



C O N S U L T I N G

Engineering Assessment

Cudgen Connection

Prepared for Cudgen Health Precinct Pty Ltd (Trustee for Cudgen Health Precinct SPV Trust)

By Planit Consulting Pty Ltd

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1 Executive Summary

This Engineering Assessment (EA) Report has been prepared to evaluate a Planning Proposal for 741 Cudgen Road, Cudgen NSW 2487. The objective of the Planning Proposal is to facilitate a Proposal, known as Cudgen Connection, which augments the existing health services of the adjoining Tweed Valley Hospital with additional core health precinct uses, including, but not limited to:

- Private hospital.
- Allied healthcare.
- University.
- Medi-hotel.
- High speed fibre cable network.
- Essential worker housing.
- Community hub & parklands.
- Retail including food and drink outlets.

Planit Consulting has been engaged by Cudgen Health Precinct Pty Ltd to assess the strategic suitability and capacity of the site to be amended from its current primary production land use identification to an urban outcome, which will inevitably involve an increase in infrastructure services. Further, this EA report specifically considers how essential services can be appropriately provided and managed within the concept masterplan for the site.

Tweed Shire Council's flood mapping identifies that the site is effectively located above the Designated Flood Level (DFL) of 3.2 m AHD and a portion of the site is subject to inundation during Probable Maximum Flood (PMF) events. Critical infrastructure (such as the proposed private hospital) is to be above the PMF level to ensure flood immunity under all modelled scenarios.

Site access is proposed off Tweed Coast Road (left-in only) and Cudgen Road (two-way access) with a road network provided through the development site to navigate around the site including the provision of footpaths for pedestrian interconnectivity. A Traffic impact Assessment completed by PSA Consulting has been prepared providing further details of the proposed traffic management strategy.

To achieve desirable outcomes, the overarching stormwater strategy is to collect stormwater in an internal pit/pipe network and discharge stormwater to a centralised treatment/detention system prior to release. The centralised treatment/detention system is anticipated to include an underground detention tank, Gross Pollutant Trap and Stormwater Filter. Further details of the proposed stormwater management strategy are available within the site's Stormwater Management Plan (SWMP) completed by Planit Consulting.

Provision of water service to the development site will involve upgrades/augmentation to the existing Council network within Cudgen Road and McPhail Ave.

Sewer servicing of the development will involve the provision of a new sewer pump station (SPS) providing a connection to the pressure sewer network on Tweed Coast Road. The SPS will be required to be a minimum 10m from buildings.

Power and telecommunication services are available within proximity to the subject site and is foreseen that no major issues will arise with connection to these services. Due to the nature of the development, it is planned that high-speed fibre cabling will be installed to service the site and part of the works.

Post Planning Proposal, future Development Application/s are anticipated to involve bulk earthworks to accommodate essential service infrastructure works. Beyond the subject site, there will also be service trenching requirements within public land to extend existing services and provide infrastructure services to the subject site, including water main upgrades and sewer servicing connections.

2 Introduction

2.1 Project Background

This Engineering Assessment (EA) Report has been prepared to assess the Cudgen Connection proposal located at 741 Cudgen Road, Cudgen NSW 2487, within the Tweed Local Government Area. The Cudgen Connection proposal seeks to augment the existing health services of the adjoining Tweed Valley Hospital with additional core health precinct uses, including, but not limited to:

- Private hospital.
- Allied healthcare.
- University.
- Medi-hotel.
- High speed fibre cable network.
- Essential worker housing.
- Community hub & parklands.
- Retail including food and drink outlets.

Appendix A of this EA presents the Concept Masterplan for the Cudgen Connection proposal.

It is understood that to realise the Cudgen Connection proposal, 2x primary processes are required. Firstly, a Planning Proposal to amend the applicable legislation identified for the site within the Tweed Local Environmental Plan 2014, such as land use zoning and maximum height of buildings. This process is then followed by Development Application process/es to formally obtain land use consent. Accordingly, Planit Consulting has been engaged by Cudgen Health Precinct Pty Ltd to assess the strategic suitability and capacity of the site to be amended from its current agricultural land use to an urban outcome, which will significantly increase the number of persons attending site at any one point in time. This Engineering Assessment Report specifically considers the development from a serviceability perspective and aims to address the feasibility of the proposed masterplan development integrating into the existing surrounding networks.

Refer to Table 1 for a summary of the development detail.

Table 1: Development Details Summary

Component	Details
Applicant	Cudgen Health Precinct Pty Ltd (Trustee for Cudgen Health Precinct SPV Trust)
Street Address	741 Cudgen Road, Cudgen, NSW 2487
Local Government Area	Tweed Shire Council (TSC)
Climatic Region	Subtropical
Zoning	RU1 – Primary Production (Tweed Local Environmental Plan 2014)
Proposed development type	Health Precinct, via an urban zoning, or SP2 - Infrastructure (Health Services Facilities)
Site Area	5.7 ha
Map Reference	Lot 6 on DP 727425

2.2 Project Scope

The purpose of this Engineering Assessment (EA) report is to examine the existing site for potential opportunities and constraints when considering the strategic process of changing the legislated land use zoning from agricultural to urban purposes, as well as the intended Cudgen Connection Concept Masterplan which the Planning Proposal seeks to enable. Specifically, the EA considers:

- Analysis of opportunities and constraints associated with the development site, typically incorporating:
 - Locality.
 - Lands usage.
 - Existing Services.
 - Engineering specifications.
 - Soil characteristics.
 - Flooding.
- Analysis and description of the development proposal from a civil engineering point of view including:
 - Preliminary analysis of earthworks requirements.
 - Service trenching requirements based on available service infrastructure.
 - Summary of Stormwater Management requirements as per recommendations of the SWMP prepared for this planning proposal.
 - Sewer and water demand assessment.
 - Power and telecommunications connection comments.

3 Civil Site Assessment

3.1 Existing Site Description

The existing site is irregular in shape approximately 5.7Ha in plan with street frontage to both the South (Cudgen Rd) and West (Tweed Coast Rd). To the North of the site, vegetation and wetland areas are present, along with the Tweed Valley Hospital to the immediate East.

The majority of the site is currently vacant with grass cover. A dwelling with scattered sheds and slabs are located onsite, as well as sporadic vegetation.

Refer to Figure 1 below for a visual of the site in its existing conditions. In addition, refer to Appendix A for the site survey.



Figure 1: Existing Site Conditions

3.2 Description of Proposed Development

Whilst the focus of this EA relates to a Planning Proposal to amend the Tweed Local Environmental Plan 2014 provisions applicable to the site, future realisation of the Cudgen Connection proposal is envisaged to involve the construction of numerous buildings and on site carparking (undercroft/podium parking), as identified in Figure 2. Whilst the specific land use composition to the proposal is subject to ongoing investigation and consultation, the development objective is to compliment the immediately adjoining Tweed Valley Hospital by facilitating land uses that enable a best practice health precinct to be realised for Tweed, and the wider subregions growing population.

For a scale masterplan of the proposed development, refer to Appendix A.



Figure 2: Proposed Development

3.3 Engineering Standards/Specifications/Guidelines

The primary focus of this EA is to consider civil infrastructure capacity and the future needs generated by the Planning Proposal. Limited legislation governs the strategic process; however, the NSW Government Local Environmental Plan Making Guideline September 2022 has been considered, specifically, Attachment C – Supporting Technical Information.

As detailed earlier, the Planning Proposal process is being pursued to enable the realisation of Cudgen Connection. In supporting the preparation of this concept, the following provisions have been considered:

- Tweed Development Control Plan 2008.
- TSC Development Design Specifications & Standard Drawings.
- WaterByDesign Guidelines.
- Water NSW MUSIC modelling guidelines.
- Queensland Urban Design Manual (QUDM).
- All relevant Australian standards.

3.4 Existing Services

To estimate the locations of existing services, a ‘Dial Before You Dig’ (DBYD) search was requested within the vicinity of the development area, the results of which are included in Appendix B. For further context, a site survey has been supplied by B&P Surveys along with the current masterplan layout, available within Appendix A of this report.

Survey Information and dial before you dig records indicate existing services within the proximity to the subject site as per Table 2.

Table 2: Existing Services (DBYD Enquiry)

Existing Service	Location	Description	Figure Reference
Stormwater	North-west of subject site, within Tweed Coast Road	DN1050 Road Crossing	Figure 3
Water	South of subject site, within Cudgen Road.	Property connection from existing DN150 main within Cudgen Road.	
Sewer	West of subject site, within Tweed Coast Road.	DN225 PVC-U (S2)	
		DN375 PVC-U (S2)	
	South of subject site, within Cudgen Road.	DN300 PVC-U (S2)	Figure 4
Electrical	South of subject site, within Cudgen Road.	Power Poles. Underground earth or wires (existing property connection)	
Telecommunication	South of subject site, within Cudgen Road.	Optus-owned underground fibre optic telecommunications.	Figure 5
Gas	N/A	No gas service present within DBYD records. TBC by detailed survey.	N/A

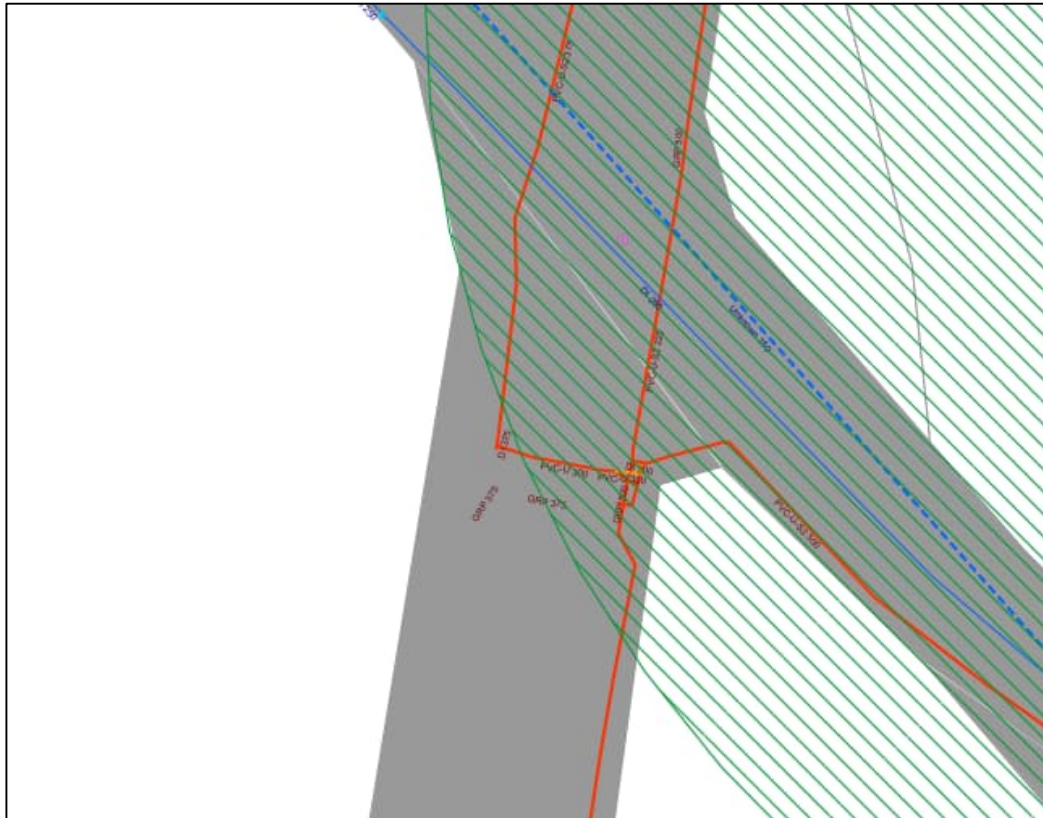


Figure 3: Stormwater, Sewer, and Water Existing Services (Source: DBYD Records)

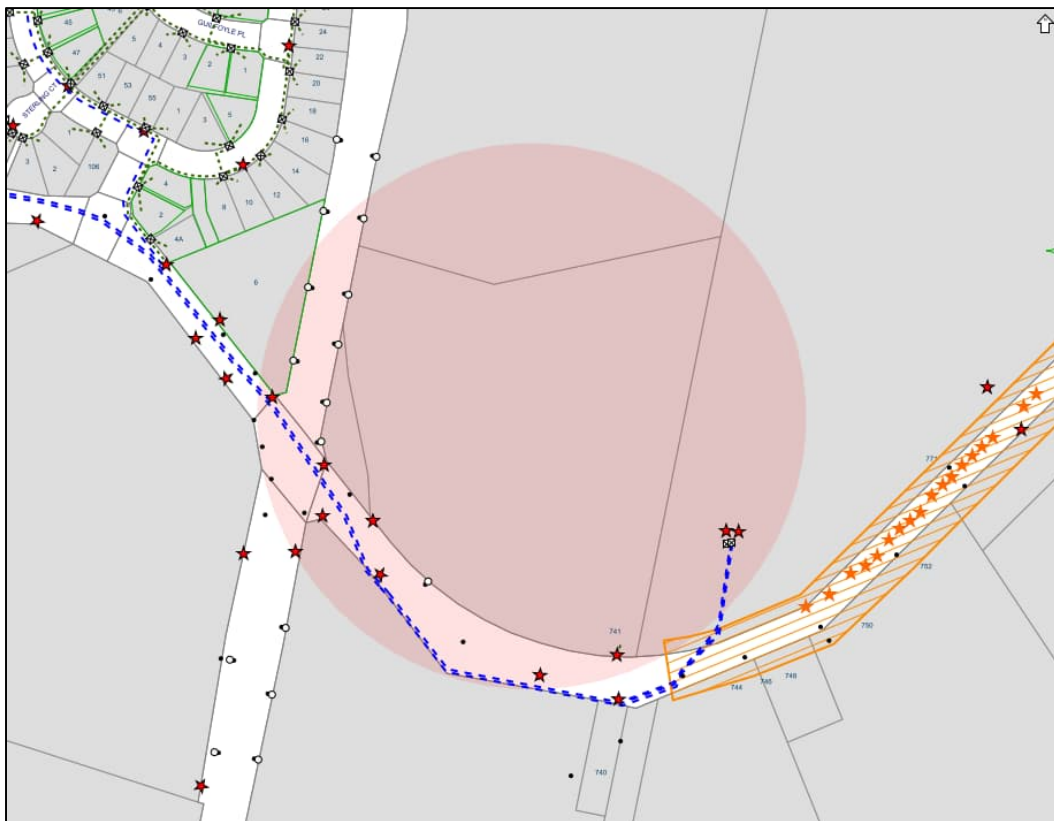


Figure 4: Existing Electrical Services (Source: DBYD Records)

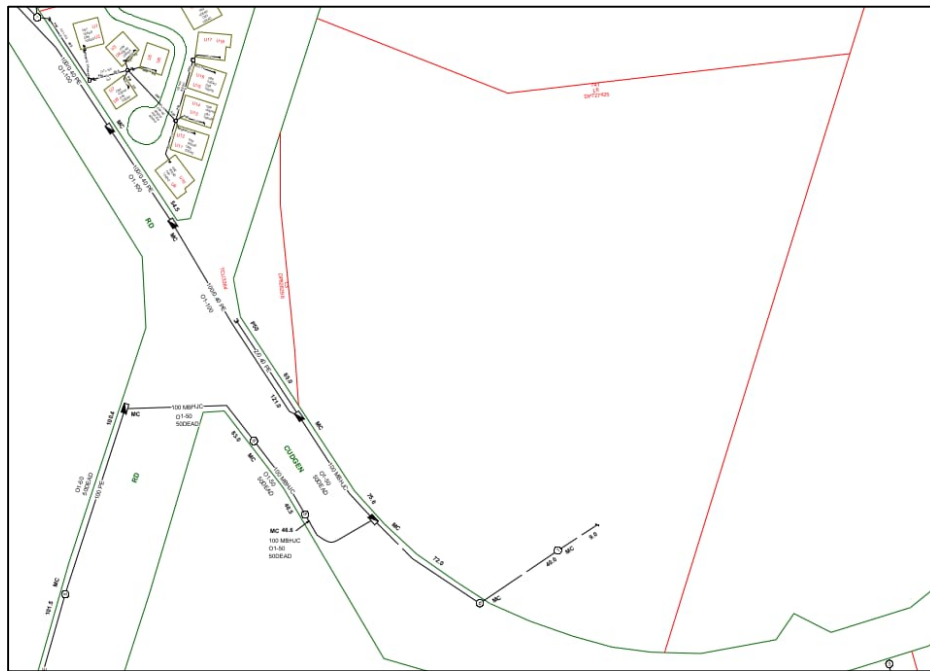


Figure 5: Existing Telecommunication Services (Source: DBYD Records)

3.5 Geotechnical Information

A desktop review of the existing information available within the SEED database consisting of Australian Soil Classification (ASC) soil type map of New South Wales has been carried out. Based on the mapping, it is anticipated that Ferrosols (FE) soils are present. Based on the visual interpretations, it is assumed that the subject site mainly consists of Red Ferrosols. These soils are very stable and have strong structure. This allows good drainage through the soil despite the often-high clay content of the sub soil. Ferrosols have very low bearing capacity & shear strength when saturated.

Geotechnical investigations will be undertaken as part of future detailed design to confirm the feasibility of re-using the existing soil when undertaking the bulk earthworks phase of construction.

3.6 Groundwater

As detailed within the figure below, the subject site has high levels of groundwater vulnerability as depicted by TSC's Mapping Service, however this is not identified as a barrier to the strategic change in land use from agriculture to urban purposes. Future geotechnical investigation is to be pursued through detailed design to locate and identify the depth to groundwater table of the existing site, guiding the design and construction phases for Cudgen Connection.

3.7 Acid Sulfate Soils

According to TSC Acid Sulfate Soil Planning Maps, the site is mapped as having the presence of Class 5 Acid Sulfate Soils (ASS). Accordingly, HMC Environmental Consulting has prepared a Preliminary Site Investigation (Report HMC2022.445.04). The following conclusion was made from this assessment.

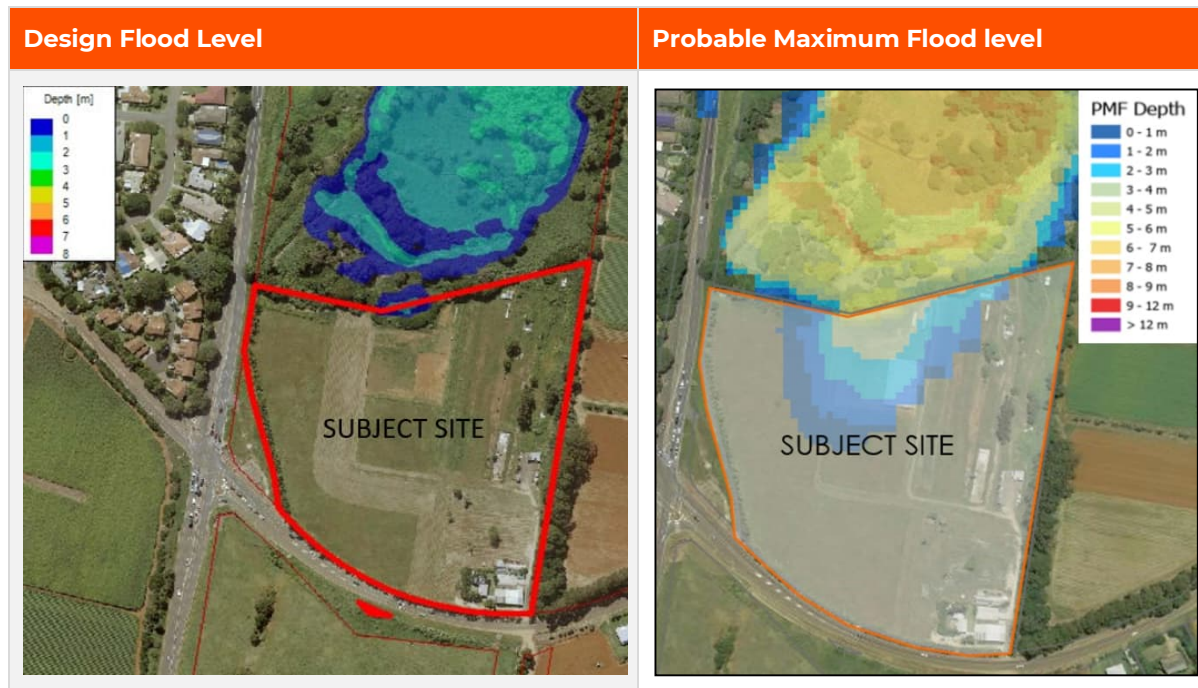
"Following a desktop assessment of the NSW acid sulfate soil planning, soil landscape, and geology mapping, together with a detailed site inspection, it is concluded that no ASS would be disturbed with the proposed development. The base of the maximum excavation is expected to be approximately RL 4-5m AHD, a minimum 3m above the expected elevation of ASS, where present. The topography, soil landscape and geology mapping does not indicate the presence of ASS on the site. It does not appear, based on likely proposed earthworks, that groundwater drawdown would occur, impacting on off-site ASS."

3.8 Flooding

Tweed Shire Council's flood mapping identifies the following key flood levels for the subject site, which are also visually displayed within Table 3:

- Design Flood Level (DFL) (1% AEP) = 3.2m AHD
- Minimum habitable flood level (DFL + 0.5m) = 3.7m AHD
- Floor Level for critical infrastructure (PMF Event) (0.05% AEP) = 8.0m AHD

Table 3: Flood Information



As displayed above, but for a minor portion along the northern boundary, the subject site is located above the DFL. Of note, the minor portion of the site affected by the DFL is free of proposed built improvements and buffered within the concept masterplan for Cudgen Connection. A larger portion of the site is identified as impacted by the Probable Maximum Flood (PMF) event. Critical infrastructure (such as the proposed private hospital) and sensitive development types are directed above this level to ensure flood immunity under all modelled scenarios. The extent of land within the subject site above the PMF level is a notable advantage for floodplain risk management, particularly key land uses which significantly benefit from co-location with public hospitals, as proposed.

4 Earthworks and Roadworks

4.1 Bulk Earthworks

The subject site involves a gentle topographic fall, primarily from south to north, providing a northerly aspect. The existing topography does not provide a barrier to the site's use for urban purposes, nor extensive modification to provide for urban land uses.

A brief elevation analysis has been carried out for the subject site using the 1 m Lidar Digital Elevation Model (DEM) downloaded from ELVIS, as illustrated in Figure 6. This analysis has determined that the maximum elevation in the subject site sits at approximately R.L. 18.5 m AHD at the Southeast boundary, adjacent to Cudgen Road. Conversely, the minimum elevation is approximately 2.0 m AHD at the Northern property boundary.

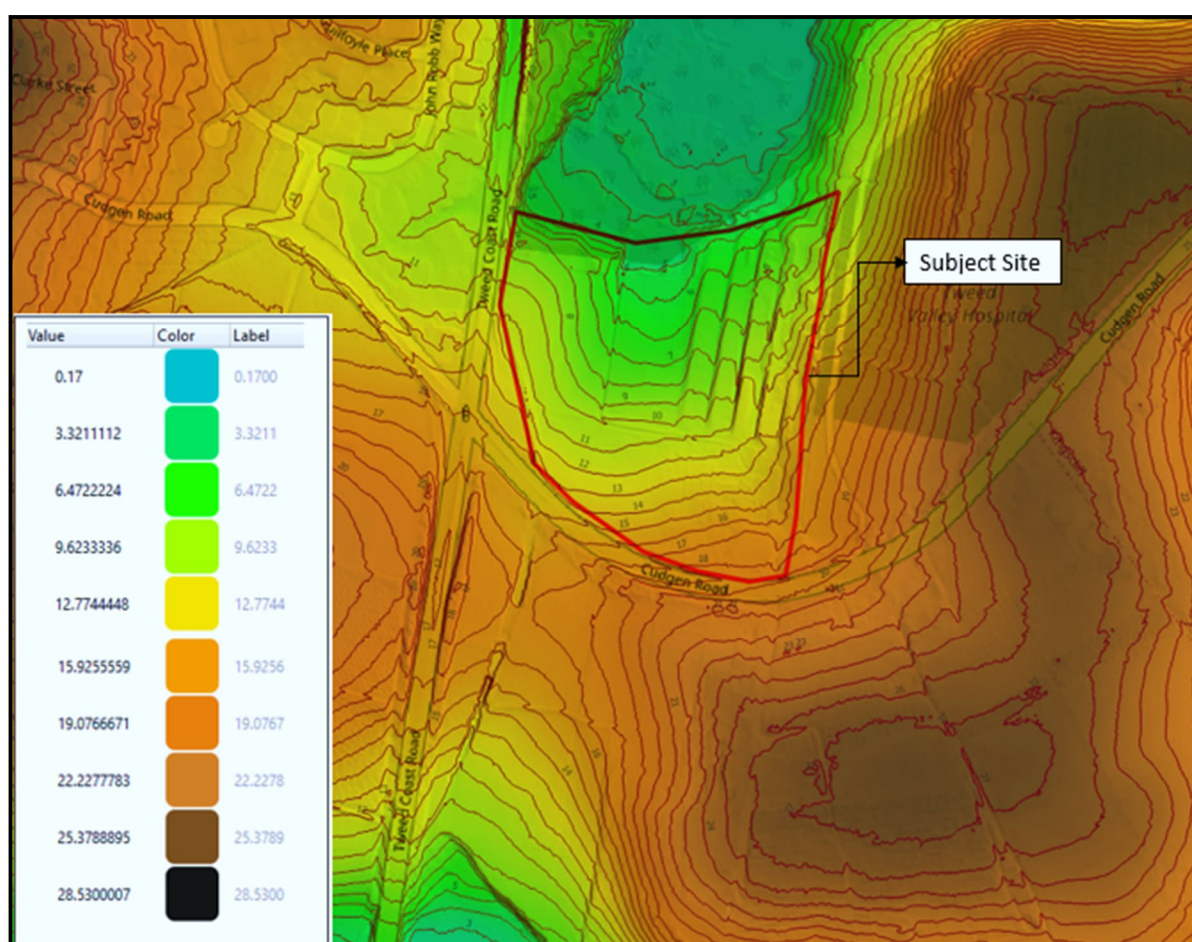


Figure 6: Site Topography (Source 1 m Lidar data from ELVIS digital elevation data)

While no earthworks design has been carried out for the site currently, it is anticipated that due to the size of the development, bulk earthworks will be required to accommodate buildings, roads and services. However, given the general gentle slopes of the site, no major issues with regrading the site to accommodate structures are foreseen.

4.2 Service Trenching

Refer to Table 4 below detailing the anticipated service trenching requirement to achieve infrastructure and servicing connection.

Table 4: Development Service Trenching Requirements

Service Connection	Proposed Connection Location	Service Connection Description	Service Trenching Requirements
Stormwater	Northern boundary of the site	Stormwater outlet for external catchments and runoff from internal to the site.	<ul style="list-style-type: none"> Minor regrading of channels to allow outfall of stormwater pipes to receiving waterway.
Water	South of subject site, within Cudgen Road.	New DN150 (TBC) Connection to the proposed DN250 main in Cudgen Road	<ul style="list-style-type: none"> Trenching of new DN250 reticulation main at two (2) locations within Cudgen Road. Moderate trenching works within the subject site to establish water service to buildings.
Sewer	North-western corner of subject site, within Tweed Coast Road.	Connection to existing DN225 rising main within Tweed Coast Road.	<ul style="list-style-type: none"> Moderate levels of internal trenching works to lay sewer mains to property connections. Trenching for installation of proposed sewer pump station. Approximately 75 m of trenching adjacent to northern access road to designated injection point into Council sewer.
Electrical	Connection to existing service within Cudgen Road.	Subject to advice from Electrical Consultant in liaison with the service provider (Essential Energy).	<ul style="list-style-type: none"> Trenching to be confirmed within future design and construction packages with Electrical Consultant.
Telecommunication	Subject to review and advice from comms providers (NBN, AARNet, Telstra).	To be confirmed by engaged Consultant in liaison with the local comms providers.	<ul style="list-style-type: none"> To be confirmed within future design and construction packages with Electrical Consultant.

Refer to Appendices B & C for the site DBYD enquiry results and civil plans respectively.

4.3 Traffic and Roadwork

Site access is proposed off Tweed Coast Rd (left-in only) and Cudgen Road (two way access) with a road network provided through the development site to navigate around the site including the provision of footpaths for pedestrian interconnectivity. A Traffic Impact Assessment completed by PSA Consulting has been prepared providing further details of the proposed traffic management strategy.

5 Stormwater Management

A Stormwater Management Plan (SWMP) has been prepared in support of the proposed Planning Proposal and future Cudgen Connection development at 741 Cudgen Road, Cudgen, NSW. The SWMP provides advice for the overall stormwater management strategy of the site to minimise the impacts of the proposed development both during its construction and operational phase.

Planit has assessed the proposed development in accordance with the TSC standards including engineering development design specifications and documents referenced within. Accordingly, the following key strategy components are recommended to facilitate future Development Application for the urban use of the site:

- Provide a stormwater network within the roads to capture site runoff and discharge to a centralised treatment and detention system.
- Provide building drainage that connects into the proposed stormwater network (subject to design).
- Provide a sump and pump system for proposed basement levels.
- Provide a treatment train that includes a Detention Tank (minimum storage of 1040m³), Humegard GPT (Model HG24) and Humefilter (Model UPT3000).
- Provide an open channel for management of external catchments including 2 new culvert crossings.
- Sediment and Erosion Control measures in accordance with TSC's Development Design Specification D7 are to be implemented during construction.

Based on the assessment undertaken, the Cudgen Connection proposal can manage stormwater appropriately. Accordingly, amendment of the Tweed Local Environmental Plan 2014 provisions to facilitate Cudgen Connection should not be refused or delayed as a result of stormwater management.

6 Services Assessment

6.1 Potable Water and Sewer

6.1.1 Water and Sewer Demands

The proposed change in land use, from dormant farmland to a suite of urban purposes is anticipated to generate a significant increase in demand for water and sewer services. The subject site is located within Council's Development Servicing Plan footprint and capacity has been identified within the catchments water and sewerage supply infrastructure. Notwithstanding, extension and upgrade works will be required to appropriately augment the existing network, which will be undertaken at no cost to Government.

The following sections detail the anticipated water and sewer infrastructure loadings created by the Cudgen Connection proposal, as well as the network augmentation required and Equivalent Tenement generations.

Table 5 presents the estimated water and sewer demands calculated in accordance with TSC Fees and Charges for equivalent tenements as guided by the NSW Water Directorate Section 64 Determinations of Equivalent Tenements.

Table 5: Water & Sewer Demand Estimates (Per TSC Fees & Charges)

Equivalent Tenement Estimate						
	Water	Sewer			Water	Sewer
Description	ET	ET	No.	m ²	ET	ET
Residential User Categories						
Multi-Dwelling Housing (High Density greater 2 stories)						
Potential of 1 bedroom each Dwelling	0.33	0.5	114	-	37.62	57.00
Potential of 2 bedroom each Dwelling	0.5	0.75	115	-	57.50	86.25
Potential of 3 or more bedroom each Dwelling	0.67	1.0	57	-	38.19	57.00
Commercial User Categories						
Shared recreational facility (Per shower & WC)	0.4	0.6	12	-	4.80	7.20
Child Care Centre (Per person)	0.06	0.1	75	-	4.50	7.50
Shop Gross Floor Area (m ²)	0.002	0.003	-	400	0.80	1.20
Commercial Premises Gross Floor Area (m ²)	0.004	0.006	-	800	3.20	4.80
Refreshment Room (m ²)	0.008	0.013	-	200	1.60	2.60
Take Away / Fast Food	0.03	0.048	-	200	6.00	9.60
Community Centre (amenities)	0.03	0.048	8	-	3.20	4.80
University (Person)	0.02	0.02	500	-	10.00	10.00
Private Hospital (Bed)	0.9	1.4	99	-	89.10	138.60
Medical Suites (Bed)	0.9	1.4	75	-	67.50	105.00
Mental Health Hospital (Bed)	0.9	1.4	66	-	59.40	92.40
Medical Hotel	0.3	0.45	86	-	25.80	38.70
Other						
Pool (assumed as 25 m lap pool)	4.33	6.5	2	-	8.66	13.00
				Totals	417.87	635.65

6.1.2 Potable Water

The proposed development will result in additional demand on the existing water main in Cudgen Road. The existing water mains adjacent to the site are DN250 mains and a section of dual DN150 mains; the existing site is currently connected to a section of the DN150 reticulation main.

To ensure adequate supply capacity to the proposed development, the following design flow calculations have been undertaken in accordance with TSC's Development Design Specifications D11 – Water Supply:

- As detailed above, the proposed demand of the development is **417.87 ET (1170.04 EP)**
- Average Daily Demand (**ADD**) on main (370L/day/EP) = **432.92 kL/day**
 - 417.87 ET @ 2.8EP/ET = **1170.04 EP**
 - 1170.04 EP @ 0.37kL/day/EP = **432.92 kL/day**
- Peak Hour Demand (**PHD**) + Fire Flow Demand (**FF**) = **42.89 L/s**
 - Peak Hour Demand (**PHD**) on main (0.05L/s/ET) = 417.87 @ 0.05L/s/ET = **20.89 L/s**
 - Fire Flow Demand (**FF**) (Commercial/multi-storey residential) = **22 L/s**

Based on the above equivalent tenement and water demand calculations, the water demand from the proposed development is estimated to be a peak of 42.89 L/s.

Earlier water demand of the original Concept Masterplan was discussed with Council. Council advised that based on the estimated sewer demand of 371.433 ET (PHD + FF = 40.58 L/s), an extension of, and connection to the existing DN250 main adjacent to Cudgen Road is the most suitable water servicing location (as summarised within Table 6).

Since the initial discussion with Council, the Concept Masterplan has evolved further, increasing the anticipated water demand by a total of 2.31 L/s to a revised PHD + FF total of 42.89 L/s. As the difference is considered negligible with respect to overall network capacity, it is envisaged that Council's advice will remain the same as what is outlined within Table 6 and Figure 7.

A request for water service connection advice has since been reissued to Council for further assurance of no change, and a response is yet to be provided.

Table 6: TSC Water Service Connection Advice (To be confirmed by TSC)

Council Service	Proposed Development Connection Location	Upgrades Required (TBC by TSC)	Additional Commentary
Water	Existing property connection located with Cudgen Road with upgrades to the existing connection to facilitate the anticipated demands of the development (subject to hydraulic analysis/design).	<p>Envisaged Developer Works: Extension of existing DN250 main adjacent to Cudgen Road frontage at a minimum to Turnock Street (DN250 minimum).</p> <p>Envisaged (Potential) Headworks: Developer may also be expected to contribute to future works upgrades along McPhail Ave./Turnock St (augmenting distribution supply from the reservoir(s) to the development site).</p>	<p>Existing DN150/DN250 within Cudgen Road contains insufficient hydraulic capacity to service the development.</p> <p>It is not envisaged that a Voluntary Planning Agreement is required. This shall be confirmed by TSC when confirming extent of upgrade works</p>

Due to a negligible increase in water supply demands, minor change in Council's advice cannot be entirely ruled out. However, as the design flow rate has only increased by approximately 2.31 L/s, it is not believed that there shall be any major changes in advice or servicing arrangements than what has been previously provided by TSC.

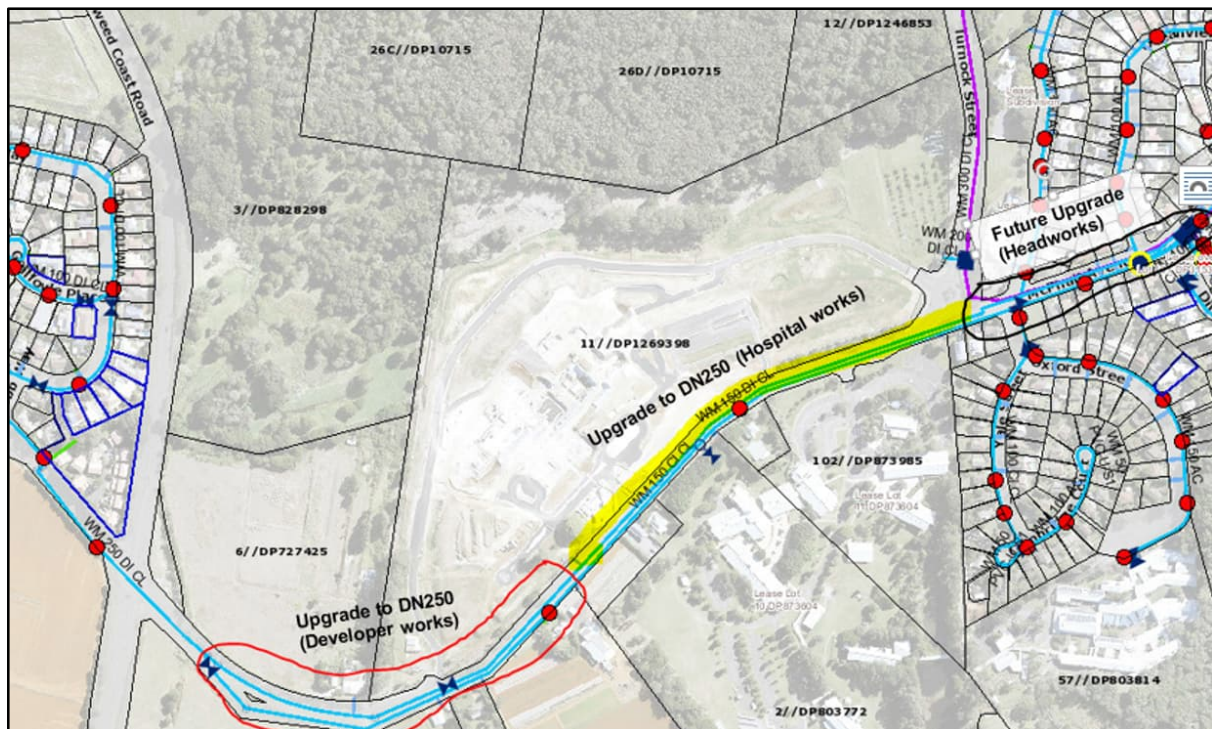


Figure 7: Water Infrastructure Upgrades

6.1.3 Sewer

Two sewer rising mains (DN225 & DN375) exist within Tweed Coast Road adjacent to the subject site. In the pre-lodgement meeting brief, TSC advised they shall advise on the sewer connection location, and providing an allowable pump rate, and pressure requirements for consideration in design following Planit's assessment of the sewer loading.

Subsequently, Planit Consulting has undertaken a demand estimation based upon the developments anticipated usages per the provided concept plans, in accordance with the WSA02 Guidelines and TSC Development Design Specification D12, as detailed below:

- As detailed above, the proposed sewer loading of the development is **635.65 ET (1779.82 EP)**.
- **ADWF** (180L/EP/day OR 0.0021 L/s/EP) = $635.65 \text{ ET} \times 2.8 \text{ EP/ET} = 1779.82 \text{ EP} \times 0.0021 \text{ L/s} = \mathbf{3.74 \text{ L/s}}$
- **PDWF** ($d \times \text{ADWF}$) = ($4.723 \times 3.74 \text{ L/s}$) = **17.66 L/s**
- **GW** ($0.025 \times A(\text{Ha}) \times \text{Portion (wet)}$) = ($0.025 \times 5.9144 \text{ Ha} \times 0.5$) = **0.074 L/s**
- **IIF** ($0.028 \times A(\text{Eff}) \times C \times I$) = $0.028 \times 2.809 \text{ Ha} \times 0.4 \times 98.11 \text{ mm/hr} = \mathbf{7.46 \text{ L/s}}$
- **Design Flow** (PDWF + GW + IIF) = ($17.66 + 0.074 + 7.46$) = **25.188 L/s**
- **C** (Soil Aspect + Network Defects Aspect) = 1.0
- **I** Rainfall Intensity Factor x Factor Size x Factor Containment = 94.840 mm/hr

Based on the above equivalent tenement and sewer flow calculations, the design sewer flow from the proposed development is estimated to be a peak of 25.188 L/s.

Earlier water demand of the original Concept Masterplan was discussed with Council. Council advised that based on the estimated sewer demand of 568.35 ET (Design Flow = 23.319 L/s), a connection to the existing DN225 sewer rising main located within Tweed Coast Road via a new private sewer pump station is proposed as detailed within Table 7.

Since the initial discussion with Council, the Concept Masterplan has evolved further, increasing the anticipated sewer demand by a total of 1.869 L/s to a revised design flow total of 25.188 L/s. As the

difference is considered negligible with respect to overall network capacity, it is envisaged that Council's advice will remain the same as what is outlined within Table 7 below.

A request for sewer service connection advice has since been reissued to Council for further assurance of no change, and a response is yet to be provided.

Table 7: TSC Sewer Service Connection Advice (To be confirmed by TSC)

Council Service	Envisaged Development Connection Location	Envisaged Developer Upgrades Required	Additional Commentary
Sewer	Construction of a new private sewer pump station within the subject site is required. This shall be accompanied with construction of a rising main which connects to existing DN225 sewer rising main (SRM) in Tweed Coast Road adjacent to NW corner of development site.	<p>Connection must include property boundary kit including:</p> <ul style="list-style-type: none"> - Isolation Valve - Reflux Valve - Isolation valve arrangement - Air valve may also be required (dependent upon longitudinal detail of private pumped system) 	When pumping alone, the receiving SRM system (part of the immediate downstream section) may be at atmospheric pressure, i.e. the receiving SRM may not be pressurized and it may be gravitating/at atmospheric pressure. Hence, an air valve may be required as part of the connection depending on the longitudinal detail of the private rising main and connection.

Due to a negligible increase in sewer design flows, minor change in Council's advice cannot be entirely ruled out. However, as the design flow rate has only increased by approximately 1.869 L/s, it is not believed that there shall be any major changes in advice or servicing arrangements than what has been previously provided by TSC.

6.2 Electrical Services

Essential Energy is the main service authority for power supply in the Northern Rivers region and is responsible for building, operating, and maintaining the electricity network of the site.

A desktop review of the existing electrical services local to the site has indicated that an underground property connection exists at the south-eastern boundary of the site, adjacent to the existing site entry.

Preliminary liaison with a local electrical consultant has indicated that whilst improvement works, such as substations, will be required to support the Cudgen Connection proposal, the provision of electricity to the site does not form a barrier to its use for urban purposes.

An electrical consultant will be engaged through future design and construction processes for the Cudgen Connection proposal to establish a fit-for-purpose electrical servicing strategy.

6.3 Telecommunications

As detailed within Table 3 of Section 3.2 of this report, Optus and ARNet are the two main telecommunications service providers of communication infrastructure surrounding the subject site.

Access to suitable telecommunications infrastructure is not a barrier to the sites intended use for urban purposes. Further, it is assumed that the telecommunications infrastructure that exists within Cudgen Road will be augmented and utilised in the developed scenario, as per typical development practices.

6.4 Developer Contributions

Whilst not applicable until the future DA phase/s, this EA acknowledges that developer contributions associated with the proposed development shall be payable, as per Council's established fees and charges developer contributions framework.

It is noted that TSC now offer non-residential high consumption charges as a user pay system in lieu of upfront developer contributions for water and sewer. It is advised that this option is likely to be pursued by the applicant noting that upfront contributions may be required for the water main upgrades between Turnock Street and McPhail Street TSC reservoirs as per Councils advice. This shall be discussed with Council in further detail once the development processes into Development Application and subsequent Section 68 Approval works under the Local Government Act 1993.

7 Conclusion/Recommendations

This Engineering Assessment (EA) details a utility and infrastructure servicing strategy that addresses current capacity, as well as the future needs of both a strategic change in land use from agriculture to urban purposes, and the Cudgen Connection proposal itself.

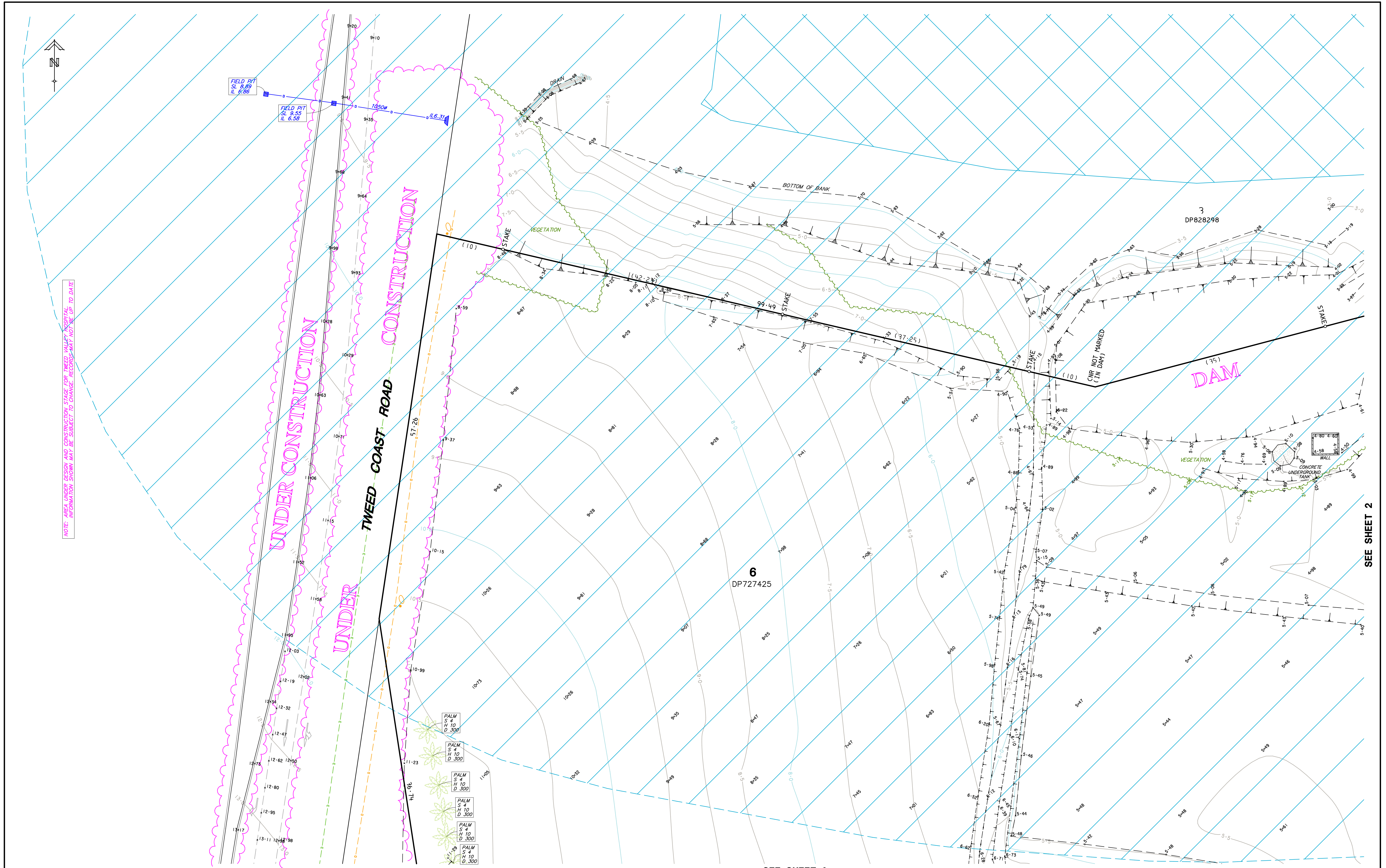
This EA does not identify any civil infrastructure barriers to facilitating the Planning Proposal and provides a suite of specific infrastructure works to appropriately facilitate the Cudgen Connection proposal.

Planit has assessed the proposed development in accordance with TSC's standards and specifications including documents reference therein. Accordingly, the following was determined:

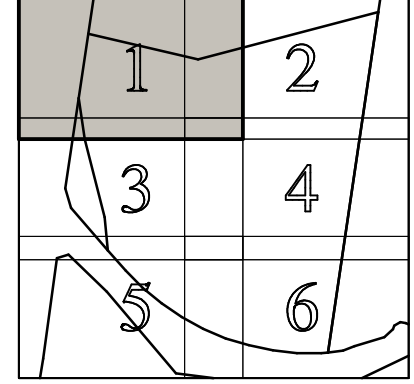
- Earthworks and Road works:
 - Earthworks to ensure the site is at a sufficient height for minimum habitable flood levels and consideration for Probable Maximum Flood (PMF) event for critical structures considered.
 - Trenching within public land to provide water and sewer connections to Council infrastructure are required.
 - Minor works likely for stormwater connections adjacent to the northern boundary.
- Stormwater (Specific detail within SWMP Report):
 - Provide a stormwater network within the roads to capture site runoff, building drainage and subsequently discharge to a centralised treatment and detention system.
 - Provide an open channel for management of external catchments.
 - Provide a sump and pump system for proposed basement levels.
- Sewer:
 - Construction of a new private sewer pump station within the subject site. This shall be accompanied with construction of a rising main which connects to existing DN225 sewer rising main (SRM) in Tweed Coast Road adjacent to NW corner of development site.
- Water:
 - Developer Works: Extension of existing DN250 main adjacent to Cudgen Road frontage at a minimum to Turnock Street (DN250 minimum).
 - (Potential) Headworks: The developer may also be expected to contribute to future works upgrades along McPhail Ave./Turnock St (augmenting distribution supply from the reservoir(s) to the development site).
- Electrical & Telecommunications:
 - Utilise the existing power services located in the vicinity to service the proposed lot, subject to the detailed design undertaken by a suitably qualified Electrical Consultant in liaison with Essential Energy.
 - Utilise the existing telecommunication property connection located on the South boundary of the subject site, along the Cudgen Road.

Based on the information collected and preliminary investigations carried out it is believed that the infrastructure and services including roads, stormwater drainage, sewer and water reticulation, electricity and telecommunications that surround the site have adequate capacities to service the proposed development.

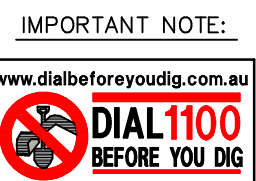
Appendix A – Site Survey & Masterplan Layout



NOTE: AREA UNDER DESIGN AND CONSTRUCTION STAGE FOR TWEED VALLEY HOSPITAL INFORMATION SHOWN MAY BE SUBJECT TO CHANGE. RECORDS MAY NOT BE UP TO DATE



EXTRACT FROM THE STATE ENVIRONMENTAL PLANNING POLICY (RESILIENCE AND HAZARDS 2021)
COASTAL WETLANDS AND LITTORAL RAINFORESTS AREA MAP:
... COASTAL WETLANDS
... PROXIMITY AREA FOR COASTAL WETLANDS



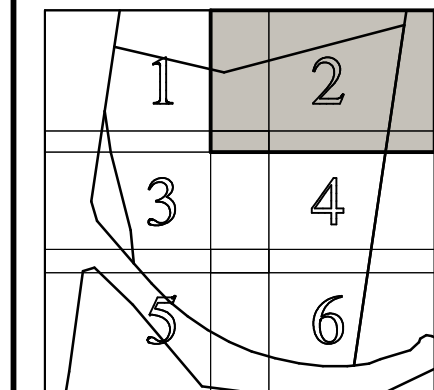
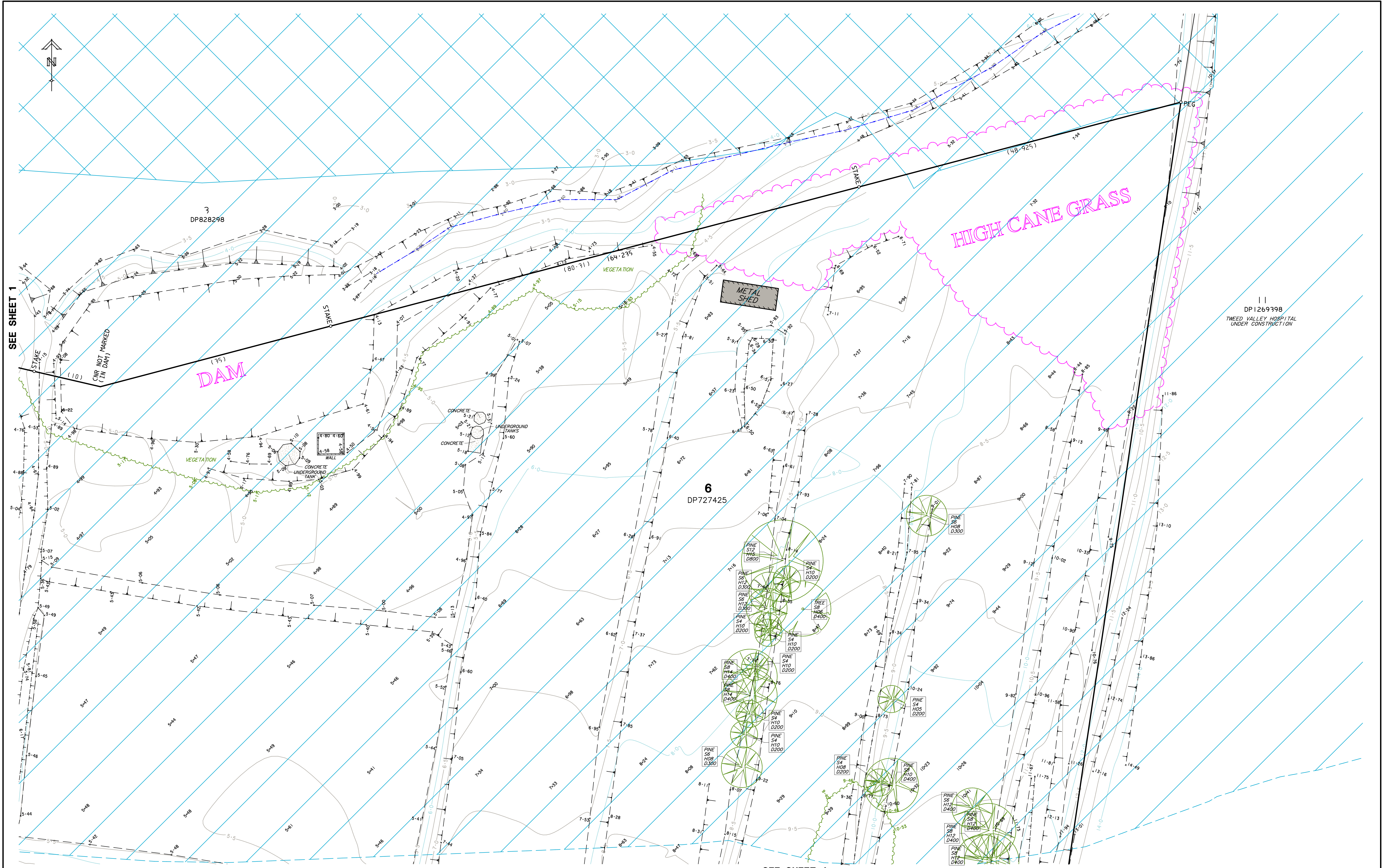
ALL UNDERGROUND SERVICES SHOULD BE LOCATED ONSITE BY RELEVANT AUTHORITIES BEFORE ANY WORK IS COMMENCED.

- LEGEND**
- ... ELECTRICITY LIGHT POLE
 - ... ELECTRICITY POLE
 - ... OPTUS UNDERGROUND MARKER
 - ... COMMUNICATIONS PIT
 - ... TELSTRA PIT
 - ... STORMWATER LINE
 - ... OVERHEAD ELECTRICITY LINE
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SEE SHEET 3

SEE SHEET 2

Revision Client: Cudgen Health Precinct Pty Ltd		Important Notes: (THIS NOTE IS AN INTEGRAL PART OF THIS PLAN) DATE OF SURVEY: 4,5,6,7,10,11,27,28/10/2022 CONTOUR INTERVAL - 0.5 m LEVEL DATUM: VIDE SSM 62101 RL 26.065 AHD CONTOURS ARE DERIVED FROM FIELD OBSERVATIONS AND ARE ACCURATE TO WITHIN HALF THE CONTOUR INTERVAL ONLY VISIBLE SURFACE FEATURES OF UNDERGROUND SERVICES HAVE BEEN SHOWN. NO REPORT IS MADE ON ANY UNDERGROUND SERVICES ON OR ADJACENT TO THE SITE. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITIES SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATION OF ALL SERVICES. THE TITLE BOUNDARIES AS SHOWN HEREON WERE NOT MARKED AT THE TIME OF SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY & NOT BY FIELD SURVEY.		LEVEL & DETAIL SURVEY LOT 6 IN DP727425 CUDGEN ROAD, CUDGEN Parish of CUDGEN County of ROUS T:\17000\17081\Topo\2209\25130B.pro Scale @ A1 1 : 250 Level Datum A.H.D. F.Bk L/L - Drawn A.W/TPK C.H.K.		B & P SURVEYS CONSULTING SURVEYORS ABN: 55 01017236 30 Beryl Street Tweed Heads, NSW 2485, Australia Telephone: (07) 5536 3611 Fax: (07) 5536 3701 Email: twed@bpsurveys.com.au Webpage: www.bpsurveys.com.au Offices Also At: Nerang Ph: (07) 55960370 Murwillumbah Ph: (02) 66721924		 A QUALITY ASSURED COMPANY			
				Ref. No. T17081		Date 3.11.2022		Drawing No./Size 25130 B		Rev. -	



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SEE SHEET 4

SHEET 2 OF 6

Cudgen Health Precinct Pty Ltd		Important Notes: (THIS NOTE IS AN INTEGRAL PART OF THIS PLAN) DATE OF SURVEY: 4,5,6,7,10,11,27,28/10/2022 CONTOUR INTERVAL: 0.5 m. LEVEL DATUM: VIDE SSM 62101 RL 26.065 AHD CONTOURS ARE DERIVED FROM FIELD OBSERVATIONS AND ARE ACCURATE TO WITHIN HALF THE CONTOUR INTERVAL ONLY VISIBLE SURFACE FEATURES OF UNDERGROUND SERVICES HAVE BEEN SHOWN. NO REPORT IS MADE ON ANY UNDERGROUND SERVICES ON OR ADJACENT TO THE SITE. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITIES SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATION OF ALL SERVICES. THE TITLE BOUNDARIES AS SHOWN HEREON WERE NOT MARKED AT THE TIME OF SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY & NOT BY FIELD SURVEY.		LEVEL & DETAIL SURVEY LOT 6 IN DP727425 CUDGEN ROAD, CUDGEN Parish of CUDGEN County of ROUS T:\17000\17081\Topo\2209\25130B.pro Scale: A1 1 : 250 Level Datum A.H.D. F.Bk L/L Drawn A.W./T.P. C.H.K.		B & P SURVEYS CONSULTING SURVEYORS ABN: 55 01017236 30 Beryl Street Tweed Heads, NSW 2485, Australia Telephone: (07) 5536 3611 Fax: (07) 5536 3701 Email: twed@bpsurveys.com.au Webpage: www.bpsurveys.com.au Offices Also At: Nerang Ph: (07) 55960370 Ph: (02) 66721924 Murwillumbah		Ref. No. T17081	Date 3.11.2022	Drawing No./Size 25130 B	Rev. -
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SEE SHEET 1

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UNDER CONSTRUCTION

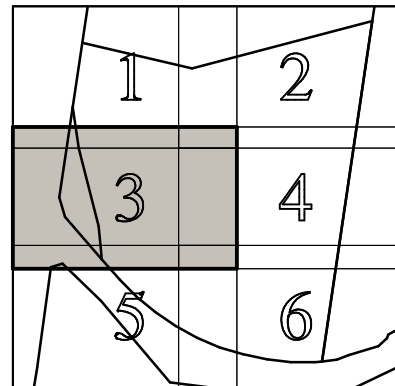
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DP727425

CUDGEN ROAD

SEE SHEET 5

SEE SHEET 4



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- ... ELECTRICITY POLE
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- ... TELSTRA PIT
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- ... OVERHEAD ELECTRICITY LINE
- ... WATER FROM DBYD RECORDS
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- ... SEWER RISING MAIN FROM DBYD RECORDS
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Cudgen Health Precinct Pty Ltd

LEVEL & DETAIL SURVEY

LOT 6 IN DP727425
CUDGEN ROAD, CUDGEN

Parish of CUDGEN County of ROUS

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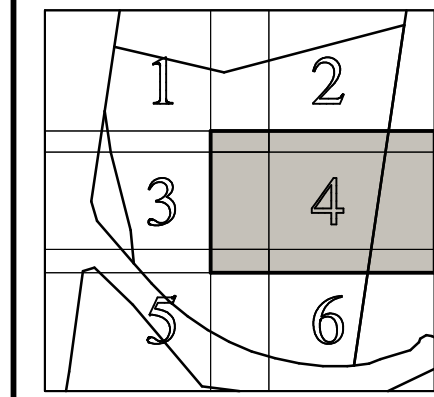
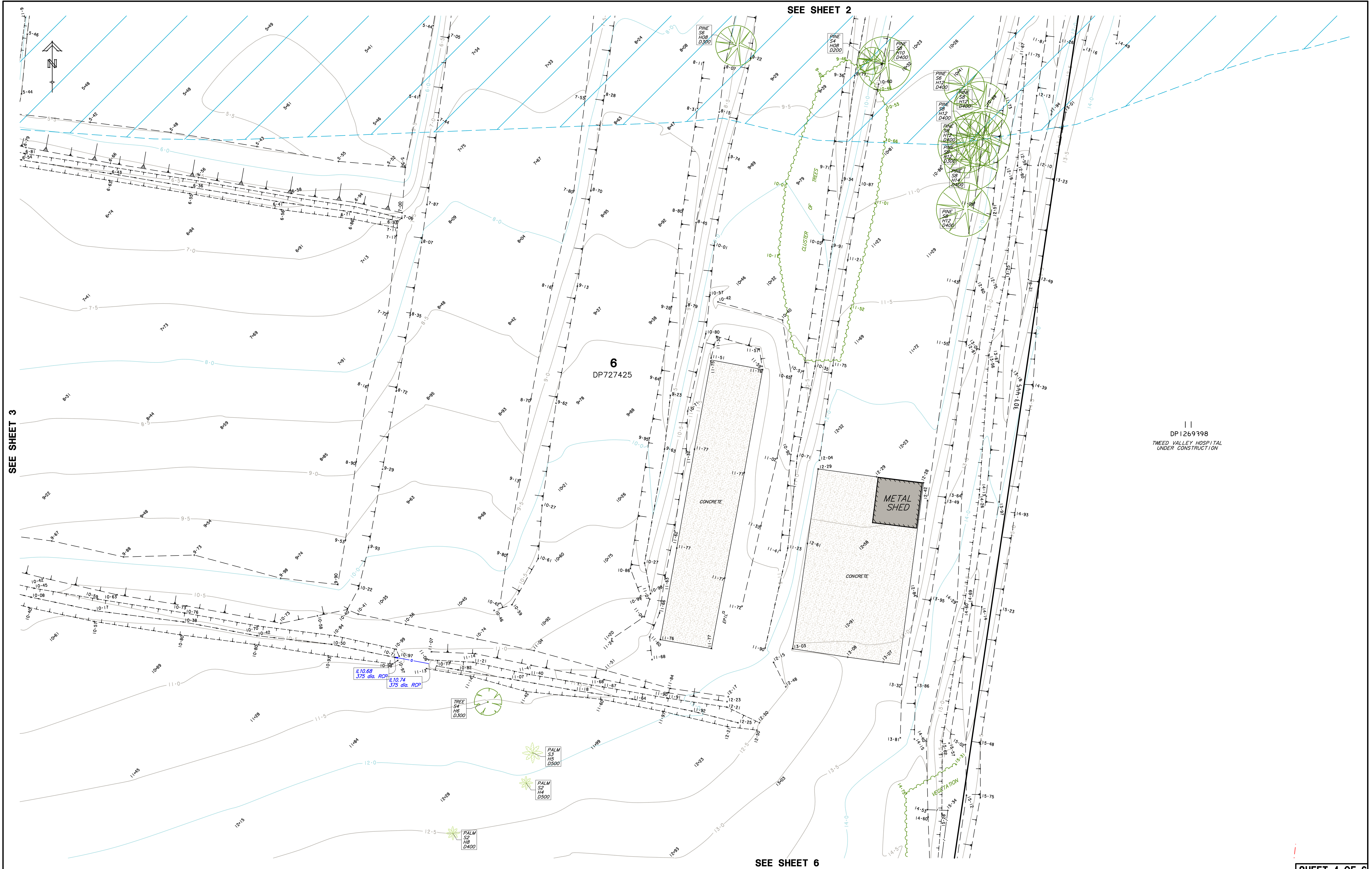
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B & P SURVEYS
CONSULTING SURVEYORS
ABN: 55 01017236
30 Beryl Street
Tweed Heads, NSW, 2485, Australia
Telephone: (07) 5536 3611
Fax: (07) 5536 3701
Email: tweed@bpsurveys.com.au
Webpage: www.bpsurveys.com.au



Offices Also At: Nerang Ph: (07) 55960370 Murwillumbah Ph: (02) 66721924

Ref. No: T17081 Date: 3.11.2022 Drawing No./Size: 25130 B Rev: -



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LEGEND

- ELP ... ELECTRICITY LIGHT POLE
- EP ... ELECTRICITY POLE
- OPTUS ... OPTUS UNDERGROUND MARKER
- COM ... COMMUNICATIONS PIT
- TELSTRA ... TELSTRA PIT
- STORM ... STORMWATER LINE
- OVERHEAD ... OVERHEAD ELECTRICITY LINE
- WATER ... WATER FROM DBYD RECORDS
- AARNET ... AARNET FROM DBYD RECORDS
- OPTUS ... OPTUS FROM DBYD RECORDS
- SEWER ... SEWER RISING MAIN FROM DBYD RECORDS
- TELSTRA ... TELSTRA FROM DBYD RECORDS

Revision

Client

Cudgen Health Precinct Pty Ltd

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CONTOUR INTERVAL: 0.5

LEVEL DATUM: VIDE SSM 62101 RL 26.065 AHD

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Parish of CUDGEN County of ROUS

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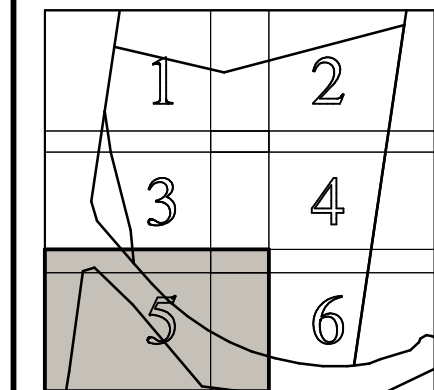
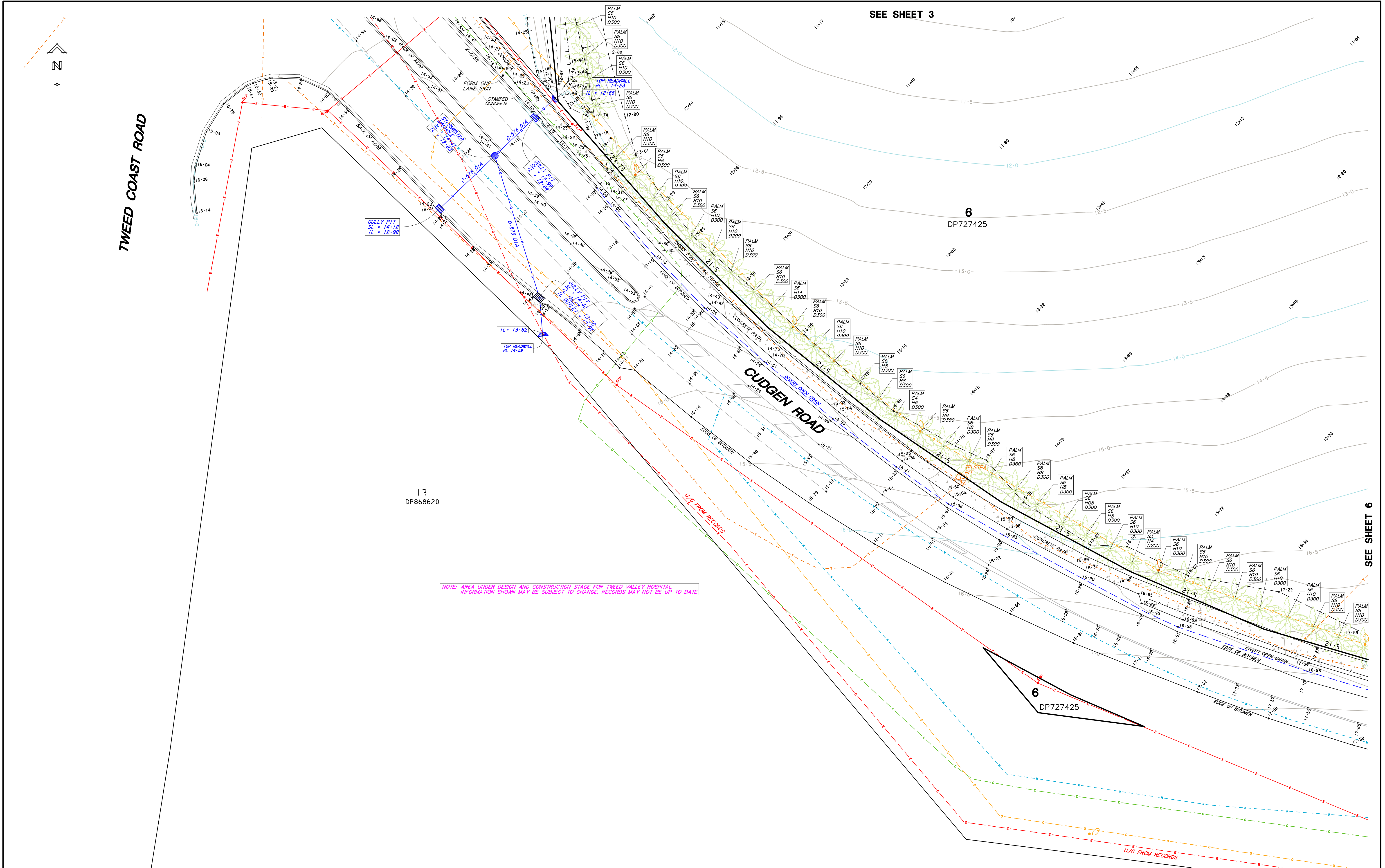
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B & P SURVEYS
CONSULTING SURVEYORS

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Ph: (07) 55960370 Ph: (02) 66721924

bp
A QUALITY ASSURED COMPANY



Scale in Metres - 1:250

IMPORTANT NOTE:

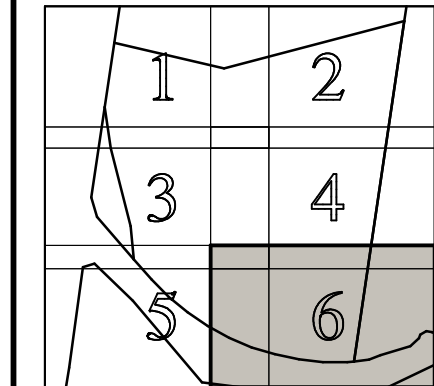
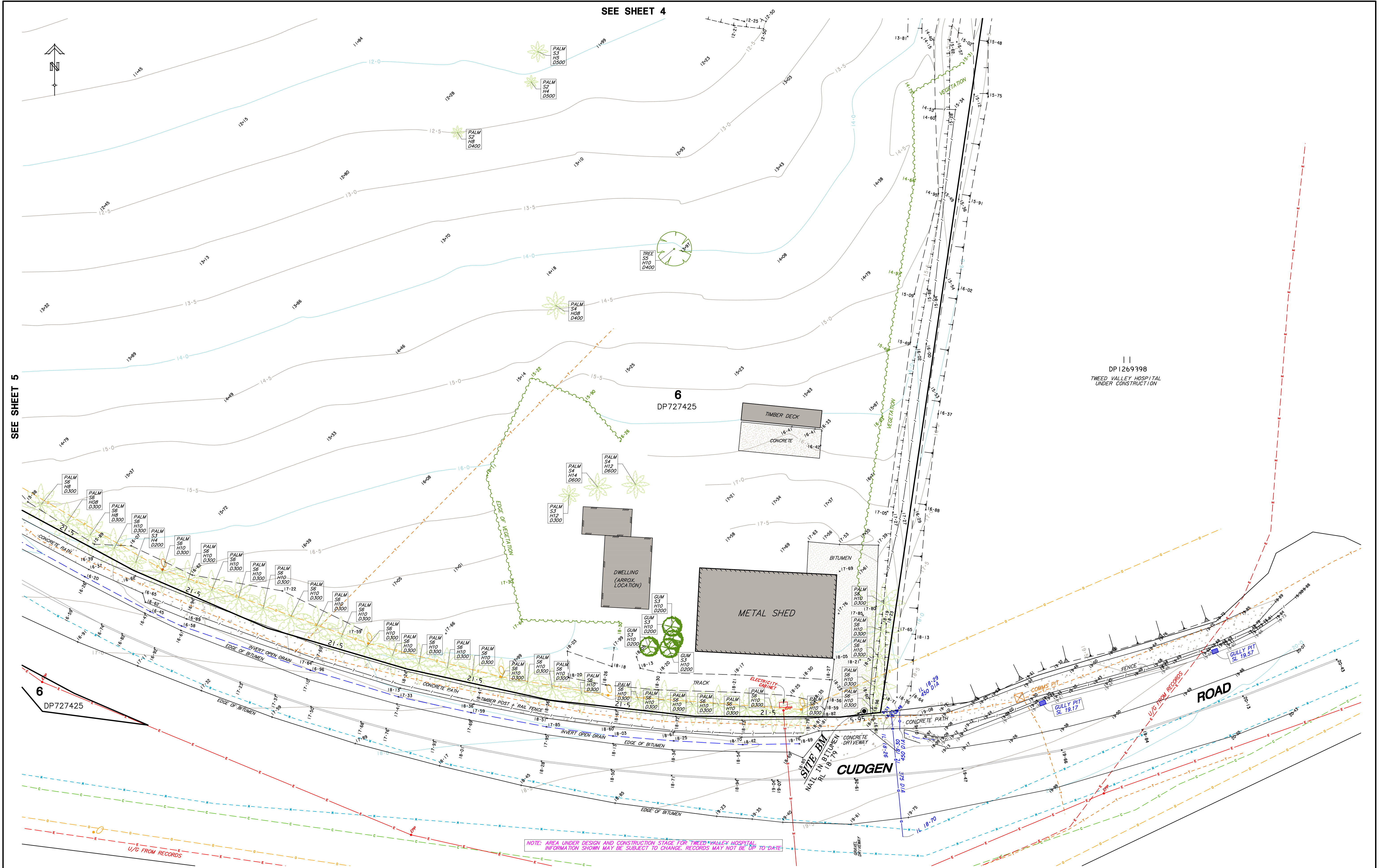


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- SL ... STORMWATER LINE
- OE ... OVERHEAD ELECTRICITY LINE
- WR ... WATER FROM DBYD RECORDS
- AR ... AARNET FROM DBYD RECORDS
- OP ... OPTUS FROM DBYD RECORDS
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Revision		Client	Chkd
Cudgen Health Precinct Pty Ltd			

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				T17081		3.11.2022	
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				25130 B		-	



DEVELOPMENT SUMMARY:	
HEALTH, UNIVERSITY AND MEDICAL HOTEL - APPROXIMATELY 28 829 m²	
RETAIL, CHILDCARE AND COMMUNITY CENTRE - APPROXIMATELY 3709 m²	
ESSENTIAL WORKER HOUSING, APPROXIMATELY 286 UNITS, 24 061 m²	
PARKLAND AND GREEN SPACES - APPROXIMATELY 13 626 m²	

Appendix B – Dial Before You Dig (DBYD)



Before You Dig Australia(BYDA) Pipeline Location Information

Customer Service | 1300 292 872 | (02) 6670 2400
PO Box 816 Murwillumbah NSW 2484
Fax (02) 6670 2429 | ABN 90 178 732 496
tsc@tweed.nsw.gov.au | www.tweed.nsw.gov.au

To:

Jake Bentley
80-84 Ballina Street Shop 9a
Lennox Head NSW 2478

Email: jakeb@planitconsulting.com.au

Phone: +61266874666

Enquiry Details

Utility ID	17550
Sequence Number	230804440
Enquiry Date	13/10/2023 08:18
Response	AFFECTED
Address	741 Cudgen Road Cudgen
Location in Road	Road,Nature Strip,Footpath
Activity	Mechanical Excavation,Manual Excavation

Enquirer Details

Customer ID	3045410
Contact	Jake Bentley
Company	
Email	jakeb@planitconsulting.com.au
Phone	+61266874666

Enquirer Responsibilities

Asbestos Cement Pipes: Some of Council's pipe assets are constructed of AC (Asbestos Cement). In most instances our plans will indicate the pipe construction material. For any diggings in the vicinity of these pipes you need to be aware of health implications of disruption to AC pipes. Individual risk assessments need to be conducted when working near these pipes to ensure protection of your staff.

Internal Drainage: Map does not cover internal drainage to property, internal water connection, water meter details or sewerage pipe details

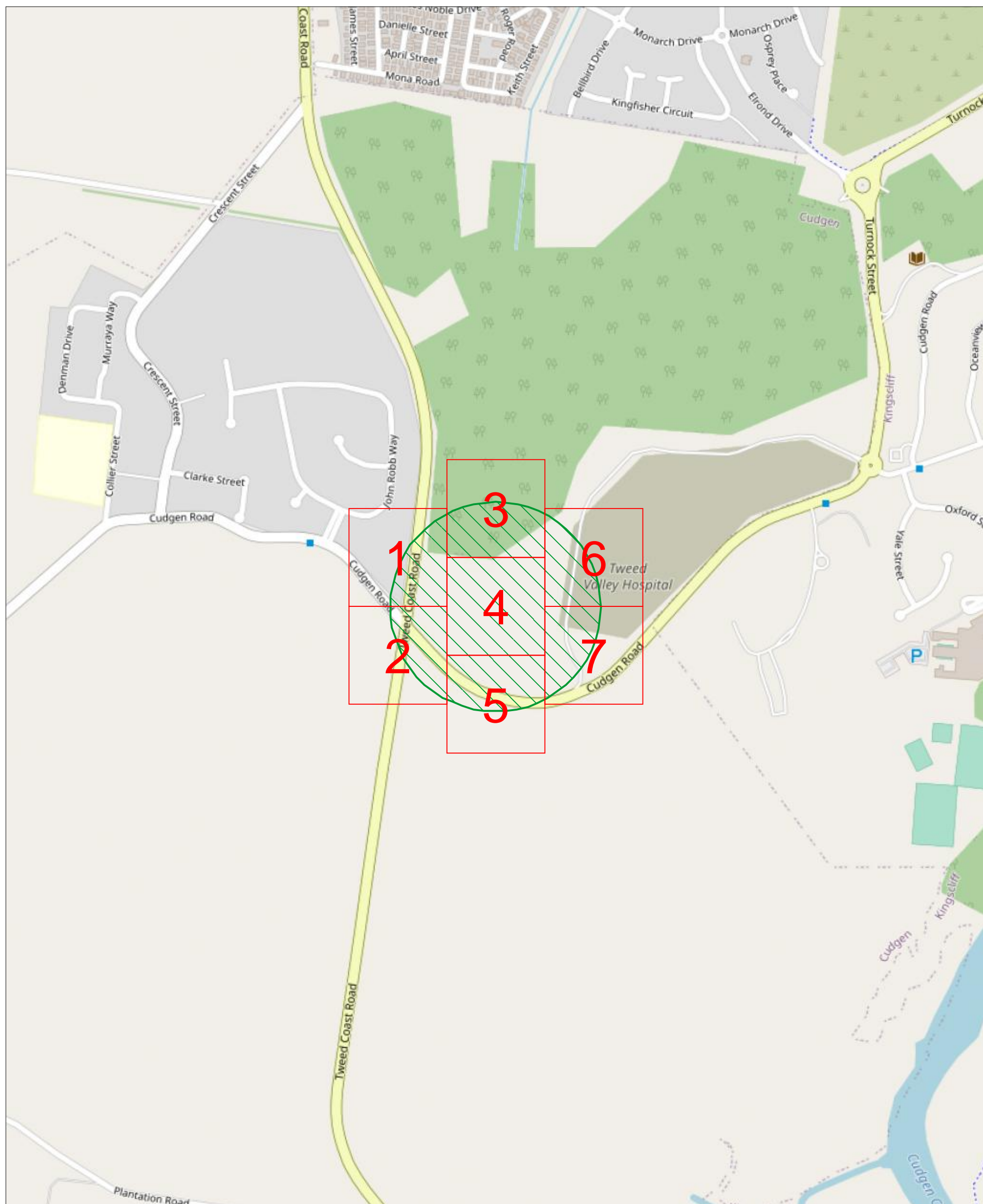
Damage: Tweed Shire Council reserves all rights to recover compensation for any damage to Sewer mains, Water mains and Stormwater.

On Site Locations: Tweed Shire Council provides on site location for BYDA requests only. For onsite sewer mains, water mains and stormwater drain locations please contact Tweed Shire Council on (02) 6670 2460 at least 2 to 3 days prior to commencement.



Overview Map

Sequence No: 230804440
 741 Cudgen Road Cudgen



1:5000 @ A3 Portrait

Legend:

 BYDA Work Area

Imagery sourced from OpenStreetMaps

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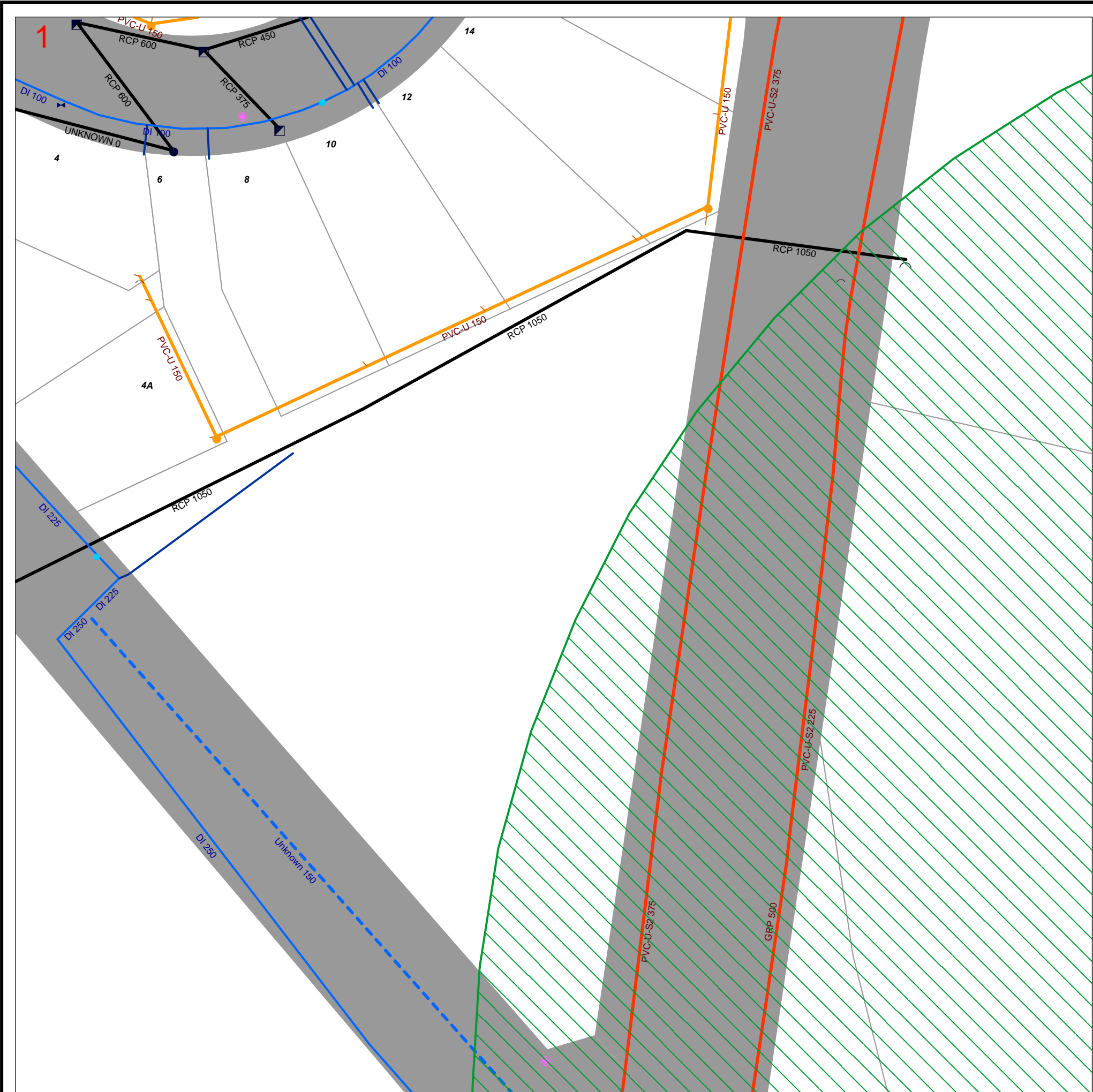


Map 1

Sequence No: 230804440
741 Cudgen Road Cudgen



Date: 13/10/2023



Sewer Pipeline <ul style="list-style-type: none">Sewer Rising MainSewer Rising Main (Abandoned)Sewer Rising Main (Private)Sewer Gravity Main (Abandoned)Sewer Gravity OverflowSewer Gravity Main (Private)Sewer Service Connection Sewer Gravity Mains <ul style="list-style-type: none">0- 200225 - 600700- 900Sewer Vacuum Mains	Sewer Node <ul style="list-style-type: none">End CapPublic ManholePublic Property PumpPublic Pump StationVacuum ChamberVent Stack Communication <ul style="list-style-type: none">Communication NodeCommunication Cables	Stormwater Pipe (Survey) <ul style="list-style-type: none">Stormwater Pipe (Survey)Stormwater Culvert (Survey) Stormwater Pipe <ul style="list-style-type: none">Stormwater PipeStormwater Pipe (Abandoned)Stormwater Pipe (Private)Stormwater CulvertStormwater Culvert (Abandoned)Stormwater ChannelStormwater Channel (Abandoned)	Stormwater Node (Survey) <ul style="list-style-type: none">ManholeDrop InletKerb InletWingwall Stormwater Node <ul style="list-style-type: none">ManholeDrop InletKerb InletWingwallPrivate Stormwater Point	Water Pipe Location <ul style="list-style-type: none">Water MainWater Main (Abandoned)Water Main (Private)Water Main (Recycled)Water Service Connections Water Node <ul style="list-style-type: none">Gate ValveHydrantPressure Reducing ValvePressure Sustaining ValvePumpReservoirScour Valve	SCIMS Survey Marks <ul style="list-style-type: none">CPCRGBMMPMSSTS General <ul style="list-style-type: none">Property BoundaryBYDA Work AreaFlood Levee
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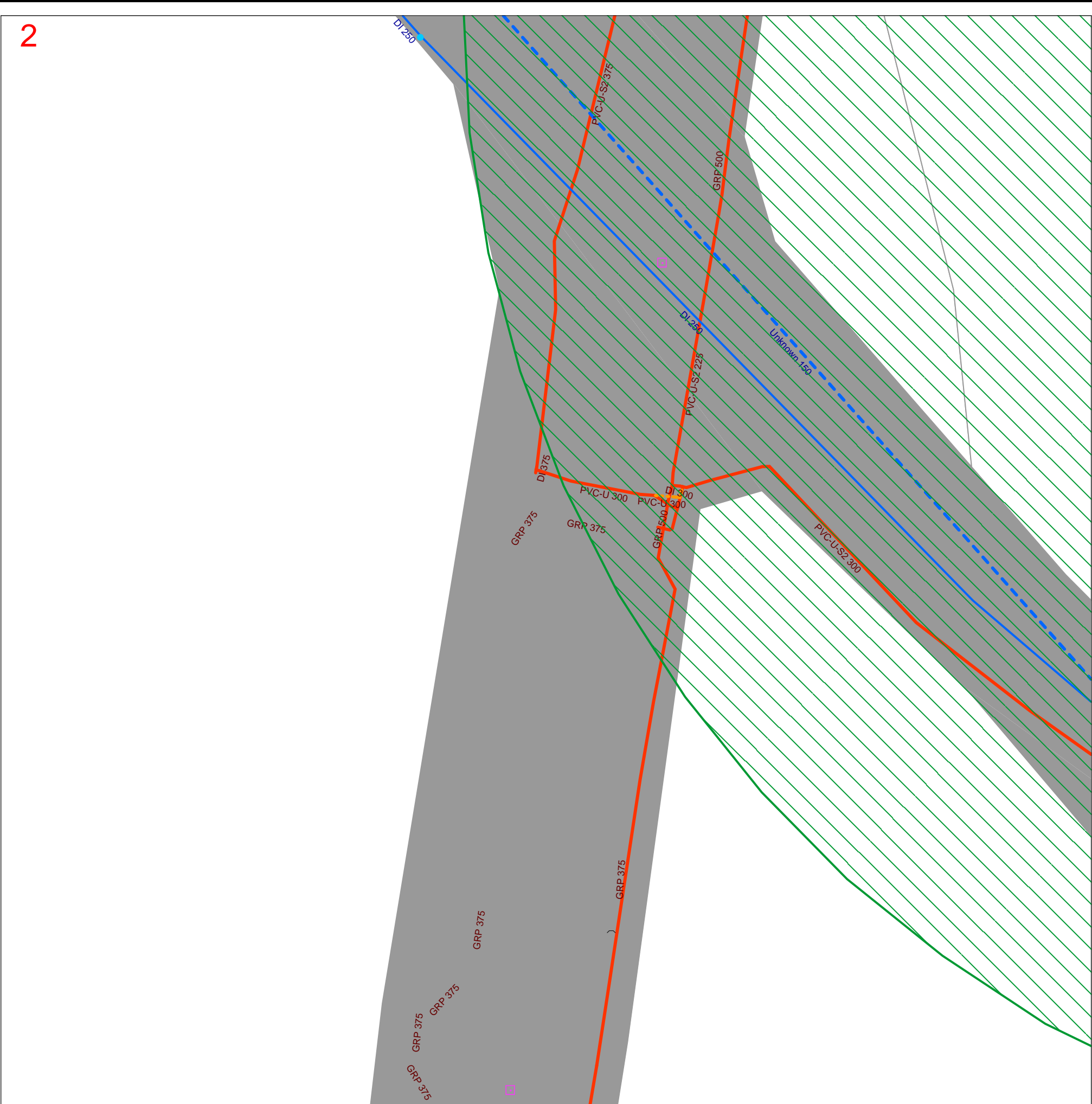


Map 2

Sequence No: 230804440
741 Cudgen Road Cudgen



Date: 13/10/2023



Sewer Pipeline <ul style="list-style-type: none">Sewer Rising MainSewer Rising Main (Abandoned)Sewer Rising Main (Private)Sewer Gravity Main (Abandoned)Sewer Gravity OverflowSewer Gravity Main (Private)Sewer Service Connection Sewer Gravity Mains <ul style="list-style-type: none">0- 200225 - 600700- 900Sewer Vacuum Mains	Sewer Node <ul style="list-style-type: none">End CapPublic ManholePublic Property PumpPublic Pump StationVacuum ChamberVent Stack Communication <ul style="list-style-type: none">Communication NodeCommunication Cables	Stormwater Pipe (Survey) <ul style="list-style-type: none">Stormwater Pipe (Survey)Stormwater Culvert (Survey) Stormwater Pipe <ul style="list-style-type: none">Stormwater PipeStormwater Pipe (Abandoned)Stormwater Pipe (Private)Stormwater CulvertStormwater Culvert (Abandoned)Stormwater ChannelStormwater Channel (Abandoned)	Stormwater Node (Survey) <ul style="list-style-type: none">ManholeDrop InletKerb InletWingwall Stormwater Node <ul style="list-style-type: none">ManholeDrop InletKerb InletWingwallPrivate Stormwater Point	Water Pipe Location <ul style="list-style-type: none">Water MainWater Main (Abandoned)Water Main (Private)Water Main (Recycled)Water Service Connections Water Node <ul style="list-style-type: none">Gate ValveHydrantPressure Reducing ValvePressure Sustaining ValvePumpReservoirScour Valve	SCIMS Survey Marks <ul style="list-style-type: none">CPCRGBMMPMSSTS General <ul style="list-style-type: none">Property BoundaryBYDA Work AreaFlood Levee
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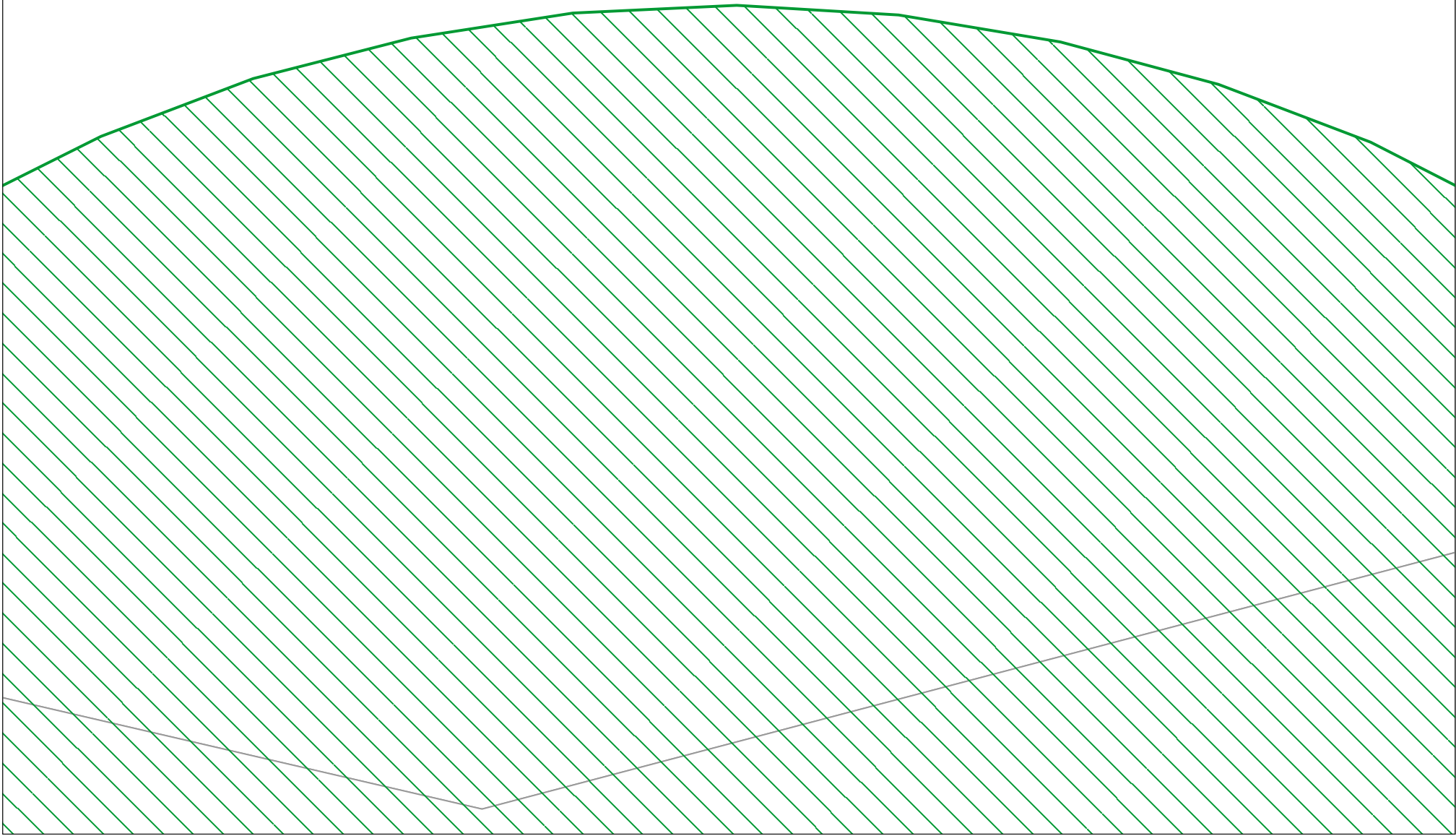
Map 3

Sequence No: 230804440
741 Cudgen Road Cudgen



Date: 13/10/2023

3



Sewer Pipeline

- Sewer Rising Main
- Sewer Rising Main (Abandoned)
- Sewer Rising Main (Private)
- Sewer Gravity Main (Abandoned)
- Sewer Gravity Overflow
- Sewer Gravity Main (Private)
- Sewer Service Connection
- Sewer Gravity Mains**
- 0- 200
- 225 - 600
- 700- 900
- Sewer Vacuum Mains

Sewer Node

- End Cap
- Public Manhole
- Public Property Pump
- Public Pump Station
- Vacuum Chamber
- Vent Stack
- Communication**
- Communication Node
- Communication Cables

Stormwater Pipe (Survey)

- Stormwater Pipe (Survey)
- Stormwater Culvert (Survey)
- Stormwater Pipe**
- Stormwater Pipe
- Stormwater Pipe (Abandoned)
- Stormwater Pipe (Private)
- Stormwater Culvert
- Stormwater Culvert (Abandoned)
- Stormwater Channel
- Stormwater Channel (Abandoned)

Stormwater Node (Survey)

- Manhole
- Drop Inlet
- Kerb Inlet
- Wingwall
- Stormwater Node**
- Manhole
- Drop Inlet
- Kerb Inlet
- Wingwall
- Private Stormwater Point

Water Pipe Location

- Water Main
- Water Main (Abandoned)
- Water Main (Private)
- Water Main (Recycled)
- Water Service Connections
- Water Node**
- Gate Valve
- Hydrant
- Pressure Reducing Valve
- Pressure Sustaining Valve
- Pump
- Reservoir
- Scour Valve

SCIMS Survey Marks

- CP
- CR
- GB
- MM
- PM
- SS
- TS
- General**
- Property Boundary
- BYDA Work Area
- Flood Levee



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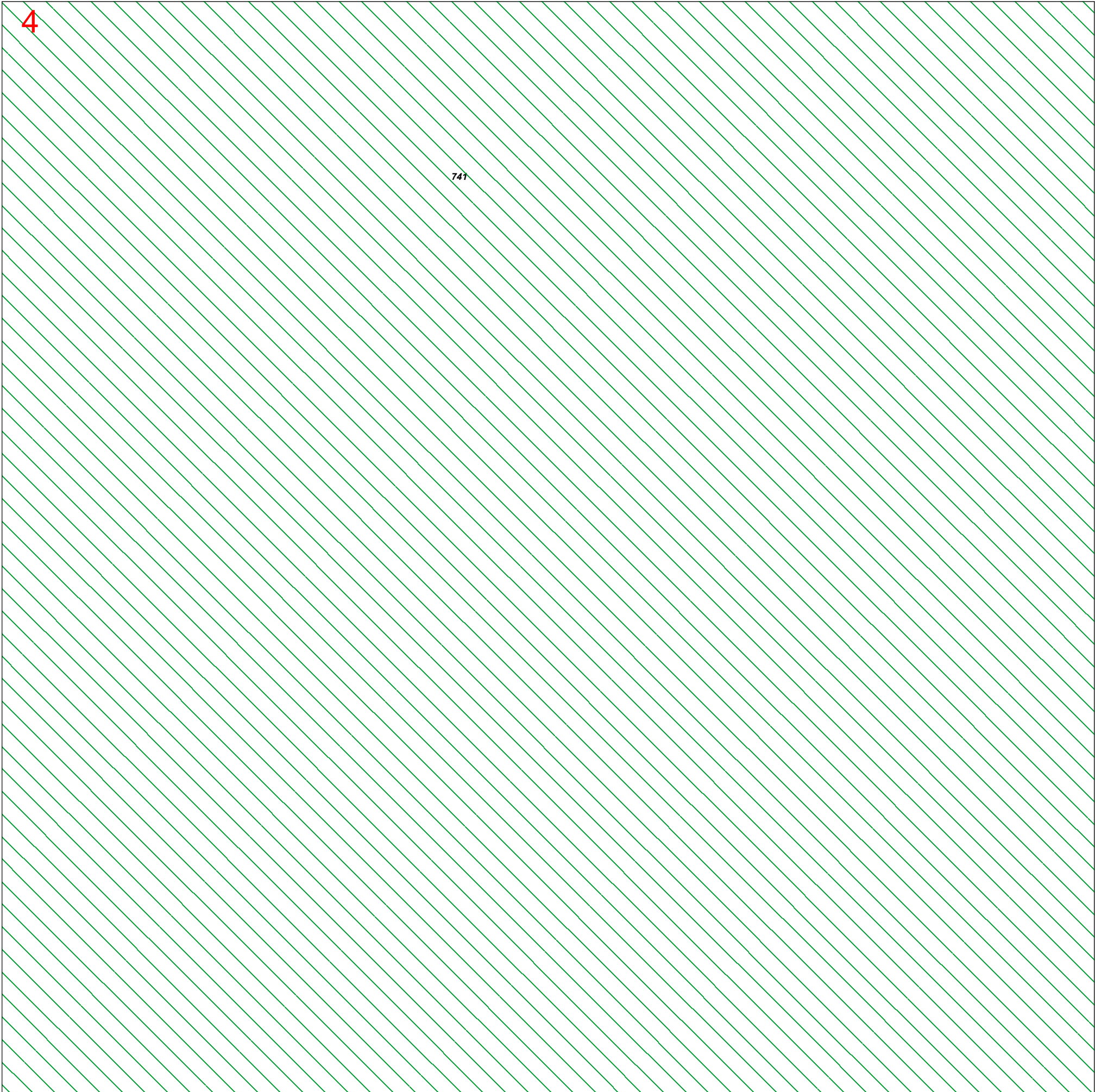
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Map 4

Sequence No: 230804440
741 Cudgen Road Cudgen

Date: 13/10/2023



Sewer Pipeline — Sewer Rising Main - - - Sewer Rising Main (Abandoned) - - - Sewer Rising Main (Private) - - - Sewer Gravity Main (Abandoned) — Sewer Gravity Overflow - - - Sewer Gravity Main (Private) — Sewer Service Connection Sewer Gravity Mains — 0- 200 — 225 - 600 — 700- 900 — Sewer Vacuum Mains	Sewer Node — End Cap ● Public Manhole Ⓜ Public Property Pump Ⓜ Public Pump Station Ⓜ Vacuum Chamber Ⓜ Vent Stack Communication Ⓜ Communication Node — Communication Cables	Stormwater Pipe (Survey) — Stormwater Pipe (Survey) - - - Stormwater Culvert (Survey) Stormwater Pipe — Stormwater Pipe - - - Stormwater Pipe (Abandoned) - - - Stormwater Pipe (Private) — Stormwater Culvert - - - Stormwater Culvert (Abandoned) — Stormwater Channel - - - Stormwater Channel (Abandoned)	Stormwater Node (Survey) ● Manhole Ⓜ Drop Inlet Ⓜ Kerb Inlet Ⓜ Wingwall Stormwater Node ● Manhole Ⓜ Drop Inlet Ⓜ Kerb Inlet Ⓜ Wingwall ● Private Stormwater Point	Water Pipe Location — Water Main - - - Water Main (Abandoned) - - - Water Main (Private) — Water Main (Recycled) — Water Service Connections Water Node Ⓜ Gate Valve ● Hydrant Ⓜ Pressure Reducing Valve Ⓜ Pressure Sustaining Valve Ⓜ Pump ○ Reservoir Ⓜ Scour Valve	SCIMS Survey Marks + CP X CR △ GB ◇ MM Ⓜ PM ● SS △ TS General □ Property Boundary ▨ BYDA Work Area — Flood Levee
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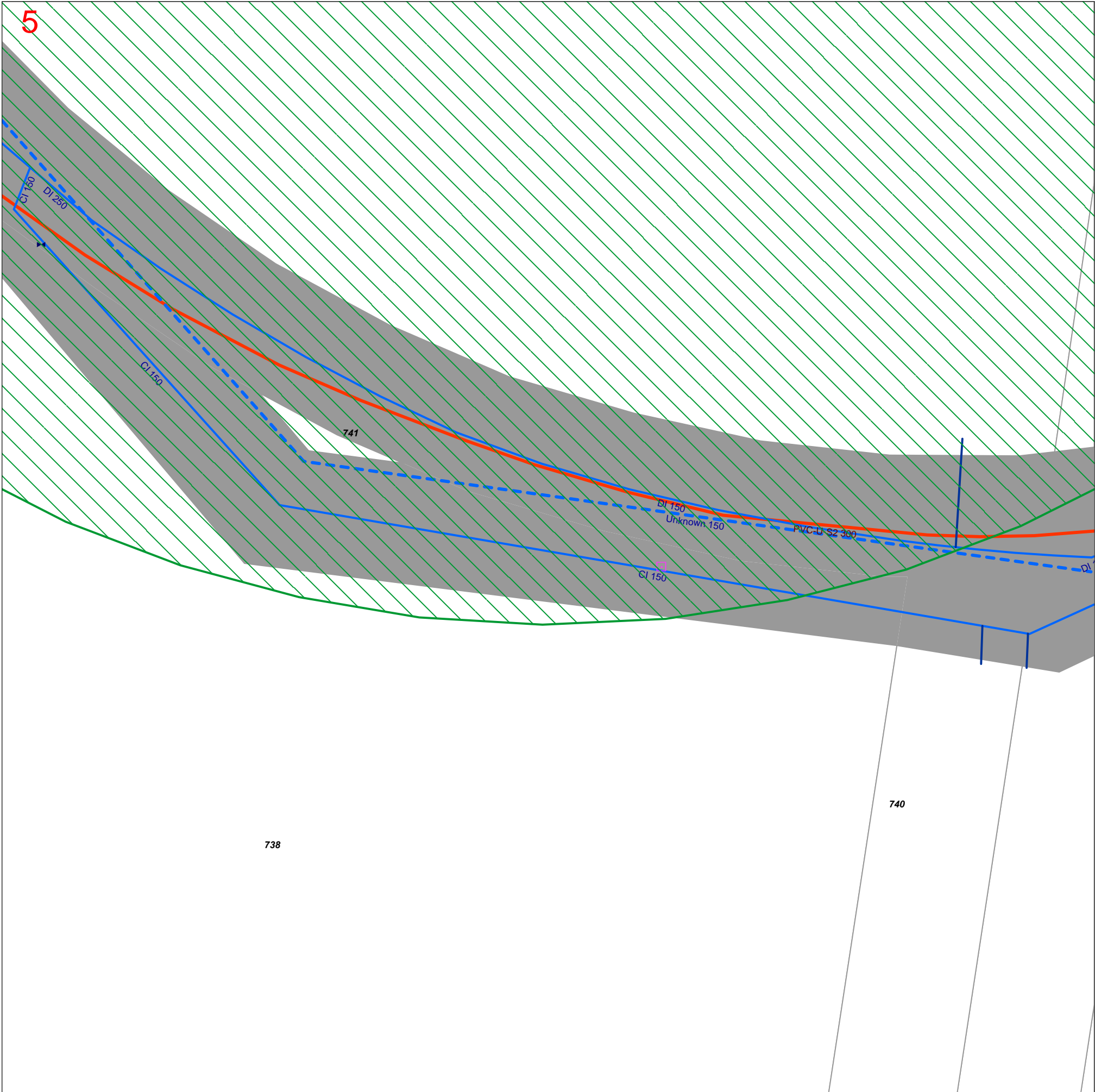


Map 5

Sequence No: 230804440
741 Cudgen Road Cudgen



Date: 13/10/2023



Sewer Pipeline	Sewer Node	Stormwater Pipe (Survey)	Stormwater Node (Survey)	Water Pipe Location	SCIMS Survey Marks
<div><div></div>Sewer Rising Main</div>	<div><div></div>End Cap</div>	<div><div></div>Stormwater Pipe (Survey)</div>	<div><div></div>Manhole</div>	<div><div></div>Water Main</div>	<div><div></div>CP</div>
<div><div></div>Sewer Rising Main (Abandoned)</div>	<div><div></div>Public Manhole</div>	<div><div></div>Stormwater Culvert (Survey)</div>	<div><div></div>Drop Inlet</div>	<div><div></div>Water Main (Abandoned)</div>	<div><div></div>CR</div>
<div><div></div>Sewer Rising Main (Private)</div>	<div><div></div>Public Property Pump</div>	<div><div></div>Stormwater Pipe</div>	<div><div></div>Kerb Inlet</div>	<div><div></div>Water Main (Private)</div>	<div><div></div>GB</div>
<div><div></div>Sewer Gravity Main (Abandoned)</div>	<div><div></div>Public Pump Station</div>	<div><div></div>Stormwater Pipe (Abandoned)</div>	<div><div></div>Wingwall</div>	<div><div></div>Water Main (Recycled)</div>	<div><div></div>MM</div>
<div><div></div>Sewer Gravity Overflow</div>	<div><div></div>Vacuum Chamber</div>	<div><div></div>Stormwater Pipe (Private)</div>	<div><div></div>Stormwater Node</div>	<div><div></div>Water Service Connections</div>	<div><div></div>PM</div>
<div><div></div>Sewer Gravity Main (Private)</div>	<div><div></div>Vent Stack</div>	<div><div></div>Stormwater Culvert</div>	<div><div></div>Manhole</div>	<div><div></div>Water Node</div>	<div><div></div>SS</div>
<div><div></div>Sewer Service Connection</div>	<div><div></div>Communication</div>	<div><div></div>Stormwater Culvert (Abandoned)</div>	<div><div></div>Drop Inlet</div>	<div><div></div>Gate Valve</div>	<div><div></div>TS</div>
<div><div></div>Sewer Gravity Mains</div>	<div><div></div>Communication Node</div>	<div><div></div>Stormwater Channel</div>	<div><div></div>Kerb Inlet</div>	<div><div></div>Hydrant</div>	<div><div></div>General</div>
<div><div></div>0- 200</div>	<div><div></div>Communication Cables</div>	<div><div></div>Stormwater Channel (Abandoned)</div>	<div><div></div>Wingwall</div>	<div><div></div>Pressure Reducing Valve</div>	<div><div></div>Property Boundary</div>
<div><div></div>225 - 600</div>			<div><div></div>Private Stormwater Point</div>	<div><div></div>Pressure Sustaining Valve</div>	<div><div></div>BYDA Work Area</div>
<div><div></div>700- 900</div>				<div><div></div>Pump</div>	<div><div></div>Flood Levee</div>
<div><div></div>Sewer Vacuum Mains</div>				<div><div></div>Reservoir</div>	
				<div><div></div>Scour Valve</div>	



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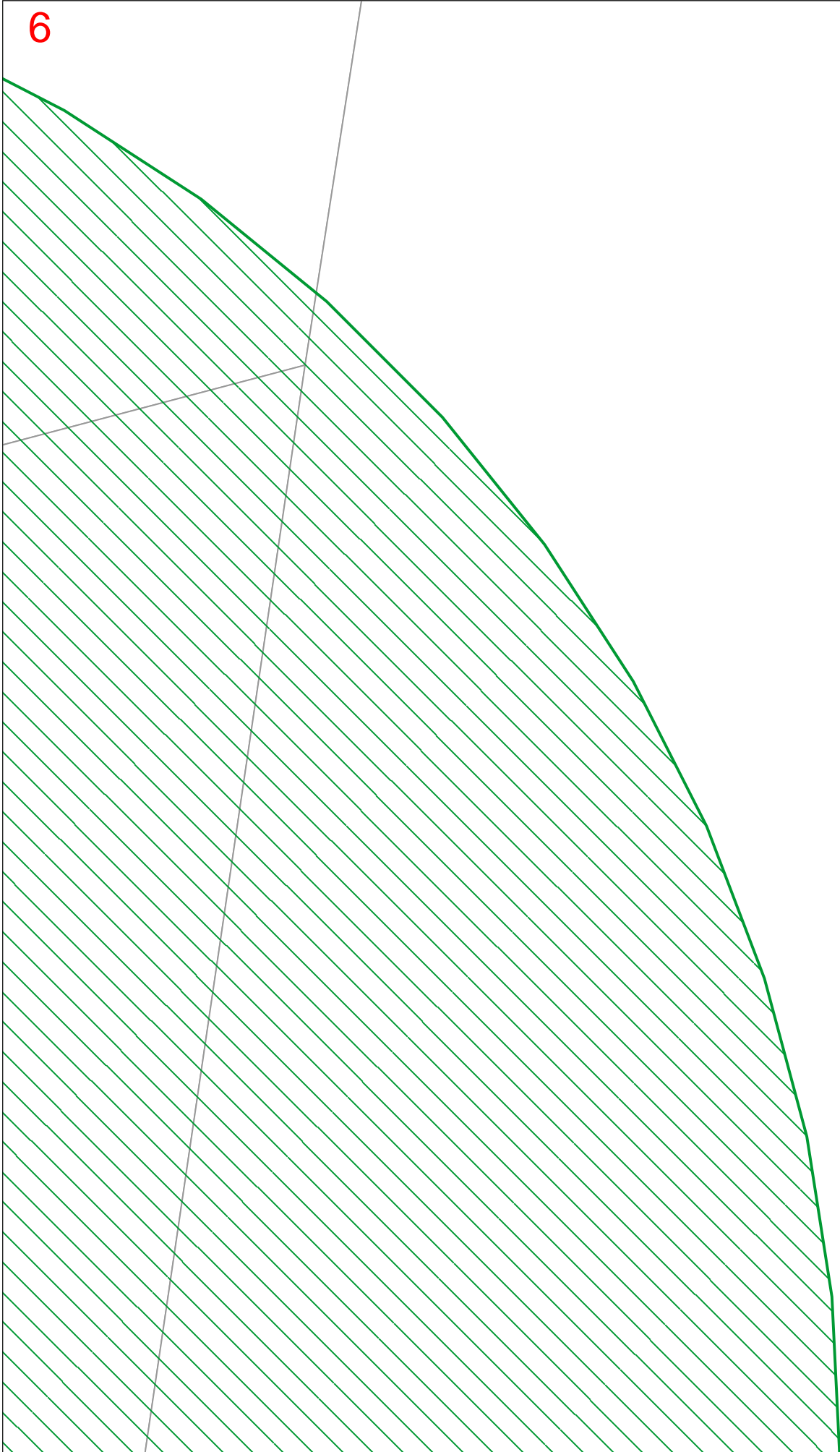
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Map 6

Sequence No: 230804440
741 Cudgen Road Cudgen

Date: 13/10/2023



Sewer Pipeline

- Sewer Rising Main
- Sewer Rising Main (Abandoned)
- Sewer Rising Main (Private)
- Sewer Gravity Main (Abandoned)
- Sewer Gravity Overflow
- Sewer Gravity Main (Private)
- Sewer Service Connection
- Sewer Gravity Mains**
- 0- 200
- 225 - 600
- 700- 900
- Sewer Vacuum Mains

Sewer Node

- End Cap
- Public Manhole
- Public Property Pump
- Public Pump Station
- Vacuum Chamber
- Vent Stack
- Communication**
- Communication Node
- Communication Cables

Stormwater Pipe (Survey)

- Stormwater Pipe (Survey)
- Stormwater Culvert (Survey)
- Stormwater Pipe**
- Stormwater Pipe
- Stormwater Pipe (Abandoned)
- Stormwater Pipe (Private)
- Stormwater Culvert
- Stormwater Culvert (Abandoned)
- Stormwater Channel
- Stormwater Channel (Abandoned)

Stormwater Node (Survey)

- Manhole
- Drop Inlet
- Kerb Inlet
- Wingwall
- Stormwater Node**
- Manhole
- Drop Inlet
- Kerb Inlet
- Wingwall
- Private Stormwater Point

Water Pipe Location

- Water Main
- Water Main (Abandoned)
- Water Main (Private)
- Water Main (Recycled)
- Water Service Connections
- Water Node**
- Gate Valve
- Hydrant
- Pressure Reducing Valve
- Pressure Sustaining Valve
- Pump
- Reservoir
- Scour Valve

SCIMS Survey Marks

- CP
- CR
- GB
- MM
- PM
- SS
- TS
- General**
- Property Boundary
- BYDA Work Area
- Flood Levee



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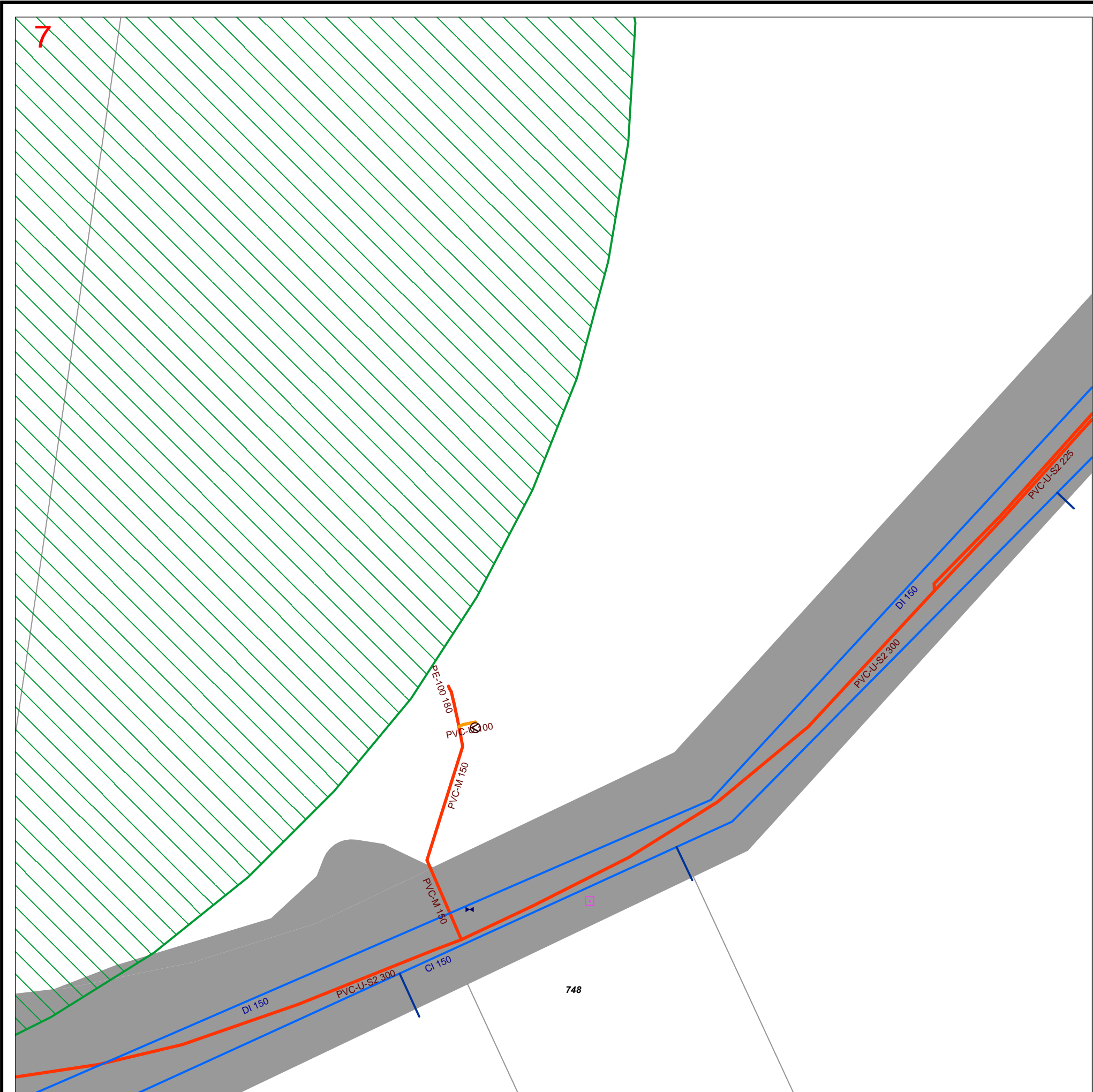
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Map 7

Sequence No: 230804440
741 Cudgen Road Cudgen

Date: 13/10/2023



Sewer Pipeline	Sewer Node	Stormwater Pipe (Survey)	Stormwater Node (Survey)	Water Pipe Location	SCIMS Survey Marks
<div><div></div>Sewer Rising Main</div>	<div><div></div>End Cap</div>	<div><div></div>Stormwater Pipe (Survey)</div>	<div><div></div>Manhole</div>	<div><div></div>Water Main</div>	<div><div></div>CP</div>
<div><div></div>Sewer Rising Main (Abandoned)</div>	<div><div></div>Public Manhole</div>	<div><div></div>Stormwater Culvert (Survey)</div>	<div><div></div>Drop Inlet</div>	<div><div></div>Water Main (Abandoned)</div>	<div><div></div>CR</div>
<div><div></div>Sewer Rising Main (Private)</div>	<div><div></div>Public Property Pump</div>	<div><div></div>Stormwater Pipe</div>	<div><div></div>Kerb Inlet</div>	<div><div></div>Water Main (Private)</div>	<div><div></div>GB</div>
<div><div></div>Sewer Gravity Main (Abandoned)</div>	<div><div></div>Public Pump Station</div>	<div><div></div>Stormwater Pipe (Abandoned)</div>	<div><div></div>Wingwall</div>	<div><div></div>Water Main (Recycled)</div>	<div><div></div>MM</div>
<div><div></div>Sewer Gravity Overflow</div>	<div><div></div>Vacuum Chamber</div>	<div><div></div>Stormwater Pipe (Private)</div>	<div><div></div>Stormwater Node</div>	<div><div></div>Water Service Connections</div>	<div><div></div>PM</div>
<div><div></div>Sewer Gravity Main (Private)</div>	<div><div></div>Vent Stack</div>	<div><div></div>Stormwater Culvert</div>	<div><div></div>Manhole</div>	<div><div></div>Water Node</div>	<div><div></div>SS</div>
<div><div></div>Sewer Service Connection</div>	<div><div></div>Communication</div>	<div><div></div>Stormwater Culvert (Abandoned)</div>	<div><div></div>Drop Inlet</div>	<div><div></div>Gate Valve</div>	<div><div></div>TS</div>
<div><div></div>Sewer Gravity Mains</div>	<div><div></div>Communication Node</div>	<div><div></div>Stormwater Channel</div>	<div><div></div>Kerb Inlet</div>	<div><div></div>Hydrant</div>	<div><div></div>General</div>
<div><div></div>0- 200</div>	<div><div></div>Communication Cables</div>	<div><div></div>Stormwater Channel (Abandoned)</div>	<div><div></div>Wingwall</div>	<div><div></div>Pressure Reducing Valve</div>	<div><div></div>Property Boundary</div>
<div><div></div>225 - 600</div>			<div><div></div>Private Stormwater Point</div>	<div><div></div>Pressure Sustaining Valve</div>	<div><div></div>BYDA Work Area</div>
<div><div></div>700- 900</div>				<div><div></div>Pump</div>	<div><div></div>Flood Levee</div>
<div><div></div>Sewer Vacuum Mains</div>				<div><div></div>Reservoir</div>	
				<div><div></div>Scour Valve</div>	



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Appendix C – Concept Civil Plans

CUDGEN HEALTH PRECINT PTY LTD
741 CUDGEN ROAD,
CUDGEN, NSW 2487
ENGINEERING PLANS



DRAWING REGISTER		
DRAWING NUMBER	DRAWING TITLE	REVISION
0001	COVER PAGE	C
0110	SEDIMENT AND EROSION CONTROL PLAN	C
0120	SEDIMENT AND EROSION CONTROL DETAILS	B
0410	STORMWATER LAYOUT PLAN	C
0415	CATCHMENT PLAN	C
0420	STORMWATER STRUCTURE DETAILS	C
SK0001	OVERVIEW OF WATER SUPPLY & SEWER UPGRADES & AUGMENTATIONS	B

HUMES STANDARD DRAWINGS	
DRAWING NUMBER	TITLE
HG24/L-01	HUMEGARD HG24/L
EP-UPT-3000-RCP-NAT-B2-GA	HUMEFILTER UPT3000 RCP INLET & OUTLET

NOTES


1. THIS DRAWING SET SHOULD BE READ IN CONJUNCTION WITH PLANITS STORMWATER MANAGEMENT PLAN (J7594-741_Cudgen_Rd-SWMP01)
2. THE STORMWATER PLAN IS BASED ON SURVEY DATA (B & P SURVEYS CONSULTING SURVEYORS) AND ARCHITECTURAL DRAWINGS (COTTEEPARKER) SUPPLIED TO PLANIT.
3. THIS PLAN IS CONCEPT ONLY WITH THE PROPOSED STORMWATER PIPE ALIGNMENT AND NOMINATED ELEVATIONS ARE INDICATIVE ONLY.
4. HYDRAULIC/HYDROLOGICAL (DRAINS SOFTWARE) WAS UTILISED TO DEMONSTRATE COMPLIANCE WITH STORMWATER QUANTITY OBJECTIVES.
5. HYDRAULIC/HYDROLOGICAL MODELLING (MUSIC SOFTWARE) WAS UTILISED TO DEMONSTRATE COMPLIANCE WITH STORMWATER QUALITY OBJECTIVES.
6. SERVICE LOCATIONS SHOWN ON THIS PLAN ARE INDICATIVE ONLY.



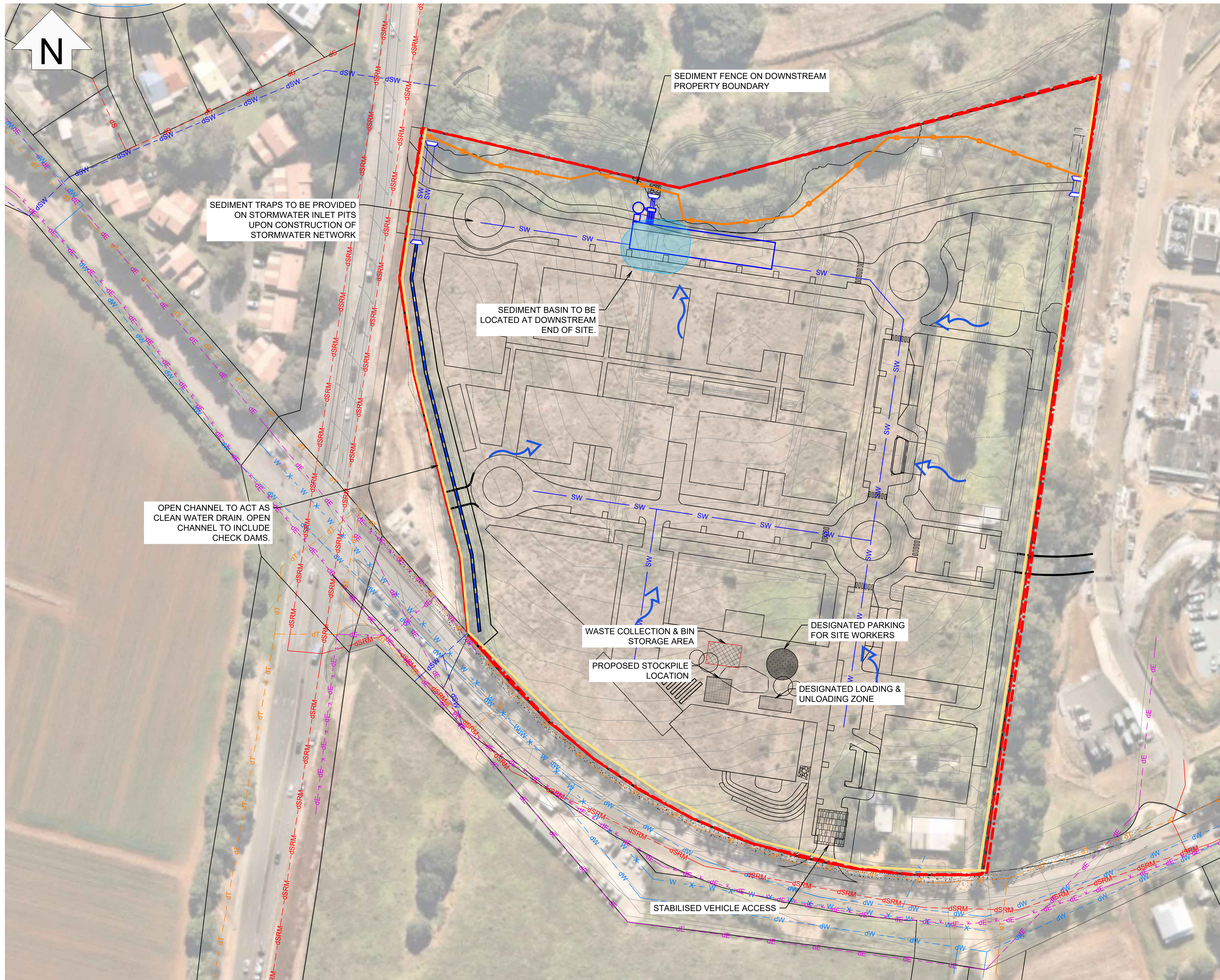
IMAGE SOURCE: NEARMAPS

LOCALITY PLAN
NOT TO SCALE

NOT FOR CONSTRUCTION

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A	PRELIMINARY ISSUE		03/02/23	DM	JB	JB	JB					NOT TO SCALE	DATE: THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED	CUDGEN HEALTH PRECINT PTY LTD	DRAWING TITLE: COVER PAGE						
B	ISSUED FOR APPROVAL		10/10/23	DM	JB	MB	JB								DO NOT SCALE FROM DRAWING	LOCAL GOVERNMENT AUTHORITY: TWEED SHIRE COUNCIL	ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:	
C	ISSUED FOR APPROVAL		28/11/23	DM	JB	RW	JB										A1	J7594	0001	C	

100mm AT ORIGINAL SIZE



WARNING

BEWARE OF UNDERGROUND SERVICES

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

LEGEND - EROSION AND SEDIMENT CONTROL

- PROPOSED SEDIMENT POND
- PROPOSED SEDIMENT FENCE
- PROPOSED STABILISED VEHICLE ACCESS
- FLOW PATH
- SUBJECT SITE
- PROPOSED STOCKPILE LOCATION
- DESIGNATED PARKING FOR SITE WORKERS
- WASTE COLLECTION & BIN STORAGE AREA
- DESIGNATED LOADING & UNLOADING ZONE
- CONSTRUCTION SECURITY FENCING

LEGEND - PROPOSED

- PROPOSED STORMWATER PIPE
- PROPOSED WATER OPEN DRAIN SWALE

LEGEND - EXISTING SERVICES DBYD

- EXISTING TELECOMMUNICATIONS DBYD
- EXISTING UNDERGROUND ELECTRICAL DBYD
- EXISTING OVER HEAD ELECTRICAL DBYD
- EXISTING SEWER RISING MAIN
- EXISTING SEWER GRAVITY MAIN
- EXISTING WATERMAIN
- EXISTING WATERMAIN ABANDONED
- EXISTING STORMWATER

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A	PRELIMINARY ISSUE	03/02/23	DM	JB	JB	JB
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C	ISSUED FOR APPROVAL	28/11/23	DM	JB	RW	JB

SCALES:
0 7.5 15 30 45
Full Size 1:750; Half Size 1:1500
Scale (m)
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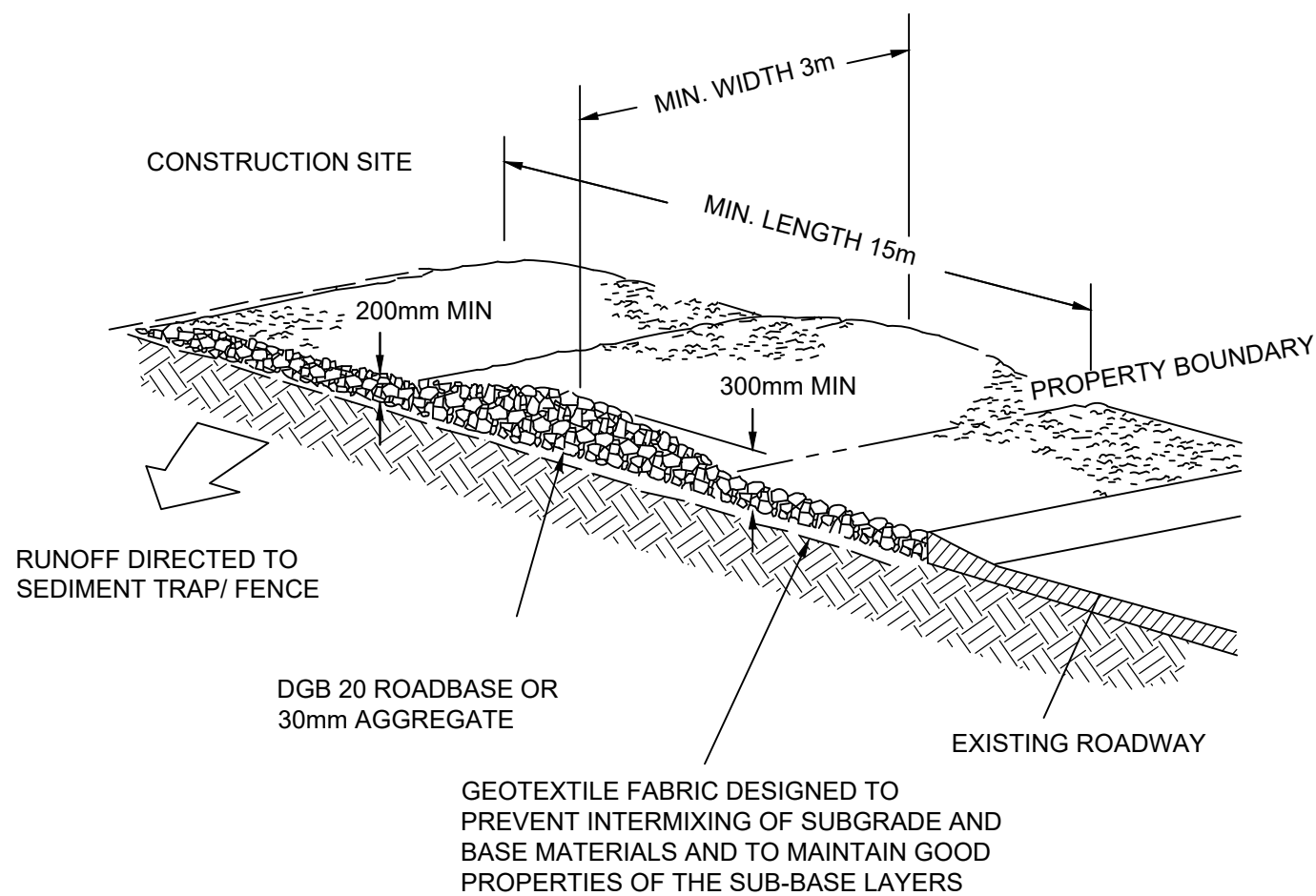
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TELEPHONE: 02 6674 5001
ABN: 20 099 261 711
EMAIL: administration@planitconsulting.com.au



CLIENT:
CUDGEN HEALTH PRECINT
PTY LTD
LOCAL GOVERNMENT AUTHORITY:
TWEED SHIRE COUNCIL

PROJECT: 741 CUDGEN CONNECTION	ORIGINAL SIZE: A1	PLANIT JOB No.: J7594	DRAWING No.: 0110	REV: C
DRAWING TITLE: SEDIMENT AND EROSION CONTROL PLAN				

100mm AT ORIGINAL SIZE

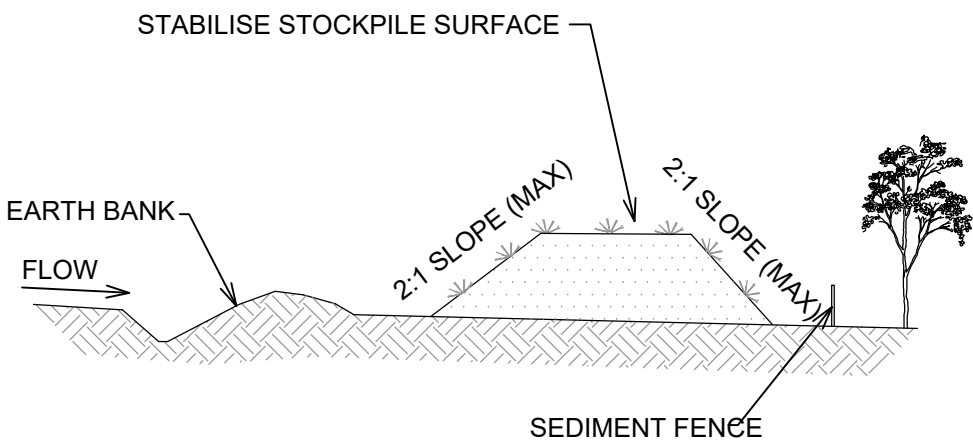


CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE PUNCHED GEOTEXTILE.
4. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30mm AGGREGATE. MINIMUM LENGTH 15m OR BUILDING ALIGNMENT. MINIMUM WIDTH 3m.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE/TRAP.

STABILISED SITE ACCESS

NOT TO SCALE

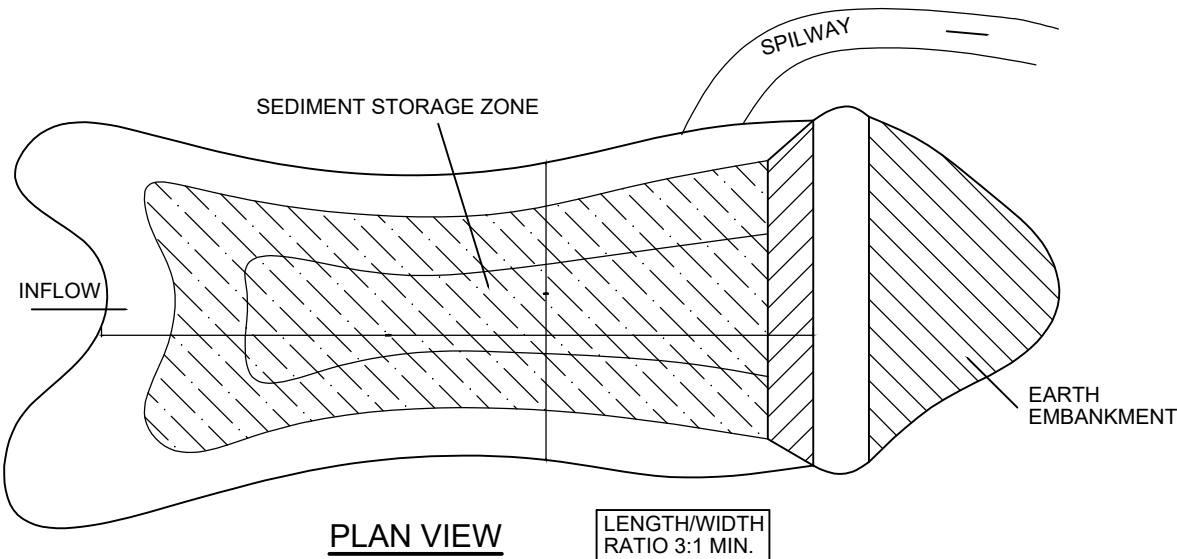


TOPSOIL STOCKPILE

NOT TO SCALE

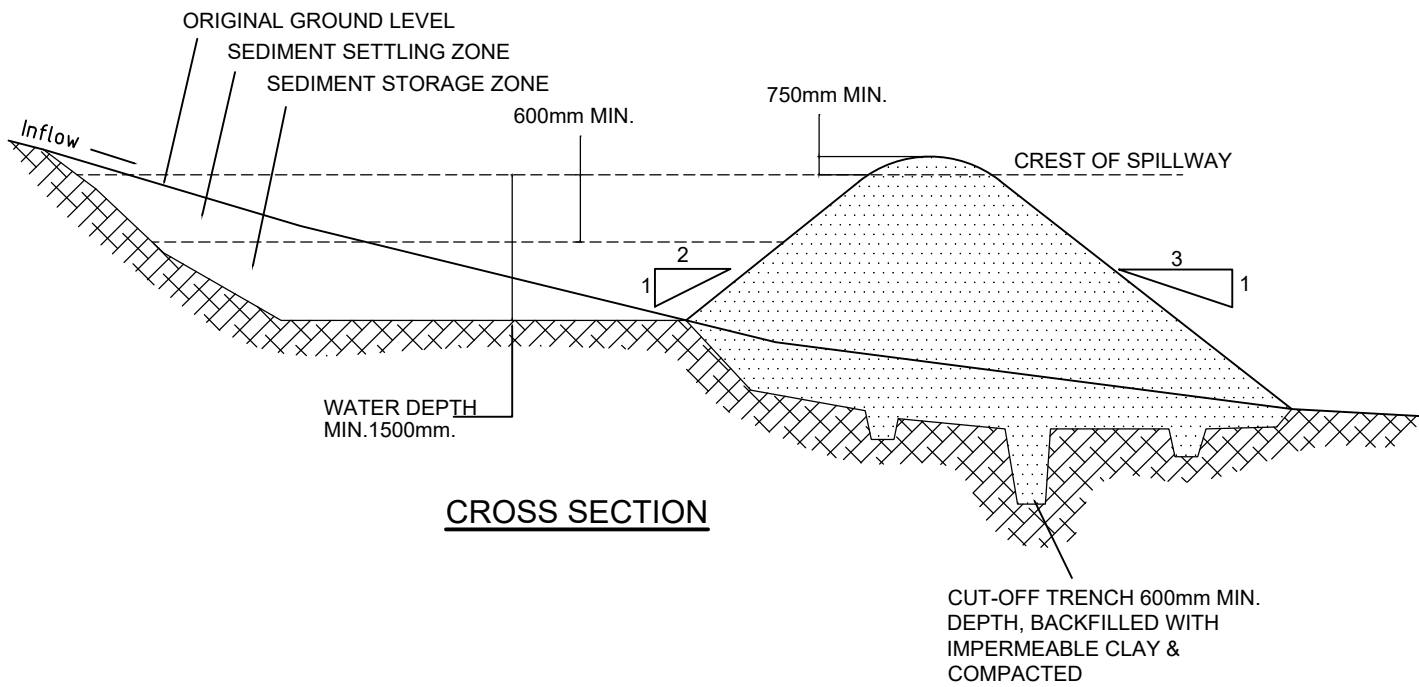
CONSTRUCTION NOTES

1. WHERE POSSIBLE LOCATE STOCKPILE AT LEAST 5m FROM EXISTING VEGETATION, CONCENTRATED WATER FLOWS, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS A LOW, FLAT, ELONGATED MOUND.
3. WHERE THERE IS SUFFICIENT AREA TOPSOIL STOCKPILE SHALL BE LESS THAN 2m IN HEIGHT.
4. REHABILITATE IN ACCORDANCE WITH THE SWMP/ESCP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT RUNOFF AROUND THE STOCKPILE AND A SEDIMENT FENCE (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE OF STOCKPILE.



PLAN VIEW

LENGTH:WIDTH RATIO 3:1 MIN.



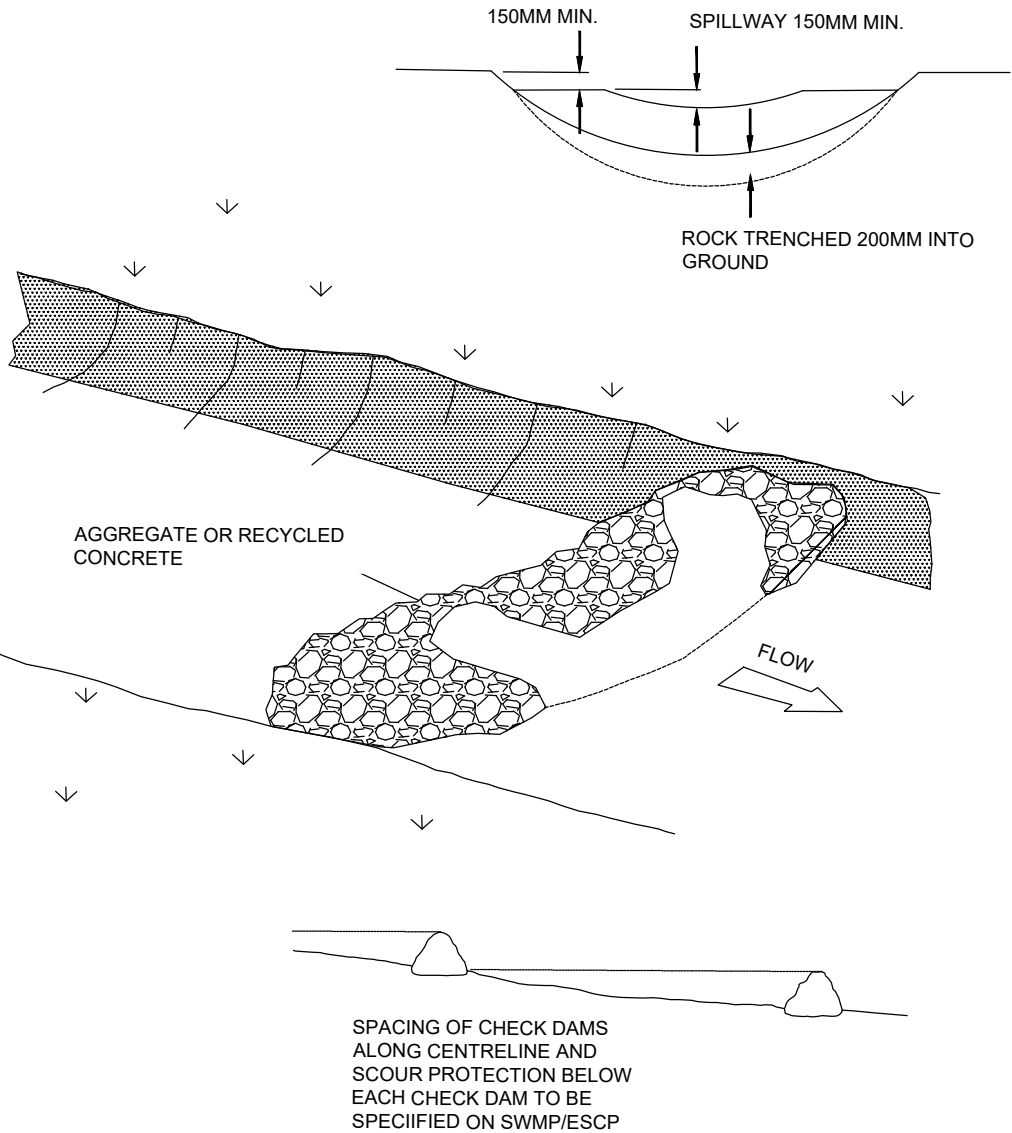
CROSS SECTION

SEDIMENT BASIN - WET

NOT TO SCALE

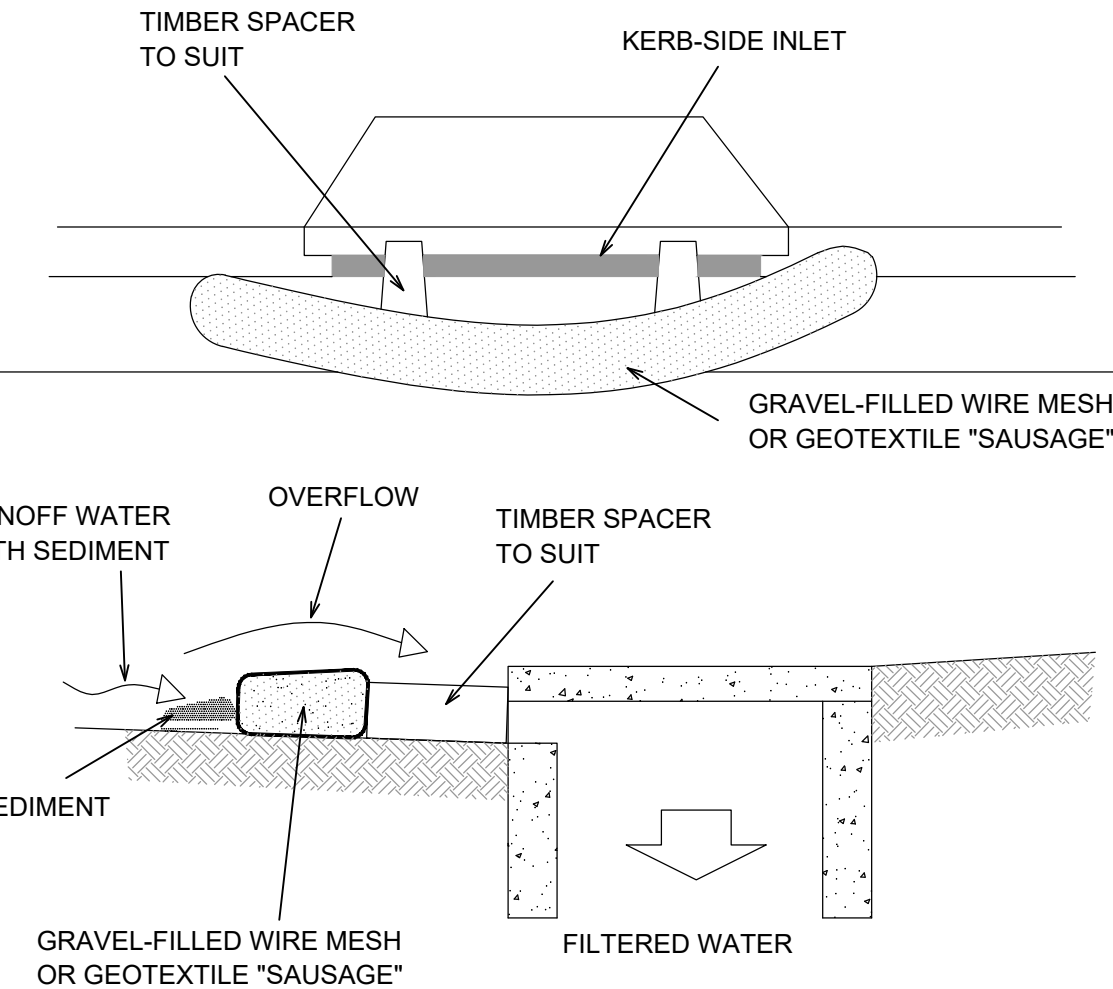
CONSTRUCTION NOTES:

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AND 1200mm WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT SPECIFIED IN THE SWMP TO 95% STANDARD PROCTOR DENSITY.
4. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING AT LEAST 100mm DEEP TO HELP BOND COMPACTED FILL TO EXISTING SUBSTRATE.
5. SPREAD FILL IN 100mm TO 150mm LAYERS AND COMPACT AT OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH SWMP.
6. CONSTRUCT EMERGENCY SPILLWAY



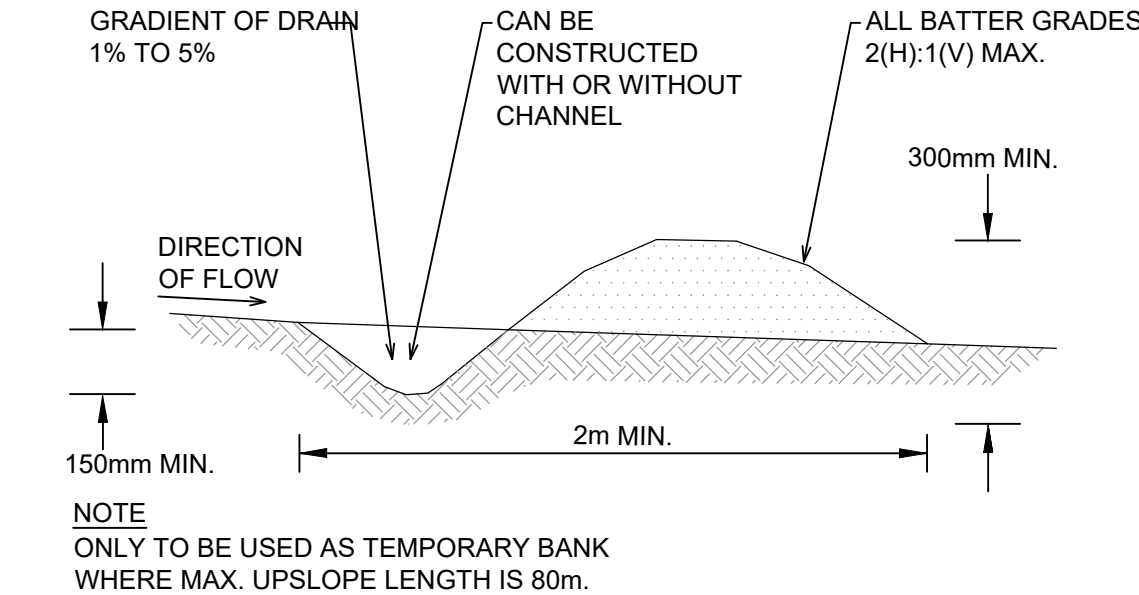
ROCK CHECK DAM

NOT TO SCALE



FILTER BAG TO SAG SIDE ENTRY PIT

NOT TO SCALE

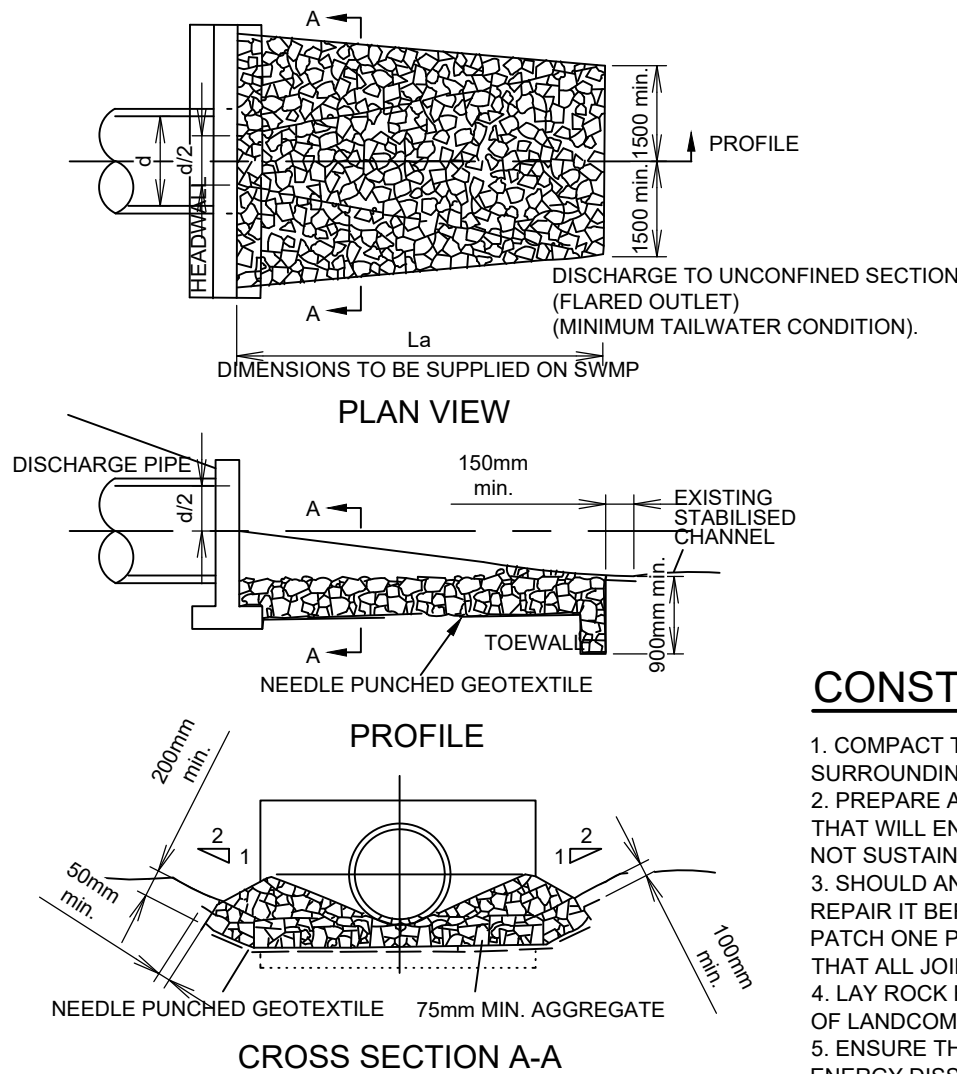


EARTH BANK (LOW FLOW)

NOT TO SCALE

CONSTRUCTION NOTES:

1. CHECK DAMS CAN BE BUILT WITH VARIOUS MATERIALS, INCLUDING ROCKS, LOGS, SANDBAGS AND STRAW BALES. THE MAINTENANCE PROGRAM SHOULD ENSURE THEIR INTEGRITY IS RETAINED, ESPECIALLY WHERE CONSTRUCTED WITH STRAW BALES. IN THE CASE OF BALES, THIS MIGHT REQUIRE THEIR REPLACEMENT EACH TWO TO FOUR MONTHS
2. TRENCH THE CHECK DAM 200MM INTO THE GROUND ACROSS ITS WHOLE WIDTH. WHERE ROCK IS USED, FILL THE TRENCHES TO ATLEAST 100MM ABOVE THE GROUND SURFACE TO REDUCE THE RISK OF UNDERCUTTING.
3. NORMALLY, THEIR MAXIMUM HEIGHT SHOULD NOT EXCEED 600MM ABOVE THE GULLY FLOOR. THE CENTRE SHOULD ACT AS A SPILLWAY, BEING ATLEAST 150MM LOWER THAN THE OUTER EDGES.
4. SPACE THE DAMS SO THE TOE OF THE UPSTREAM DAM IS LEVEL WITH THE SPILLWAY OF THE NEXT DOWNSTREAM DAM.

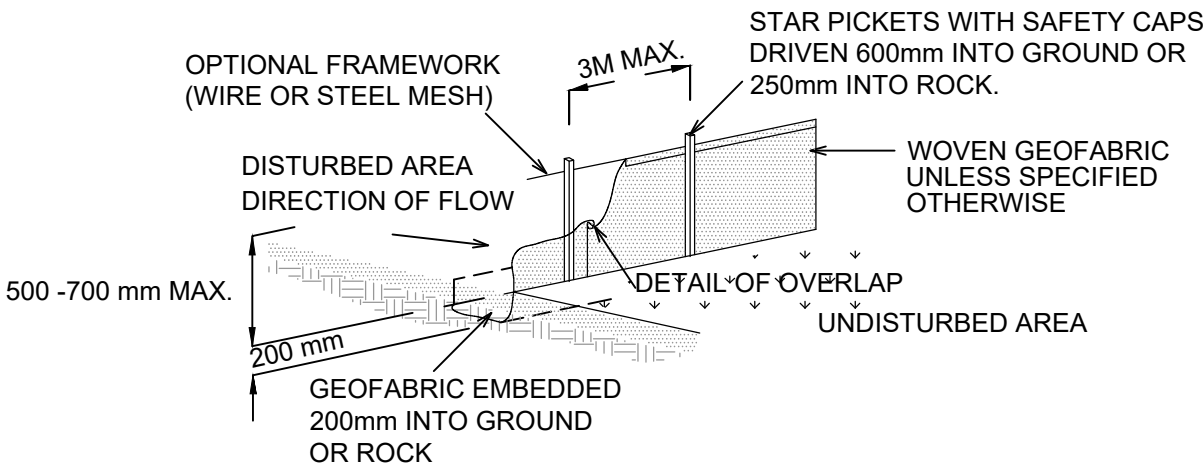


ENERGY DISSIPATOR

NOT TO SCALE

CONSTRUCTION NOTES

1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT.
2. FILL THE SLEEVE WITH 25mm TO 50mm GRAVEL. FROM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING OF THE KERB INLET OR FIELD INLET LEAVING A 100mm GAP AT THE TOP TO ACT AS AN EMERGENCY SPILLWAY.
5. MAINTAIN THE OPENING WITH SPACER BLOCKS.
6. FORM A SEAL WITH THE KERBING AND PREVENT SEDIMENT BYPASSING THE FILTER.
7. FIT TO ALL KERB INLETS AND FIELD INLET PITS AT SAG POINTS.



SEDIMENT FENCE

NOT TO SCALE

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CLIENT:

CUDGEN HEALTH PRECINT
PTY LTD

LOCAL GOVERNMENT AUTHORITY:

TWEED SHIRE COUNCIL

PROJECT:

741 CUDGEN CONNECTION

DRAWING TITLE:

SEDIMENT AND EROSION CONTROL DETAILS

ORIGINAL SIZE:

A1

PLANIT JOB No.:

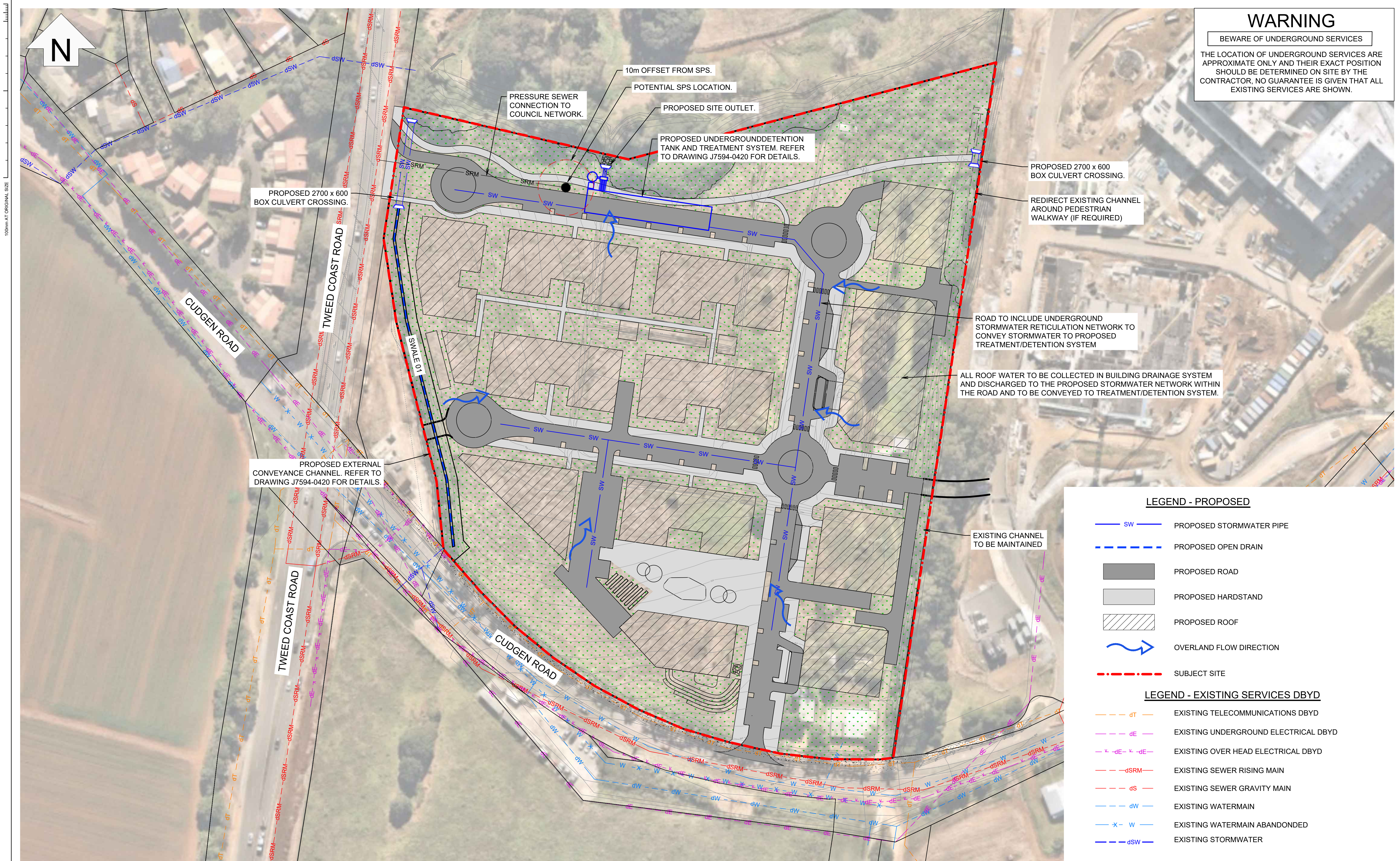
J7594

DRAWING No.:

0120

REV:

B



WARNING

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LEGEND - PROPOSED

- SW PROPOSED STORMWATER PIPE
- PROPOSED OPEN DRAIN
- PROPOSED ROAD
- PROPOSED HARDSTAND
- PROPOSED ROOF
- OVERLAND FLOW DIRECTION
- SUBJECT SITE

LEGEND - EXISTING SERVICES DBYD

- EXISTING TELECOMMUNICATIONS DBYD
- EXISTING UNDERGROUND ELECTRICAL DBYD
- EXISTING OVER HEAD ELECTRICAL DBYD
- EXISTING SEWER RISING MAIN
- EXISTING SEWER GRAVITY MAIN
- EXISTING WATERMAIN
- EXISTING WATERMAIN ABANDONED
- EXISTING STORMWATER

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SCALES:
0 7.5 15 30 45
Full Size 1:750; Half Size 1:1500
Scale (m)
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PTY LTD
LOCAL GOVERNMENT AUTHORITY:
TWEED SHIRE COUNCIL

PROJECT:
741 CUDGEN CONNECTION
DRAWING TITLE:
STORMWATER LAYOUT PLAN
ORIGINAL SIZE: A1
PLANIT JOB No.: J7594
DRAWING No.: 0410
REV: C

100mm AT ORIGINAL SIZE



LEGEND - PROPOSED

- ROOF RUNOFF DRAINING TO TREATMENT (C1)
- ROAD RUNOFF DRAINING TO TREATMENT (C2)
- GROUND RUNOFF DRAINING TO TREATMENT (C3)
- GROUND RUNOFF BYPASSING TREATMENT (C4-C5)

CATCHMENT BREAKDOWN TABLE		
CATCHMENT	AREA (m ²)	IMPERVIOUS %
C1	16090	100
C2	10080	100
C3	23630	28
C4	1360	0
C5	5700	0
TOTAL	56860	58

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Full Size 1:750 ; Half Size 1:1500
Scale (m)
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PTY LTD

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TWEED SHIRE COUNCIL

PROJECT:

741 CUDGEN CONNECTION

DRAWING TITLE:

CATCHMENT PLAN

ORIGINAL SIZE:

A1

PLANIT JOB No.:

J7594

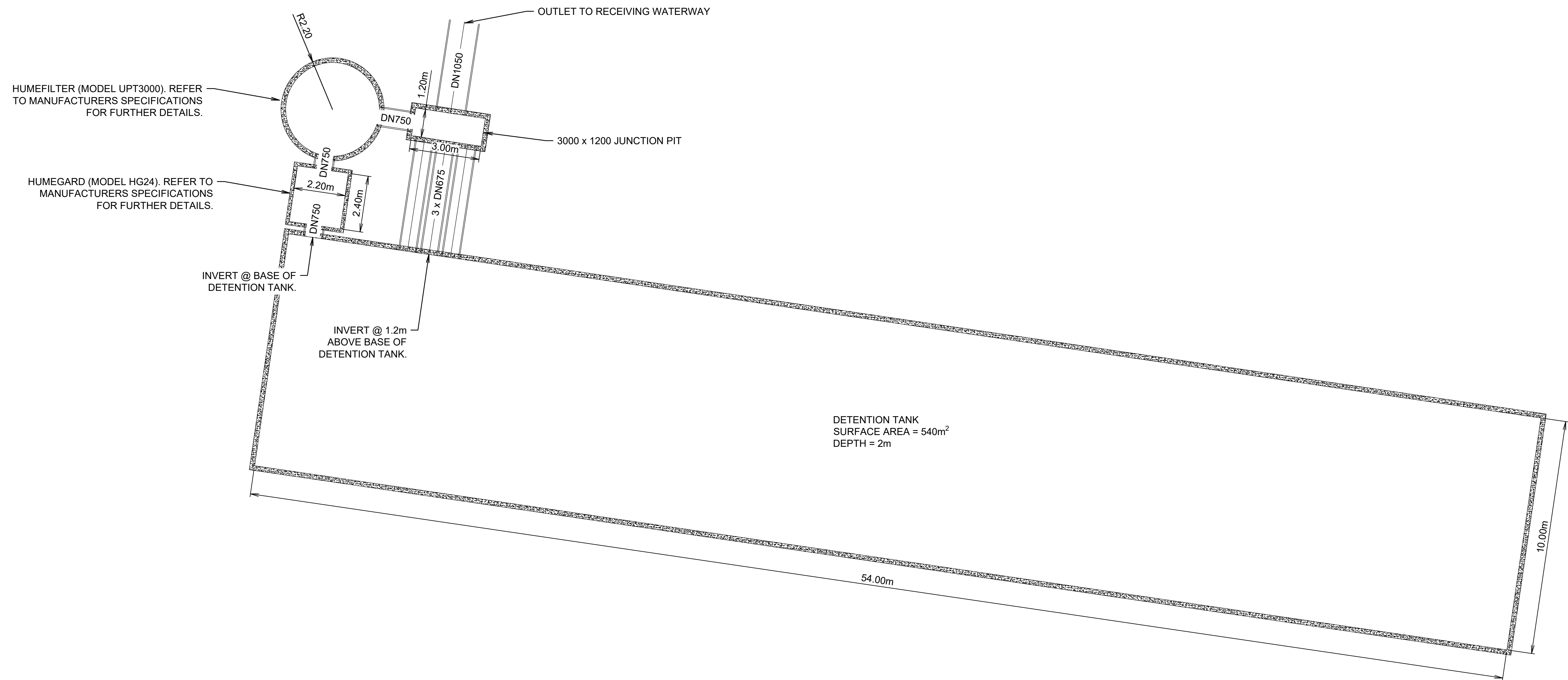
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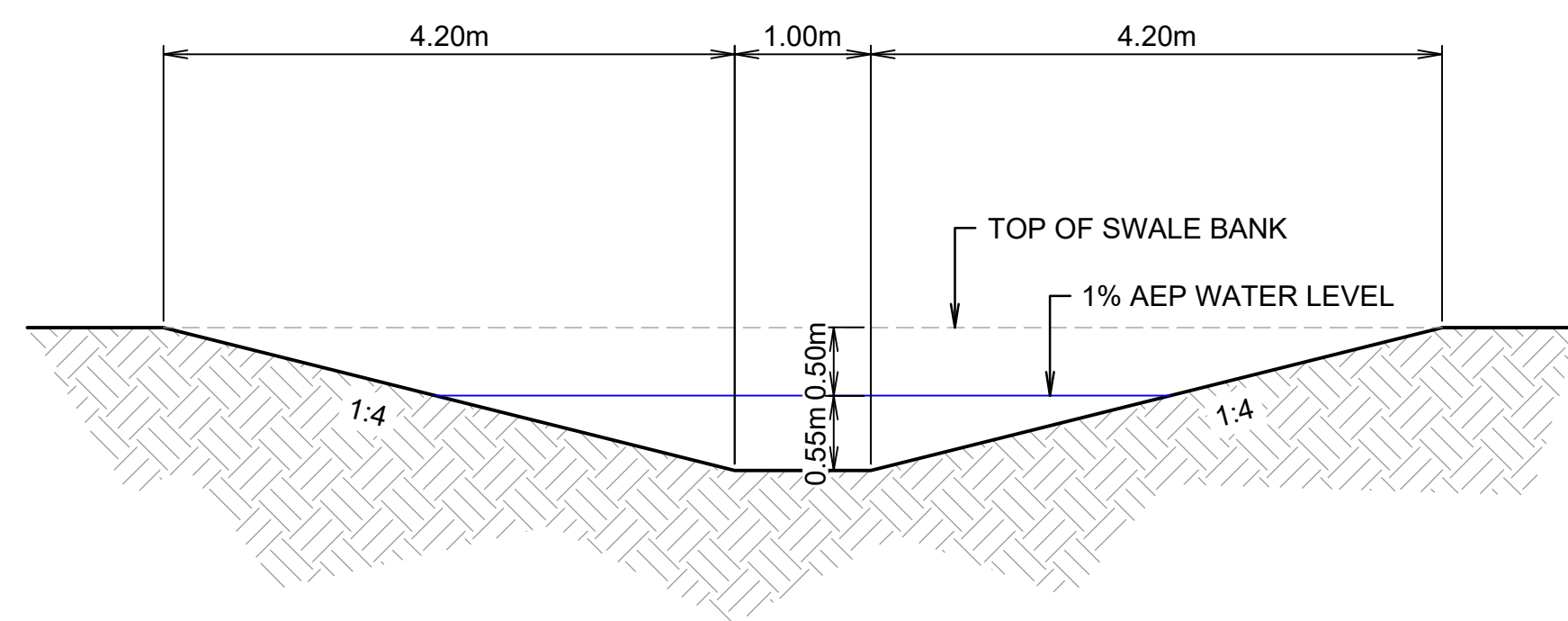
REV:

C

100mm AT ORIGINAL SIZE



UNDERGROUND DETENTION TANK AND TREATMENT SYSTEM
SCALE 1:100 @ A1

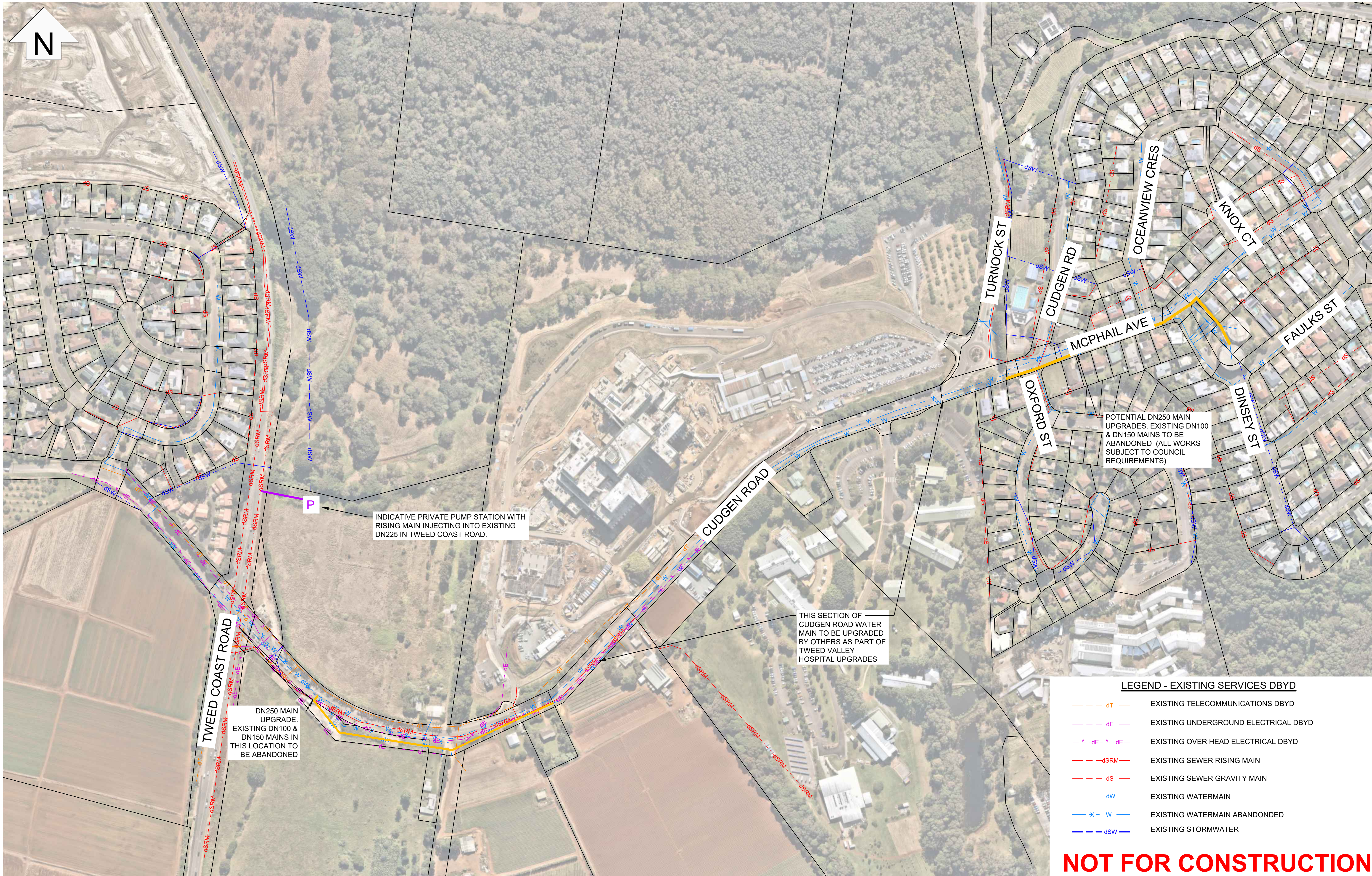


SWALE 01 TYPICAL SECTION
SCALE 1:50 @ A1

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C	ISSUED FOR APPROVAL	28/11/23	DM	JB	RW	JB	Full Size 1:100 ; Half Size 1:200	Scale (m)	EMAIL: administration@planitconsulting.com.au	KINGSCLIFF NSW 2487	TWEED SHIRE COUNCIL	STORMWATER STRUCTURE DETAILS
							DO NOT SCALE FROM DRAWING					ORIGINAL SIZE:
												A1
												PLANIT JOB No.:
												J7594
												DRAWING No.:
												0420
												REV:
												C

100mm AT ORIGINAL SIZE



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Full Size 1:2000 ; Half Size 1:4000
Scale (m)
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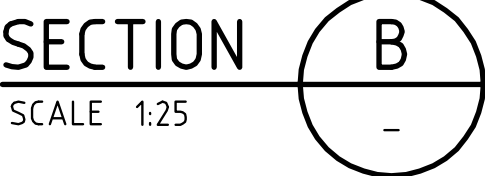
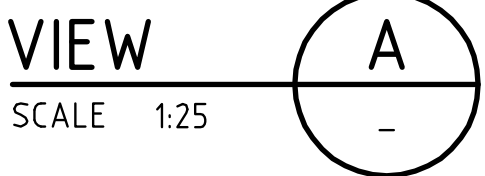
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LOCAL GOVERNMENT AUTHORITY:
TWEED SHIRE COUNCIL

PROJECT:
741 CUDGEN CONNECTION
DRAWING TITLE:
OVERVIEW OF WATER SUPPLY & SEWER UPGRADES & AUGMENTATIONS
ORIGINAL SIZE:
A1
PLANIT JOB No.:
J7594
DRAWING No.:
SK0001
REV:
B




NOTES:

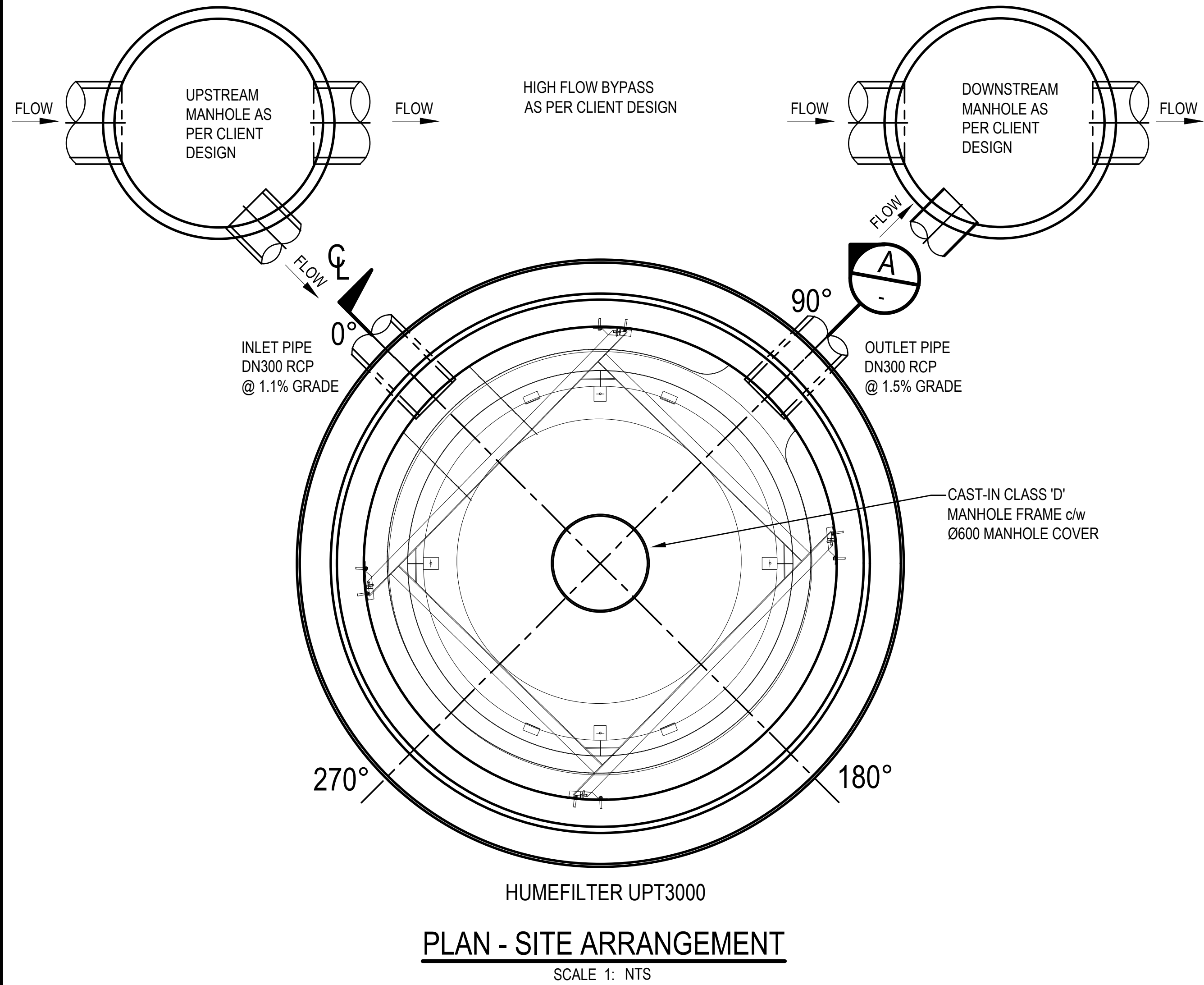
1. WHEN LIFTING ENTIRE UNIT FROM FOOT ANCHORS, SPREADER BEAM MUST BE USED TO ENSURE 4 POINT LIFT.
2. ALL METAL COMPONENTS ARE TO BE MADE FROM 304-GRADE STAINLESS STEEL.
3. SEE DRAWING HG-CAST FOR CASTING SEQUENCE.
4. SEE DRAWING HG-CONNECT FOR ALL CONNECTION DETAILS.
5. MASS OF COMPLETE UNIT = 13.0 † (WITHOUT LID).
MASS OF LID = 3.2 †
6. KOR-N-SEAL BOOT CONNECTOR P/N = S206-30L (INLET & OUTLET)

- ## DESIGN BASIS
1. DESIGN SPECIFICATION AS3600 CONCRETE STRUCTURES.
 2. DESIGN LOADS 0-2m FILL WITH SM1600 VEHICLE LOAD TO ASS100 BRIDGE DESIGN.
 3. DESIGN FOR UP TO B2 EXPOSURE CLASSIFICATION TO AS3600 CONCRETE STRUCTURES.

Humes TECHNICAL (DESIGN) SERVICES
BRISBANE, QUEENSLAND

		DSN.	DFW	12-03-07	HUMES STANDARD DRAWING HUMEGARD HG24/L DN600/DN600 FJ RCP GENERAL ASSEMBLY				
		DWN.	MZ	12-03-07					
		CKD.	DFW	12-03-07					
		APP.	DFW	12-03-07					
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2007		C							

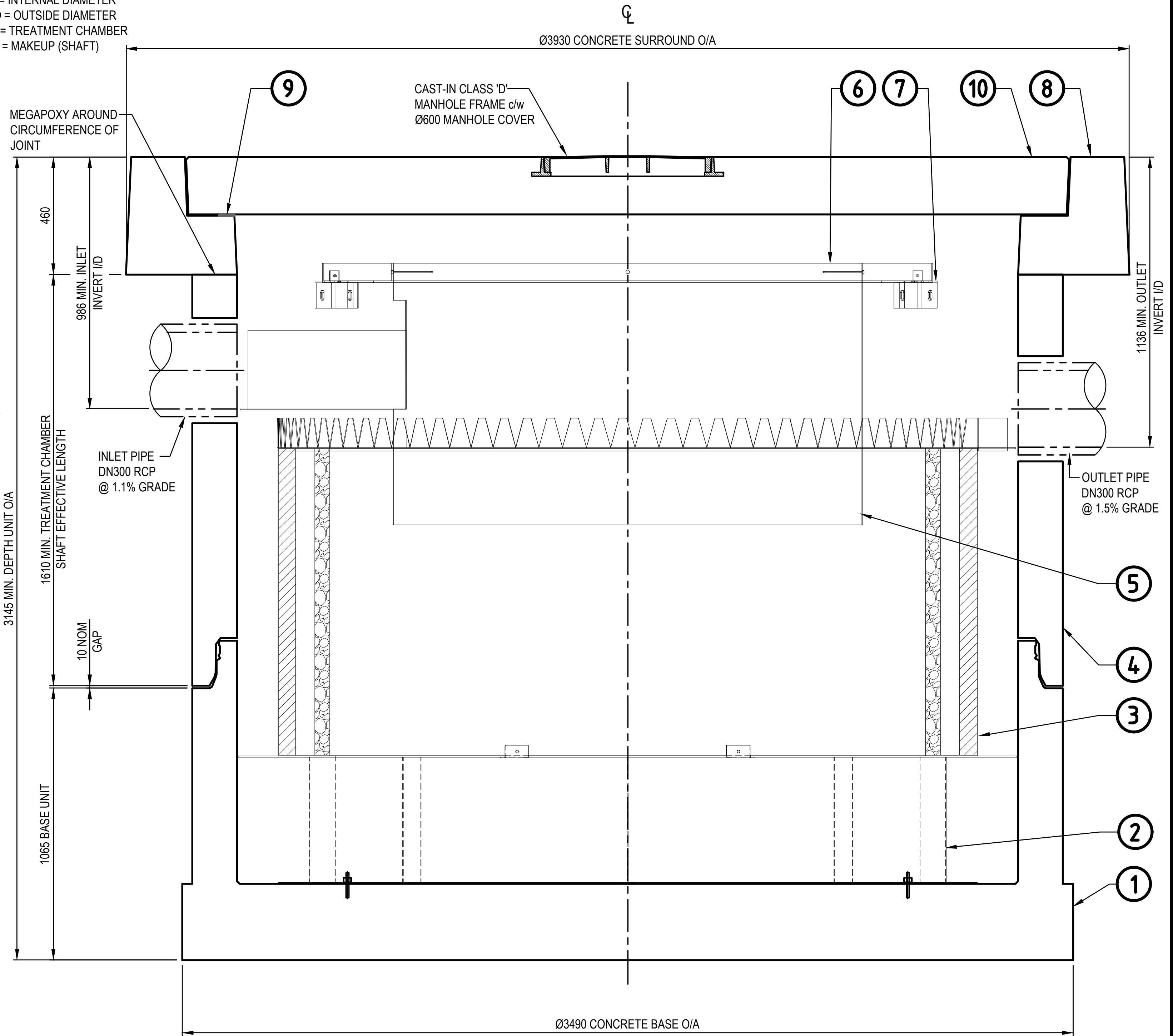
UNIVERSAL POLLUTANT TRAP (UPT3000) PARTS TABLE						
ITEM No.	PART	MANUF'T	SUPPLIED BY	No OFF.	APPROX MASS (t)	COMMENTS
1	BASE UNIT	HUMES	HUMES	1	11.38	INSTALLED BY CONTRACTOR ON-SITE
2	PLINTH	BY OTHERS	HUMES	1	BY OTHERS	INSTALLED BY HUMES IN FACTORY
3	FILTER MEDIUM CARTRIDGE	BY OTHERS	HUMES	1	BY OTHERS	INSTALLED BY CONTRACTOR ON-SITE
4	TREATMENT CHAMBER SHAFT	HUMES	HUMES	1	7.04 SHAFT ONLY)	INSTALLED BY CONTRACTOR ON-SITE
5	TREATMENT CHAMBER INSERT	BY OTHERS	HUMES	1	BY OTHERS	INSTALLED BY CONTRACTOR ON-SITE
6	T.C. SUPPORT FRAME	BY OTHERS	HUMES	1	BY OTHERS	
7	T.C. SUPPORT FRAME BRACKET	BY OTHERS	HUMES	4	BY OTHERS	INSTALLED BY HUMES IN FACTORY
8	CONCRETE SURROUND RING	HUMES	HUMES	1	4.31	INSTALLED BY CONTRACTOR ON-SITE
9	RUBBER RING	HUMES	HUMES	1	0.02	INSTALLED BY CONTRACTOR ON-SITE
10	CONCRETE LID	HUMES	HUMES	1	5.29	INSTALLED BY CONTRACTOR ON-SITE
	ANCON 5.0t "UNILIFT" CONE ANCHOR CLUTCHES	ANCON	CONTRACTOR	4	-	PROVIDED BY CONTRACTOR FOR LIFTING
	ANCON 10.0t "UNILIFT" CONE ANCHOR CLUTCHES	ANCON	CONTRACTOR	4	-	PROVIDED BY CONTRACTOR FOR LIFTING
	MEGAPOXY / EPOXY / MASTIC SEALANT	-	HUMES	-	-	INSTALLED BY CONTRACTOR ON-SITE
	STAINLESS STEEL CLEVIS PIN / R-CLIP	WHITWORTHS	HUMES	4xEACH		USED TO REMOVE AND SECURE INSERT



GENERAL NOTES:

- CONCRETE DESIGNED TO AS3600
- EXPOSURE CLASSIFICATION: B2 AS PER AS3600. SELF COMPACTING CONCRETE WITH RIGID FORMWORK
- TRAFFIC LOADING: SM1600 VEHICLE TO AS5100 AND LIVE LOAD FACTOR 1.5 WITH 1.25 DYNAMIC ALLOWANCE
- MINIMUM COVER TO REINFORCEMENT = 25mm (NOMINAL COVER = 30mm ± 5 UNO)
- FOUNDING MATERIAL TO BE A MINIMUM 150kPa (WORKING LOAD) AND 150mm THICK COMPACTED GRAVEL TO 95% MDD
- SEALANT: PU MASTIC OR SIKAFLEX 11FC
- ABBREVIATIONS:
O/A = OVERALL
I/D = INTERNAL DIAMETER
O/D = OUTSIDE DIAMETER
TC = TREATMENT CHAMBER
MU = MAKEUP (SHAFT)

PIPES CONNECTION TABLE			
	SIZE / TYPE	CONNECTION	COMMENTS
INLET	DN300 RCP CLASS TBC CONSULTANT	EPOXY JOINT	RCP SUPPLIED AND INSTALLED BY CONTRACTOR ON-SITE.
OUTLET	DN300 RCP CLASS TBC CONSULTANT	EPOXY JOINT	RCP SUPPLIED AND INSTALLED BY CONTRACTOR ON-SITE.



REVISIONS					
REV		DETAILS OF ALTERATIONS	DWN	DATE ISS.	CHKD BY
A	ISSUED FOR INFORMATION		CMT	02-02-22	CK
B	MINOR AMENDMENTS - REISSUED FOR INFORMATION		CMT	--	--

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE. DO NOT SCALE

Humes

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FOR INFORMATION ONLY							
DWG STATUS:	NAT. WATER SOLUTIONS	ENG DSN BY: KRB	ENG DSN CHK: N/A	DRAFT BY: CMT	DRAFT CHK: GJH	APP. CK	
QR / QA CODE:		ENG DSN BY DATE: 02-02-22	ENG DSN CHK DATE: XX-XX-XX	DRAFT BY DATE: 01-02-22	DRAFT CHK DATE: 02-02-22	APP. DATE: 02-02-22	

CLIENT :	HUMES WATER SOLUTIONS
PROJ ADD:	HUMEFILTER TECHNICAL MANUAL
TITLE 1:	HUMEFILTER UPT3000
TITLE 2:	RCP INLET & OUTLET
DWG DES:	GENERAL ARRANGEMENT
DWG No.:	EP-UPT-3000-RCP-NAT-B2-GA

PDF SHEET SIZE:	A2
ISSUE:	B

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DRAWING MAY VARY
SUBJECT TO DETAIL DESIGN

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