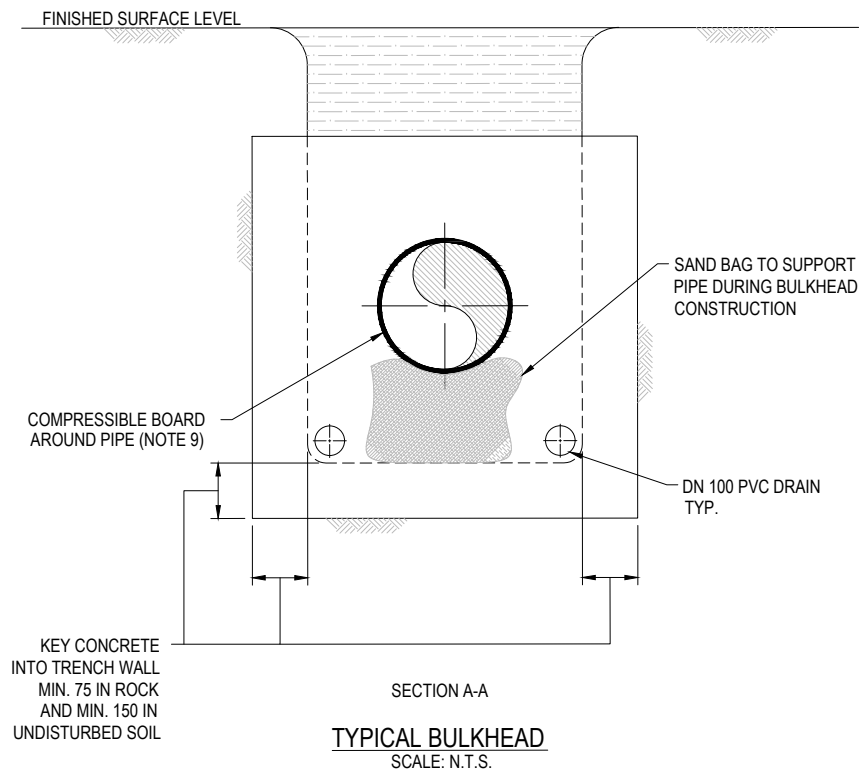
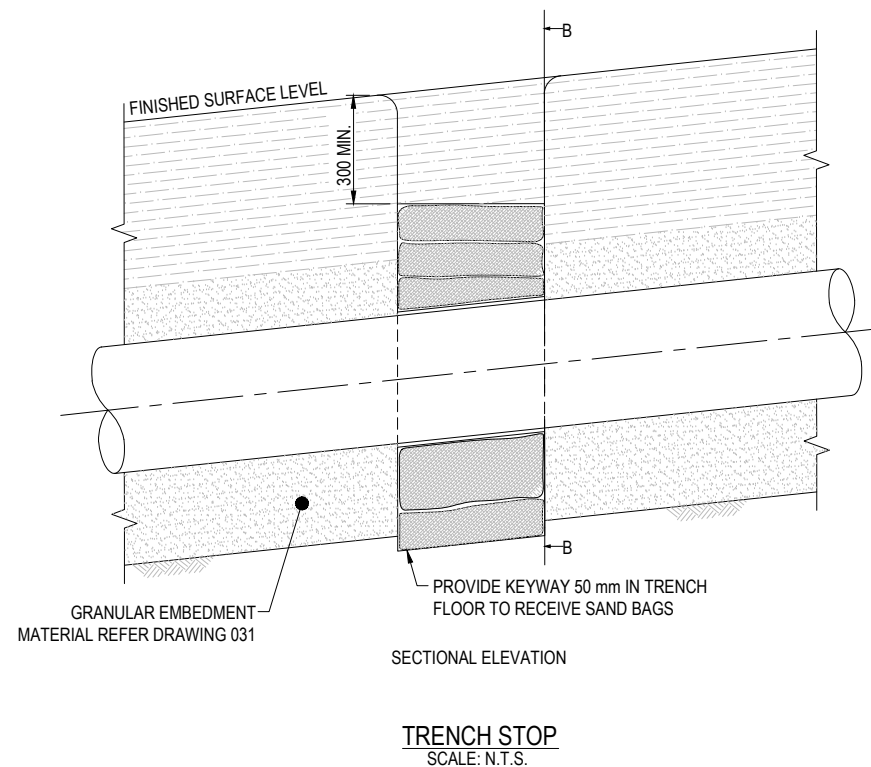
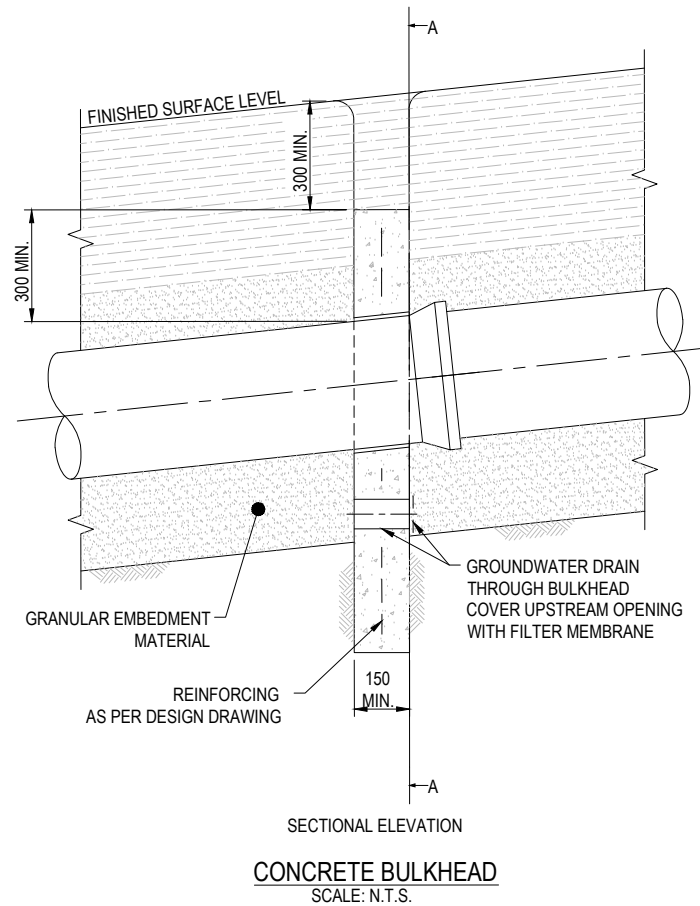
8654-01

DRAWING NUMBER

033

REVISION

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- ## NOTES:
1. CONSTRUCT CONCRETE BULKHEADS AND TRENCH STOPS AT LOCATIONS SPECIFIED ON DESIGN DRAWINGS.
 2. BULKHEADS LOCATED UNDER RETAINING WALLS TO BE DIRECTLY UNDER THE WALL.
 3. KEY CONCRETE BULKHEADS AND TRENCH STOPS INTO SIDES AND BOTTOM OF TRENCH AGAINST A BEARING SURFACE OF UNDISTURBED SOIL.
 4. CONCRETE TO BE CLASS N25.
 5. DO NOT DEFORM PIPES DURING PLACEMENT OF CONCRETE.
 6. SEAL BAGS TO PREVENT LEAKAGE OF MATERIAL CONTAINED INSIDE.
 7. PROVIDE A CONTINUOUS DRAINAGE PATH:
 - THROUGH BULKHEADS AND TRENCH STOPS.
 - AROUND MAINTENANCE HOLES.
 - IN TRENCH EXCAVATIONS ACROSS ROADWAYS.
 8. TRENCH DRAINAGE TO BE IN ACCORDANCE WITH SD-2105.
 9. COMPRESSIBLE BOARD AROUND PIPE TO BE 3 mm THICK RUBBER FOR BULKHEADS AND TRENCH STOPS.
 10. EMBEDMENT AND BACKFILL MATERIAL TO BE PLACED PROGRESSIVELY ON BOTH SIDES OF BULKHEAD / TRENCH STOP.
 11. STANDARD TRENCH DETAILS NOT TO BE USED IN REGIONS OF POTENTIAL SLIP, UNSTABLE OR TALUS GROUND.

REQUIREMENTS FOR BULKHEADS AND TRENCH STOPS		
TRENCH/PIPE GRADE (%)	REQUIREMENT	SPACING "S" (m)
5-14	TRENCH STOP	S = 100/GRADE(%)
15-29	CONCRETE BULKHEAD	S = Lp/GRADE(%), WHERE Lp = 80 x PIPE LENGTH (m) (450 MAX.) WHERE Lp > 100 m - USE INTERMEDIATE TRENCH STOPS AT SPACING <100/GRADE(%)

* PIPE LENGTH IS THE STANDARD PIPE LENGTH INSTALLED

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PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

	CLIENT
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HEANBEYAN COUNCIL

DRAWING STATUS

DETAILED DESIGN

SCALE
NA

COORDINATE SYSTEM
GAD2020

DATUM
AHD

DRAWING TITLE

TYPICAL DETAILS
SHEET 5 OF 5

DRAWING NUMBER

034

VISION

REVISION

1. ALL WORK TO COMPLY WITH ENVIRONMENT PROTECTION GUIDELINES IN ACCORDANCE WITH THE BLUE BOOK AND COUNCIL REQUIREMENTS.
2. WASTE ENCLOSURES WILL BE USED FOR ALL RUBBISH ON SITE AND RUBBISH REMOVED FROM ENCLOSURE(S) WHEN REQUIRED OR FULL
3. THE CONTRACTOR PROPOSING TO DEVELOP THE SITE MUST HOLD AN ENVIRONMENT AUTHORISATION OR ENTER INTO AN ENVIRONMENT PROTECTION AGREEMENT WITH THE ENVIRONMENT PROTECTION AUTHORITY (EPA) IN RESPECT OF THE ACTIVITY PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. CONTRACTOR TO ENSURE ALL APPROVALS ARE OBTAINED PRIOR TO COMMENCEMENT OF CONSTRUCTION.

WHERE BUILDING WORK GENERATES DUST, ALL REASONABLE AND PRACTICABLE MEASURES SHOULD BE TAKEN TO MINIMISE THAT DUST.

1. STRIPPING AREAS PROGRESSIVELY AND ONLY WHERE IT IS NECESSARY FOR WORKS TO OCCUR.
2. EMPLOYING STABILISING METHODS SUCH AS MATTING, GRASSING OR MULCH.
3. DAMPENING THE GROUND WITH A LIGHT WATER SPRAY (CONTACT ENVIRONMENT PROTECTION AUTHORITY FOR REQUIREMENTS DURING EXTREME DROUGHT CONDITIONS).
4. ROUGHENING SURFACE OF EXPOSED SOIL.
5. COVERING STOCKPILES AND LOCATING THEM WHERE THEY ARE PROTECTED FROM THE WIND.
6. RESTRICTING VEHICLE MOVEMENTS.
7. ALL LOADS TO BE COVERED WHEN TRANSPORTING MATERIAL OFF SITE
8. CONSTRUCTING WIND BREAKS SUCH AS WIND FENCES IN ACCORDANCE WITH THE BLUE BOOK.
9. A WATER CART OR SUFFICIENT WATER SPRAYS SHALL BE MADE AVAILABLE AT ALL TIMES. IN ADVERSE CONDITIONS WHEN DUST CANNOT BE ADEQUATELY CONTROLLED WHEN WORKS AREA BEING UNDERTAKEN, WORKS WILL CEASE IN THESE AREAS UNTIL CONDITIONS IMPROVE.
10. WATER SHALL BE APPLIED TO SUPPRESS DUST FROM OPEN EARTHWORKS AS WELL AS UNPROTECTED STOCKPILES.
11. AREAS OF COMPLETED EARTHWORKS SHALL BE PROGRESSIVELY REHABILITATED WITH DRYLAND GRASS AND FENCED OFF AS SOON AS PRACTICABLE TO PREVENT FURTHER EROSION.
12. THE CONTRACTOR IS TO CONTACT THE WATER RESOURCES UNIT TO OBTAIN AN EXEMPTION TO USE NON-POTABLE WATER FROM ON OR OFF THE SITE IF REQUIRED.
13. ALL WORK TO STOP IF DUST CONTINUES TO LEAVE SITE WHEN ALL ABOVE METHODS HAVE BEEN UNDERTAKEN

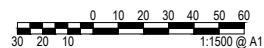
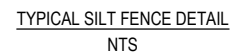
ENSURE ALL BUILDING WORK THAT GENERATES NOISE IS CONDUCTED WITHIN THE TIME PERIODS DETAILED IN SCHEDULE 2 OF THE ENVIRONMENT PROTECTION REGULATIONS 2005.

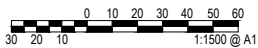
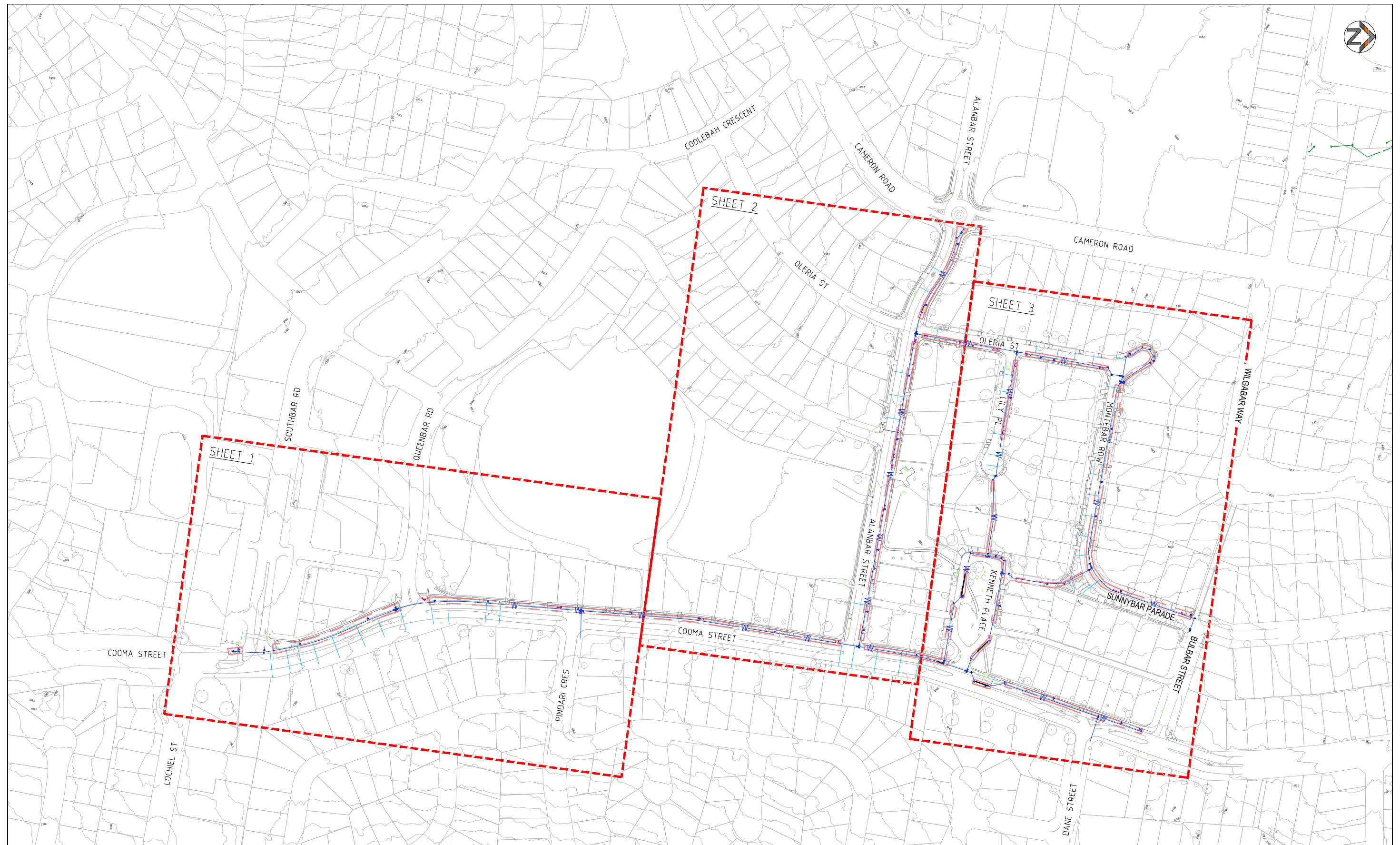
1. SCHEDULE NOISY ACTIVITIES FOR THE LEAST SENSITIVE TIMES OF THE DAY SUCH AS MID-MORNING OR MID-AFTERNOON.
2. SELECT MACHINERY THAT PRODUCES LESS NOISE; AND ENSURE MACHINERY IS WELL MAINTAINED.

1. SEDIMENT AND EROSION CONTROL DEVICES TO BE INSTALLED AND FULLY OPERATIONAL PRIOR TO STRIPPING OF SITE TOPSOIL.
2. STOCK PILES TO BE LOCATED AWAY FROM DRAINAGE LINES AND SURFACE FLOW PATHS, CONTOURED STRIATIONS OR FURROWS TO BE PROVIDED TO STOCK PILES TO MINIMISE EROSION.
3. STABILISED CONSTRUCTION ENTRANCE TO BE CONSTRUCTED PRIOR TO ACCESS TO SITE BY CONSTRUCTION VEHICLES. AGGREGATE TO BE TURNED WHEN SEDIMENT BUILDS UP AND RENEWED WHEN REQUIRED.
4. WHERE STORMWATER DRAINAGE IS INSTALLED TO INTERNAL ROADWORKS, PROVIDE GRATED SUMP FILTER IN ACCORDANCE WITH EPA GUIDELINES.
5. BUILDER IS TO ESTABLISH A MAINTENANCE PROGRAM FOR SEDIMENT & EROSION CONTROL DEVICES TO ENSURE INSPECTION AFTER SIGNIFICANT RAINFALL AND THAT ANY REPAIRS NECESSARY ARE QUICKLY ATTENDED TO.
6. ALL NEW CONSTRUCTION WORK MUST BE CONTAINED WITHIN THE SITE EXCEPT FOR APPROVED SERVICE CONNECTIONS AND ROADWORKS.
7. LIMIT ACCESS TO SITE DURING AND IMMEDIATELY AFTER WET WEATHER.
8. REMOVE ANY SOIL FROM ROADS ADJACENT TO THE SITE AT THE END OF EACH DAY.
9. NO STORAGE OF CONSTRUCTION MATERIALS, PARKING OF VEHICLES NOR EQUIPMENT PERMITTED OUTSIDE OF BLOCK WITHOUT TAMS APPROVAL.
10. NO SITE SHEDS, STORAGE SHEDS, SITE AMENITIES TO BE ERECTED OUTSIDE OF BLOCK WITHOUT TAMS APPROVAL.
11. PROVIDE KERBSIDE FILTER ROLL TO SUMPS / STORMWATER INLETS ADJACENT TO THE SITE AND ANY ADDITIONAL SUMPS AS DETAILED.
12. KERBSIDE FILTER ROLLS TO BE REMOVED, CLEANED AND REINSTATED ON A WEEKLY BASIS AT A MINIMUM. TRAPPED SEDIMENT ABOUT SUMPS IS ALSO TO BE REMOVED. CLEANING IS ALSO TO TAKE PLACE IMMEDIATELY AFTER PERIODS OF RAINFALL DURING CONSTRUCTION.
13. ALL SERVICE TRENCHES TO BE BACKFILLED WITHIN 24 HOURS OF INSPECTION.
14. EXCESS SOIL IS TO BE DISPOSED AT AN ENVIRONMENT PROTECTION AUTHORITY APPROVED LOCATION.
15. THE SITE FOREMAN IS TO CONTACT ENVIRONMENT PROTECTION AUTHORITY (131555) TO ARRANGE A SITE INSPECTION AND ENDORSEMENT OF SEDIMENT AND EROSION CONTROL MEASURES PRIOR TO WORKS COMMENCING.
16. THE SITE FOREMAN IS TO CONTACT ENVIRONMENT PROTECTION AUTHORITY (131555) TO DISCUSS ANY MAJOR CHANGES TO SEDIMENT AND EROSION CONTROLS ON SITE PRIOR TO IMPLEMENTING THE CHANGES.
17. THE SITE FOREMAN WILL ENSURE CONTRACTORS ACCESS AND EXIT THE SITE USING ONLY ENVIRONMENT PROTECTION AUTHORITY APPROVED STABILISED ACCESS/EXIT POINTS AS DETAILED ON ENDORSED SEDIMENT AND EROSION CONTROL PLANS.
18. THE CONTRACTOR TO LIMIT STRIPPING OF TOPSOIL AND REMOVAL OF VEGETATION TO AREAS ESSENTIAL FOR UNDERTAKING THE WORKS.
19. DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION AS SOON AS PRACTICABLE.
20. THE CONTRACTOR SHALL LIMIT VEHICLES AND PLANT MOVEMENT TO PARKING AREAS AND ACCESS ROUTES AS APPROVED OR ONLY IN AREAS WHERE WORK IS PROCEEDING.
21. THE CONTRACTOR IS NOT ALLOWED TO PARK ON OR DISTURB ROAD VERGES EXCEPT WHERE NEW DRAINAGE LINES ARE REQUIRED.
22. CONTRACTOR TO RETAIN A COPY OF THE APPROVED "EROSION AND SEDIMENT CONTROL PLAN" DURING LAND DEVELOPMENT IN THE SITE OFFICE.

4. LIMIT CONSTRUCTION VEHICLE ACCESS TO SITE DURING AND IMMEDIATELY FOLLOWING WET WEATHER.

- SITE AREA: 0.4 ha

[illegible]



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PJN	ID	TN	KM	20/01/2023

LAND OWNER:	
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CLIENT



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INDESCO PTY LTD
CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601

GPO Box 565 Canberra, ACT 2601

(02) 6285 1022

www.indesco.com.au
ABN: 37 008 581 066

PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

CLIENT

ANBEGAN COUNCIL

D

SCALE
AS SHOWN

AS SHOWN
SHEET SIZE

A1

COORDINATE SYSTEM
CAD2020

GAD2020
PROJECT NUMBER

8654-01

DRAWING TITLE

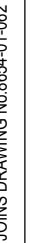
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CONCEPT EROSION AND
SEDIMENT CONTROL PLAN
SHEET 1 OF 4

DRAWING NUMBER

041

REVISION

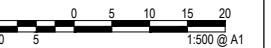
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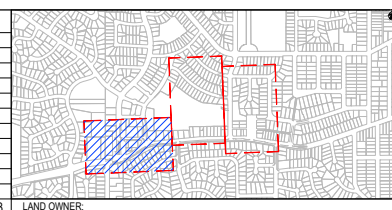
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SITE FENCE

NOTE:
CONTRACTOR TO ALLOW FOR STREET SWEEPING /CLEARING ALL SEDIMENT FROM ROAD SURFACE PROGRESSIVELY AS WORKS ARE COMPLETED AND REOPENED.



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGM	JP	TN	KM	20/01/2022



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COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

SCALE
AS SHOWN

COORDINATE SYSTEM
GAD2020

DATUM
AHD

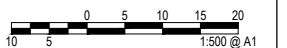
SHEET SIZE
A1

PROJECT NUMBER	8654-01
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DRAWING TITLE
CONCEPT EROSION AND
SEDIMENT CONTROL PLAN
SHEET 2 OF 4

DRAWING NUMBER
042

SION



QPRC 

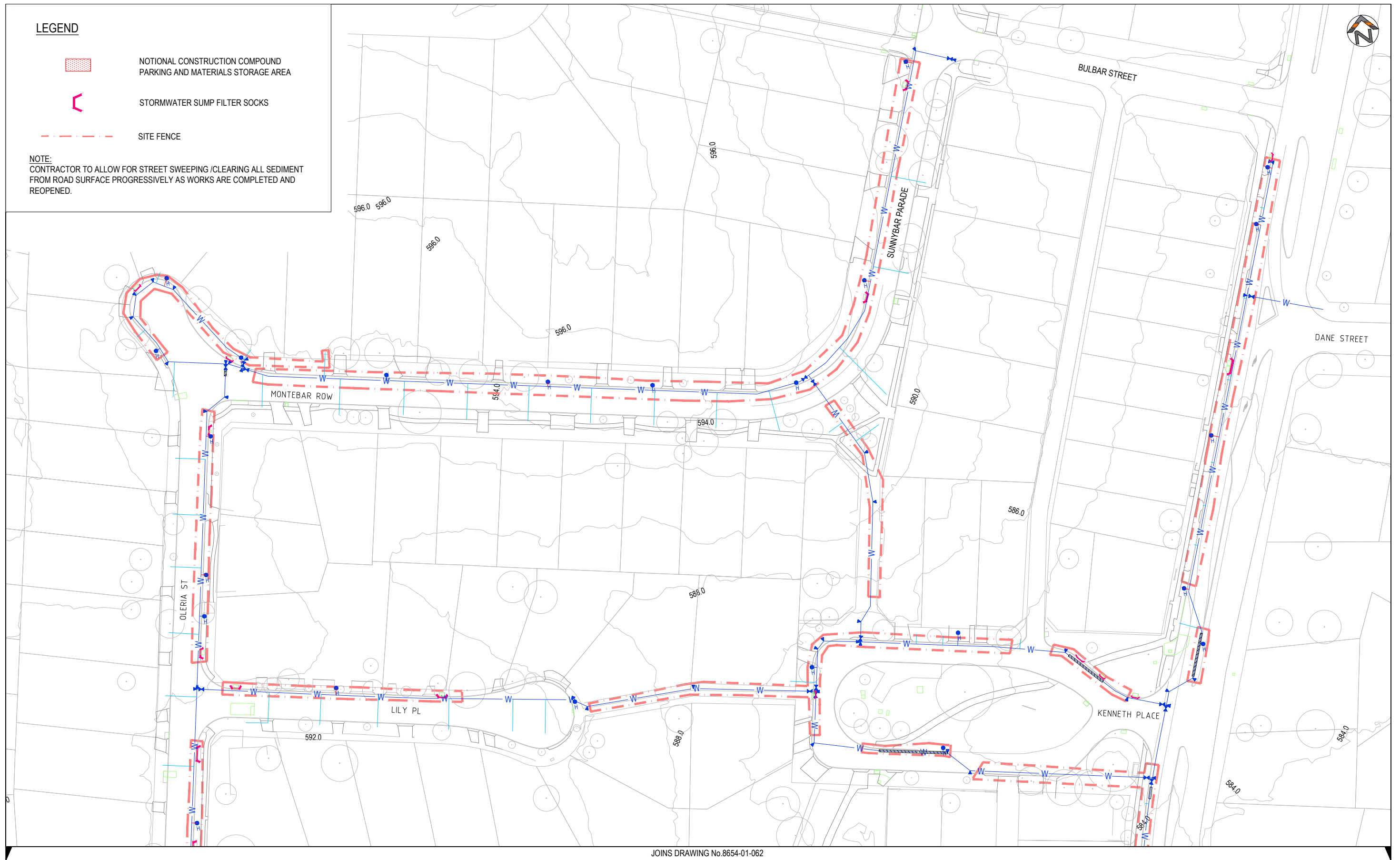
COOMA STREET WATER MAIN REPLACEMENT

REVISION

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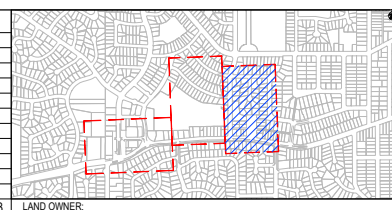
SITE FENCE

NOTE:
CONTRACTOR TO ALLOW FOR STREET SWEEPING /CLEARING ALL SEDIMENT FROM ROAD SURFACE PROGRESSIVELY AS WORKS ARE COMPLETED AND REOPENED.



JOINS DRAWING No.8654-01-062

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGM	JP	TN	KM	20/01/2022



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CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601
GPO Box 565 Canberra, ACT 2601
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ABN: 37 008 581 066
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	PROJECT TITLE
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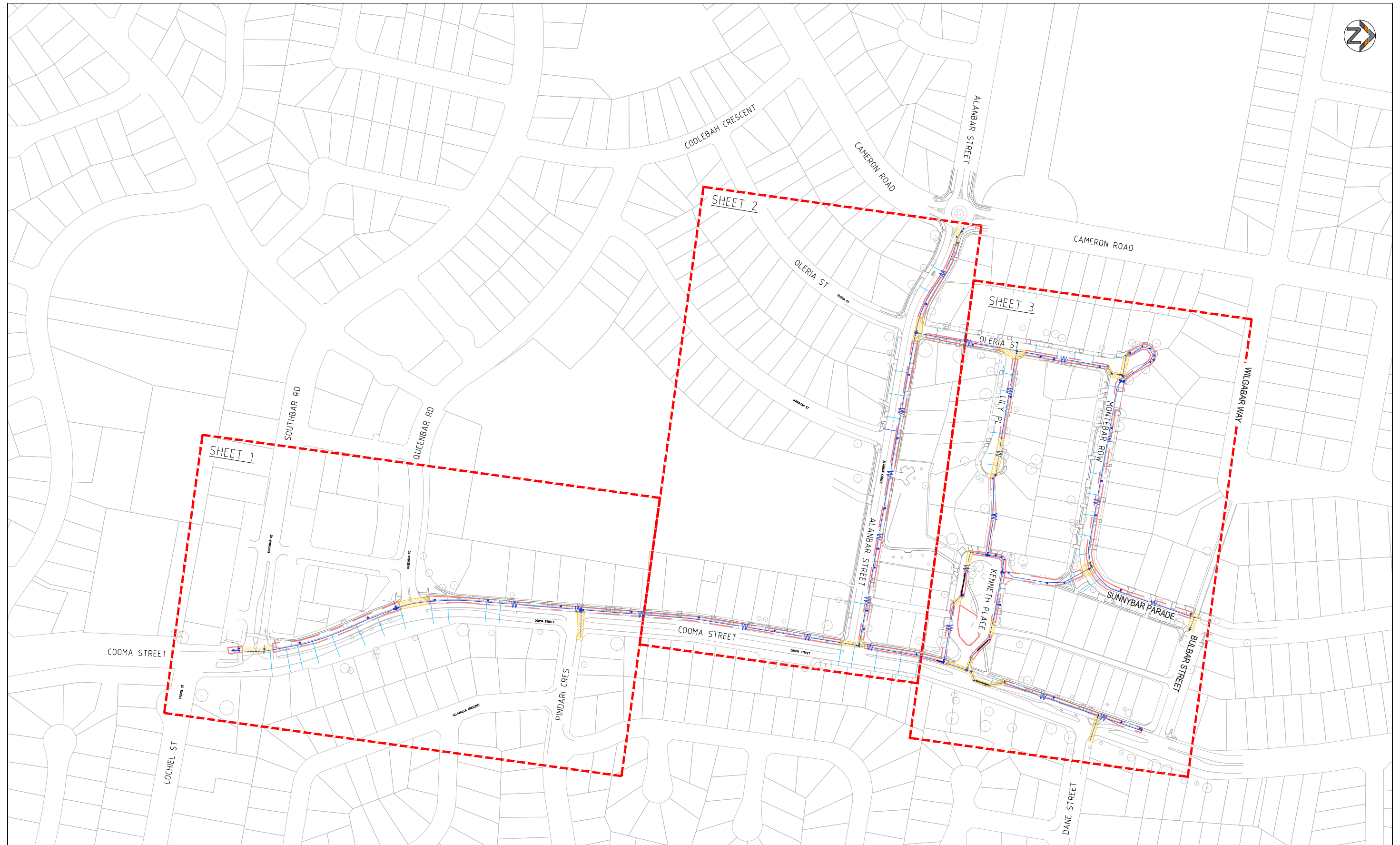
COOMA STREET
WATER MAIN
REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	

DRAWING STATUS	
DETAILED DESIGN	
SCALE AS SHOWN	COORDINATE SYSTEM GAD2020
SHEET SIZE A1	PROJECT NUMBER 8654-01

DRAWING TITLE
CONCEPT EROSION AND
SEDIMENT CONTROL PLAN
SHEET 4 OF 4

DRAWING NUMBER	REVISION
044	A



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGN	JP	TN	KM	20/01/2023

LAND OWNER	
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CLIENT



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INDESCO PTY LTD
CQ1, Level 5, 68 Northbourne Avenue
CANBERRA CITY ACT 2601

www.indesco.com.au
ABN: 37 008 581 066

GPO Box 565 Canberra, ACT 2601
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PROJECT TITLE

COOMA STREET WATER MAIN REPLACEMENT

CLIENT

QUEANBEYAN COUNCIL

DRAWING STATUS
DETAILED DESIGN

SCALE
AS SHOWN

SHEET SIZE
A1

COORDINATE SYSTEM
GAD2020

PROJECT NUMBER	8654-01
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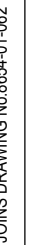
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AHD

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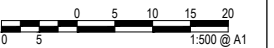
CONCEPT TEMPORARY
TRAFFIC MANAGEMENT PLAN
SHEET 1 OF 4

DRAWING NUMBER
050

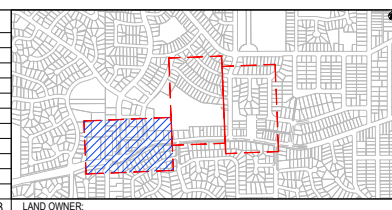
REVISION



CONTRACTOR TO ORGANISE LANE
CLOSURES AS REQUIRED



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGM	JP	TN	KM	20/01/2022



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CQ1, Level 5, 68 Northbourne Avenue
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COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

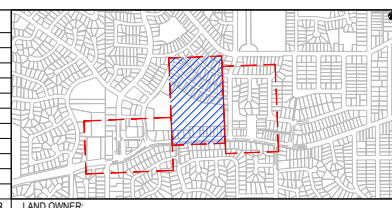
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SHEET SIZE A1	PROJECT NUMBER 8654-01	

DRAWING TITLE
CONCEPT TEMPORARY
TRAFFIC MANAGEMENT PLAN
SHEET 2 OF 4

DRAWING NUMBER	REVISION
051	A



REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	DCN	ID	TN	KM	20/01/2007



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CQ1, Level 5, 68 Northbourne Avenue
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	PROJECT TITLE
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COOMA STREET
WATER MAIN
REPLACEMENT

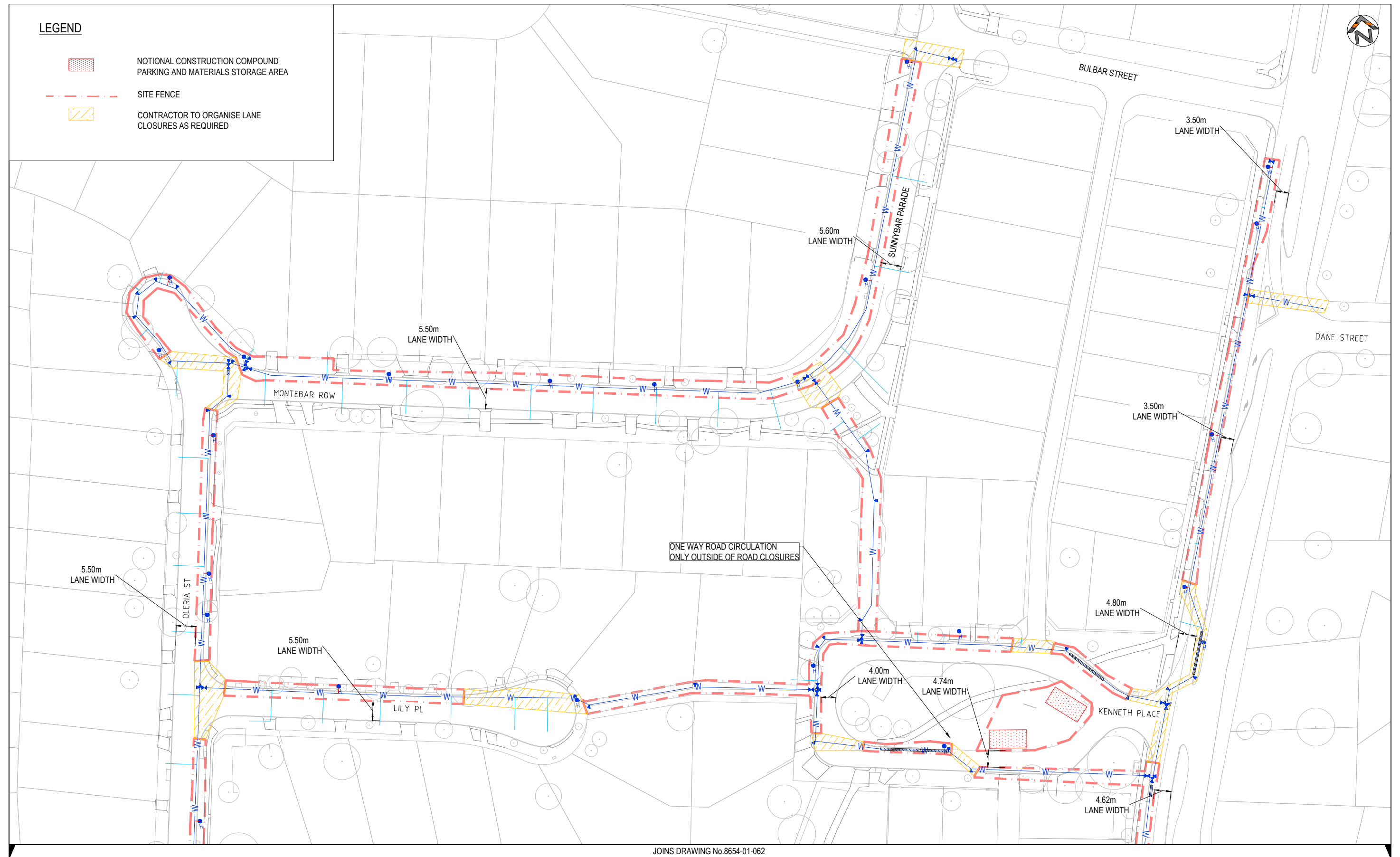
CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

SCALE AS SHOWN	COORDINATE SYSTEM GAD2020	DATUM AHN
SHEET SIZE A1	PROJECT NUMBER 8654-01	

DRAWING TITLE	CONCEPT TEMPORARY TRAFFIC MANAGEMENT PLAN SHEET 3 OF 4
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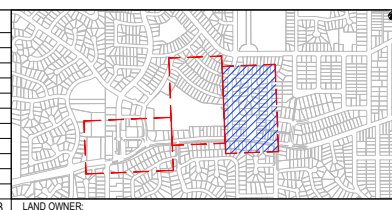
DRAWING NUMBER
052

REVISION
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JOINS DRAWING No.8654-01-062

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	PGM	JP	TN	KM	20/01/2022



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CQ1, Level 5, 68 Northbourne Avenue
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	PROJECT TITLE
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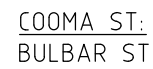
COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	DETAILED DESIGN

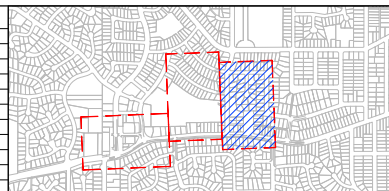
SCALE AS SHOWN	COORDINATE SYSTEM GAD2020
SHEET SIZE A1	PROJECT NUMBER 8654-01

DRAWING TITLE
CONCEPT TEMPORARY
TRAFFIC MANAGEMENT PLAN
SHEET 4 OF 4

DRAWING NUMBER	REVISION
053	A



ONE WAY ROAD CIRCULATION
ONLY OUTSIDE OF ROAD CLOSURES



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CD1, Level 5, 68 Northbourne Avenue
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ARN: 37 008 581 066

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	PROJECT TITLE
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COOMA STREET WATER MAIN REPLACEMENT

CLIENT	QUEANBEYAN COUNCIL
DRAWING STATUS	

DRAWING STATUS

DETAILED DESIGN

SCALE
AS SHOWN

SHEET SIZE
A1

COORDINATE SYSTEM	GAD2020
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PROJECT NUMBER	8654-01
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DATUM
AHD

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DRAWING TITLE

CONCEPT TEMPORARY
TRAFFIC MANAGEMENT PLAN
PIPE WORKS STAGING

DRAWING NUMBER
054

REVISION
A

REV.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	APPROVED	DATE
A	FOR CLIENT REVIEW	DN	DN	TAL	KIA	20/01/2022

