PLANIT CONSULTING

Stormwater Management Plan

741 Cudgen Road, Cudgen, NSW 2487

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 Preliminary Stormwater Management Plan (SWMP) has been prepared to evaluate a Planning Proposal for 741 Cudgen Road, Cudgen NSW 2487. The objective of the Planning Proposal is to facilitate 'Cudgen Connection', a Proposal 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 have 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 a greater proportion of hardstand area. Further, this SWMP report specifically considers how stormwater can be appropriately managed within the concept masterplan for the site.

The subject site is approximately 5.7ha in size, largely free of built form improvements and accommodates a gentle northerly aspect. A tract of mapped Coastal Wetlands is located adjoining and downstream of the subject site. Accordingly, this SWMP seeks to ensure the quantity and quality of stormwater created by the strategic change in land use proposed can be suitably accommodated.

To achieve desirable outcomes, the overarching proposed 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. Hydrological and hydraulic modelling was completed with MUSIC and DRAINS software to size these structures and provide an appropriate outlet configuration.

The Legal Point Of Discharge (LPOD) for the site is identified as the boundary adjacent to the coastal wetland to the north of the site. The stormwater strategy has considered Tweed Shire Council's stormwater retention requirements, as expressed through its Design and Construction Specifications and Neutral or Beneficial (NorBE) assessment of the water quality has been completed and achieved.

To manage external catchments entering the site it is proposed to provide an open drain to capture and convey runoff using DRAINS hydraulic modelling to size this drain.

Whilst any formal development proposal will be subject to future Development Application process/es, this SWMP has not identified any barrier to achieving suitable stormwater management outcomes by amending the land use type from agriculture to urban purposes as per the Planning Proposal. In addition, this SWMP determines that the proposed Cudgen Connection development, as expressed within the Concept Masterplan, can appropriately manage stormwater in accordance with relative standards.

2 Introduction

2.1 Project Background

This Stormwater Management Plan (SWMP) has been prepared to assess the proposed Cudgen Connection development 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 SWMP 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 have 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 inevitably involve a greater proportion of hardstand area. Further, this SWMP report specifically considers how stormwater can be appropriately managed within the concept masterplan for the site.

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

This SWMP presents the analysis/assessment of the following:

- The subject site including:
  - Locality.
  - Existing stormwater services.
  - Legislation.
  - Flooding.
- Stormwater Management Strategy including:
  - Catchment analysis of the pre and post development site.
  - Hydrological and hydraulic modelling to estimate peak flow rates in the existing and proposed scenario and size infrastructure appropriately.
  - Recommendations for stormwater conveyance and flow mitigation to address TSC's quantity requirements.
  - Hydrological and hydraulic modelling to determine the required stormwater treatment infrastructure.
  - Recommendations for the proposed treatment train to address TSC quality objectives and Neutral or Beneficial (NorBE) requirements.
  - Sediment and Erosion Control.
- Providing conclusions/recommendations regarding stormwater management of the site.

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 SWMP 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 on numerous buildings and basement carparking on site, 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 Design Standards/Specifications/Guidelines

This SWMP has been prepared in accordance with TSC standards and specifications including documents referenced therein. These standards and specifications include but not limited to:

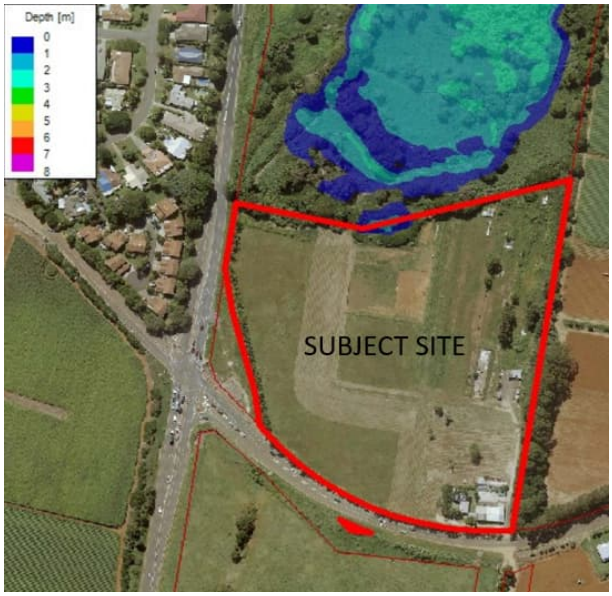
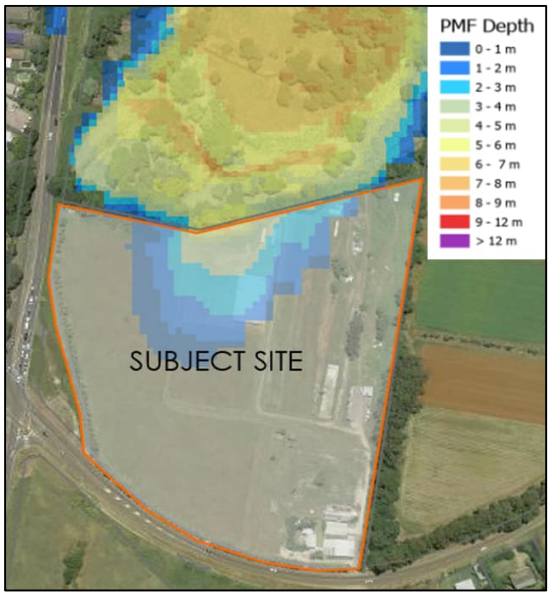
- Tweed Development Control Plan 2008.
- TSC Development Design Specifications & Standard Drawings.
- WaterByDesign Guidelines.
- Water NSW MUSIC modelling guidelines.
- Queensland Urban Design Manual (QUDM).
- All relevant Australian standards.

3.4 Flooding

Tweed Shire Council's flood mapping identifies the following key flood levels for the subject site, which are also visually displayed within Table 2:

- 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 2: Flood Information

Design Flood Level	Probable Maximum Flood level
	

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 Stormwater Management

4.1 Stormwater Conveyance

4.1.1 Existing Catchments

The site has an existing grade of approximately 5% falling from the southern to the northern boundary. The current highpoint has a RL of approximately 18.5m AHD and the low point of approximately 2m AHD. Stormwater runoff flows towards the low point on the northern boundary of the subject site and ultimately into the coastal wetland (Figure 3).

Figure 3: Existing Stormwater Conveyance

Table 3 provides a catchment breakdown for the existing conditions.

Table 3: Existing Catchment Breakdown

Catchment	Total (m^2)	Impervious area (m^2)	Impervious %
C1 (EXIST)	56,860	2800	5

4.1.2 Proposed Catchments

The proposed plans include the construction of several buildings, basement carparking and roads which will the increase in impervious area of the site. Whilst the Cudgen Connection proposal itself is subject to ongoing investigations and consultation, any strategic shift from agricultural land use types to urban purposes is anticipated to have a notable increase in impervious area and supporting stormwater infrastructure.

The overall strategy for the urban use of the site, including the Cudgen Connection proposal, is to convey stormwater via an underground reticulation network, located within the internal roads, draining runoff to a centralised stormwater treatment and detention system. Refer to Figure 4 below for a visual of the proposed strategy. In addition, refer to Table 4 for a catchment breakdown of the site.

It should be noted that any underground basement areas are to be collected in a pump and sump system and pumped to the stormwater network. These basement areas will be required to be pre-treated prior to entering the stormwater network in accordance with Tweed Shire Council's Development Design Specification D7.

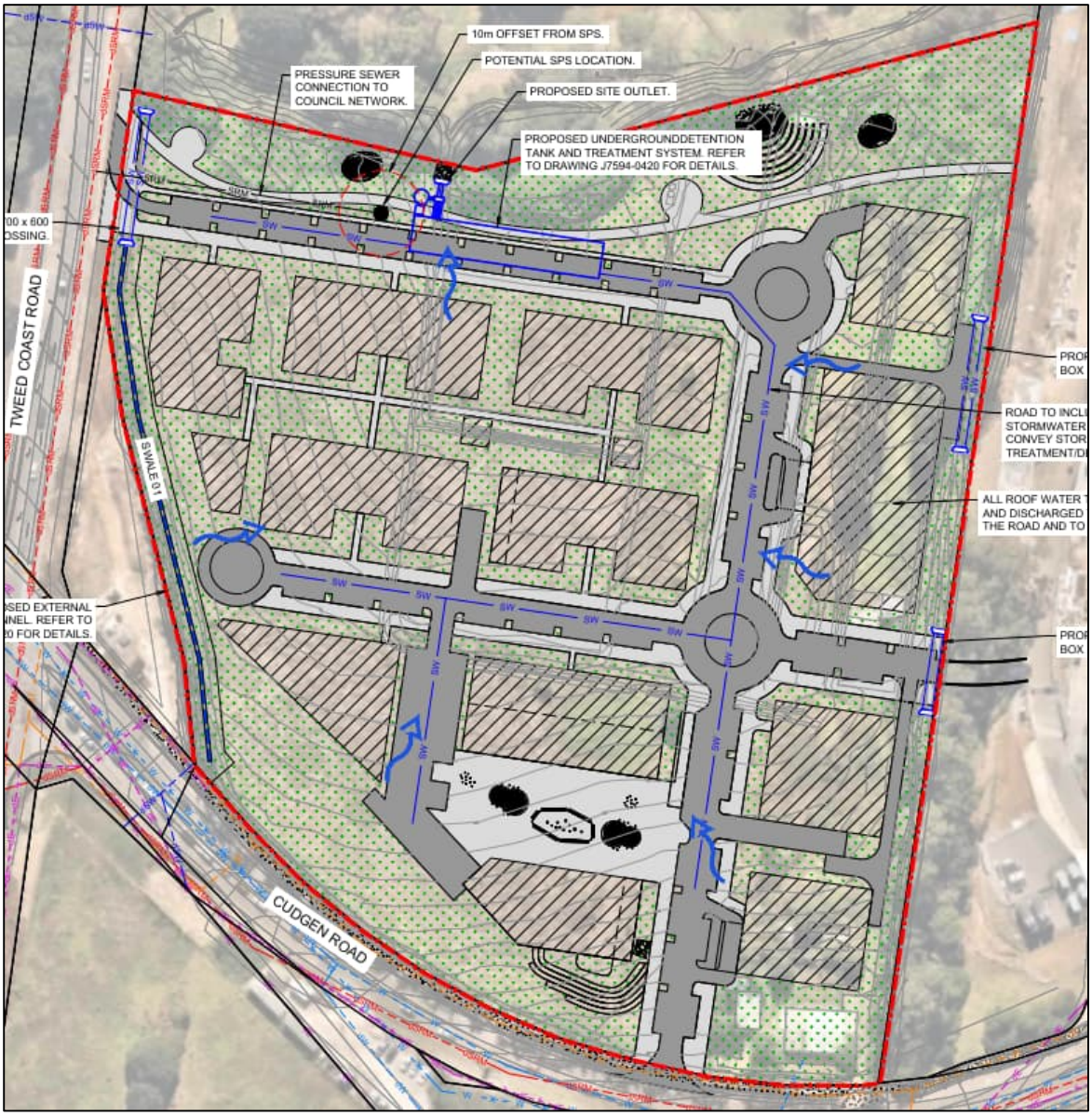


Figure 4: Proposed Stormwater Conveyance

Table 4: Proposed Catchment Breakdown

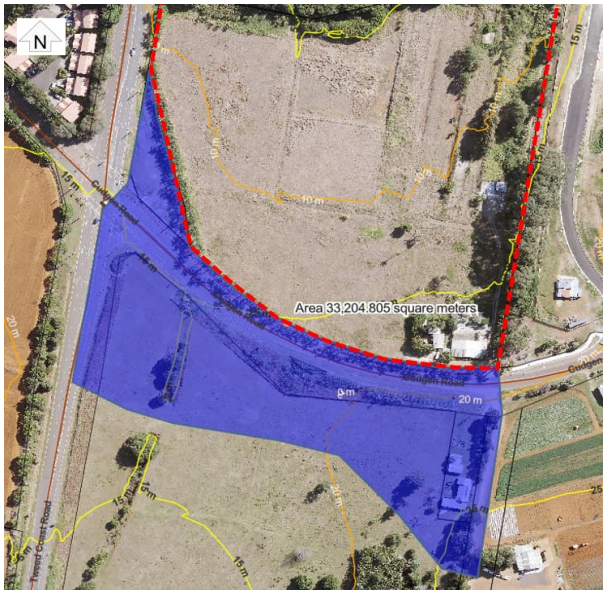
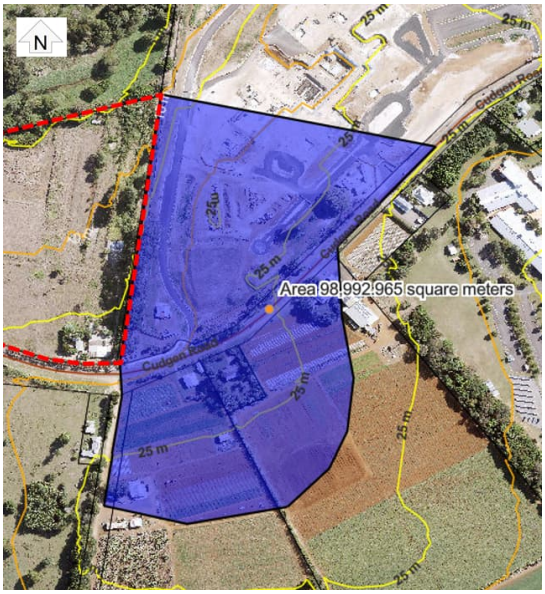
Catchment	Description	Area (m^2)	Impermeable Area (m^2)	Impervious %
C1	Total Roof Area to enter treatment/detention system	16090	16090	100%
C2	Total Road Area to enter treatment/detention system	10080	10080	100%
C3	Total remaining area to enter treatment/detention system	23630	6600	28%
C4	Upstream catchment to be diverted around site	1360	0	0%
C5	Downstream catchment to drain as per existing	5700	0	0%
	Total	**56860**	**32770**	**58%**

Refer to Appendix C for the concept civil plans for the site including a visual of the catchment breakdown.

4.1.3 External Catchment

Analysis of the site's surroundings reveal that an external catchment is present that contributes runoff to the development site. This catchment is shown in Table 5 and is approximately 3.32Ha.

Table 5: External Catchments

External Catchment 1 **Area = 3.32Ha @ 5% impervious**	**External Catchment 2** **Area = 9.90Ha @ 55% impervious**
	

4.1.4 Lawful Point of Discharge (LPOD)

Based on the analysis of the existing site, proposed site, and external catchments. The LPOD is considered as the low-lying wetland to the north of the development site. This LPOD will be considered as the point of assessment for stormwater runoff comparing the pre and post development runoff to demonstrate that both stormwater quantity and quality objectives have been met in accordance with TSC's standards and requirements.

4.2 Stormwater Quantity

As part of the proposed change from agriculture to urban uses, the impervious area of the site will be increased. Accordingly, onsite detention has been proposed to mitigate the increase in peak runoff from the site from the 1EY (Exceedance per Year) event to the 1% AEP (Annual Exceedance Probability) event. To determine the required infrastructure for peak flow mitigation DRAINS hydraulic modelling software has been utilised to estimate the peak runoff from the pre and post development.

4.2.1 Model Hydrology and Parameters

The subject site is located in northern New South Wales, within close proximity to the Queensland border and within a sub-tropical climate zone. Rainfall is seasonal and the highest recorded rainfall is traditionally in the summer months. Typical rainfall events in this period are typified by severe thunderstorms with high rainfall intensities. The design rainfall data has been obtained from the ARR Data Hub for the following latitude and longitude, -28.2654, 153.5632. The intensity, frequency and duration (IFD) values for the site are presented in Table 6 below.

Table 6: AEP Rainfall Intensity (mm/hr)

Duration	63.20%	50%	20%	10%	5%	2%	1%
5 min	118.00	133.00	182.00	215.00	247.00	291.00	326.00
10 min	96.00	108.00	146.00	171.00	195.00	226.00	249.00
20 min	70.60	79.60	107.00	126.00	143.00	166.00	182.00
30 min	56.70	64.00	86.50	102.00	116.00	136.00	150.00
1 hour	37.50	42.40	58.10	69.10	80.00	95.20	107.00
2 hours	24.20	27.60	38.60	46.60	54.80	66.60	76.30
3 hours	18.90	21.50	30.50	37.20	44.10	54.10	62.30
6 hours	12.50	14.40	20.70	25.50	30.50	37.60	43.40
12 hours	8.42	9.73	14.20	17.40	20.90	25.50	29.30
24 hours	5.66	6.56	9.51	11.60	13.70	16.60	18.70
48 hours	3.69	4.26	6.07	7.30	8.51	10.10	11.30
72 hours	2.78	3.21	4.52	5.40	6.25	7.40	8.26

DRAINS ILSAX model has been utilised for the quantity assessment to demonstrate no increase in peak flow from the 1EY event the 1% AEP event. The parameters assigned to the model are presented in Figure 5 below.

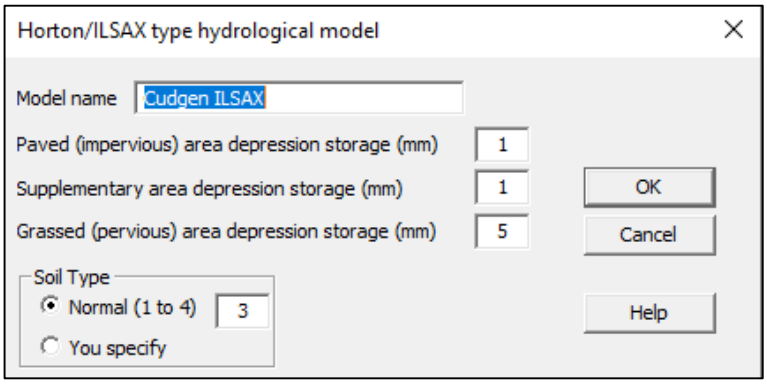


Figure 5: Hydraulic Model Type/Parameters

4.2.2 Hydraulic Assessment

To demonstrate compliance, a comparative analysis of the flow rates generated from the median storm up to and including the 1% AEP event from 5 minutes to 3 hours including 10 ensembles for each duration for the pre and the ultimate development scenario has been carried out. Refer to Table 7 below for the catchment assigned in the hydraulic model. In addition, Refer to Figure 6 below for a visual of the DRAINS model layout.

It should be noted that only DRAINS Catchments 'EXIST' (Existing Site) and 'C1-C3' (Proposed Site) were used to determine detention volumes and the basin outlet configuration as other catchments included in the model does not change catchment characteristics in the post development (i.e., increase impervious area). Other catchments included in the model have been used to size appropriate stormwater conveyance structures.

Table 7: Hydraulic Model Catchments

Catchment Name	Area (Ha)	% Impervious
***EXIST**	5.1310	5
***POST C1-C3**	5.1310	73
C4	0.1320	0
C5	0.4230	0
EXT 01	3.3200	5
EXT 02	9.9000	55

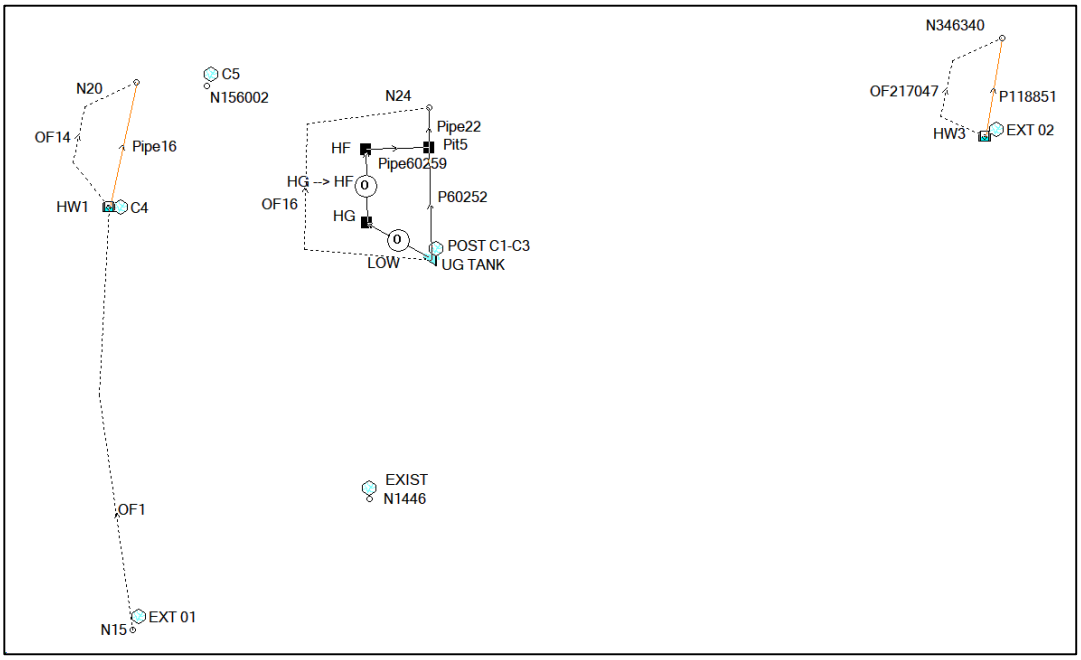


Figure 6: DRAINS Model Layout

It should be noted that the following design AEPs are relevant for the proposed development:

- 1EY Event for waterway stability objectives.
- 10% AEP event for minor system design criteria.
- 1% AEP event for major systems design criteria.

4.2.3 On-site Detention

The proposed development increases the impervious area of the site. Accordingly, peak flow mitigation will be required. DRAINS hydraulic modelling was carried out to estimate the pre and post development peak flows and determine a suitable detention system that will appropriately mitigate the increase in peak flows discharging from the subject site due to the proposed development.

The proposed flow mitigation device for this development is an above ground detention basin. This proposed basin was modelled in DRAINS with the inclusion of an outlet structure to control flows. Figure 7 shows the storage verses elevation relationship of the basin modelled and the maximum water level achieved within the 1% AEP event.

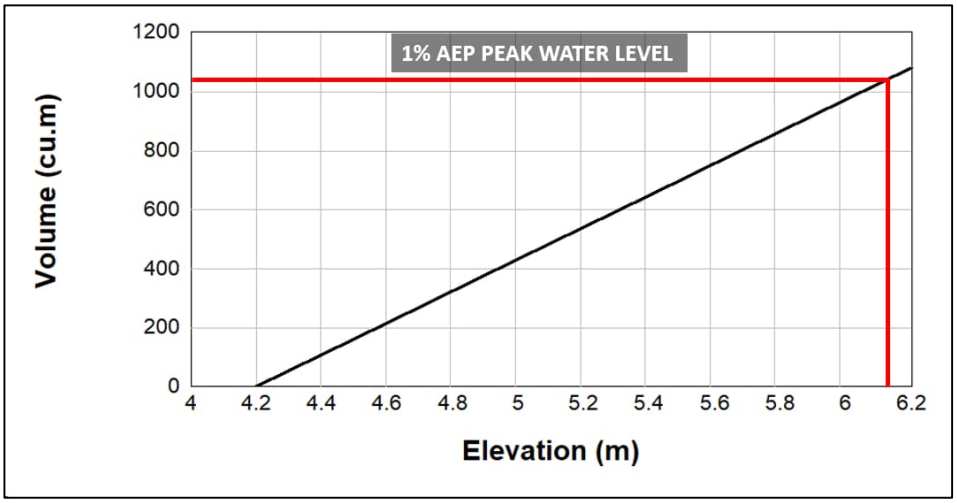


Figure 7: DRAINS Detention Basin Storage

Based on the hydraulic model results, a detention volume of 1040m^3 will appropriately mitigate peak flows from the post development scenario. Refer to Appendix C for details of the proposed detention system including the proposed outlet configuration.

4.2.4 Hydraulic Model Results

The DRAINS model demonstrated that peak flows from the 1EY event to the 1% AEP event can be appropriately mitigated with the inclusion of the proposed detention system. Refer to Table 8 below for the peak flow rates for the pre and post development site from the 1EY event to the 1% AEP event.

Table 8: DRAINS Model Results

Scenario	1EY (m3/s)	0.5EY (m3/s)	20% AEP (m3/s)	10% AEP (m3/s)	5% AEP (m3/s)	2% AEP (m3/s)	1% AEP (m3/s)
Pre development	0.65	0.90	1.24	1.47	1.73	2.10	2.34
Post Development	0.55	0.70	1.05	1.40	1.68	2.04	2.29
Impact	**-0.09**	**-0.20**	**-0.19**	**-0.07**	**-0.05**	**-0.06**	**-0.05**

In addition, refer to Figure 8 to Figure 10 for a comparison of the pre and post development flow rates for a visual of the DRAINS results for the following events.

- 1EY event (Frequent event)
- 10% AEP event (Minor event).
- 1% AEP event (Major event).

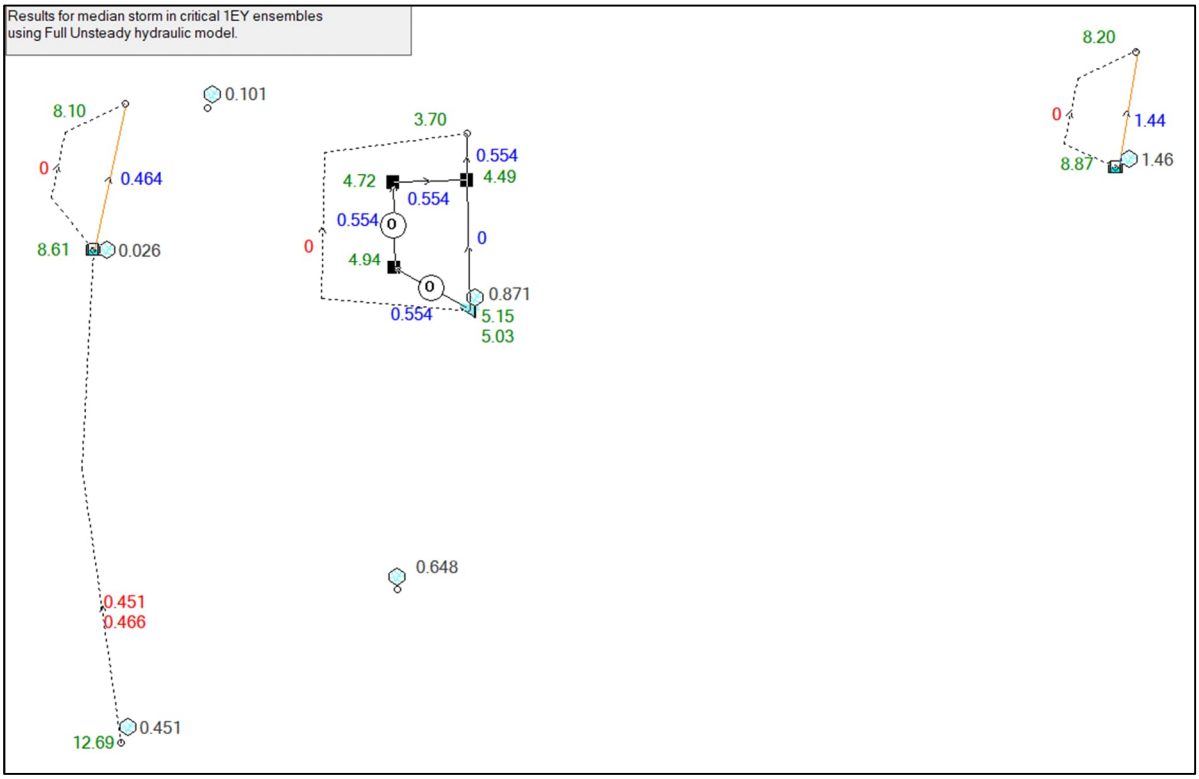


Figure 8: DRAINS Results (1EY)

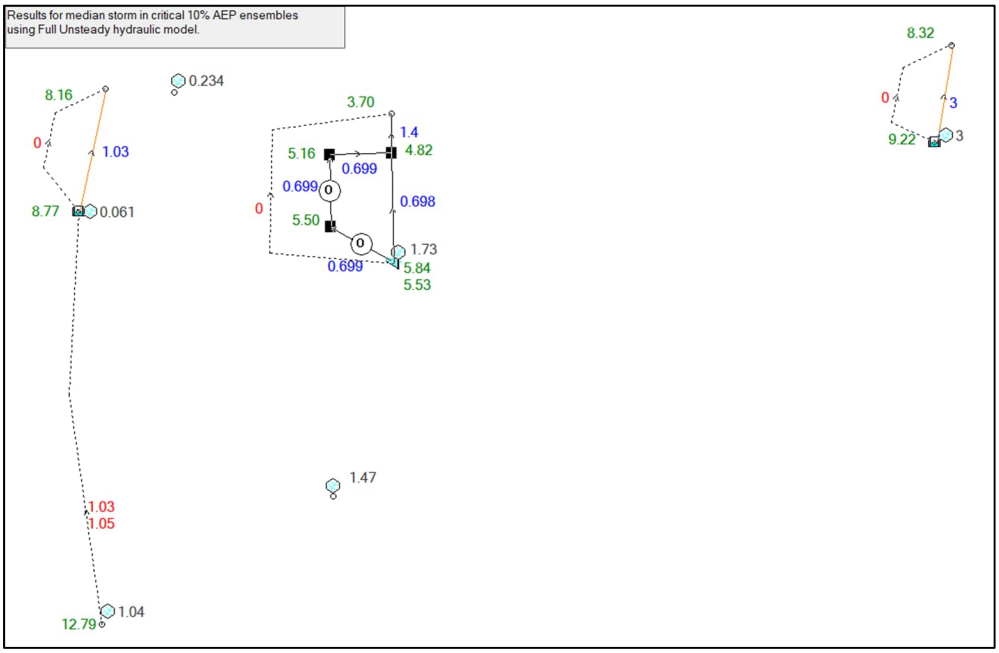


Figure 9: DRAINS Results (10% AEP)

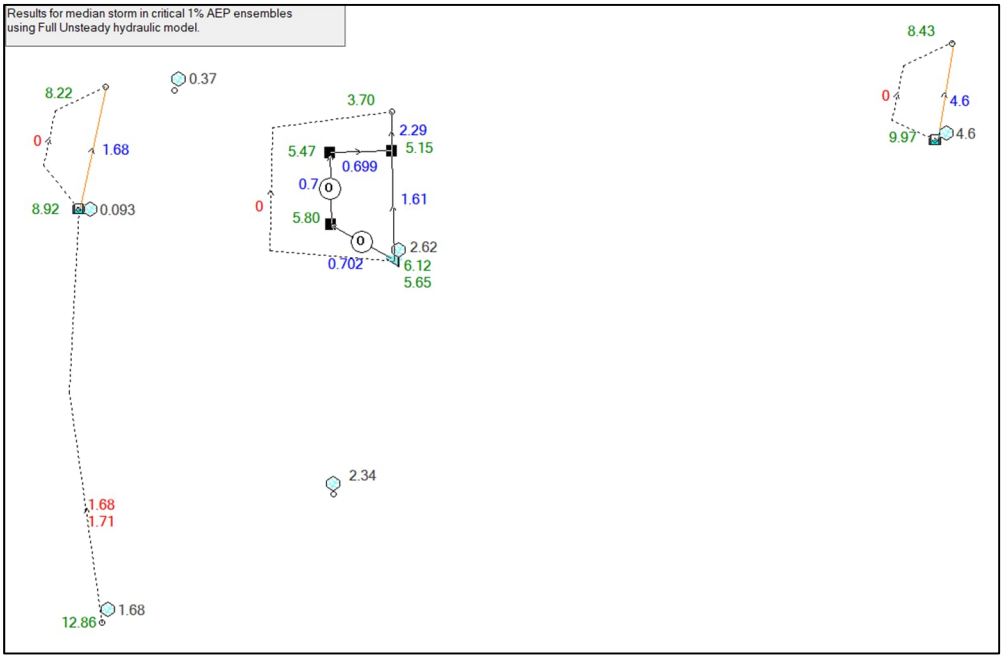


Figure 10: DRAINS Results (1% AEP)

4.2.5 External Catchment Conveyance

In addition to confirming the site detention requirements, the hydraulic model also include external catchments to determine the infrastructure required to convey external catchments appropriately.

It is proposed to provide an open channel around the site to convey these external catchments. These open channels have been designed to cater for the 1% AEP event plus 500mm freeboard as per TSC development design specification. Refer to Appendix A for details of the proposed open channels.

In addition, to the open channels, 2 culvert crossings will be required to convey external catchments. These culvert size has been nominated based on catering for the 1% AEP event with a minimum freeboard of 500mm. Refer to Appendix C for the proposed culvert crossing size.

4.3 Stormwater Quality

4.3.1 Objectives

TSC's Development Design Specification D7 notes key pollutant removal percentages that are required to be achieved prior to stormwater being discharged from a development site. These removal percentages and the corresponding pollutant are presented in Table 9 below.

Table 9: TSC Stormwater Quality Objectives

Pollutant	Reduction Required
Total Suspended Solids (TSS)	80%
Total Phosphorus (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants (>5mm)	90%

As the site discharges to a sensitive area (coastal wetland), stormwater runoff from the proposed development must remain consistent or improved regarding water quality, including but not limited to no significant impact on:

- The biophysical, hydrological or ecological integrity of the adjacent coastal wetland, or
- The quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.

Accordingly, a Neutral or Beneficial (NorBE) assessment of the water quality has been completed in addition to the requirements noted by TSC. Table 10 below identifies the requirements to demonstrate that runoff quality has a neutral or beneficial effect.

Table 10: NorBE Water Quality Objectives

Pollutants	Target Reduction Load
Pollutant Loads	Pollutant loads for the developed case should aim to achieve 10% less than the pre-development case for total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN). For gross pollutants (GP), the modelled post-development load only needs to be equal to or less than pre-development load.
Pollutant Concentration	Pollutant concentrations for TP and TN for the post-development case (including mitigation measures) must be equal to or better compared to the pre-development case for between the 50th and 98th percentiles over the five-year modelling period when runoff occurs.

4.3.2 Model

To demonstrate compliance with stormwater quality objectives, MUSIC software has been utilised. The model has generally been set up in accordance with WaterNSW and WaterByDesigns MUSIC Modelling Guidelines, however, Water NSW MUSIC Modelling guidelines have also been used to demonstrate NorBE requirements have been achieved. Refer below for the assigned model parameters.

4.3.2.1 Rainfall Data

The D7.13.1 MUSIC - Rainfall Data Set (Murwillumbah 6 min) has been utilised for the MUSIC Model.

4.3.2.2 Rainfall Runoff Parameters

Rainfall runoff parameters have been assigned as per Figure 11 (WaterByDesign's MUSIC Modelling Guidelines) corresponding to the relative land use. Rural Residential parameters have been assigned for the existing site and Commercial/Industrial for the proposed site.

PARAMETER	LAND USE			
	URBAN RESIDENTIAL	COMMERCIAL AND INDUSTRIAL	RURAL RESIDENTIAL	FORESTED
RAINFALL THRESHOLD (MM)	1	1	1	1
SOIL STORAGE CAPACITY (MM)	500*	18	98	120
INITIAL STORAGE (% CAPACITY)	10	10	10	10
FIELD CAPACITY (MM)	200	80	80	80
INFILTRATION CAPACITY COEFFICIENT A	211	243	84	200
INFILTRATION CAPACITY COEFFICIENT B	5.0	0.6	3.3	1.0
INITIAL DEPTH (MM)	50	50	50	50
DAILY RECHARGE RATE (%)	28	0	100	25
DAILY BASEFLOW RATE (%)	27	31	22	3
DAILY DEEP SEEPAGE RATE (%)	0	0	0	0

Figure 11: MUSIC Rainfall Runoff Parameters

4.3.2.3 Pollutant loading

Pollutant loadings have been assigned to each node as per WaterByDesign Guidelines shown in Figure 12 below. Rural Residential loading has been assigned for the existing site and Commercial/Industrial for the proposed site.

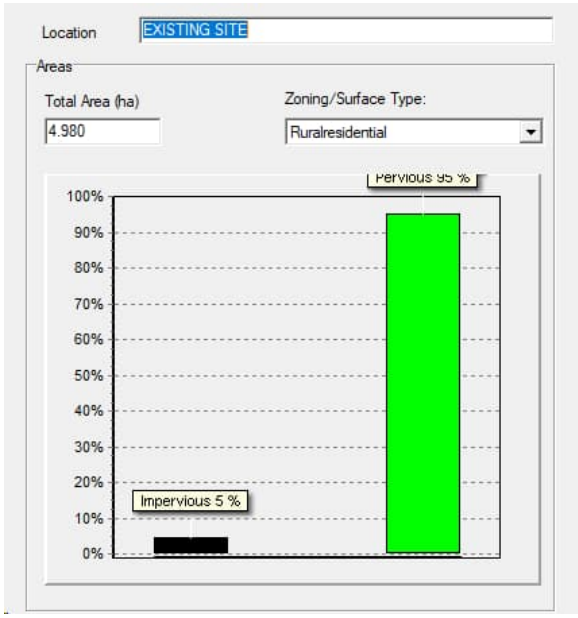
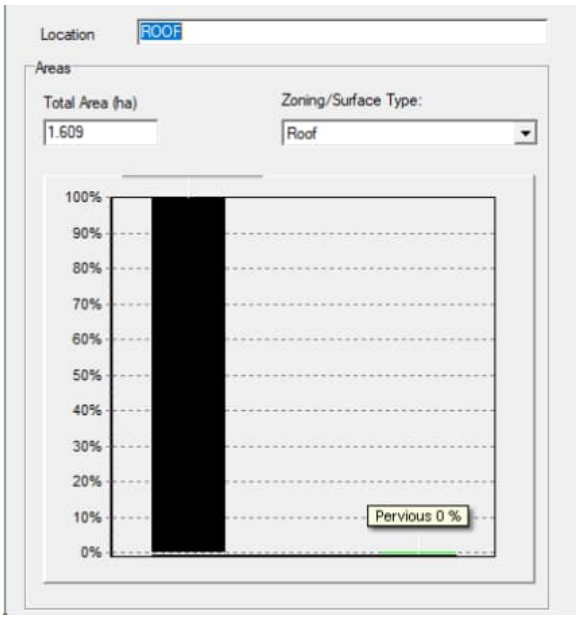
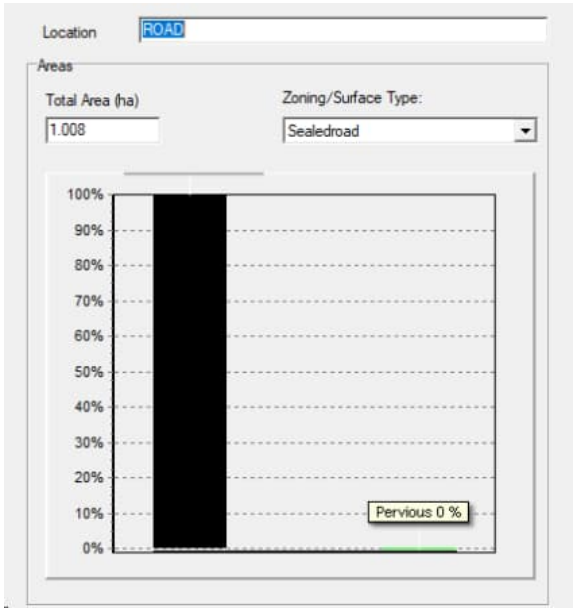
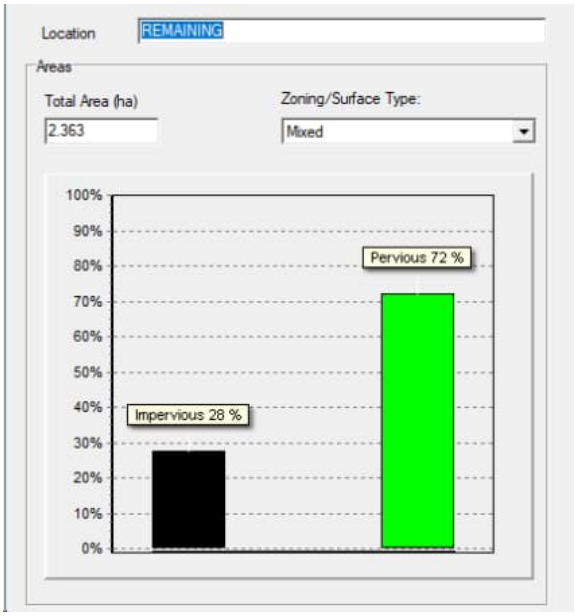
LANDUSE	FLOW TYPE	TSS LOG¹⁰ VALUES		TP LOG¹⁰ VALUES		TN LOG¹⁰ VALUES	
		MEAN	ST. DEV	MEAN	ST. DEV	MEAN	ST. DEV
Urban residential	Baseflow	1.00	0.34	-0.97	0.31	0.20	0.20
	Stormflow	2.18	0.39	-0.47	0.32	0.26	0.23
Industrial	Baseflow	0.78	0.45	-1.11	0.48	0.14	0.20
	Stormflow	1.92	0.44	-0.59	0.36	0.25	0.32
Commercial	Baseflow	0.78	0.39	-0.60	0.50	0.32	0.30
	Stormflow	2.16	0.38	-0.39	0.34	0.37	0.34
Rural residential	Baseflow	0.53	0.24	-1.54	0.38	-0.52	0.39
	Stormflow	2.26	0.51	-0.56	0.28	0.32	0.30
Forest	Baseflow	0.51	0.28	-1.79	0.28	-0.59	0.22
	Stormflow	1.90	0.20	-1.10	0.22	-0.075	0.24
Agriculture*	Baseflow	1.00	0.13	-1.155	0.13	-0.155	0.13
	Stormflow	2.477	0.31	-0.495	0.30	0.29	0.26

Figure 12: MUSIC Pollutant Loading

4.3.2.4 Catchments

Catchments for the MUSIC assessment has been based on catchments provided in Section 4.1.1 and 4.1.2 of this document. Refer to Table 11 below for MUSIC catchments assigned.

Table 11: MUSIC Catchments

Existing Site	Roof
	
Road	**Remaining**
	

4.3.2.5 Treatment Train

To treatment stormwater appropriately prior to discharge offsite, it is proposed to provide an underground detention basin that drains the peak 3 month event (4EY) to a Humegard GPT and a Humefilter (or approved equivalent). The Humegard and Humefilter treatment nodes have been obtained from Humes with no characteristics of these nodes been altered, The detention basin node included in the model has parameters assigned as per Planit's Civil Design Plans.

4.3.2.6 Model Layout

The model layout used to demonstrate compliance with relative objectives is shown in Figure 13 Below.

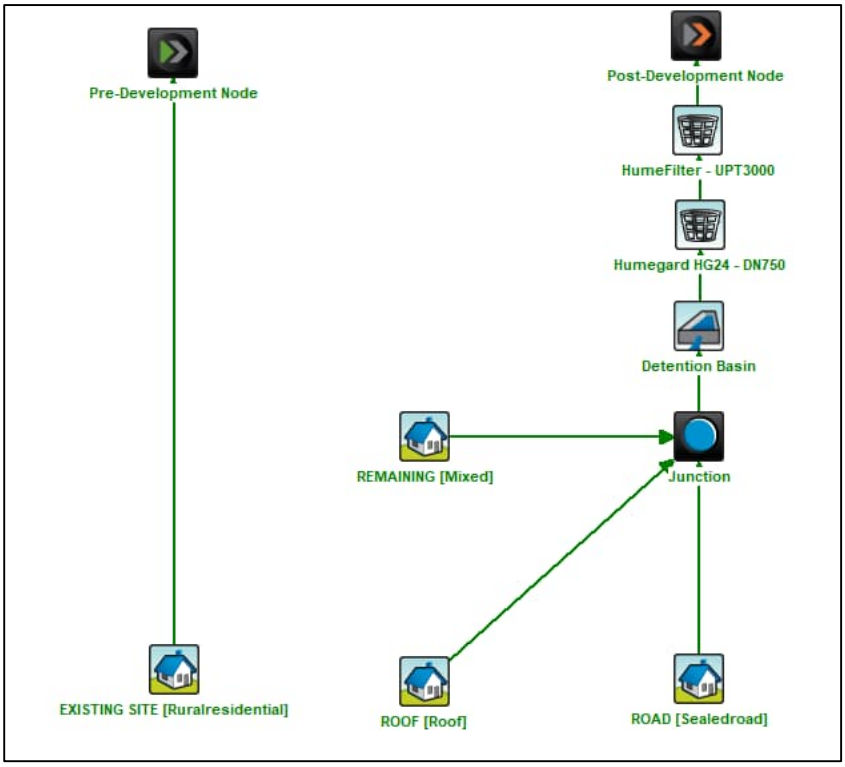


Figure 13: MUSIC Layout

4.3.3 Results

As mentioned in Section 4.3.1 of this document, the proposed development requires compliance with both TSC and NorBE quality objectives. The Sections below detail the MUSIC results and demonstrate that objectives have been met.

4.3.3.1 TSC Objectives

Refer to Table 12 for the MUSIC results demonstrating compliance with TSC quality objectives.

Table 12: Pollutant Load Results – TSC Compliance

Pollutant	Source Load (kg/yr)	Residual Load (kg/yr)	% Reduction	Compliance
Total Suspended Solids	13100	1240	90.5	✓
Total Phosphorus	26.2	6.64	74.7	✓
Total Nitrogen	145	72.8	49.8	✓
Gross Pollutants	1300	0	100	✓

4.3.3.2 NorBE Objectives

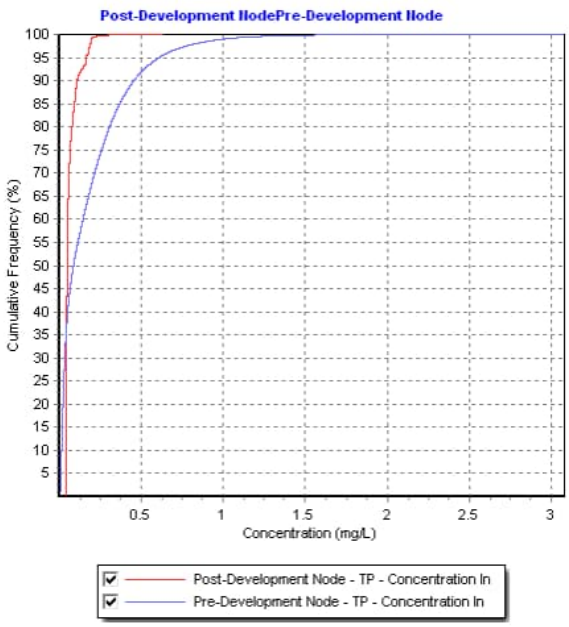
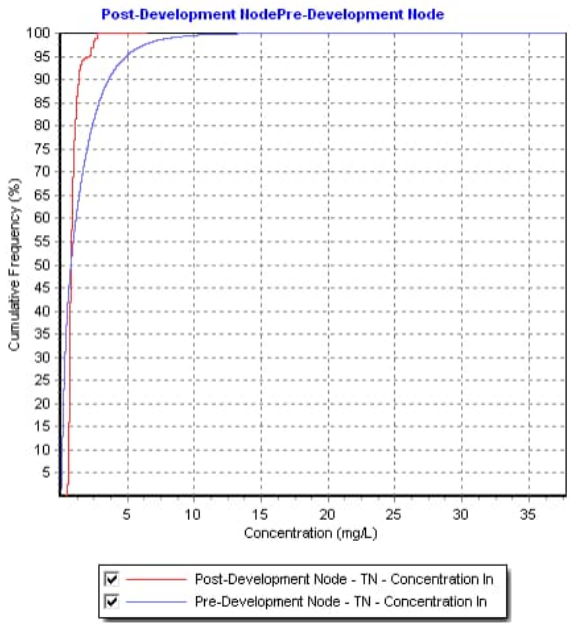
Refer to Table 13 for the MUSIC results demonstrating compliance with NorBE quality objectives for pollutant loads.

Table 13: Pollutant Load Results – NorBE Compliance

Pollutant	Source Load (kg/yr)		Residual Load (kg/yr)		Post Development 10% Reduction Target (kg/yr)	Compliance
Scenario	**Pre**	**Post**	**Pre**	**Post**		
Total Suspended Solids	13300	13100	13300	1240	11970	✓
Total Phosphorus	12.7	26.2	12.7	6.64	11.43	✓
Total Nitrogen	97.7	145	97.7	72.8	87.9	✓
Gross Pollutants	181	1300	181	0	162.9	✓

Refer to Table 14 for the MUSIC results demonstrating compliance with NorBE quality objectives for pollutant concentration.

Table 14: Pollutant Load Concentration Results – NorBE Compliance

Total Phosphorus	Total Nitrogen
	

Pollutant concentrations for TP and TN for the post-development case are equal to or better compared to the pre-development case for between the 50th and 98th percentiles. Therefore, NorBE objectives for pollutant concentrations have been met.

5 Conclusion/Recommendations

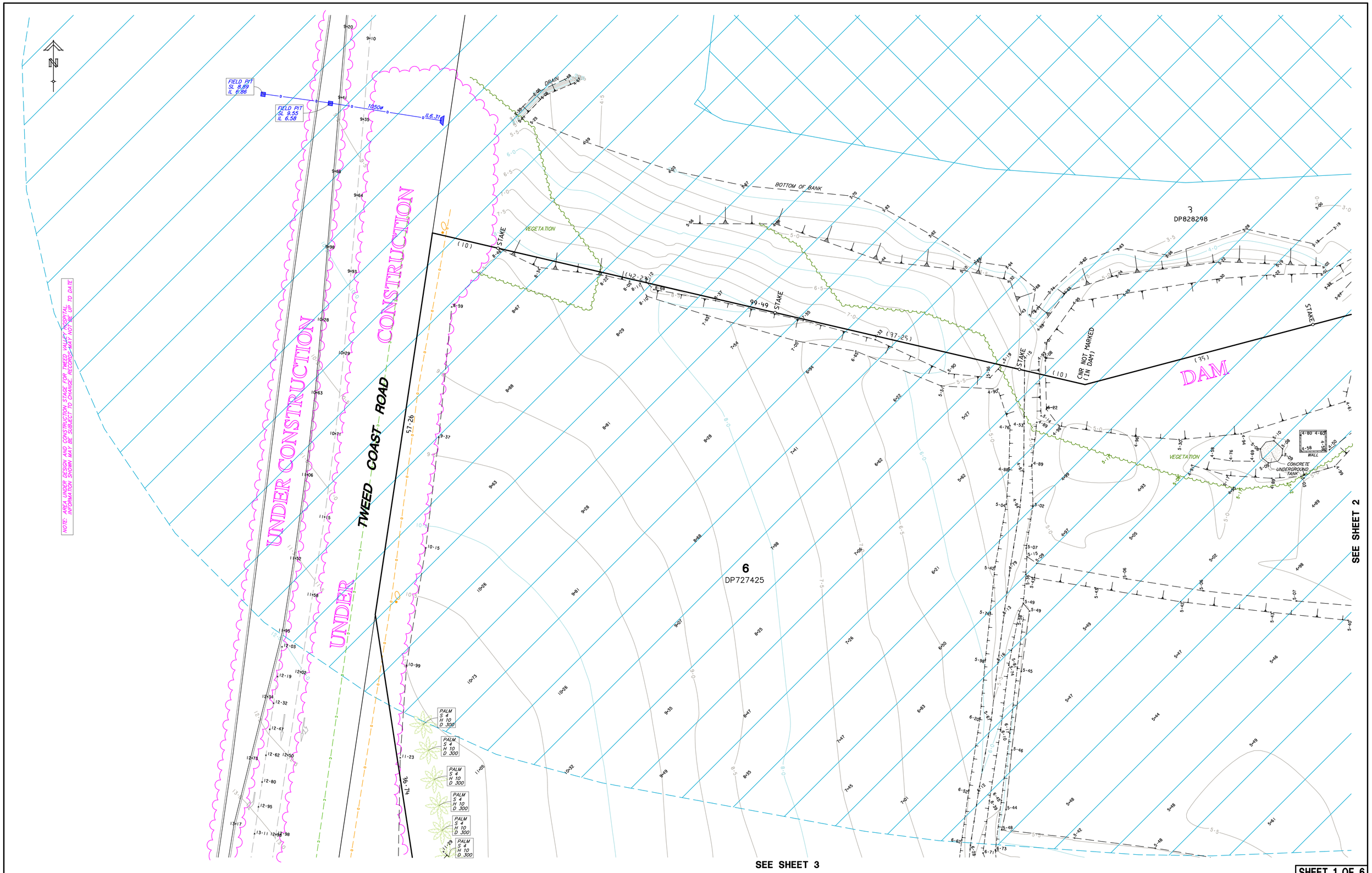
This Stormwater Management Plan (SWMP) has been prepared to access the Planning Proposal and future Cudgen Connection development at 741 Cudgen Road, Cudgen, NSW. This SWMP provides advice for the overall stormwater management strategy of the site to minimise the impacts of the proposed development both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

Planit has assessed the proposal 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 the future 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 1040m^3), Humegard GPT (Model HG24) and Humefilter (Model UPT3000).
- Provide an open channel for management of external catchments including 1 new culvert crossing.
- Provide 2 new culvert crossings on along the existing swale running along the East site boundary.
- 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, it is confirmed that the subject site and 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.

Appendix A – Survey and Layout Plan



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- OPIT ... COMMUNICATIONS PIT
- TPIT ... TELSTRA PIT
- ... STORMWATER LINE
- ... OVERHEAD ELECTRICITY LINE
- ... WATER FROM DBYD RECORDS
- ... AARNET FROM DBYD RECORDS
- ... OPTUS FROM DBYD RECORDS
- SRM ... SEWER RISING MAIN FROM DBYD RECORDS
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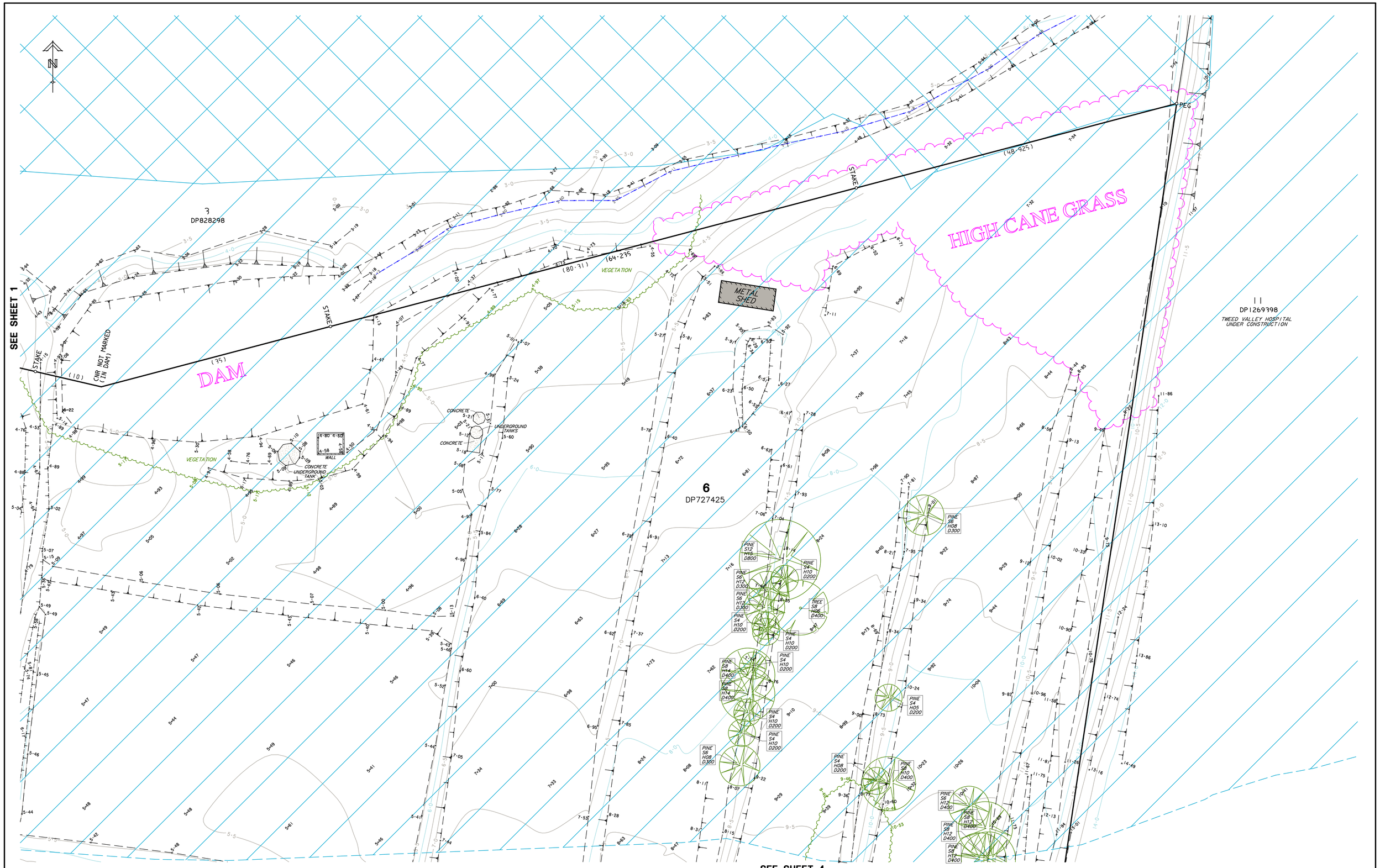

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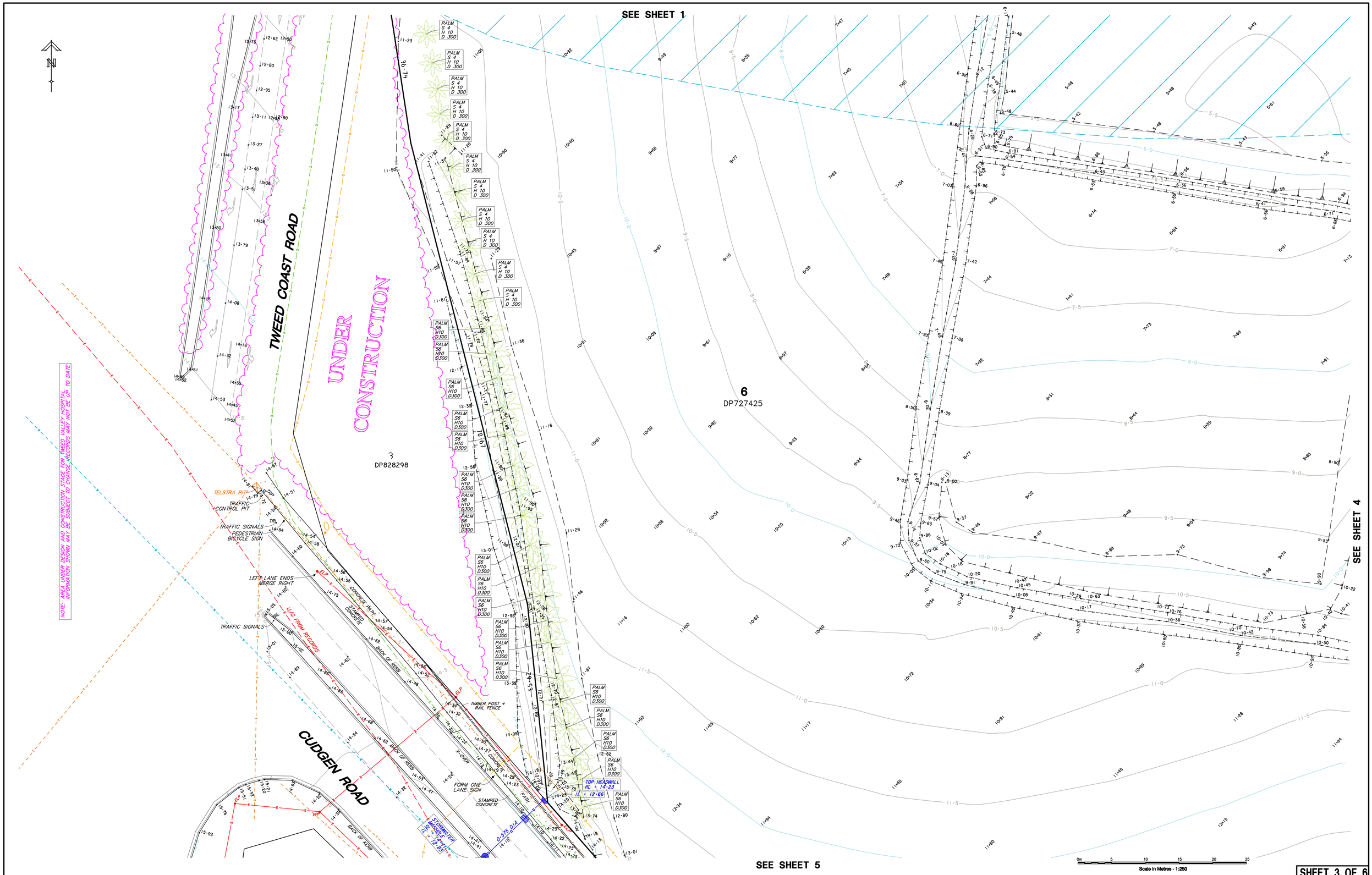

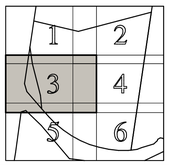

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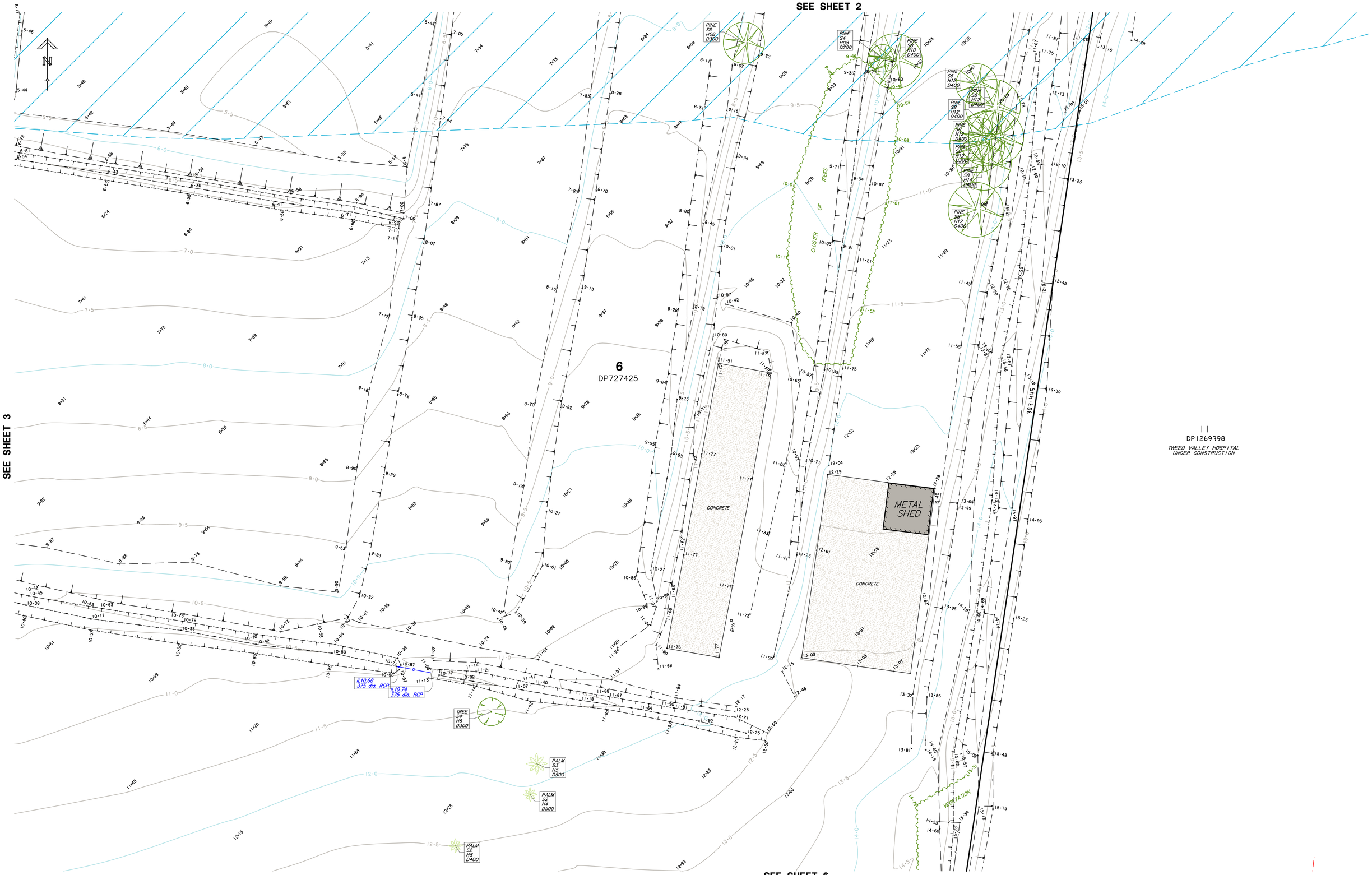

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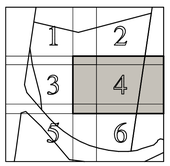

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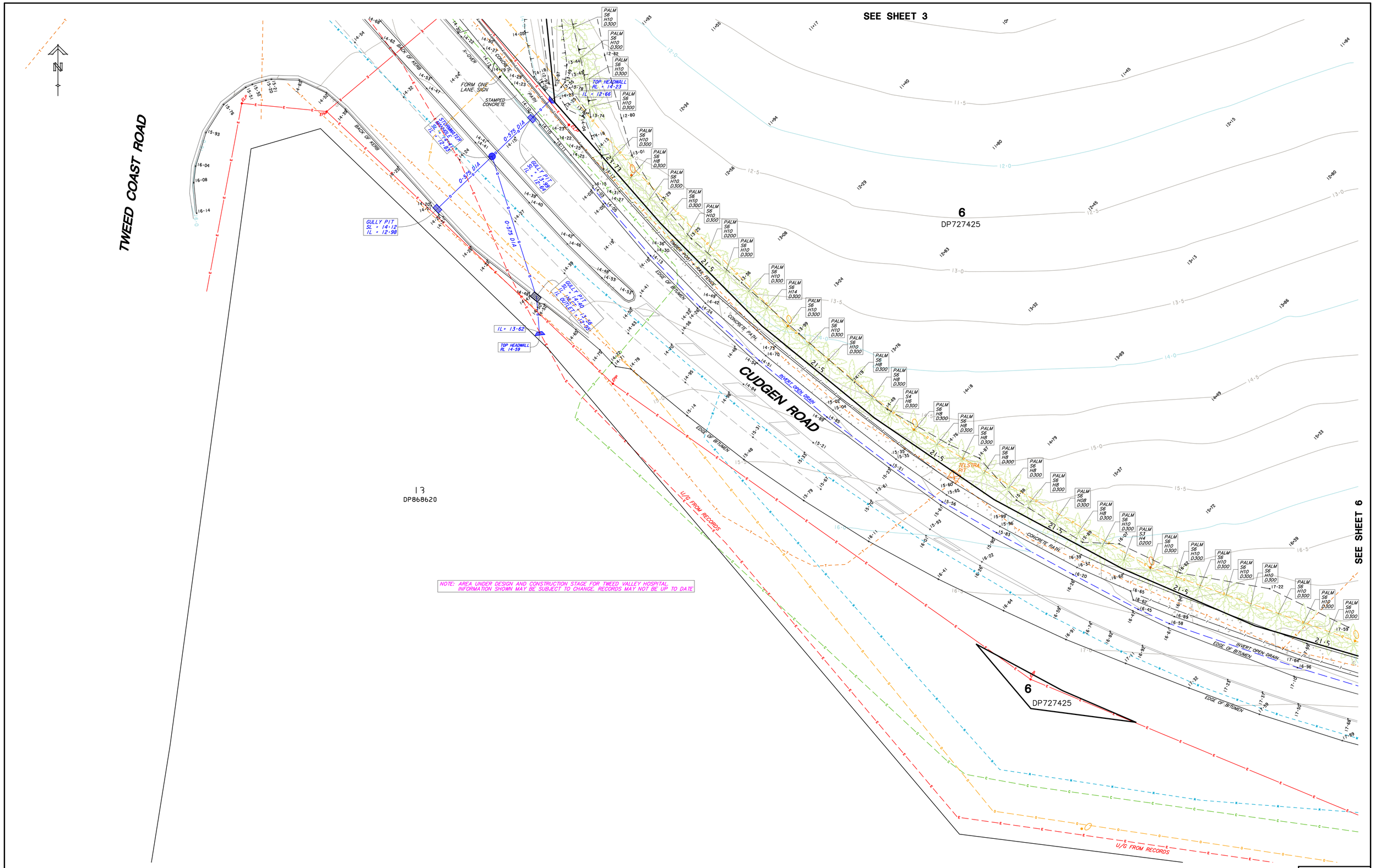

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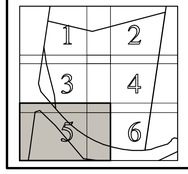

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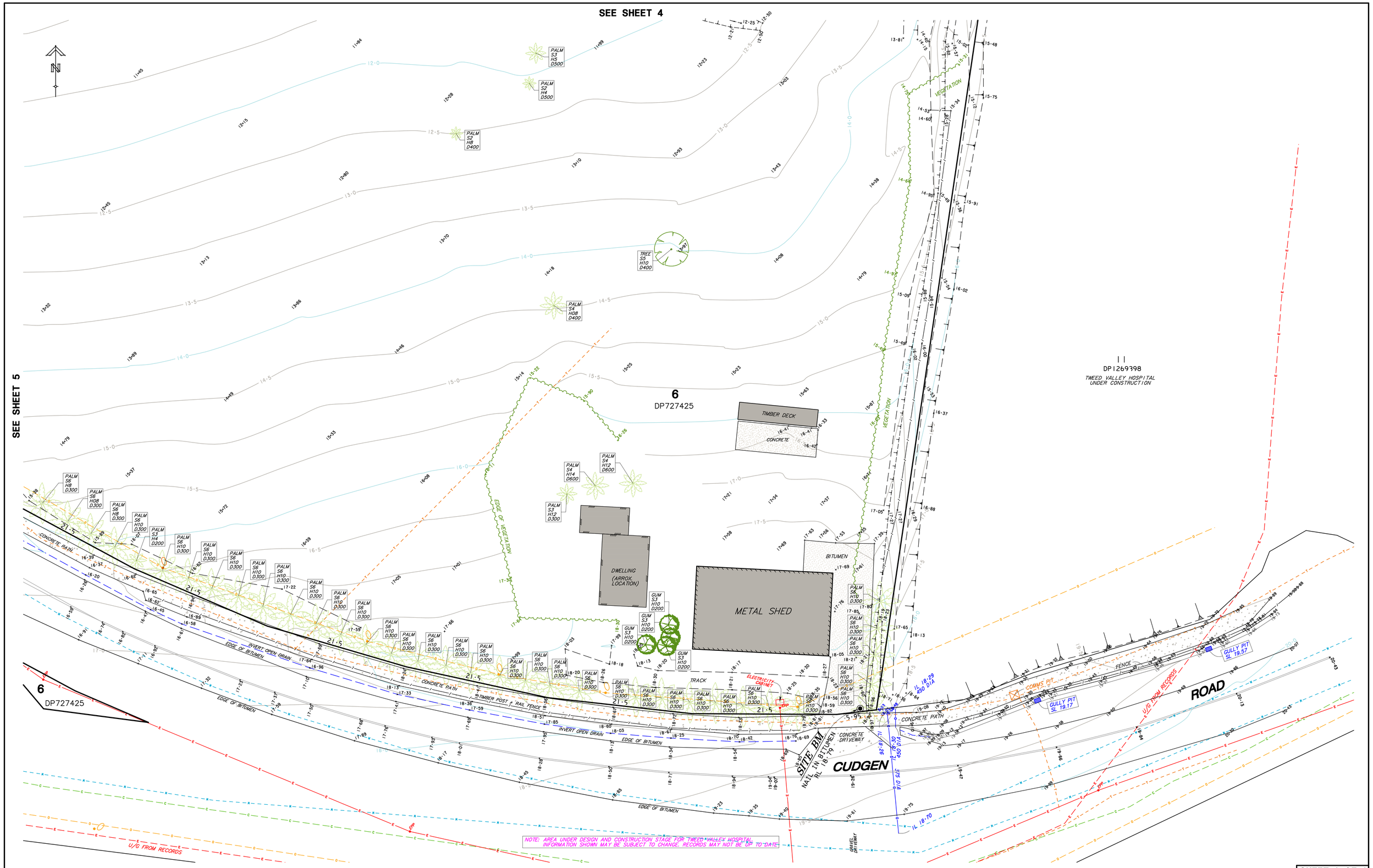

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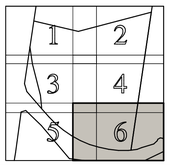

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LEVEL DATUM: VIDE SSM 62101 RL 26.065 AHD
CONTOURS ARE DERIVED FROM FIELD OBSERVATIONS AND ARE ACCURATE TO WITHIN HALF THE CONTOUR INTERVAL
ONLY VISIBLE SURFACE FEATURES OF UNDERGROUND SERVICES HAVE BEEN SHOWN.
NO REPORT IS MADE ON ANY UNDERGROUND 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	Level Datum	F.Bk	L.Bk	Drawn AJW/TPK Chk'd
1 : 250	A.H.D.	L/L	–	

B & P SURVEYS
CONSULTING SURVEYORS
A.B.N. 55 010 117 236
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 Ph.(02)66721924
Murwillumbah
A QUALITY ASSURED COMPANY

Ref. No.	Date	Drawing No./Size	Rev.
T17081	3.11.2022	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

COTTEEPARKER

N

0 15 30 45 60 75

SCALE 1: 750 @ A1
SCALE 1: 1500 @ A3

Centuria DIGITAL INFRATECH

CONCEPT MASTERPLAN

PROJ. NAME 741 Cudgen Road | PROJ. NO. 20006148 | SHEET NO. 10003 | REV. 04

BIMcloud: CPACLDBIMM01 - BIMcloud/2000/6148 Cudgen Rd Master: 21/11/2023: 5:13 PM

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

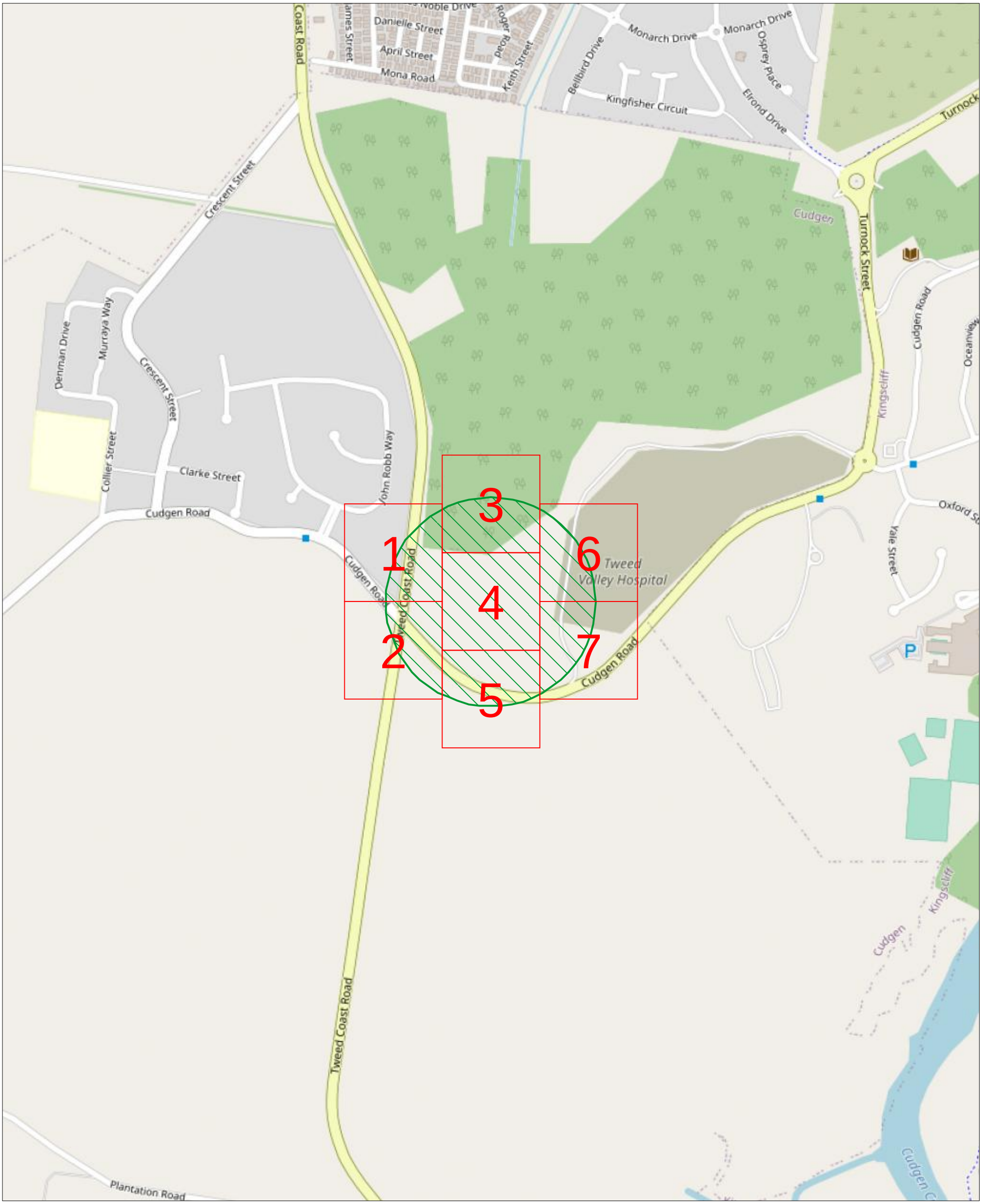
Damage: Tweed Shire Council reserves all rights to recover compensation for any damage to Sewer mains, Water mains and Stormwater.

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

Date: 13/10/2023



N

1:5000 @ A3 Portrait

Legend:

BYDA Work Area

Imagery sourced from OpenStreetMaps

While every care is taken to ensure the accuracy of this data, Tweed Shire Council makes no representations or warranties expressed or implied, statutory or otherwise, about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way and for any reason. This information is supplied for general guidance and is to be considered indicative and diagrammatic only. The information contained on this document remains valid for 30 days only from the date of supply. Please note that water pipes and sewer rising mains operate under high pressure and present a significant risk for any work around them while live. These mains will have associated thrust blocks that should also be considered in design/construction clearances.

DIAL BEFORE YOU DIG www.1100.com.au

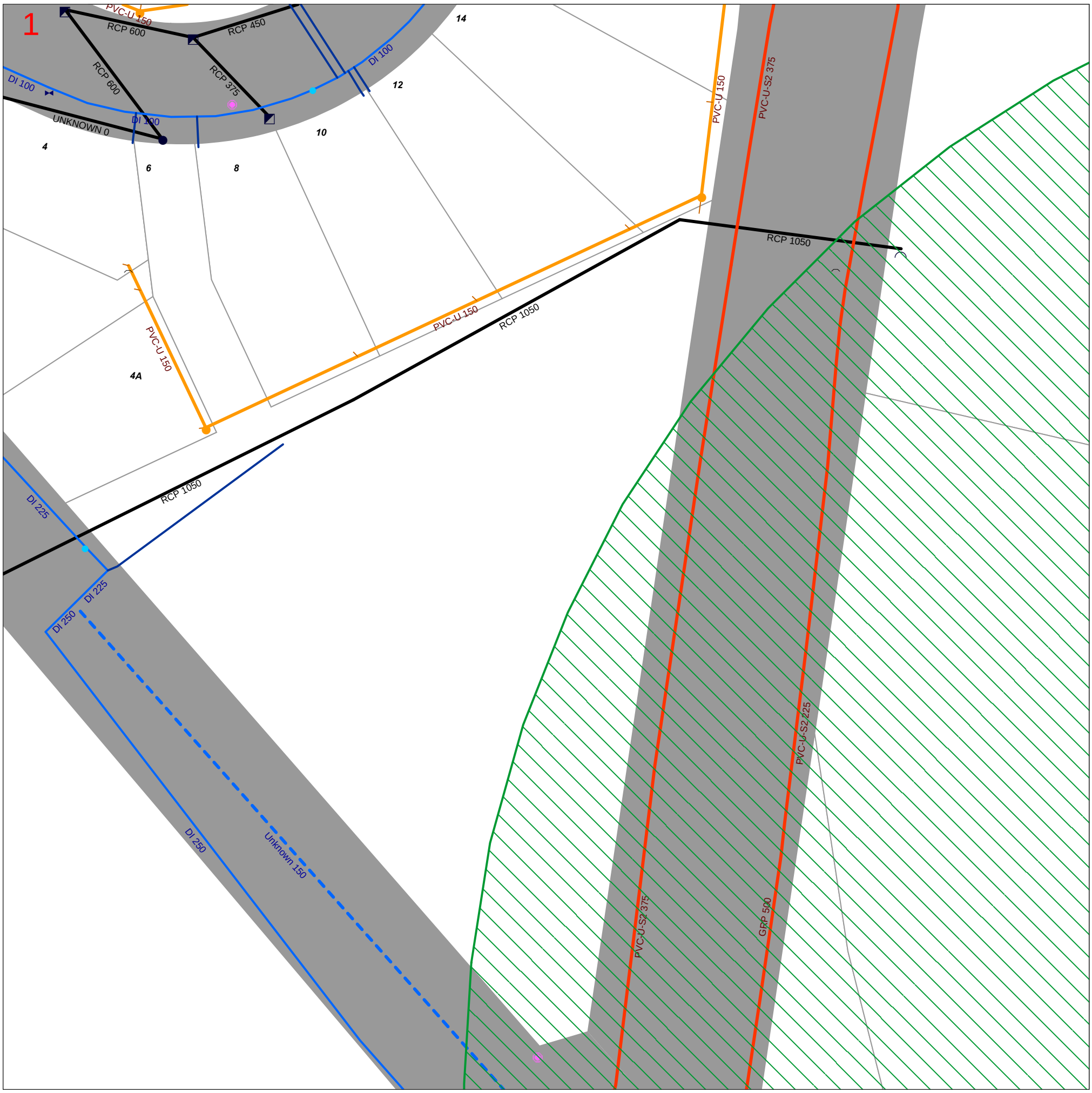
Map 1

Sequence No: 230804440

741 Cudgen Road Cudgen

TWEED SHIRE COUNCIL

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

N

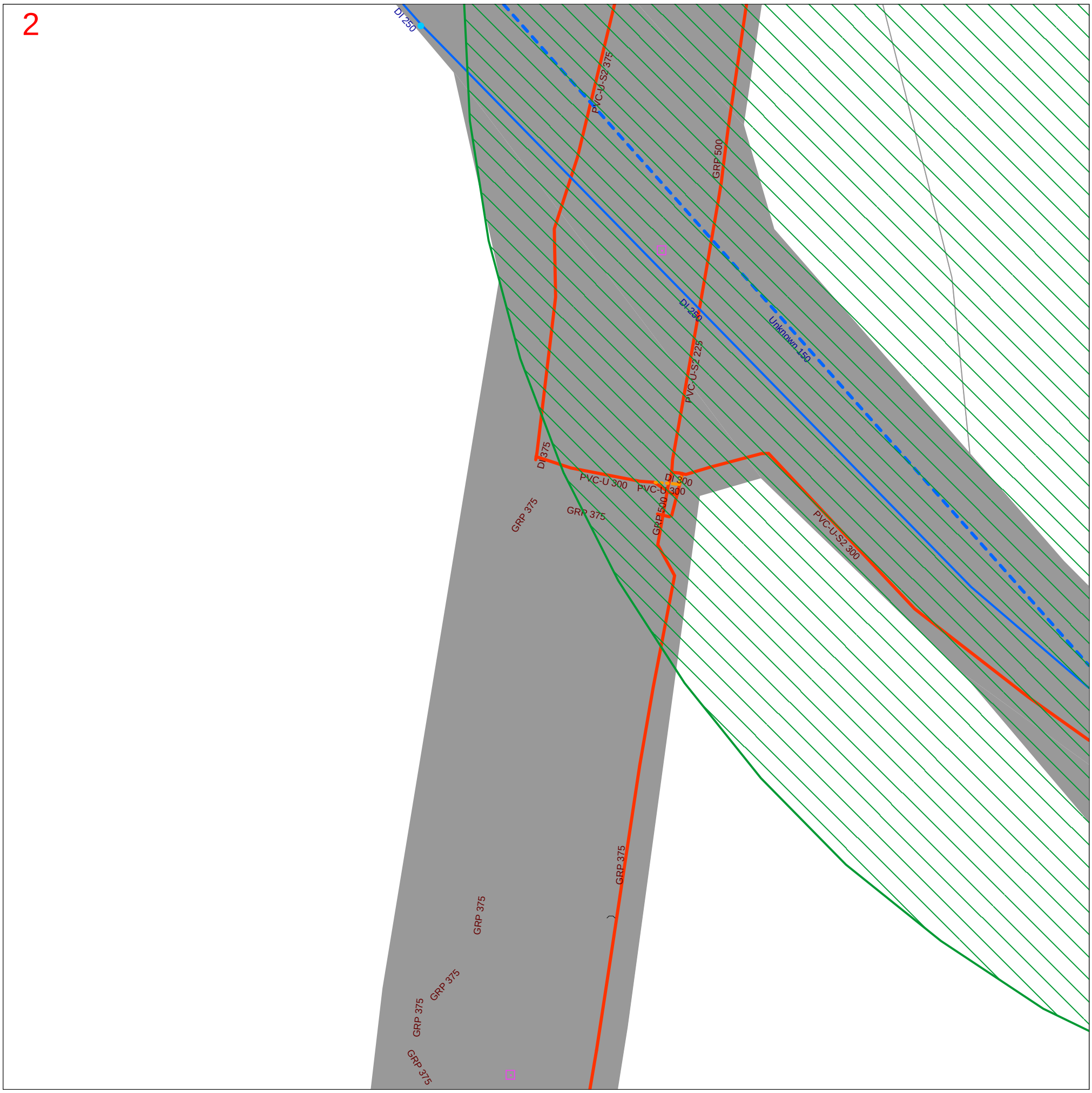
1:500 @ A3 Portrait

Date printed: 13/10/2023
© Land and Property Information (LPI) & Tweed Shire Council. Boundaries shown should be considered approximate only

Map 2

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
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- 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
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SCIMS Survey Marks
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General
- Property Boundary
- BYDA Work Area
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N

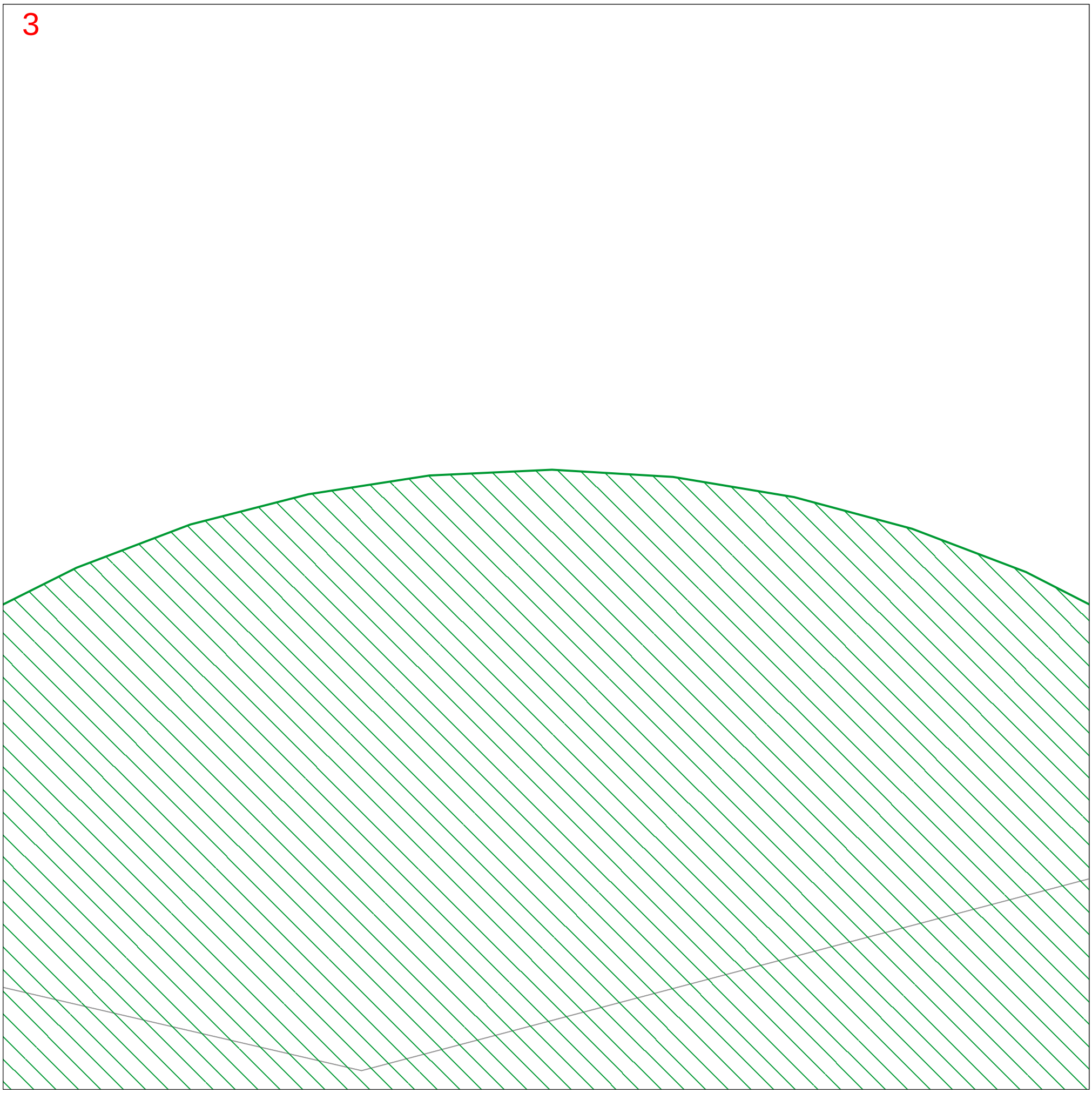
1:500 @ A3 Portrait

Date printed: 13/10/2023
© Land and Property Information (LPI) & Tweed Shire Council.
Boundaries shown should be considered approximate only

Map 3

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
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SCIMS Survey Marks
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- MM
- PM
- SS
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General
- Property Boundary
- BYDA Work Area
- Flood Levee

N

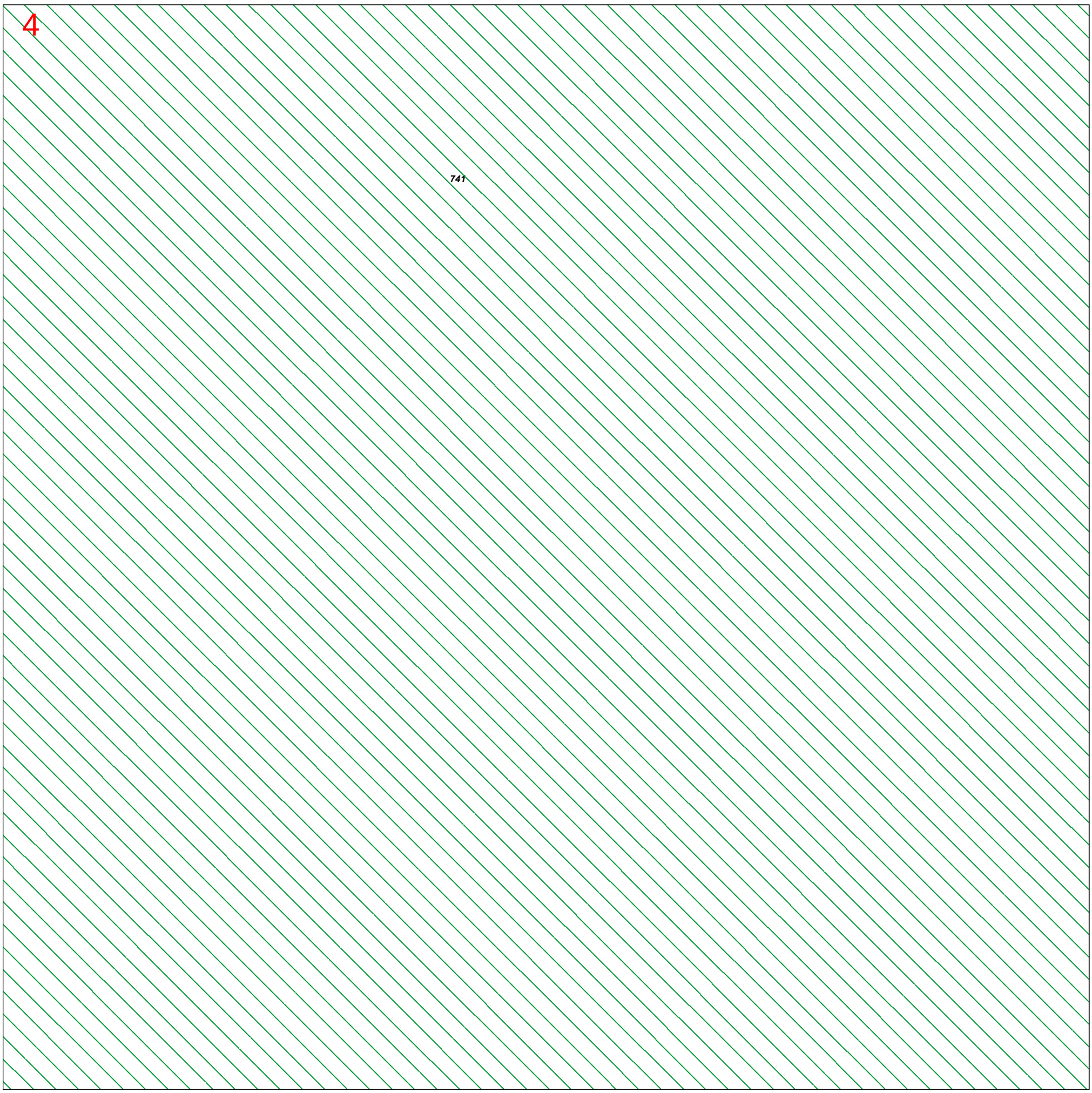
1:500 @ A3 Portrait

Date printed: 13/10/2023
© Land and Property Information (LPI) & Tweed Shire Council. Boundaries shown should be considered approximate only

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
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- Public Property Pump
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- Vacuum Chamber
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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
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SCIMS Survey Marks
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General
- Property Boundary
- BYDA Work Area
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N

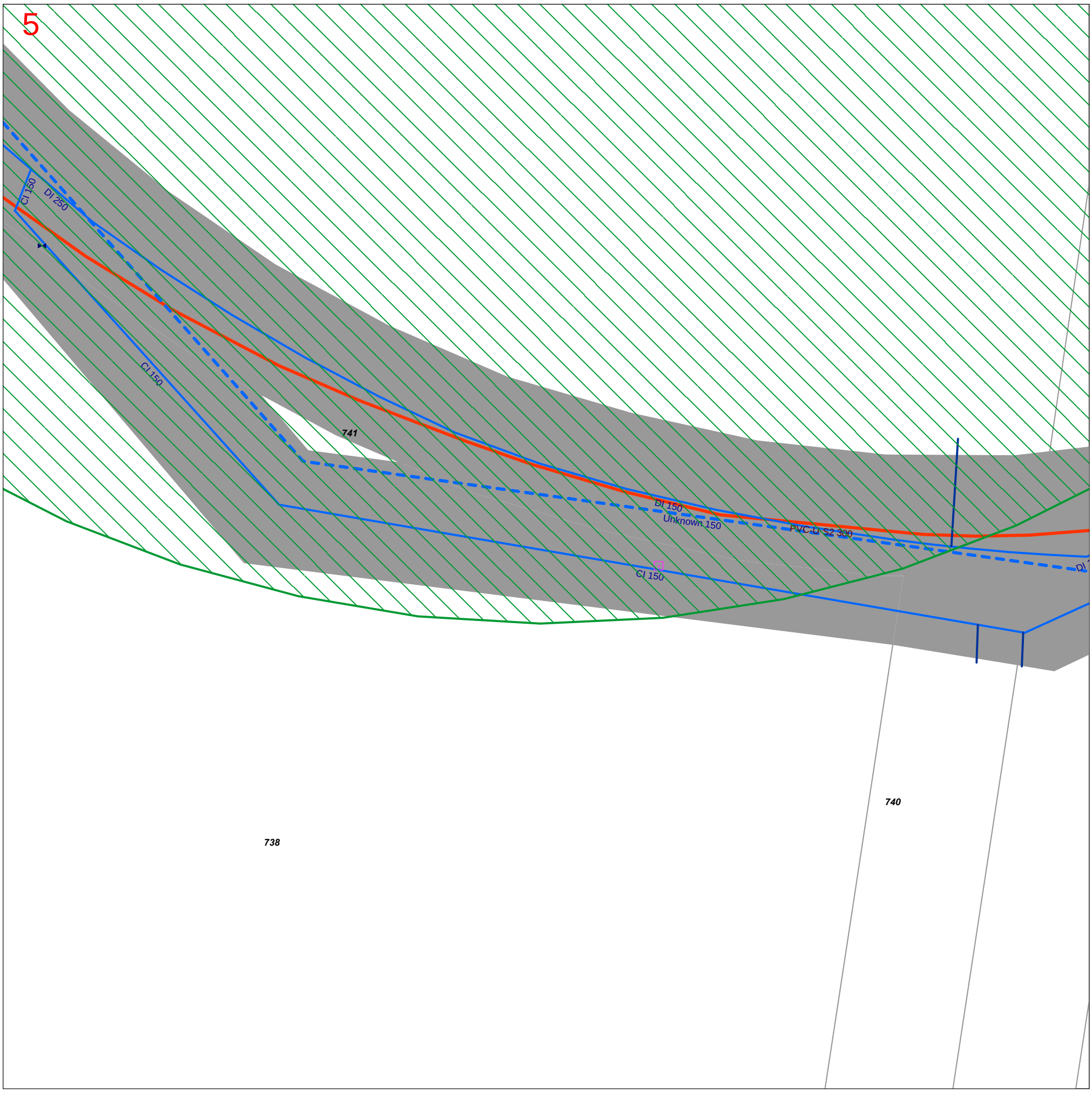
1:500 @ A3 Portrait

Date printed: 13/10/2023
© Land and Property Information (LPI) & Tweed Shire Council. Boundaries shown should be considered approximate only

Map 5

Sequence No: 230804440
741 Cudgen Road Cudgen

Date: 13/10/2023



Sewer Pipeline
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- Stormwater Channel
- Stormwater Channel (Abandoned)

Stormwater Node (Survey)
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Stormwater Node
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- BYDA Work Area
- Flood Levee

N

1:500 @ A3 Portrait

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Boundaries shown should be considered approximate only

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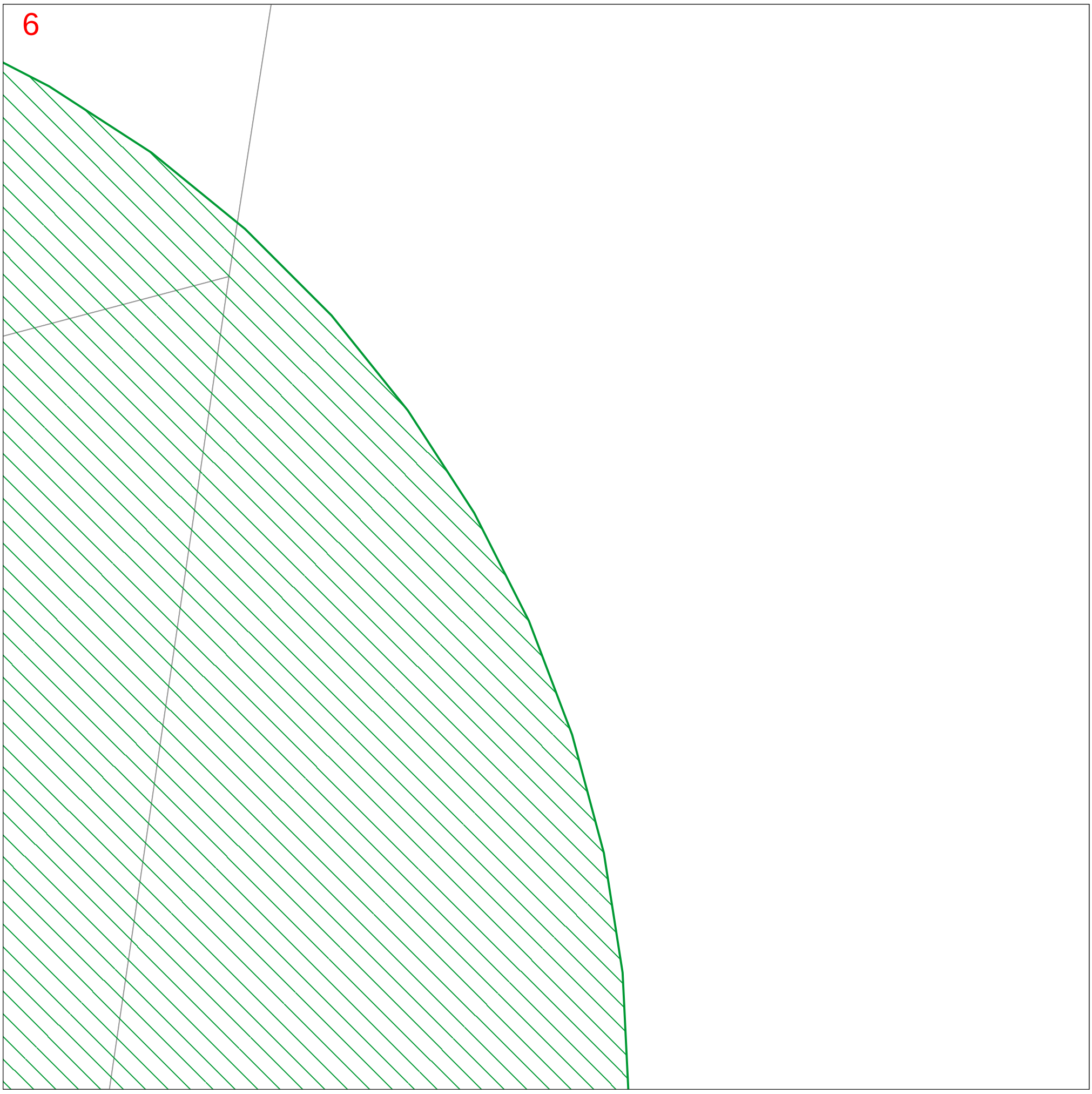
Map 6

Sequence No: 230804440

741 Cudgen Road Cudgen

TWEED SHIRE COUNCIL

Date: 13/10/2023



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General
- Property Boundary
- BYDA Work Area
- Flood Levee

N

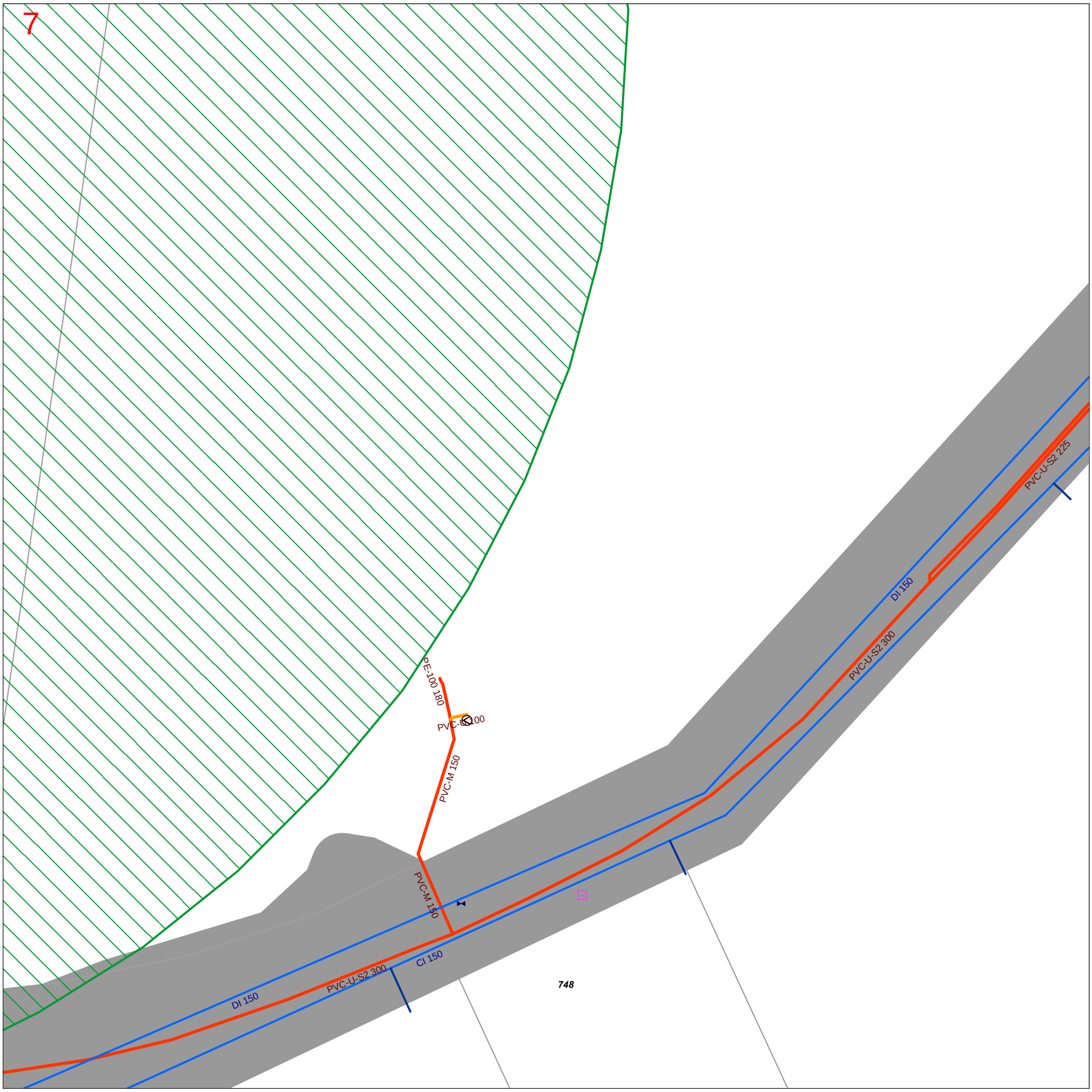
1:500 @ A3 Portrait

Date printed: 13/10/2023
© Land and Property Information (LPI) & Tweed Shire Council.
Boundaries shown should be considered approximate only

Map 7

Sequence No: 230804440
741 Cudgen Road Cudgen

Date: 13/10/2023



Sewer Pipeline
- Sewer Rising Main
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- Sewer Gravity Overflow
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- Sewer Vacuum Mains

Sewer Node
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- Public Pump Station
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Communication
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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
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Water Pipe Location
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Water Node
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- Reservoir
- Scour Valve

SCIMS Survey Marks
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- PM
- SS
- TS

General
- Property Boundary
- BYDA Work Area
- Flood Levee

N

1:500 @ A3 Portrait

Date printed: 13/10/2023
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Boundaries shown should be considered approximate only

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

IMAGE SOURCE: NEARMAPS

LOCALITY PLAN
NOT TO SCALE

NOTES

1. THIS DRAWING SET SHOULD BE READ IN CONJUCTION 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.

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	03/02/23	DM	JB	JB	JB
B	ISSUED FOR APPROVAL	10/10/23	DM	JB	MB	JB
C	ISSUED FOR APPROVAL	28/11/23	DM	JB	RW	JB

SCALES: NOT TO SCALE

DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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

PLANIT CONSULTING
LEVEL 2, 11-13 PEARL STREET
PO BOX 1623
KINGSCLIFF NSW 2487

TELEPHONE: 02 6674 5001
ABN: 20 099 261 711
EMAIL: administration@planitconsulting.com.au

CLIENT: CUDGEN HEALTH PRECINT PTY LTD

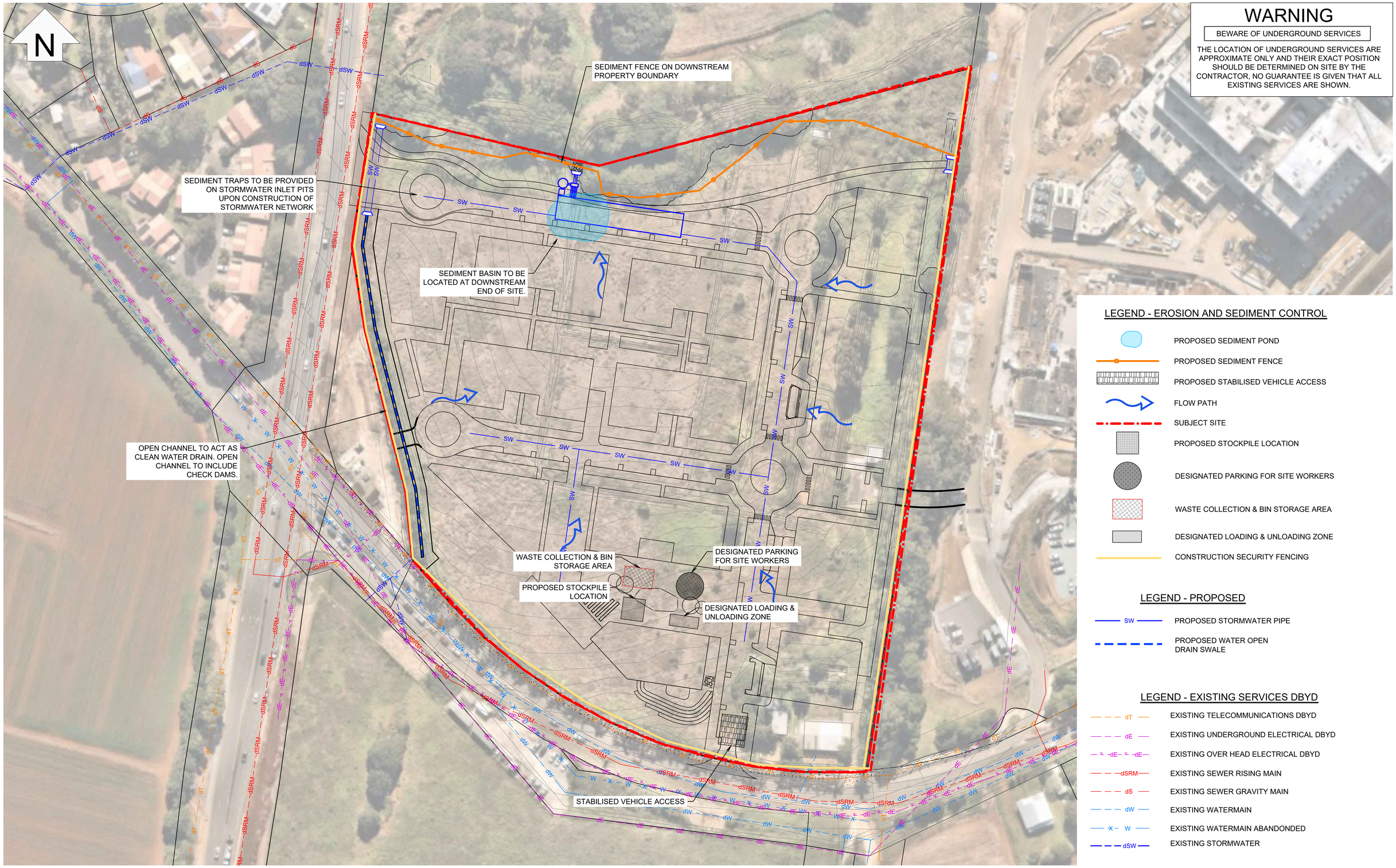
LOCAL GOVERNMENT AUTHORITY: TWEED SHIRE COUNCIL

PROJECT: 741 CUDGEN CONNECTION

DRAWING TITLE: COVER PAGE

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7594	0001	C

CAD FILE: C:\12DS\DATA\PLANITSYN\J7594 - CUDGEN CONNECTION_590\7 - ENGINEERING\7.4 DRAFTING\0001 COVER PAGE.DWG PLOTTED BY: PE.JAKE PLOT DATE: 28/11/2023 5:26:53 PM



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

- SW — PROPOSED STORMWATER PIPE
- PROPOSED WATER OPEN DRAIN SWALE

LEGEND - EXISTING SERVICES DBYD

- dT — EXISTING TELECOMMUNICATIONS DBYD
- dE — EXISTING UNDERGROUND ELECTRICAL DBYD
- dE — EXISTING OVER HEAD ELECTRICAL DBYD
- dSRM — EXISTING SEWER RISING MAIN
- dS — EXISTING SEWER GRAVITY MAIN
- dW — EXISTING WATERMAIN
- W — EXISTING WATERMAIN ABANDONDED
- dSW — EXISTING STORMWATER

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	03/02/23	DM	JB	JB	JB
B	ISSUED FOR APPROVAL	10/10/23	DM	JB	MB	JB
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)

DO NOT SCALE FROM DRAWING

APPROVED BY:

DATE:

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CLIENT:
CUDGEN HEALTH PRECINT PTY LTD

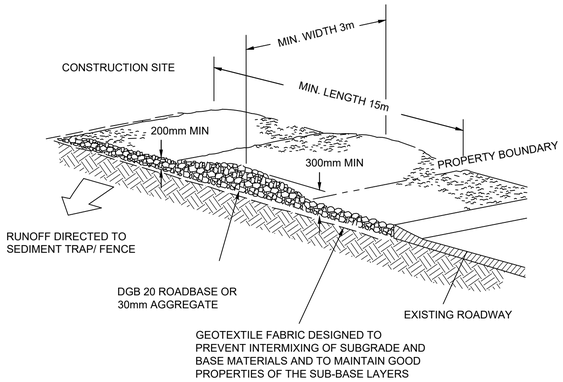
PROJECT:
741 CUDGEN CONNECTION

DRAWING TITLE:
SEDIMENT AND EROSION CONTROL PLAN

LOCAL GOVERNMENT AUTHORITY:
TWEED SHIRE COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7594	0110	C

CAD FILE: C:\12DS\DATA\PLANITSYN\J7594 - CUDGEN CONNECTION_590\7 - ENGINEERING\7.4 DRAFTING\0110 SEDIMENT AND EROSION.DWG PLOTTED BY: PE JAKE PLOT DATE: 28/11/2023 5:22:33 PM

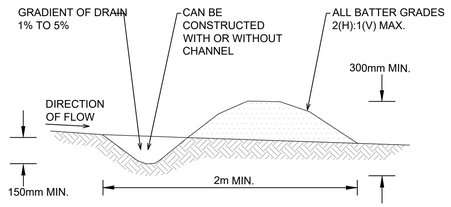


CONSTRUCTION NOTES

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. MININUM 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



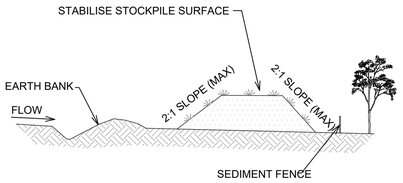
NOTE
ONLY TO BE USED AS TEMPORARY BANK WHERE MAX. UPSLOPE LENGTH IS 80m.

CONSTRUCTION NOTES

1. CONSTRUCT WITH GRADIENT OF 1% TO 5%.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE.
3. DRAINS TO BE CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. PERMANENT OR TEMPORARY STABILISATION OF THE EARTH BANK TO BE COMPLETED WITHIN 10 DAYS OF CONSTRUCTION.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO A SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL SITE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT BANK WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

EARTH BANK (LOW FLOW)

NOT TO SCALE

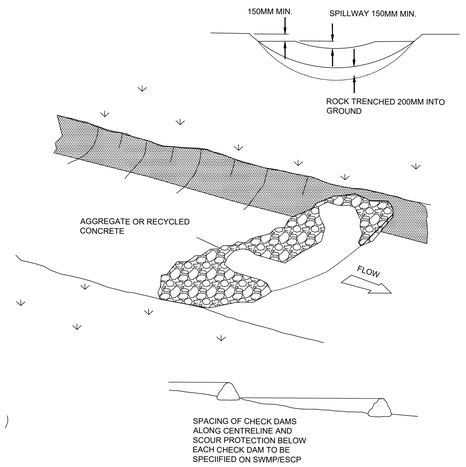


CONSTRUCTION NOTES

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.

TOPSOIL STOCKPILE

NOT TO SCALE

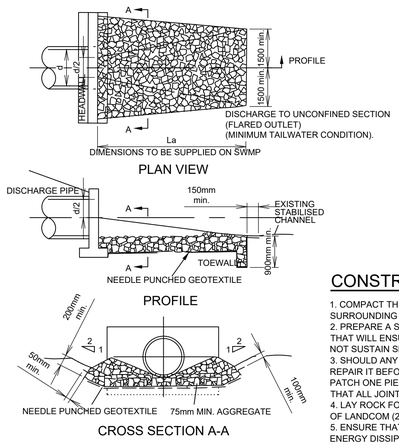


CONSTRUCTION NOTES:

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.

ROCK CHECK DAM

NOT TO SCALE

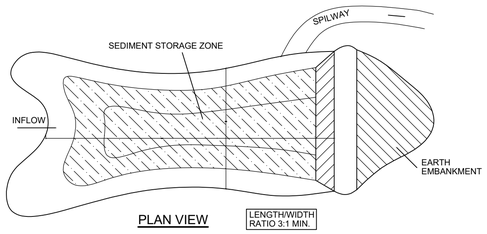


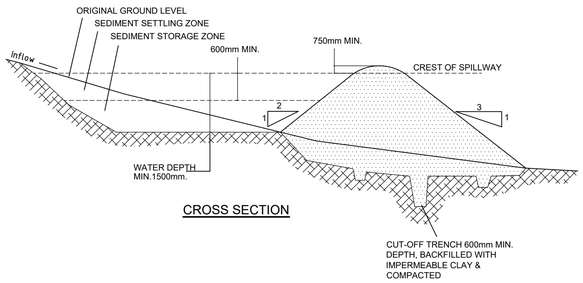
CONSTRUCTION NOTES:

1. COMPACT THE SUBGRADE FILL TO THE DESNITY OF THE SURROUNDING UNDISTURBED MATERIAL.
2. PREPARE A SMOOTH, EVEN FOUNDATION FOR THE STRUCTURE THAT WILL ENSURE THAT THE NEEDLE-PUNCHED GEOTEXTILE DOES NOT SUSTAIN SERIOUS DAMAGE WHEN COVERED WITH ROCK.
3. SHOULD ANY MINOR DAMAGE TO THE GEOTEXTILE OCCUR, REPAIR IT BEFORE SPREADING ANY AGGREGATE. FOR REPAIRS, PATCH ONE PIECE OF FABRIC OVER THE DAMAGE, MAKING SURE THAT ALL JOINTS AND PATCHES OVERLAP MORE THAN 300mm.
4. LAY ROCK FOLLOWING THE DRAWING, ACCORDING TO TABLE 5.2 OF LANDCOM (2004) AND WITH A MINIMUM DIAMETER OF 75mm.
5. ENSURE THAT ANY CONCRETE OR RIPRAP USED FOR THE ENERGY DISSIPATER OR THE OUTLET PROTECTION CONFORMS TO THE GRADING LIMITS SPECIFIED ON THE SWMP.

ENERGY DISSIPATOR

NOT TO SCALE



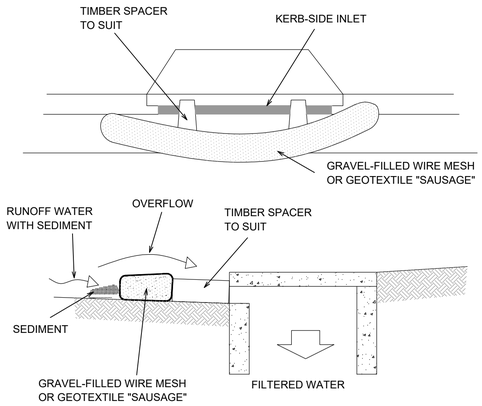


CONSTRUCTION NOTES:

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

SEDIMENT BASIN - WET

NOT TO SCALE

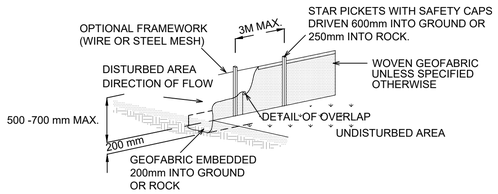


CONSTRUCTION NOTES

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.
3. 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.

FILTER BAG TO SAG SIDE ENTRY PIT

NOT TO SCALE



SEDIMENT FENCE

NOT TO SCALE

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	03/02/23	DM	JB	JB	JB
B	ISSUED FOR APPROVAL	10/10/23	DM	JB	MB	JB

SCALES: NOT TO SCALE

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CLIENT: CUDGEN HEALTH PRECINT PTY LTD

LOCAL GOVERNMENT AUTHORITY: TWEED SHIRE COUNCIL

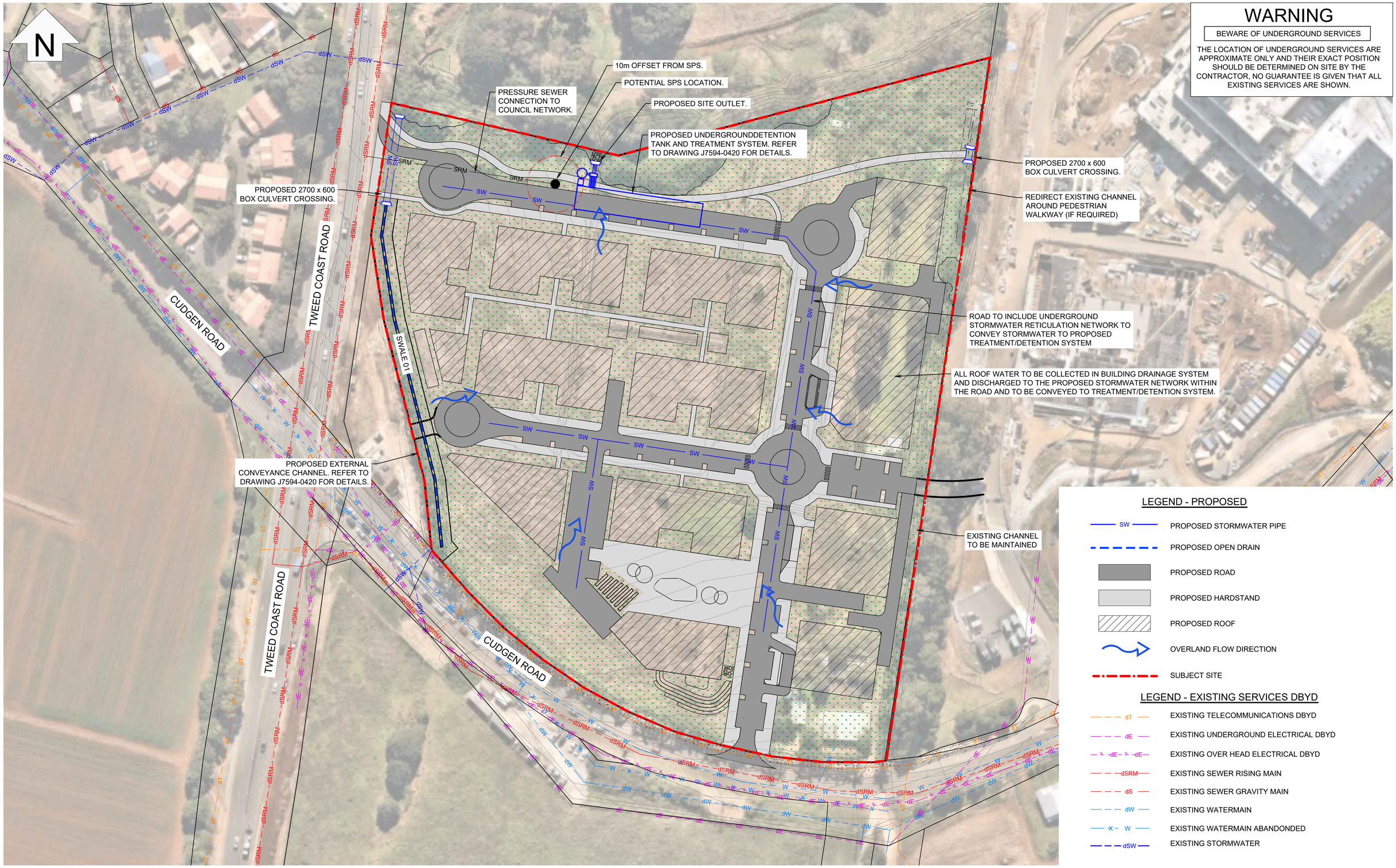
PROJECT: 741 CUDGEN CONNECTION

DRAWING TITLE: SEDIMENT AND EROSION CONTROL DETAILS

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7594	0120	B

CAD FILE: C:\12DS\DATA\PLANITSYN\J7594 - CUDGEN CONNECTION_590\7 - ENGINEERING\7.4 DRAFTING\0120 SEDIMENT AND EROSION DETAILS.DWG PLOTTED BY: PE.JAKE PLOT DATE: 10/10/2023 1:31:11 PM

100mm AT ORIGINAL SIZE



100mm AT ORIGINAL SIZE

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	03/02/23	DM	JB	JB	JB
B	ISSUED FOR APPROVAL	10/10/23	DM	JB	MB	JB
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)

DO NOT SCALE FROM DRAWING

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CLIENT:
CUDGEN HEALTH PRECINT PTY LTD

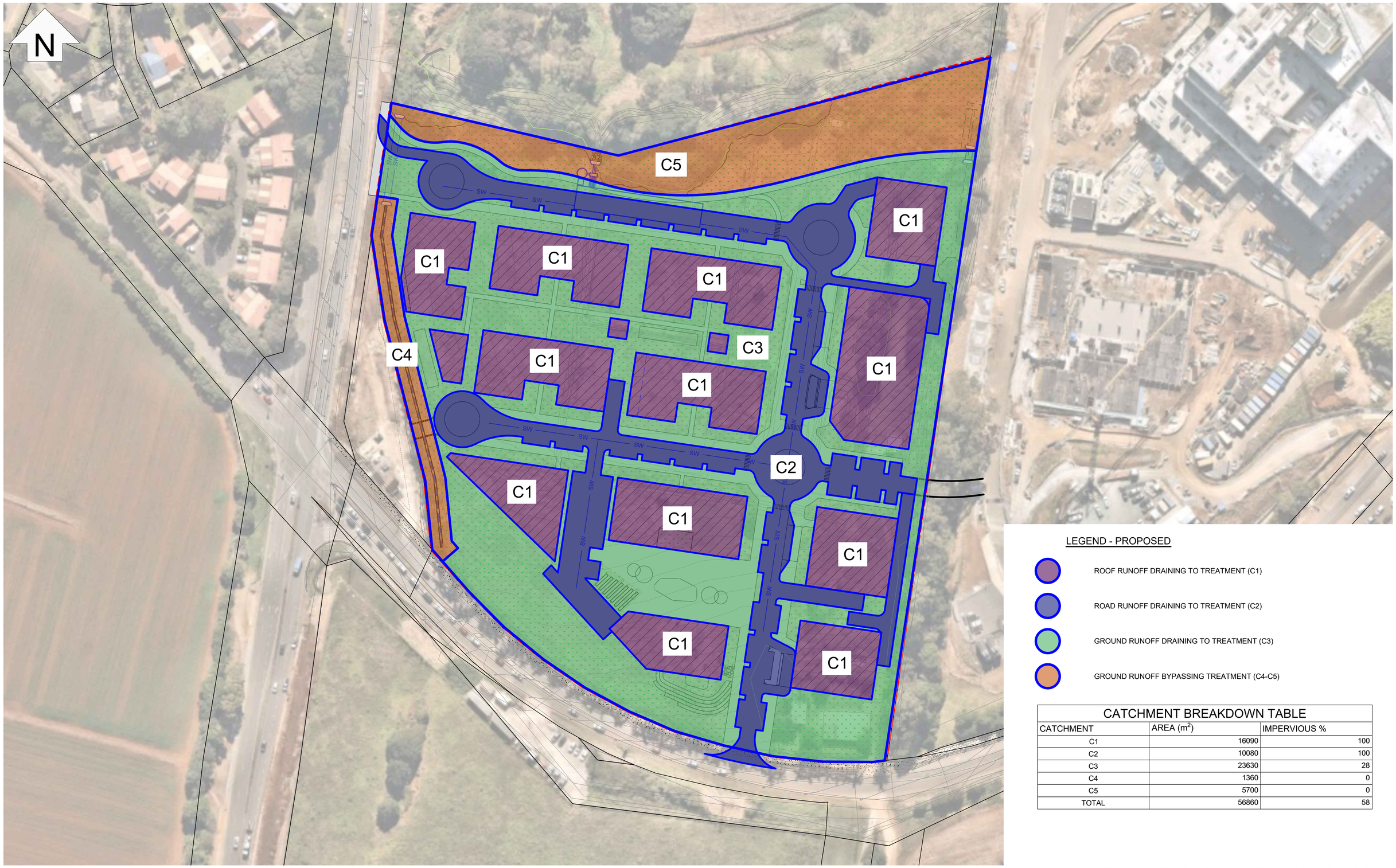
PROJECT:
741 CUDGEN CONNECTION

DRAWING TITLE:
STORMWATER LAYOUT PLAN

LOCAL GOVERNMENT AUTHORITY:
TWEED SHIRE COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7594	0410	C

CAD FILE: C:\12DS\DATA\PLANITSYN\J7594 - CUDGEN CONNECTION_590\7 - ENGINEERING\7.4 DRAFTING\0410 STORMWATER LAYOUT.DWG PLOTTED BY: PE.JAKE PLOT DATE: 28/11/2023 5:13:06 PM



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

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	03/02/23	DM	JB	JB	JB
B	ISSUED FOR APPROVAL	10/10/23	DM	JB	MB	JB
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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CLIENT:
CUDGEN HEALTH PRECINT PTY LTD

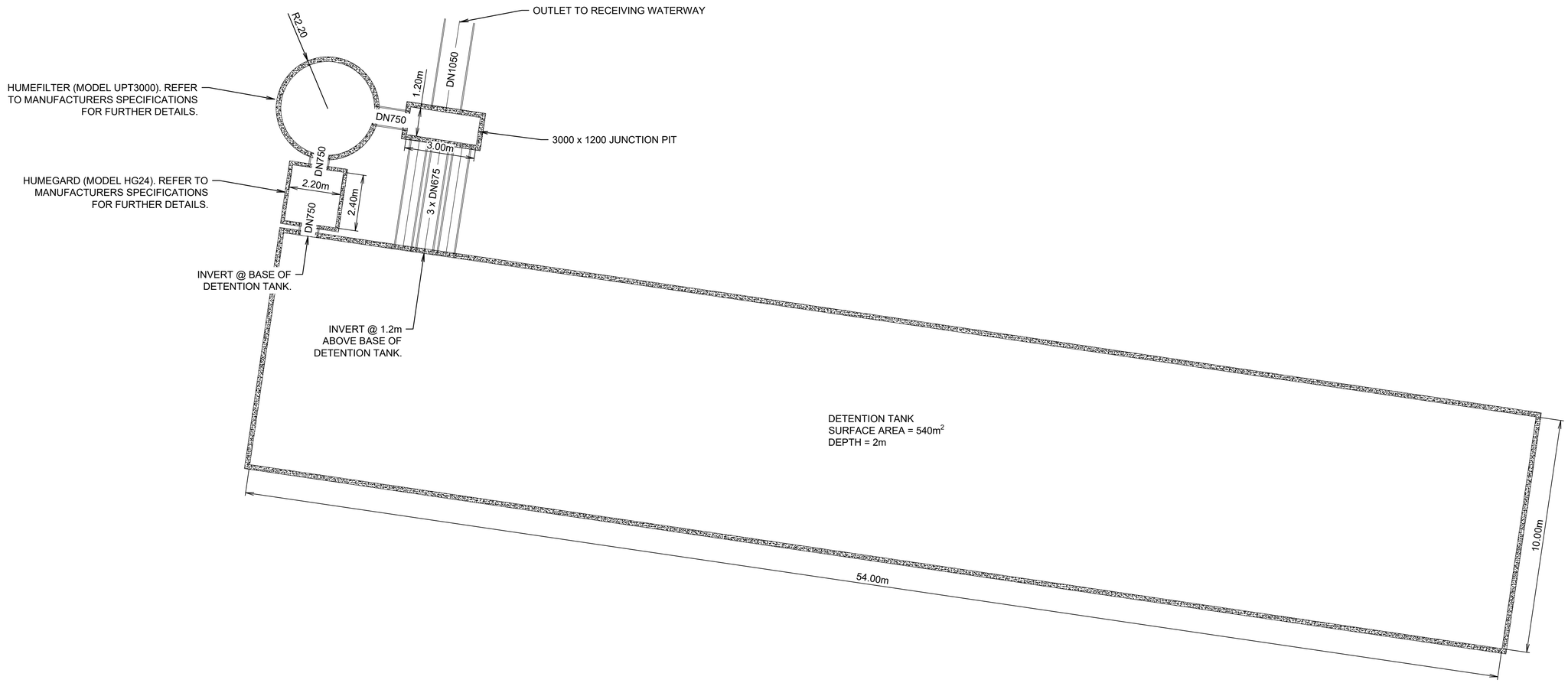
PROJECT:
741 CUDGEN CONNECTION

DRAWING TITLE:
CATCHMENT PLAN

LOCAL GOVERNMENT AUTHORITY:
TWEED SHIRE COUNCIL

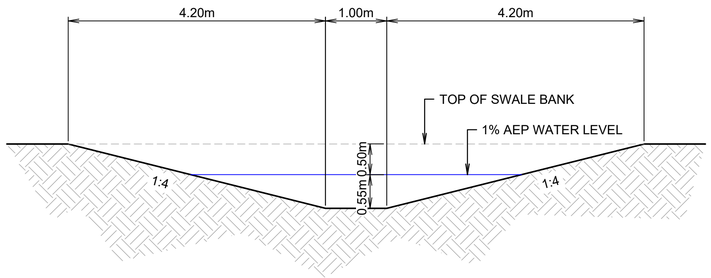
ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7594	0415	C

CAD FILE: C:\12DS\DATA\PLANITSYN\J7594 - CUDGEN CONNECTION_590\7 - ENGINEERING\7.4 DRAFTING\0415 CATCHMENT PLAN.DWG PLOTTED BY: PE.JAKE PLOT DATE: 28/11/2023 5:18:57 PM



UNDERGROUND DETENTION TANK AND TREATMENT SYSTEM

SCALE 1:100 @ A1



SWALE 01 TYPICAL SECTION

SCALE 1:50 @ A1

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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B	ISSUED FOR APPROVAL	10/10/23	DM	JB	MB	JB
C	ISSUED FOR APPROVAL	28/11/23	DM	JB	RW	JB

SCALES:
0 0.5 1 2 3
Full Size 1:50 ; Half Size 1:100
Scale (m)
0 1 2 4 6
Full Size 1:100 ; Half Size 1:200
Scale (m)

DO NOT SCALE FROM DRAWING

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DATE:

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CUDGEN HEALTH PRECINT PTY LTD

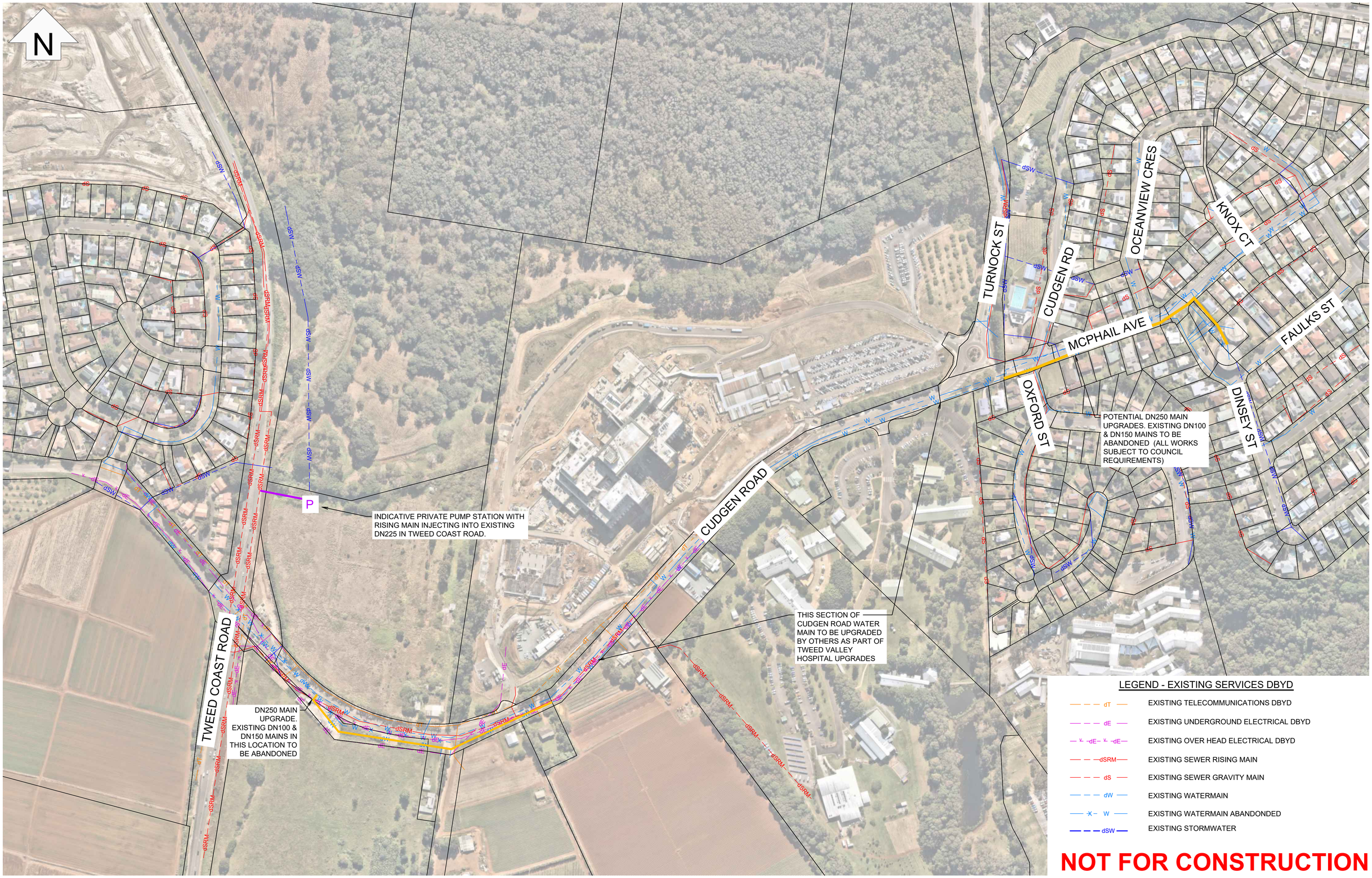
LOCAL GOVERNMENT AUTHORITY:
TWEED SHIRE COUNCIL

PROJECT:
741 CUDGEN CONNECTION

DRAWING TITLE:
STORMWATER STRUCTURE DETAILS

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7594	0420	C

CAD FILE: C:\12DS\DATA\PLANITSYN\J7594 - CUDGEN CONNECTION_590\7 - ENGINEERING\7.4 DRAFTING\0420 STORMWATER DETAILS.DWG PLOTTED BY: PE.JAKE PLOT DATE: 28/11/2023 5:08:56 PM



LEGEND - EXISTING SERVICES DBYD

dT	EXISTING TELECOMMUNICATIONS DBYD
dE	EXISTING UNDERGROUND ELECTRICAL DBYD
dE	EXISTING OVER HEAD ELECTRICAL DBYD
dSRM	EXISTING SEWER RISING MAIN
dS	EXISTING SEWER GRAVITY MAIN
dW	EXISTING WATERMAIN
W	EXISTING WATERMAIN ABANDONDED
dSW	EXISTING STORMWATER

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	PRELIMINARY ISSUE	03/02/23	DM	RW	JB	RW
B	ISSUED FOR APPROVAL	10/10/23	DM	RW	JB	RW

SCALES: 0 20 40 80 120
Full Size 1:2000 ; Half Size 1:4000
Scale (m)

DO NOT SCALE FROM DRAWING

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LOCAL GOVERNMENT AUTHORITY:
TWEED SHIRE COUNCIL

PROJECT:
741 CUDGEN CONNECTION

DRAWING TITLE:
OVERVIEW OF WATER SUPPLY & SEWER UPGRADES & AUGMENTATIONS

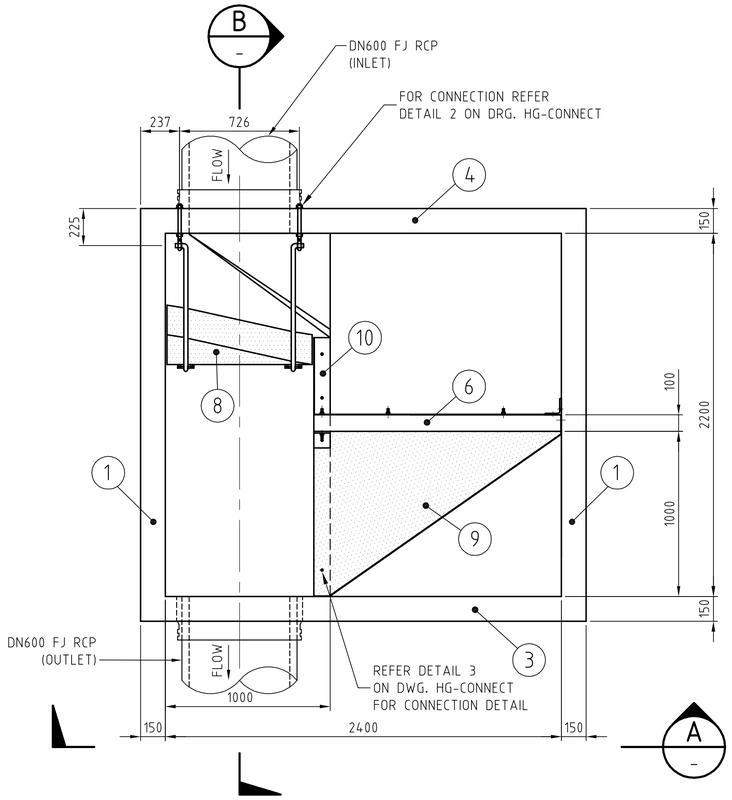
ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J7594	SK0001	B

CAD FILE: C:\12DS\DATA\PLANITSYNJ7594 - CUDGEN CONNECTION_590\7 - ENGINEERING\7.4 DRAFTING\SK0001 WATER SUPPLY UPGRADES.DWG PLOTTED BY: PE.JAKE PLOT DATE: 10/10/2023 12:58:54 PM

100mm AT ORIGINAL SIZE

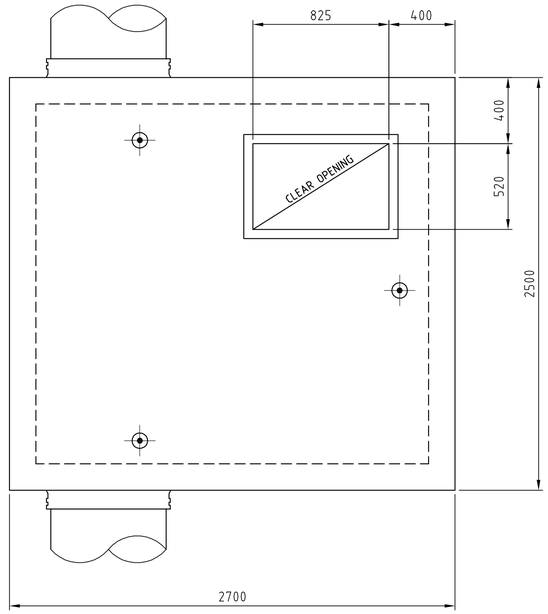
ISSUE	DETAILS OF ALTERATIONS	DWN	DATE	CKD
1	GENERAL REVISION - ISSUED FOR MANUFACTURE	MZ	12-03-07	DFW

ITEM No	DWG DESCRIPTIONS	DWG No
1	END WALL	HG24/L-02
2	BASE SLAB	HG24/L-03
3, 4	SIDE WALL	HG24/L-04
5	FALSE FLOOR	HG24/L-05
6	CONCRETE BAFFLE WALL	HG24/L-05
7	PRECAST LID	HG24/L-06
8	FLOATING BOOM	HG24/L-07
9	WEIR	HG24/L-08
10	BAFFLE SIDE WALL	HG24/L-09
11	COMB	HG24/L-10
	SITE LAYOUT	HG24/L-11



PLAN VIEW (LID REMOVED)

SCALE 1:25



PLAN ON LID

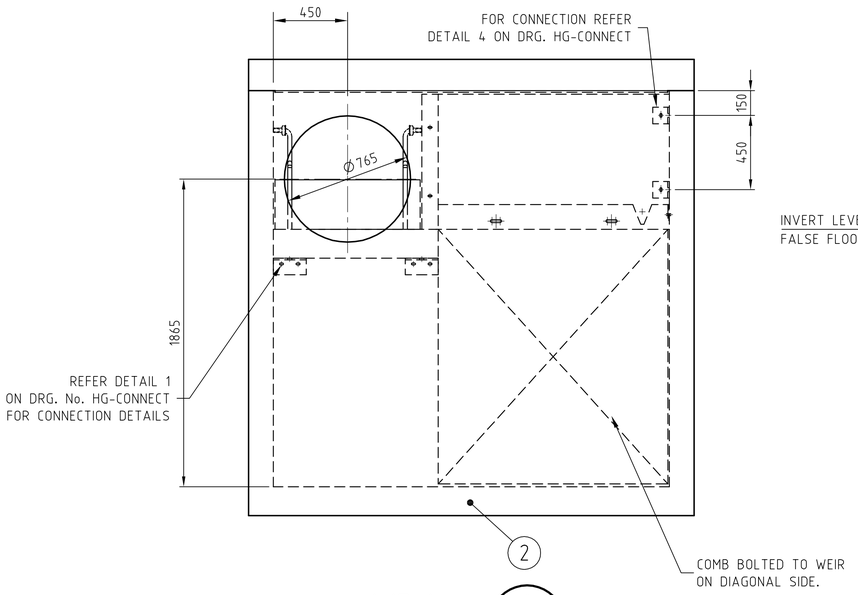
SCALE 1:25

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 t (WITHOUT LID).
   MASS OF LID = 3.2 t
6. KOR-N-SEAL BOOT CONNECTOR P/N = S206-30L (INLET & OUTLET)

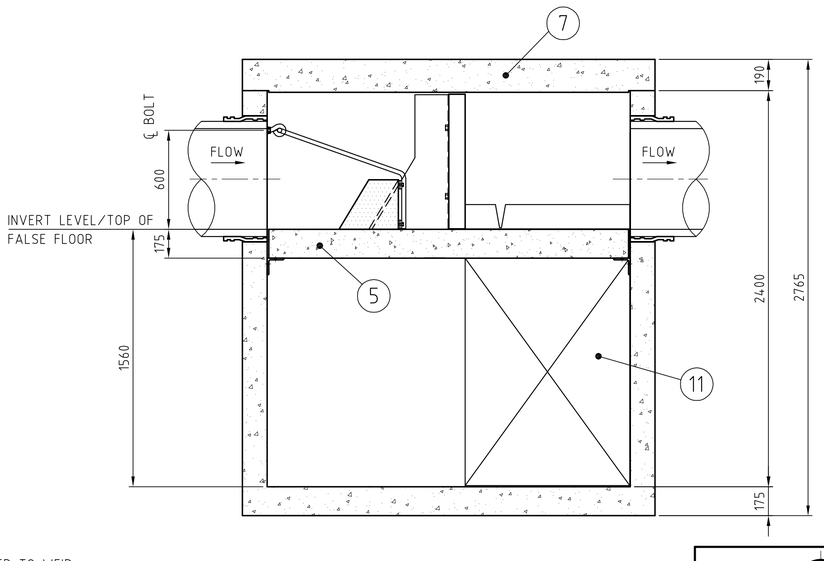
DESIGN BASIS

1. DESIGN SPECIFICATION AS3600 CONCRETE STRUCTURES.
2. DESIGN LOADS 0-2m FILL WITH SM1600 VEHICLE LOAD TO AS5100 BRIDGE DESIGN.
3. DESIGN FOR UP TO B2 EXPOSURE CLASSIFICATION TO AS3600 CONCRETE STRUCTURES.



VIEW A

SCALE 1:25



SECTION B

SCALE 1:25

Humes TECHNICAL (DESIGN) SERVICES BRISBANE, QUEENSLAND

DSN.	DFW	12-03-07
DWN.	MZ	12-03-07
CKD.	DFW	12-03-07
APP.	DFW	12-03-07

SUPERSEDES HG24/L-01 REV. 0

HUMES
STANDARD DRAWING
HUMEGARD HG24/L
DN600/DN600 FJ RCP
GENERAL ASSEMBLY

PLOT SCALE	SIZE	DRG. NO.	ISSUE
1:1	A2	HG24/L-01	1

UNIVERSAL POLLUTANT TRAP (UPT3000) PARTS TABLE

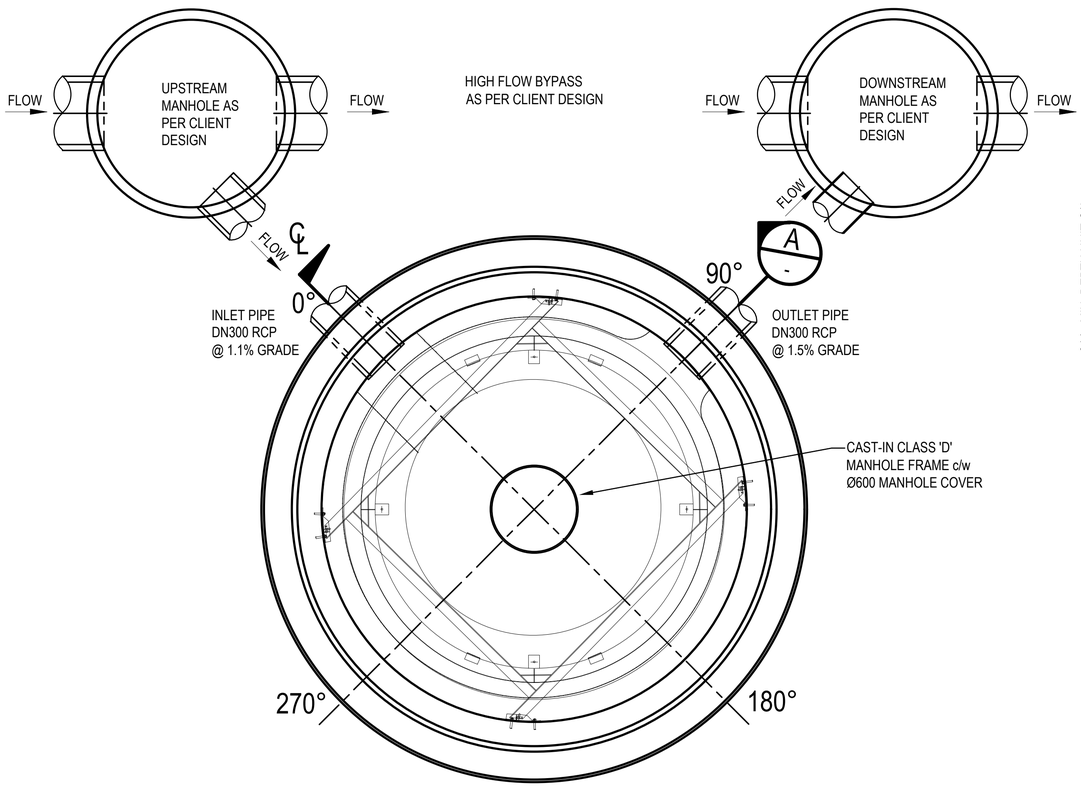
ITEM No.	PART	MANUF'T	SUPPLIED BY	No OFF.	APPROX MASS (t)	COMMENTS
1	BASE UNIT	HUMES	HUMES	1	11.38	INSTALLED BY CONTRACTOR ON-SITE
2	PLINTH	BY OTHERS	HUMES	1	BY OTHERS	INSTALLED BY HUMES IN FACTORY
3	FILTER MEDIUM CARTRIDGE	BY OTHERS	HUMES	1	BY OTHERS	INSTALLED BY CONTRACTOR ON-SITE
4	TREATMENT CHAMBER 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:

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

PIPES CONNECTION TABLE

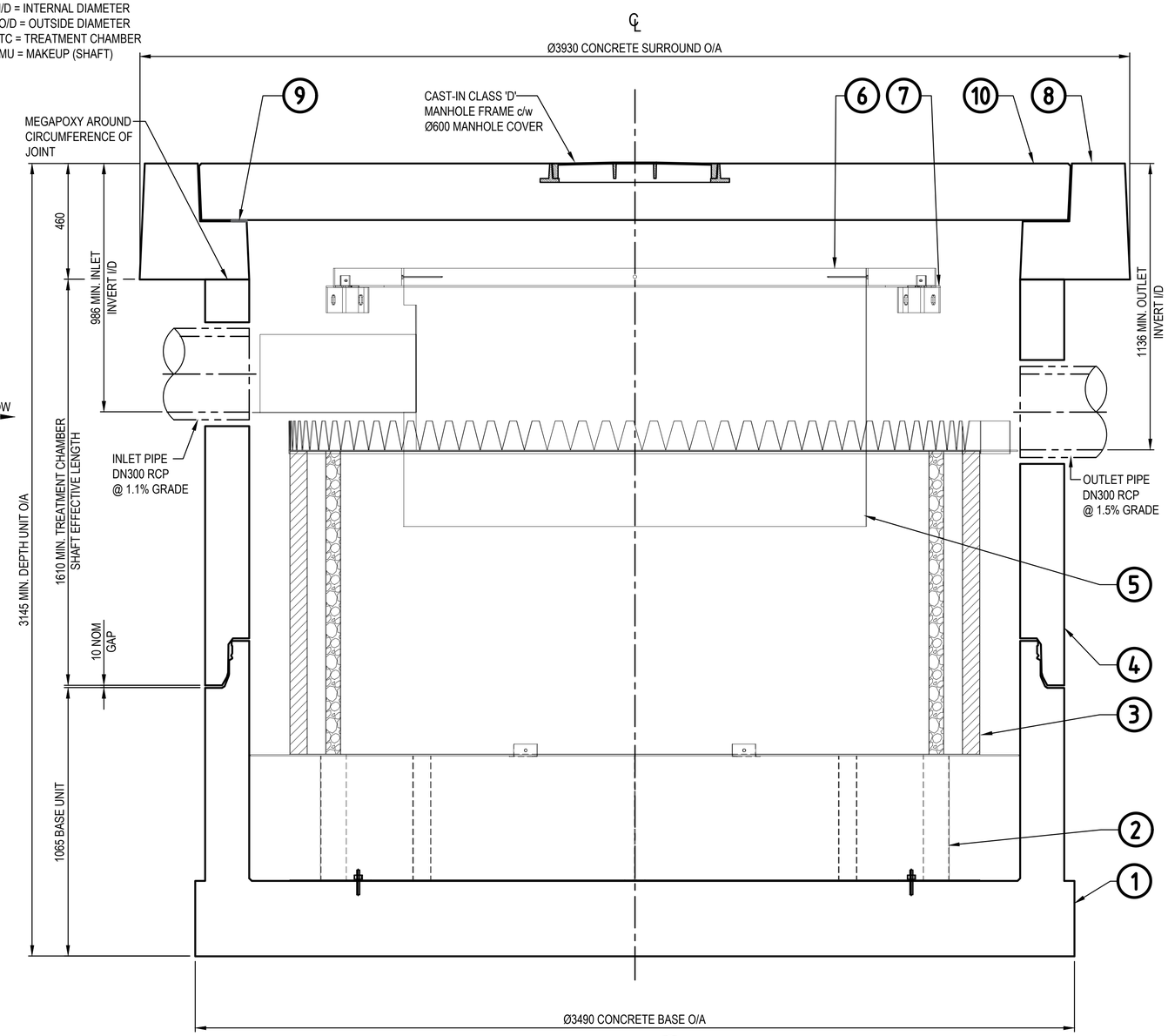
	SIZE / TYPE	CONNECTION	COMMENTS
INLET	DN300 RCP CLASS TBC CONSULTANT	EPOXY JOINT	RCP SUPPLIED AND INSTALLED BY CONTRACTOR ON-SITE.
OUTLET	DN300 RCP CLASS TBC CONSULTANT	EPOXY JOINT	RCP SUPPLIED AND INSTALLED BY CONTRACTOR ON-SITE.



HUMEFILTER UPT3000

PLAN - SITE ARRANGEMENT

SCALE 1: NTS



SECTION A - A

SCALE 1: NTS

AS INSTALLED

DESIGN IS A CONCEPT ONLY.
DRAWING MAY VARY
SUBJECT TO DETAIL DESIGN

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

REVISIONS

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

DWG STATUS: FOR INFORMATION ONLY					
DWG PROD. BY: NAT. WATER SOLTUIONS	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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PLANIT

CONSULTING