

WATER AND WASTEWATER ASSESSMENT

Proposed Residential Subdivision

**31 & 41-53 Courtney Drive, 176 & 202 Baileys
Mountain Road, Lot 57 & 288 Reserve Road,
Upper Coomera**

**Lots 184 on RP173727, 185 & 186 on
SP173728, Lot 183 on RP156422, Lot 58 on
SP191940, Lot 56 on RP162858 & Lot 57 on
SP214370**

For Norfolk Estates Pty Ltd

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Project Manager:	Daley Curran
Author:	Andrew Rickert
Applicant:	Norfolk Estates Pty Ltd
Client:	Norfolk Estates Pty Ltd
Client Contact:	John Warlow
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Synopsis:	This <i>Water and Wastewater Assessment</i> describes the site investigations completed and determines the impacts of the proposed development on the local water and wastewater networks and ensure the development can be serviced while satisfying relevant design criteria.

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1.0 INTRODUCTION

OSKA Civil Consultants have been engaged by Norfolk Estates Pty Ltd to prepare a water and wastewater network investigation to support a Development Application for the proposed residential subdivision development situated at 31 & 41-53 Courtney Drive, 176 & 202 Baileys Mountain Road, Lot 57 & 288 Reserve Road, Upper Coomera.

The objective of this investigation is to determine the impacts of the proposed Residential Subdivision on the local water and wastewater network and ensure the development can be serviced while satisfying relevant design criteria. Water and wastewater infrastructure have been adopted in accordance with the City of Gold Coast's (City's) Water Supply and Sewerage Infrastructure Plan 2019 (WSSIP) master planning servicing strategies.

1.1 Site Location

The subject site is located at 31 & 41-53 Courtney Drive, 176 & 202 Baileys Mountain Road, Lot 57 & 288 Reserve Road, Upper Coomera. The site fronts Courtney Drive to the north, Baileys Mountain Road to the east, Reserve Road and Richardson Crescent to the south and has existing residential properties to the north, east and west. The site covers a total combined area of 18.22 ha, as illustrated in Figure 1. The development is within the City's local government area who act as the responsible distributor-retailer water authority.



Figure 1: Approximate location of Eden Upper Coomera proposed development

2.0 ASSUMPTIONS

This section details key assumptions made in the proposed development water and wastewater analysis.

2.1 Development Demands

The ultimate Equivalent Person (EP) demand for the proposed Eden Upper Coomera development has been nominated as 525 EP for both wastewater and water supply loadings. The proposed development summary produced by Saunders Havill Group was used as the basis to calculate the demand value adopted for the purposes of this assessment and is summarised in Table 1.

Table 1: Adopted development demand rates

Development Type	Demand Equivalent Conversion Rate	Quantity ¹	Demand (EP) ²
Detached Dwelling	2.79 EP / Dwelling	188	525
TOTAL			525

Notes: 1) Yields adopted as per development summary produced by Saunders Havill Group (June 2025)

The City has further requested that the impacts of additional ultimate (2066) demand from nearby approved development applications be assessed in the wastewater network analyses (approximately 85 EP & 340 EP respectively).

2.2 Desired Standards of Service

Key Design Standards of Service (DSS) adopted from the SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code) for water and wastewater are presented in Table 2.

Table 2: Key DSS adopted for water supply and wastewater

Design Criteria	Summary
Water Supply (adopted in accordance with the SEQ WS&S D&C Code)	
Average Day Demand (AD)	220 L/EP/day
Estimated Non-Revenue Water (NRW)	20 L/EP/day
Maximum allowable velocity (m/s)	2.5 m/s at peak hour (PH) demand
Minimum service pressure under normal operating conditions ²	22 m in the main adjoining the Property boundary
Emergency fire operating conditions ²	12 m min at the main at the hydrant
Urban Fire Fighting	Residential: 15 L/s for 2 hours Commercial / Industrial: 30 L/s for 4 hours
Minimum Operating Level (MOL)	15% depth maintained in all tanks
Wastewater (adopted in accordance with the SEQ WS&S D&C Code)	
Average Dry Weather Flow (ADWF)	200 L/EP/d up to 2041 and 180 L/EP/d thereafter
Peak Wet Weather Flow (PWWF)	5 x ADWF
Emergency storage	4 hours at ADWF
Total pump station capacity	PWWF
Required pump station operating volume	0.9*Q/N
Gravity sewer performance criteria (Existing / New)	>1 m freeboard at PWWF / PWWF within 75% d/D
Rising main recommended velocities (Max. / Min.)	3 m/s / 0.75 m/s

3.0 WATER SUPPLY NETWORK ASSESSMENT

The water supply network analysis has been undertaken in accordance with the 2019 WSSIP master planning service strategies.

3.1 Extent of Assessment

The existing primary connection point and adjacent water supply network servicing the proposed development can be seen in Figure 2.

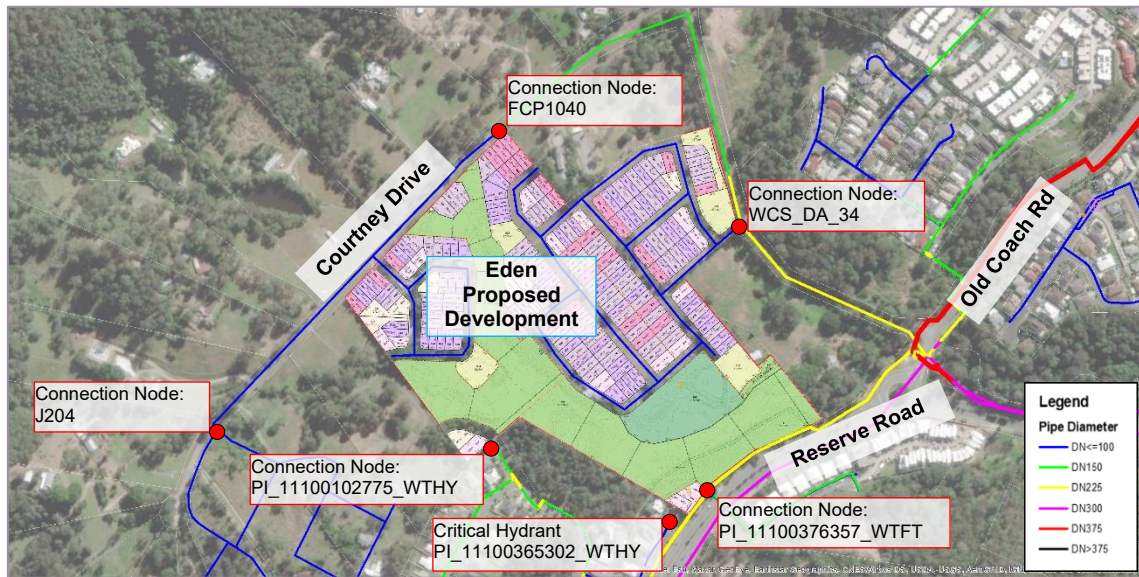


Figure 2: Existing external water supply infrastructure servicing the proposed development

The proposed development has been connected to the existing WSSIP19 network via the following connection nodes:

- J210 (approved DA node) located on a proposed DN100 running on Courtney Drive. It should be noted that advice from City of Gold Coast assumes the developer would be responsible for construction of water main along Courtney Drive from the existing connection point fronting 89 Courtney Drive.
- WCS_DA_34 (new connection) located on the existing DN200 running along Baileys Mountain Road, downstream of the relocated booster pump.
- FCP1040 located on the WSSIP19 proposed DN150 running on Courtney Drive.
- PI_11100365302_WTHY (critical nearby existing hydrant for fire flow analysis) located on the existing DN200 running on Reserve Road.
- PI_11100102775_WTHY located on the existing DN150 running on Richardson Crescent.

The internal network analysis is addressed separately in Section 3.4.

3.1.1 Baileys Mountain Road & Courtney Drive Service Supply Rezoning

Advice from City of Gold Coast, stated that the proposed WSSIP19 booster pump (proposed for 2026) at corner of Reserve Road and Old Coach Road is not to be commissioned. Instead, to meet pressure and flow requirements, the WSSIP19 proposed booster service area is to be connected to the Upper Coomera High Level Zone (HLZ), via two new connection points, thus creating a supply loop encompassing Rangeview Road, Reserve Road, Baileys Mountain Road and Courtney Drive. As shown in Figure 3, a closed boundary valve at existing pipe

CP_41227PIPE_11100085373 will need to be constructed for security of supply between the two zones.

To accurately represent the revised (rezoning) configuration in the Northern v95_WSSIP_2019 provided by The City, recently commissioned and proposed infrastructure was incorporated into the network model, as outlined in Figure 4.

The proposed development lots on 41 & 53 Courtney Drive have been nominated to connect into the Upper Coomera HLZ via a new water main adjacent to 89 Courtney Drive, which was not included in the model received. The new water network infrastructure elements between Wimmera Crescent and Courtney Drive were requested from City of Gold Coast, however the network was not provided. Therefore, the new water network elements were incorporated with the best available data (City of Gold Coast Infrastructure Assets; Water Network Analysis for 71-99 Courtney Drive (H20ne)). A detailed modelling summary of additional model elements included can be reviewed in Appendix A.

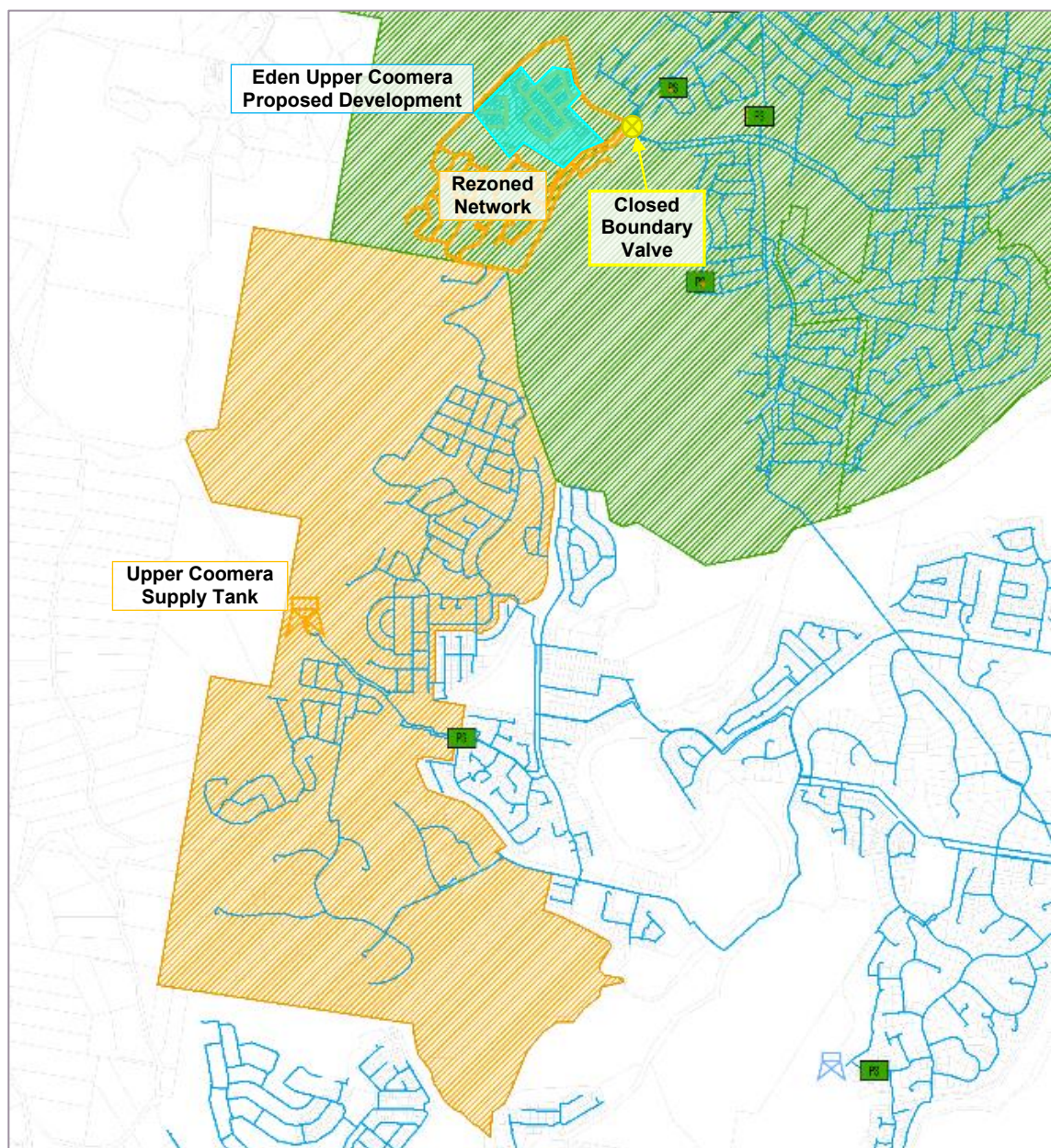


Figure 3: Extent of area to be rezoned from Coomera Pimpama LLZ (green) to Upper Coomera HLZ (orange).



Figure 4: Recently commissioned and proposed infrastructure incorporated into the network model (shown in red)

Based on the proposed supply zone rezoning and associated infrastructure, the proposed development is gravity supplied by the Upper Coomera tank (3.5 ML) approximately 2.8 km to the southwest. Figure 5 illustrates the extent of the (rezoned) Upper Coomera HLZ assessed.

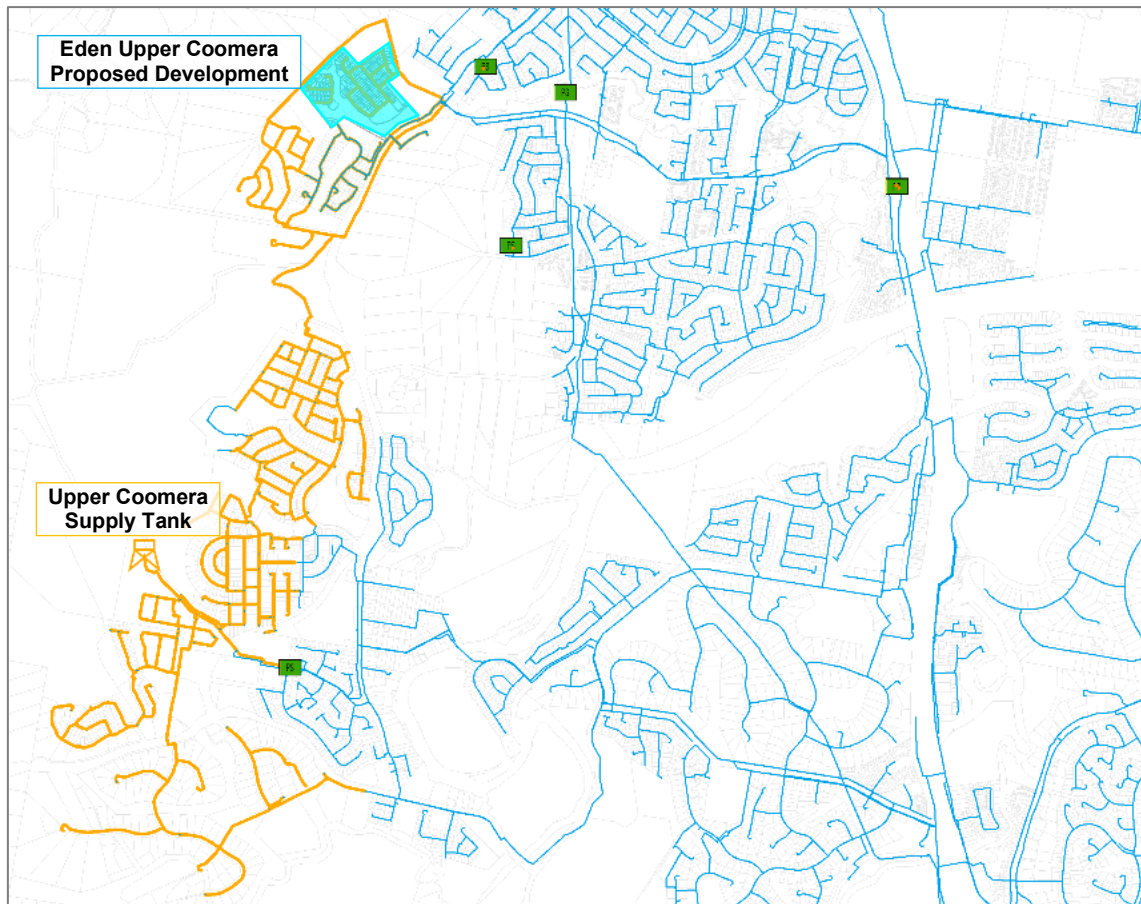


Figure 5: Extent of Upper Coomera HLZ area assessed (highlighted in orange)

3.2 Flow Projections

The following water flow projections have been estimated in accordance with the SEQ WS&S D&C Code. These projections have been compared to the City's 2019 WSSIP predicted demands and are presented in Table 3.

Table 3: Daily water flow projections

Site Loading	Land Use	Demand (EP)	Average Day (kL/d)	MDMM (kL/d)	Peak Day (kL/d)	Peak Hour (L/s)
Existing (2021) WSSIP Demand	Multi-Residential	0	0.0	0.0	0.0	0.00
Proposed DA	Multi-Residential	525	125.9	212.4	255.1	8.17
Total Increase		525	125.9	212.4	255.1	8.17
Approved DAs	Tourist	85	20.4	34.6	48.6	1.32

The daily water flow projections indicate that the proposed development is expected to increase the existing (2021) peak hour demand by approximately 8.2 L/s. However, beyond the intermediate (2041) planning horizon, calculated flow projections decrease as the proposed development has lower demand (525 EP) than the WSSIP projections associated with the site (533 EP).

It should also be noted that previously approved development demands within the area assessed are expected to increase the ultimate (2066) peak hour demand by approximately 1.3 L/s.

3.3 Existing Network Modelling

Hydraulic modelling of the water supply network was undertaken using the InfoWater model for the City's northern potable water network (Northern v95_WSSIP_2019) provided by the City. The hydraulic modelling was completed to evaluate system performance under existing (2021) through to the intermediate (2041) planning horizon flow conditions, both with and without the proposed development loading.

It should be noted that beyond the intermediate (2041) planning horizon, desktop analysis shows the proposed development demands will decrease in overall EP compared to the existing network demands. Therefore, no modelling was undertaken for the ultimate (2066) planning horizon.

3.3.1 Reservoir Analysis

To ensure the Peanba Park Road Tanks achieve the City's DSS recommended minimum operating level of 15% depth, a 3-day extended simulation was run in accordance with SEQ WS&S D&C Code recommendations using the Maximum Day (MD) demand scenario within the network model.

Modelling results indicate that the existing (2021) through ultimate (2066) network demands do not deplete the Peanba Park Road Tanks below the DSS of 15%.

3.3.2 Peak Hour Analysis

To determine peak hour minimum pressures and maximum network velocities, a 3-day standard flow analysis was run using the MD scenario within the network model.

It should be noted that beyond the intermediate (2041) planning horizon, desktop analysis shows the proposed development demands will not lead to an increase in demands compared to the existing network demands. Therefore, no modelling was undertaken for the ultimate (2066) planning horizon.

The results from the network peak hour analysis are detailed in Table 4 and Table 5.

Table 4: Peak hour minimum pressures modelled at connection node and greater Upper Coomera HLZ

Planning Horizon	Location	Peak Hour Minimum Pressure (m)					
		Existing	Failures	w/ Approved DAs	Failures	w/ Approved DAs & Proposed Development	Failures
2021	PI_11100365302_WTHY	58.4	-	55.5	-	50.8	-
	UPPER COOMERA HLZ	23.0	-	22.6	-	20.2	2
2026	PI_11100365302_WTHY	56.7	-	52.8	-	50.5	-
	UPPER COOMERA HLZ	22.8	-	20.9	1	18.2	2
2031	PI_11100365302_WTHY	53.6	-	50.7	-	50.3	-
	UPPER COOMERA HLZ	22.8	-	19.3	2	17.1	3
2036	PI_11100365302_WTHY	51.0	-	50.5	-	49.1	-
	UPPER COOMERA HLZ	21.4	1	18.3	2	15.6	3
2041	PI_11100365302_WTHY	52.9	-	47.3	-	46.7	-
	UPPER COOMERA HLZ	19.2	2	13.7	4	13.1	4

Modelling results indicate that the existing (2021) through intermediate (2041) network have sufficient capacity to service the proposed development under peak hour demands while satisfying the SEQ WS&S D&C Code recommended minimum pressure of 22 m. However, several loading nodes within the Upper Coomera HLZ fall below the recommended minimum

pressure in the existing (2021) through intermediate (2041) network scenarios (Refer to **Appendix B**). Failures were found to occur under existing WSSIP19 demands (including approved DAs) or are not significantly worsened by the proposed development demand. Furthermore, observed failures occurred on the new network elements incorporated in to the model and the demands applied to the new network elements (Figure 4) were highly conservative due to City of Gold Coast not advising any removal of WSSIP19 demands from the corresponding lots in the existing network.

Table 5: Maximum velocities modelled within Upper Coomera HLZ

Planning Horizon	Location	Peak Hour Maximum Velocity (m/s)					
		Existing	Failures	w/ Approved DAs	Failures	w/ Approved DAs & Proposed Development	Failures
2021	Upper Coomera HLZ	1.7	-	1.7	-	1.7	-
2026		1.7	-	1.7	-	1.7	-
2031		1.7	-	1.7	-	1.7	-
2036		1.7	-	1.7	-	1.7	-
2041		1.7	-	1.7	-	1.7	-

Note: No water mains under 10 m in length were considered as part of this assessment

Modelling results indicate that the existing (2021) through ultimate (2066) network have sufficient capacity to service the proposed development under peak hour demands while satisfying the SEQ WS&S D&C Code recommended maximum velocity of 2.5 m/s.

3.3.3 Fire Flow Analysis

Fire flow simulations were completed using the InfoWater Fireflow simulator and the 2/3 PH time noted in the model. Minimum fire flow residual pressures modelled at the nearest hydrant to the proposed development and greater Upper Coomera HLZ are summarised in Table 6.

Table 6: Fire flow minimum residual pressures modelled at nearest hydrant and greater Upper Coomera HLZ

Planning Horizon	Location	Fire Flow Minimum Residual Pressure (m)					
		Existing	Failures	w/ Approved DAs	Failures	w/ Approved DAs & Proposed Development	Failures
2021	PI_11100365302_WTHY	41.5	-	40.9	-	40.5	-
	UPPER COOMERA HLZ	5.9	1	6.0	1	6.0	1
2026	PI_11100365302_WTHY	41.1	-	40.7	-	40.3	-
	UPPER COOMERA HLZ	5.9	1	5.9	1	5.9	1
2031	PI_11100365302_WTHY	40.5	-	40.3	-	40.2	-
	UPPER COOMERA HLZ	5.9	1	5.9	1	5.9	1
2036	PI_11100365302_WTHY	40.6	-	40.3	-	39.7	-
	UPPER COOMERA HLZ	5.9	1	5.9	1	5.8	1
2041	PI_11100365302_WTHY	41.5	-	38.6	-	38.3	-
	UPPER COOMERA HLZ	5.9	1	5.8	1	5.8	1

Note: 1) Fire flow pressure calculated in accordance with SEQ WS&S D&C Code recommendations at 2/3 PH demand (12:00) with 15 L/s adopted at the proposed development hydrant

The fire flow analysis indicates that the existing (2021) through ultimate (2066) networks have sufficient capacity to service the proposed development for fire flow demands with the nearest hydrant (PI_11100365302_WTHY) having adequate capacity to satisfy SEQ WS&S D&C Code recommended 12 m minimum residual pressure.

Within the greater Upper Coomera HLZ, there is one hydrant failure under all planning horizons at HE_11100008252_WTHY. This failure occurs both with and without demands from the proposed development and is therefore considered existing failures.

3.4 Internal Network Modelling

The internal water network analysis was undertaken using an InfoWater model developed using the proposed water layout attached in **Appendix C**. Internal modelled nodes have adopted surface RL levels from the Gold Coast 2014 LGA 1m Digital Elevation Model. All demands from the proposed Eden Upper Coomera development have been allocated evenly across the modelled internal nodes. The analysis has been undertaken in accordance with SEQ WS&S D&C Code recommendations with connections points to the existing network model as outlined in Figure 2.

3.4.1 Internal network modelling results

The internal network model was run under peak hour and fire flow demands under the previously mentioned assumptions and design standards of service, with key results detailed in Figure 6 through Figure 9. Network modelling results indicate that the existing (2021) through ultimate (2066) networks have sufficient capacity to service the proposed development while satisfying SEQ WS&S D&C Code recommendations under both peak hour and fire flow conditions.

It should be noted that in addition to modelled pressures, the internal network also satisfied SEQ WS&S D&C Code recommendations for maximum velocity (2.5 m/s) and maximum headloss (5 m/km).



(rezoned).



Figure 7: Peak hour internal network modelling results under intermediate (2041) planning horizon (rezoned).



Figure 8: Fire flow internal network modelling results under existing (2021) planning horizon (rezoned).



Figure 9: Fire flow internal network modelling results under intermediate (2041) planning horizon (rezoned).

3.4.2 Conclusion and Recommendations

The water network analysis was adapted from the WSSIP19 network model provided by City of Gold Coast. Analysis of the water supply network has concluded that there is sufficient capacity in the existing (2021) through ultimate (2066) network to service the proposed development during peak hour and fire flow demand while satisfying SEQ WS&S D&C Code recommendations. The ultimate (2066) planning horizon existing network has been assumed to be able to service the proposed development as the WSSIP19 demands will lead to a net decrease with the addition of the proposed development. Within the greater Upper Coomera HLZ, there are several locations where modelled water infrastructure supply does not meet the SEQ WS&S D&C Code recommendations. However, these failures are not significantly worsened by the proposed development and are based on a highly conservative demand allocation.

It is suggested that the proposed development of approximately 525 EP be approved with respect to adequate water supply network capacity, with the following recommendations:

- The developer liaises with City of Gold Coast to determine if, based on the proposed rezoning strategy, the observed breaches to SEQ WS&S D&C Code recommended peak hour minimum pressure of 22 m are acceptable or if the WSSIP19 network settings can be adjusted within the Upper Coomera HLZ to meet the minimum pressure requirement at all demand nodes.
- The developer liaises with City of Gold Coast to ensure that the proposed DN150/200 trunk water mains along Courtney Drive, connect to the existing network via 89 Courtney Drive.
- The developer liaises with City of Gold Coast to ensure that the proposed DN150/200 trunk water mains along Baileys Mountain Road and Reserve Road are constructed in a timely manner to create the adequate servicing via the proposed loop bounding the development site.
- The developer liaises with City of Gold Coast to ensure that the proposed boundary valve at the intersection of Baileys Mountain Road, Reserve Road and Old Coast Road (pipe CP_41227PIPE_11100085373) is constructed concurrently to secure supply within the proposed development supply rezoning area.

4.0 WASTEWATER NETWORK ASSESSMENT

The wastewater network analysis has been undertaken in accordance with the City's 2019 WSSIP master planning service strategies.

4.1 Extent of Assessment

The sewerage impact assessment included the gravity mains from the proposed development to the downstream sewage pumping station (SPS) PA01, as seen in Figure 10 and Figure 11. It should be noted that to service the approved and proposed developments along Courtney Drive, updates have been made to the WSSIP19 proposed sewer network. Specifically, sewer trunk line 1 is a reconfiguration the existing WSSIP19 proposed trunk sewer between 41 Courtney Drive and Richardson Crescent. The proposed trunk sewer configuration servicing the approved development at 79-99 Courtney Drive has also been incorporated into the current modelling. The decommissioned WSSIP19 proposed trunk sewers are dashed grey, as shown in Figure 11.

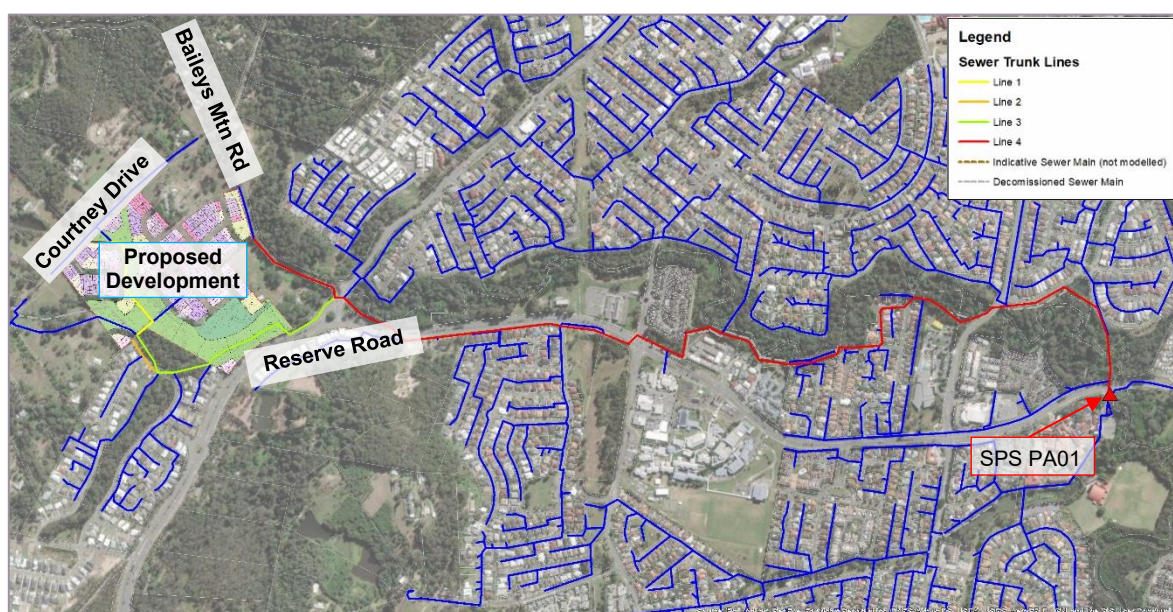


Figure 10: Wastewater infrastructure from the proposed development through to SPS PA01



Figure 11: Proposed Development wastewater loading locations.

As outlined in Figure 11, demands from the proposed development have been loaded to model nodes connected to proposed sewer reticulation discharge points (refer to **Appendix C** for detailed internal sewer servicing plan). The existing sewer network gravity feeds approximately 3 km to SPS PA01. Table 7 summarises the yields applied to respective loading nodes.

Table 7: Proposed Development Sewer Loading Summary

Loading Node	Demand (ET)	Demand (EP)	Trunk Line #
WCS_DA_02	3	8.4	1
WCS_DA_04	30	83.7	1
WCS_DA_05	44	122.8	1
SEMH_PA01_9000149364	2	5.6	2
SEMH_PA01_9000031633	2	5.6	3
SEMH_PA01_9000031643	68	189.7	3
GM_PA01_13AUG	39	108.8	4

4.2 Flow and Emergency Storage Projections

The wastewater flow and emergency storage (ES) projections for the Eden Upper Coomera development have been estimated in accordance with the SEQ WS&S D&C Code and are presented in Table 8.

Table 8: Wastewater flow and emergency storage projections

Site Loading	Demand (EP)	ADWF (L/s)	PWWF (L/s)	Additional ES Required (kL)
Ultimate (2066) WSSIP Demand	475	1.0	5.0	14.3
Proposed DA	525	1.1	5.5	15.7
2066 Total Increase	49	0.1	0.5	1.5
Ultimate (2066) Approved DAs	340	0.71	3.5	10.2

Notes: 1) Proposed wastewater flow projections calculated in accordance with existing Conventional Sewer design criteria

The analysis indicates that the proposed development is expected to increase the ultimate (2066) PWWF demands of the SPS PA01 catchment by approximately 0.5 L/s. It should be noted that there is an additional ultimate (2066) demand of approximately 3.5 L/s PWWF from approved DAs in the SPS PA01 catchment.

4.3 Network Modelling

Hydraulic modelling of the wastewater network was undertaken using the InfoSWMM model for Pimpama (PI_WSSIP_2019) provided by the city. The hydraulic modelling was completed to evaluate system performance under existing (2021) through to the ultimate (2066) planning horizon flow conditions, including additional approved DAs, both with and without the proposed development loading.

4.4 Impact Assessment

4.4.1 Gravity Mains

Key profiles of the gravity network immediately downstream of the proposed development to SPS PA01 can be seen in Figure 12 through Figure 21.

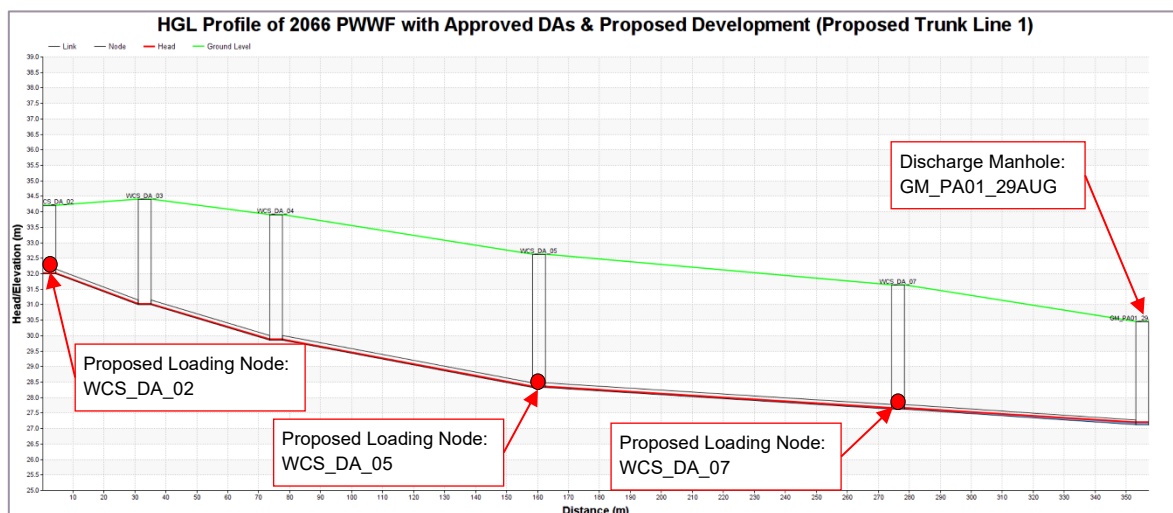


Figure 12: Reconfigured gravity network (traversing proposed development lots 185 on RP173727 and 186 on RP173728) under ultimate (2066) PWWF including demands from approved DAs and the proposed development

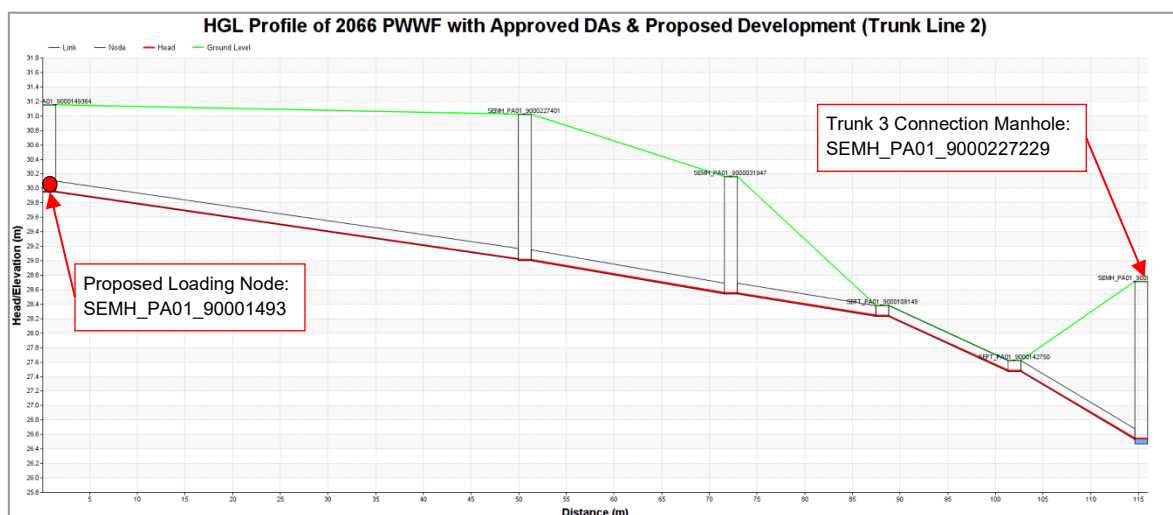


Figure 13: Trunk 2 gravity network under ultimate (2066) PWWF including demands from approved DAs and the proposed development (note existing WSSIP19 network surface RL data missing)

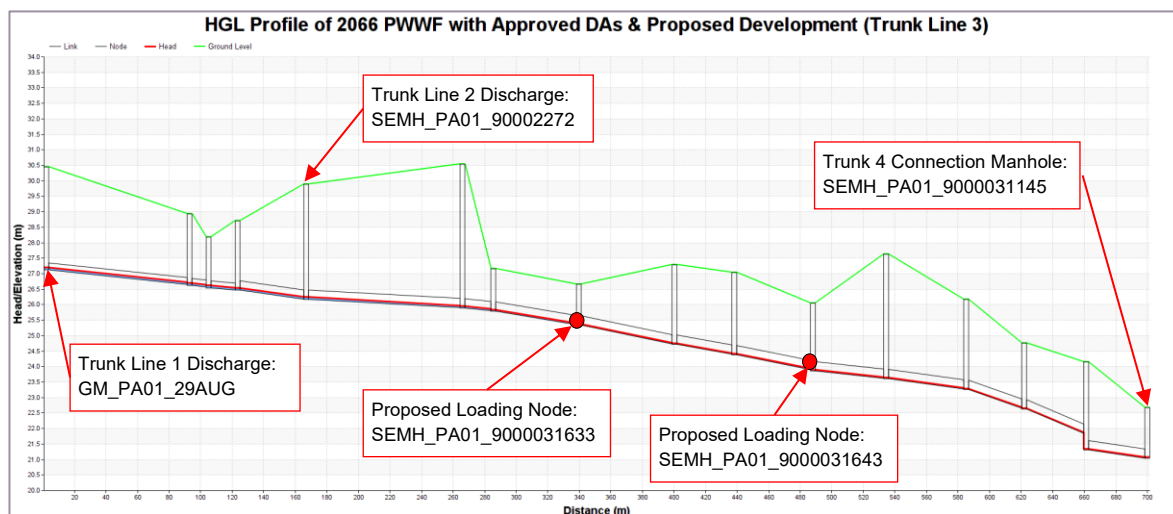


Figure 14: Trunk 3 gravity network under existing ultimate (2066) including demands from approved DAs and the proposed development

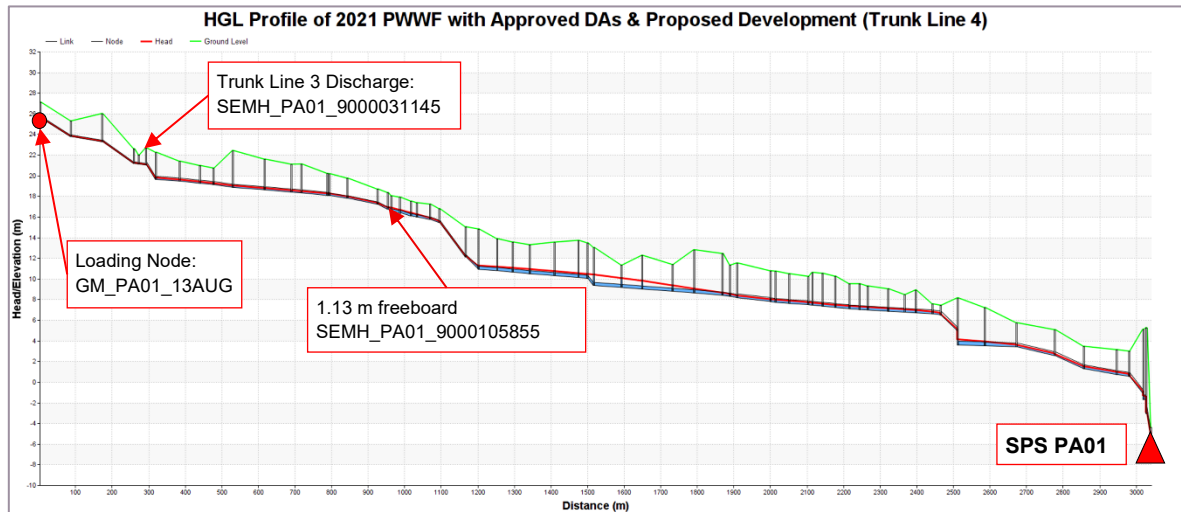


Figure 15: Trunk 4 existing WSSIP19 gravity network under existing (2021) PWWF including demands from approved DAs and the proposed development.

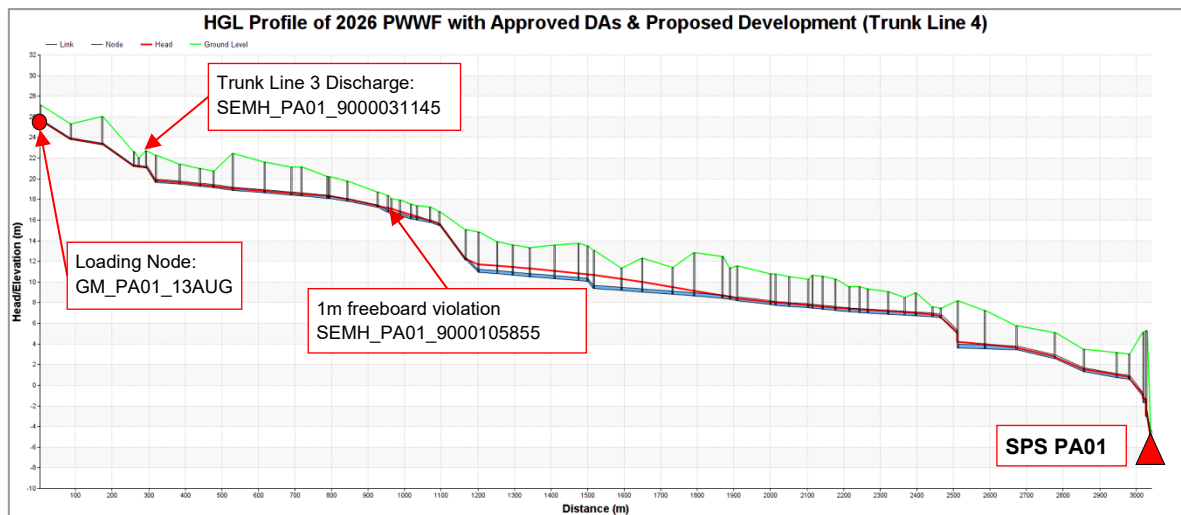


Figure 16: Trunk 4 existing WSSIP19 gravity network under intermediate (2026) PWWF including demands from approved DAs and the proposed development, showing 1m freeboard violations.

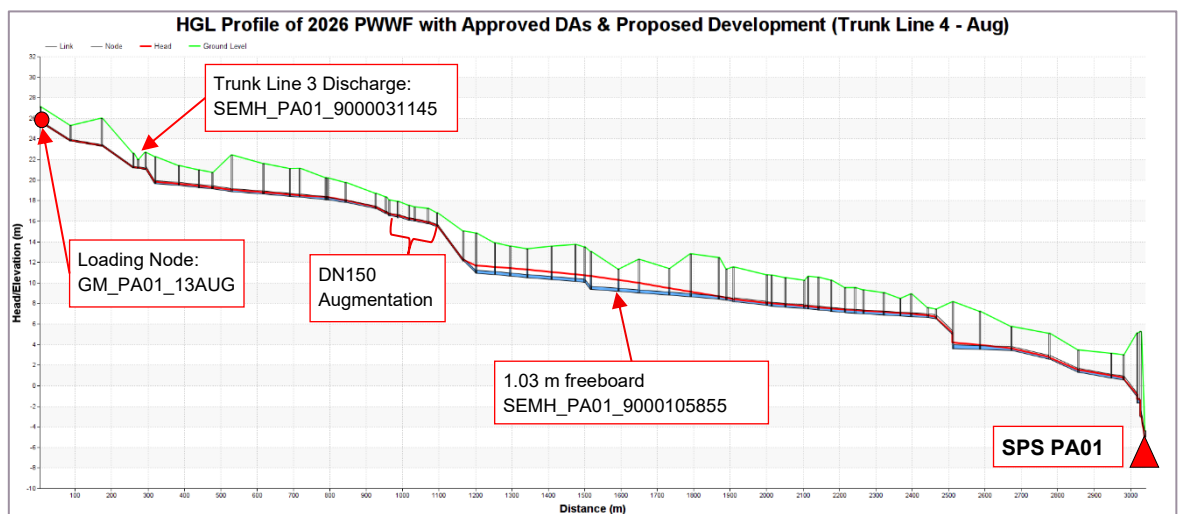


Figure 17: Trunk 4 gravity network under intermediate (2026) PWWF including demands from approved DAs and the proposed development, including proposed DN150 augmentation.

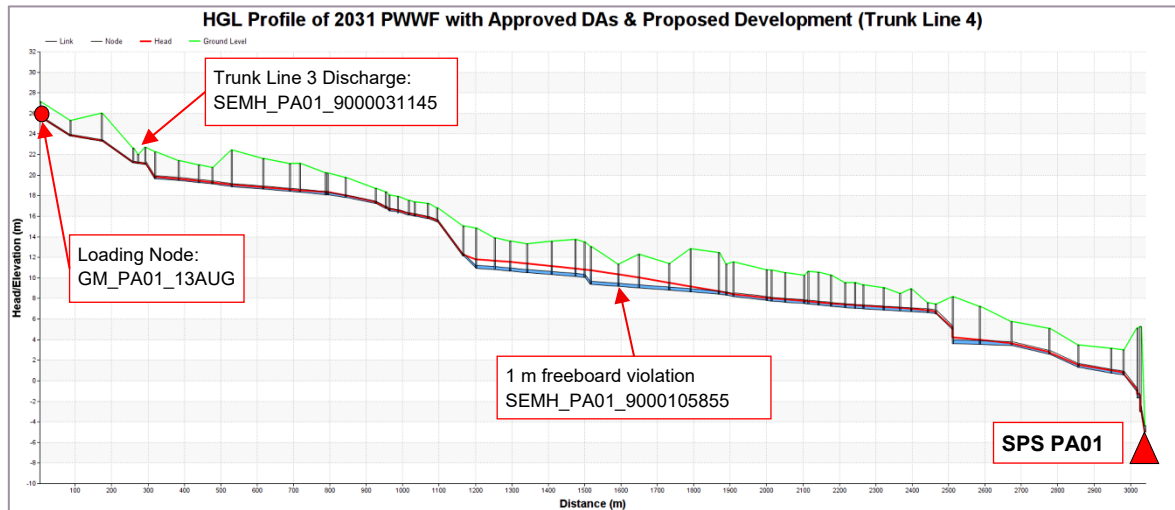


Figure 18: Trunk 4 gravity network under intermediate (2031) PWWF including demands from approved DAs and the proposed development, including proposed DN150 augmentation, showing 1m freeboard violation.

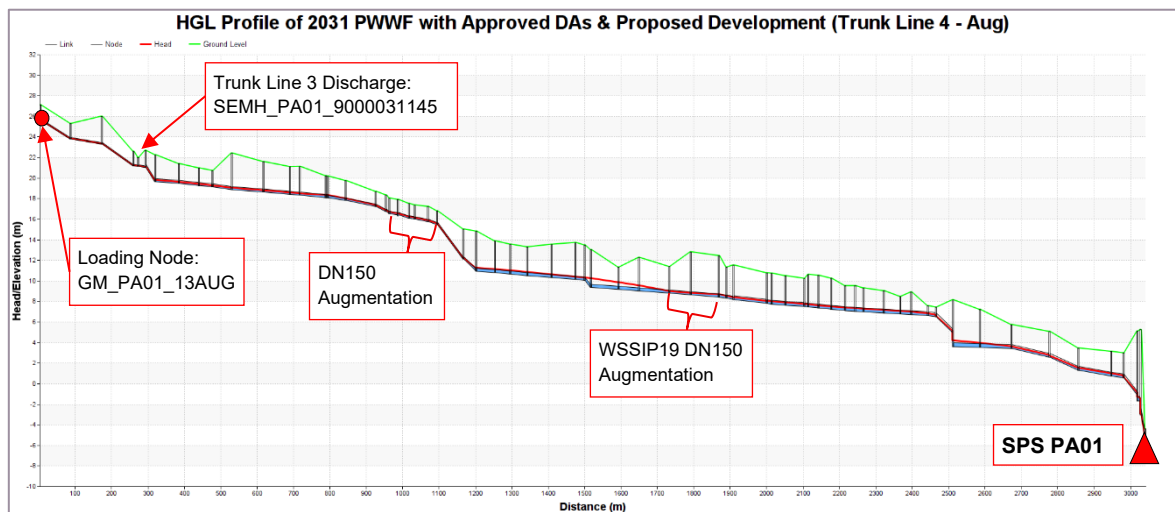


Figure 19: Trunk 4 gravity network under intermediate (2031) PWWF including demands from approved DAs and the proposed development, including proposed DN150 augmentation and WSSIP19 DN150 augmentations brought forward to 2031.

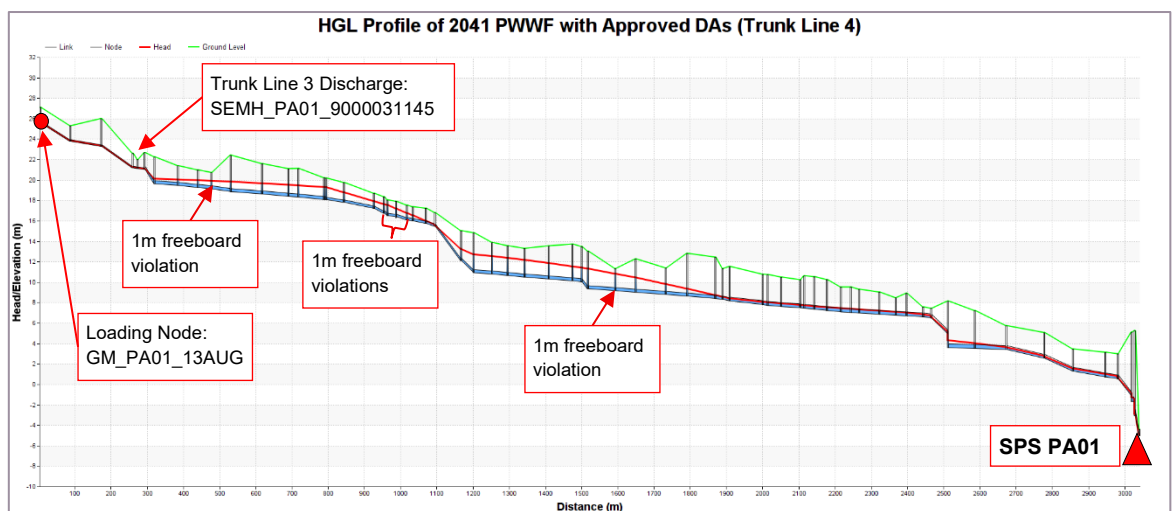


Figure 20: Trunk 4 existing WSSIP19 gravity network under intermediate (2041) PWWF including demands from approved DAs, showing 1m freeboard violations.

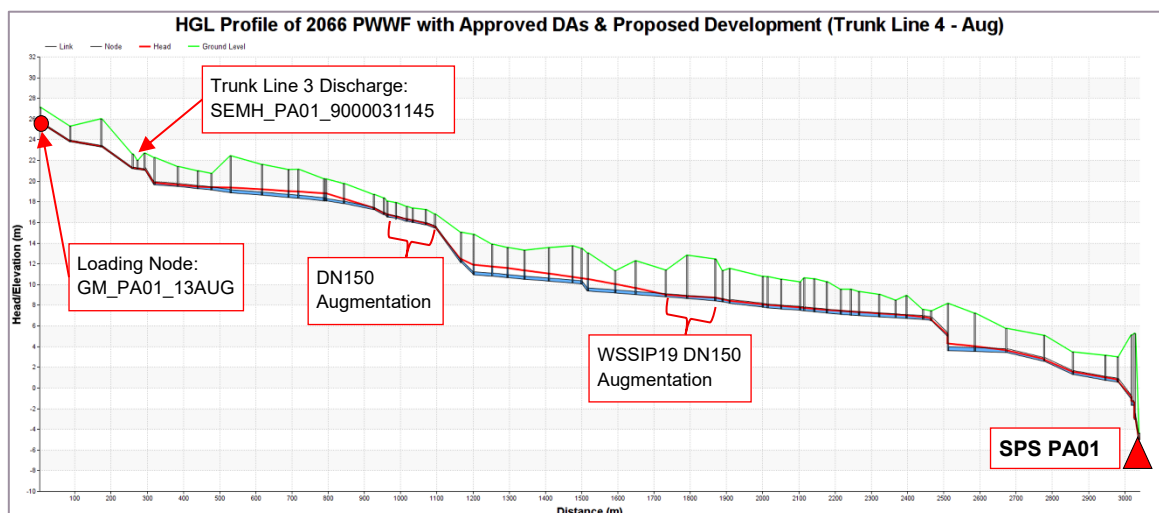


Figure 21: Trunk 4 gravity network under intermediate (2066) PWWF including demands from approved DAs and the proposed development, including proposed DN150 augmentation and WSSIP19 DN150 augmentations.

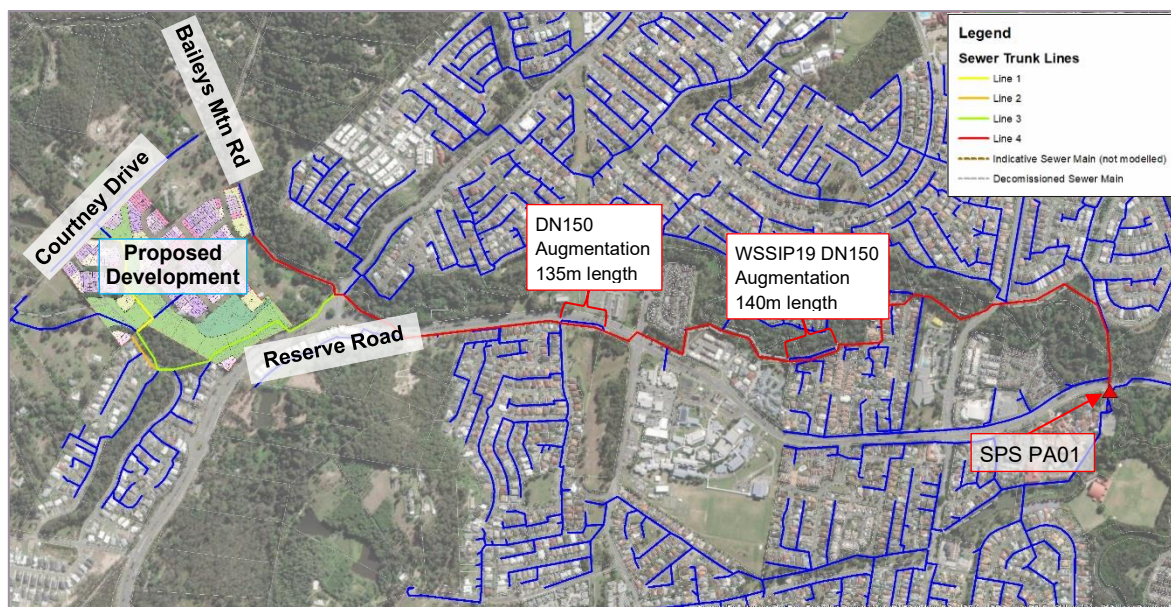


Figure 22: Proposed wastewater infrastructure upgrades from the proposed development through to SPS PA01

Modelling confirms the following key trends in network performance:

- As illustrated in Figure 16, from the intermediate (2026) planning horizon, with the inclusion of approved DAs and the proposed development, the downstream sewer network fails to satisfy the City of Gold Coast's adopted requirement of 1m freeboard at PWWF at manhole SEMH_PA01_9000105855.
- With the inclusion of a 135m of DN150 parallel augmentation between manholes SEMH_PA01_9000105855 to SEMH_PA01_9000140368, the minimum 1m freeboard DSS is satisfied through in the intermediate (2026) planning horizon, as shown in Figure 17.
- In the intermediate (2031) planning horizon, 1m freeboard is breached at manhole SEMH_PA01_9000146850, as illustrated in Figure 18. To alleviate this freeboard criteria

failure (Figure 20), the WSSIP19 proposed 140m of DN150 parallel augmentation (conduits GM_PA01_9000146840L01AUG & GM_PA01_9000027992L01AUG) should be brought forward from the 2066 to 2031 planning horizon.

- It should be noted (Figure 20) that the proposed augmentations would be necessary from the intermediate (2041) planning horizon with approved DA discharge only, regardless of the flows from the proposed development. Therefore, the network deficiencies identified are considered existing network issues, which would be brought forward in timing from 2041 to 2026 as a result of the proposed development demands.
- Although the outcome of the modelling is not affected, it should be further noted that the ground elevation appears close to the sewer obvert at manholes SEFT_PA01_900010814 and SEFT_PA01_9000108150 (limited cover). These levels are from the existing WSSIP19 network model and should be verified by City of Gold Coast.

4.4.2 Sewage Pumping Station

A desktop assessment was completed using the demands nominated in the Pimpama wastewater network model (PI_WSSIP_2019), to ensure that the proposed development could be adequately serviced by the existing pump station (SPS PA01) and is summarised in the following sections:

4.4.2.1 Pump Capacity

Table 9: Flow requirements versus existing capacity

Planning Horizon	Maximum Capacity ¹ (L/s)	PWWF (L/s)		
		Existing 2019 WSSIP ²	With Approved DAs	With Approved DAs & Proposed Development
Existing (2021)	253.5	165.0	173.8	179.8
2026		169.0	176.4	182.4
2031		182.1	188.8	194.9
2036		192.7	198.8	204.8
2041		202.2	208.0	214.0
2066		204.3	207.9	208.4

Note: 1) SPS PA01 existing dual pumps capacity obtained from email received from the City of Gold Coast
2) Demands for PWWF calculations obtained from the CO_WSSIP_2019 network models.

4.4.2.2 Operating volume

Table 10: Operating volume requirements versus existing capacity

Planning Horizon	Existing Capacity ¹ (L/s)	Operating Volume Required (m ³)		
		Existing 2019 WSSIP ²	With Approved DAs	With Approved DAs & Proposed Development
Existing (2021)	15.6	8.7	9.1	9.4
2026		8.9	9.3	9.6
2031		9.6	9.9	10.2
2036		10.1	10.4	10.8
2041		10.6	10.9	11.2
		10.7	10.9	10.9

Note: 1) SPS PA01 existing operating storage volume obtained from email received from the City of Gold Coast
2) Demands for PWWF calculations obtained from the CO_WSSIP_2019 network models.

4.4.2.3 Rising Main

Table 11: Rising main velocities

Planning Horizon	Rising Main Internal Diameter ¹ (mm)	Velocity @ Ultimate (2066) PWWF (m/s)		
		Existing 2019 WSSIP	With Approved DAs	With Approved DAs & Proposed Development
Existing (2021)	375	1.5	1.6	1.6
2026		1.5	1.6	1.7
2031		1.6	1.7	1.8
2036		1.7	1.8	1.9
2041		1.8	1.9	1.9
		1.8	1.9	1.9

Note: 1) Diameters obtained from the CO_WSSIP_2019 network model

4.4.2.4 Emergency Storage

Table 12: Emergency storage requirements versus existing capacity

Planning Horizon	Available Emergency Storage ^{1,3} (kL)	Emergency Storage Required for 4hrs @ADWF (kL)		
		Existing 2019 WSSIP ²	With Approved DAs	With Approved DAs & Proposed Development
Existing (2021)	394.0	413.4	438.8	456.3
2026	393.5	431.8	452.9	470.4
2031	392.1	464.1	483.4	500.9
2036	391.0	490.2	507.7	525.2
2041	390.4	512.3	529.0	546.4
2066	390.4	518.3	528.5	529.9

Note: 1) SPS PA01 existing available emergency storage volume obtained from email received from the City of Gold Coast
2) Demands for PWWF calculations obtained from the CO_WSSIP_2019 network models.
3) WSSIP2019 proposed to build additional 140.4 kL of extra emergency storage in 2021.

The desktop assessment of SPS PA01 has concluded that the pump station has sufficient capacity to service the proposed development under existing (2021) demands through to the ultimate (2066) planning horizon.

However, assessment of the PA01 emergency storage required based on modelled demands compared with existing available storage identified by the City of Gold Coast revealed that there may not be sufficient capacity to satisfy the SEQ WS&S D&C Code recommendation of 4 hours at ADWF. The shortcoming occurs under all planning horizons prior to the demands associated with the proposed development. Once the additional WSSIP19 proposed emergency storage of 140.4 kL has been commissioned, then the available emergency storage meets DSS requirements with the proposed development in all planning horizons.

Hydraulic analysis was undertaken using full network model runs for all scenarios to substantiate the desktop assessment findings and capacities noted within. Network modelling results confirm that SPS PA01 has sufficient capacity to service the proposed development through to the ultimate (2041) planning horizon.

4.5 CONCLUSION AND RECOMMENDATIONS

Analysis of the wastewater gravity network has concluded that there is currently insufficient capacity in the existing (2021) through ultimate (2066) gravity network to service the proposed development while satisfying SEQ WS&S D&C Code recommendations. However, with the inclusion of the proposed augmentations as detailed in Section 4.4.1, SEQ WS&S D&C Code

recommendations can be met across all planning horizons. It was further determined that the SPS PA01 catchment may not have adequate emergency storage availability for all planning horizons both with and without proposed demands. SPS PA01 and associated downstream rising main was found to have sufficient capacity to service the proposed development while satisfying SEQ WS&S D&C Code recommendations from the existing (2021) through ultimate (2066) planning horizons.

It is therefore suggested that the proposed development of approximately 525 EP be approved with respect to adequate wastewater network capacity under the following recommendations:

- The City of Gold Coast consider the 15.7 kL of emergency storage required from the proposed development when designing any future upgrade to emergency storage within the PA01 catchment.

APPENDIX A: WATER NETWORK ELEMENTS INCORPORATED INTO EXISTING WSSIP19 NETWORK MODEL

ID (Char)	ELEVATION (m)	Demand (L/s)	Min.Pressure (m)	Residual Pressure (m)
11100585029	48.26	0.04	39.25	40.30
11100585036	46.64	0.04	40.84	41.83
11100585047	49.08	0.04	38.46	39.59
11100622669	61.42	0.08	26.32	26.36
11100622684	53.02	0.08	34.73	36.04
11100622685	50.56	0.00	37.19	38.76
11100622709	53.59	0.08	34.15	34.45
11100622715	51.64	0.08	36.10	37.00
11100622718	74.62	0.08	13.12	12.57
11100622732	51.02	0.08	36.72	37.41
11100622733	73.31	0.08	14.43	13.63
11100622735	38.39	0.00	52.89	55.55
11100622737	68.17	0.08	19.57	19.32
11100622739	65.07	0.00	22.80	24.57
11100622740	51.55	0.08	36.20	37.38
11100622742	70.30	0.08	17.44	16.46
11100746541	56.40	0.00	35.42	38.22
11100771826	49.19	0.00	38.41	39.77
11100771827	50.78	0.00	36.88	38.33
11100772071	57.50	0.09	30.09	31.39
9000345993	51.15	0.08	36.59	37.14
FCP1040	37.00	1.86	49.69	45.93
J176	59.50	0.09	28.02	28.96
J178	59.20	0.09	28.19	27.64
J180	62.30	0.09	24.96	23.47
J182	63.20	0.09	24.02	20.80
J184	61.30	0.09	25.90	22.07
J186	60.20	0.09	26.97	22.78
J188	58.00	0.09	29.15	24.98
J192	53.30	0.09	33.82	30.35
J194	55.00	0.09	32.12	23.91
J196	59.10	0.09	28.02	14.87
J198	52.50	0.09	34.61	32.54
J200	52.20	0.09	34.87	33.05
J202	51.10	0.09	35.93	34.94
J204	46.50	1.13	40.46	38.12
J206	55.90	0.09	31.20	29.86
J208	43.60	0.12	43.35	40.82
J210	40.00	0.12	46.95	45.01
J212	40.60	0.12	46.39	44.56
J214	46.80	0.19	40.23	37.61

ID (Char)	ELEVATION (m)	Demand (L/s)	Min.Pressure (m)	Residual Pressure (m)
J216	51.90	0.19	35.13	31.40
J218	49.40	0.19	37.63	32.06
J220	53.40	0.19	33.64	29.95
J222	53.60	0.19	33.46	31.22
J224	48.10	0.09	39.06	38.51
J226	57.70	0.09	29.46	28.74
J228	42.90	0.09	44.31	43.80
J230	61.30	0.09	26.09	24.97
J232	60.80	0.09	26.52	24.90
J234	59.40	0.09	27.84	26.27
J236	40.60	0.12	46.40	44.81
J238	51.90	0.09	35.13	34.20
J240	57.10	0.09	30.04	26.69
J242	61.80	0.09	25.37	21.79
J246	62.30	0.09	24.89	21.42
J250	61.90	0.09	25.31	22.23
J252	52.70	0.09	34.42	31.69
J254	49.60	0.09	37.51	36.04
J256	48.40	0.09	38.59	36.65
WCS_DA_01	38.25	0.08	48.45	42.83
WCS_DA_02	36.34	0.08	50.34	38.60
WCS_DA_03	33.65	0.08	53.02	39.67
WCS_DA_04	34.21	0.08	52.47	39.75
WCS_DA_05	35.78	0.08	50.90	39.30
WCS_DA_07	31.20	0.10	55.67	53.55
WCS_DA_08	31.50	0.10	55.34	51.80
WCS_DA_09	30.50	0.10	56.28	50.25
WCS_DA_10	33.00	0.10	53.77	47.36
WCS_DA_11	43.98	0.10	42.79	36.55
WCS_DA_12	48.50	0.10	38.26	32.64
WCS_DA_13	43.00	0.10	43.78	38.96
WCS_DA_14	37.76	0.10	49.03	43.83
WCS_DA_15	29.50	0.10	57.30	52.95
WCS_DA_16	39.50	0.10	47.29	42.84
WCS_DA_17	30.15	0.10	56.60	49.94
WCS_DA_18	28.00	0.10	58.75	50.47
WCS_DA_19	34.50	0.10	52.27	46.46
WCS_DA_20	30.50	0.10	56.23	48.57
WCS_DA_21	30.00	0.10	56.73	47.70
WCS_DA_22	33.01	0.10	53.71	44.12
WCS_DA_23	34.91	0.10	51.81	41.92
WCS_DA_24	38.15	0.10	48.57	38.62
WCS_DA_25	42.30	0.10	44.42	34.73
WCS_DA_26	44.63	0.10	42.09	32.89
WCS_DA_27	31.38	0.10	55.35	46.86

ID (Char)	ELEVATION (m)	Demand (L/s)	Min.Pressure (m)	Residual Pressure (m)
WCS_DA_28	35.33	0.10	51.40	42.61
WCS_DA_30	36.40	0.08	50.28	40.22
WCS_DA_31	43.50	0.10	43.23	35.34
WCS_DA_32	46.13	0.10	40.60	32.87
WCS_DA_33	42.50	0.10	44.23	36.98
WCS_DA_35	41.50	0.10	45.23	35.04
WCS_DA_36	41.50	0.10	45.23	32.91
WCS_DA_37	48.00	0.10	38.73	23.57
WCS_DA_38	33.32	0.08	53.35	39.77
WCS_DA_39	34.30	0.08	52.37	38.75
WCS_DA_41	35.71	0.08	50.96	35.77
WCS_DA_42	34.39	0.08	52.28	39.07
WCS_DA_43	37.00	0.06	49.69	45.22
WCS_DA_44	41.00	0.08	45.77	43.75
WCS_DA_45	37.44	0.08	49.25	43.95

ID (Char)	DESCRIPT (Char)	LENGT H (m)	DIAMETER (mm)	ROUGHNESS (Double)	Max.Velocit y (m/s)	Max.Headloss (m/k-m)
EXP10	CoGC GIS	31.13	151.9	110	0.26	0.87
EXP11	CoGC GIS	30.71	151.9	110	0.27	0.88
EXP12	CoGC GIS	66.05	151.9	110	0.27	0.90
EXP13	CoGC GIS	31.75	150	110	0.06	0.06
EXP14	CoGC GIS	15.26	150	110	0.05	0.05
EXP15	CoGC GIS	36.74	150	110	0.05	0.04
EXP16	CoGC GIS	26.46	150	110	0.04	0.03
EXP17	CoGC GIS	17.07	150	110	0.04	0.02
EXP18	CoGC GIS	31.14	150	110	0.03	0.02
EXP19	CoGC GIS	33.15	150	110	0.03	0.01
EXP2	CoGC GIS	115.85	200	110	0.78	4.66
EXP20	CoGC GIS	37.06	150	110	0.02	0.01
EXP21	CoGC GIS	39.23	150	110	0.02	0.00
EXP22	CoGC GIS	32.54	150	110	0.01	0.00
EXP23	CoGC GIS	23.55	150	110	0.01	0.00
EXP3	CoGC GIS	732.65	200	110	0.78	4.66
EXP4	CoGC GIS	110.44	200	110	0.35	1.06
EXP5	CoGC GIS	94.86	200	110	0.32	0.88
EXP6	CoGC GIS	77.37	200	110	0.32	0.88
EXP7	CoGC GIS	36.31	200	110	0.16	0.25
EXP9	CoGC GIS	41.3	151.9	110	0.26	0.85
FPI_30100_PIPE _WSSIP19	WSSIP19 AUGMENTATION	43.52	100	100	0.03	0.04
P13612	WSSIP19 AUGMENTATION	40.8	100	100	0.17	0.74
P13710	H20ne Network	68.58	150	110	0.28	0.99
P13712	H20ne Network	40.8	100	100	0.36	3.04
P13714	H20ne Network	46.7	100	100	0.35	2.84
P13716	H20ne Network	60.8	100	100	0.17	0.71
P13718	H20ne Network	38.2	100	100	0.15	0.61
P13720	H20ne Network	47.5	100	100	0.14	0.52
P13722	H20ne Network	54.7	100	100	0.13	0.43
P13724	H20ne Network	72.1	100	100	0.11	0.35
P13726	H20ne Network	71.3	100	100	0.03	0.02
P13728	H20ne Network	74.8	100	100	0.01	0.01
P13730	H20ne Network	38.6	100	100	0.07	0.16
P13732	H20ne Network	55	100	100	0.17	0.75
P13734	H20ne Network	59.4	100	100	0.16	0.66
P13736	H20ne Network	34.5	100	100	0.23	1.33
P13738	H20ne Network	59.4	100	100	0.06	0.10
P13740	H20ne Network	57.4	100	100	0.04	0.05
P13742	H20ne Network	79.2	100	100	0.15	0.56
P13744	H20ne Network	126.8	100	100	0.09	0.25
P13746	H20ne Network	16.9	100	100	0.16	0.69
P13748	H20ne Network	119.4	100	100	0.09	0.21

ID (Char)	DESCRIPT (Char)	LENGT H (m)	DIAMETER (mm)	ROUGHNESS (Double)	Max.Velocit y (m/s)	Max.Headloss (m/k-m)
P13750	H20ne Network	88.1	100	100	0.05	0.07
P13752	H20ne Network	27.7	100	100	0.03	0.02
P13754	H20ne Network	98.6	100	100	0.07	0.13
P13756	H20ne Network	86.6	100	100	0.09	0.24
P13758	H20ne Network	98.5	100	100	0.10	0.28
P13762	H20ne Network	36.2	100	100	0.25	1.49
P13764	H20ne Network	80.9	100	100	0.00	0.00
P13766	H20ne Network	57.8	100	100	0.21	1.06
P13768	H20ne Network	64.2	100	100	0.19	0.94
P13770	H20ne Network	13.1	100	100	0.09	0.21
P13772	H20ne Network	69.2	100	100	0.22	1.19
P13774	H20ne Network	58.6	100	100	0.23	1.33
P13776	H20ne Network	53	100	100	0.25	1.47
P13778	H20ne Network	76.7	100	100	0.26	1.61
P13784	H20ne Network	66.4	100	100	0.13	0.48
P13786	H20ne Network	76.7	100	100	0.12	0.40
P13788	H20ne Network	25.5	100	100	0.15	0.56
P13792	H20ne Network	65	100	100	0.17	0.76
P13794	H20ne Network	35.8	100	100	0.16	0.66
P13796	H20ne Network	24.7	100	100	0.06	0.12
P13798	H20ne Network	43.5	100	100	0.22	1.21
P13800	H20ne Network	31.3	100	100	0.23	1.35
P13802	H20ne Network	25.2	100	100	0.22	1.20
P13804	H20ne Network	4	100	100	0.26	1.64
WCS_DA_P01	WCS Network	64.55	100	100	0.10	0.30
WCS_DA_P02	WCS Network	41.93	100	100	0.04	0.06
WCS_DA_P03	WCS Network	75.68	100	100	0.03	0.04
WCS_DA_P04	WCS Network	46.86	100	100	0.02	0.02
WCS_DA_P05	WCS Network	47.04	100	100	0.04	0.04
WCS_DA_P07	WCS Network	100.81	100	100	0.20	0.87
WCS_DA_P08	WCS Network	36.21	100	100	0.20	1.02
WCS_DA_P09	WCS Network	43.27	100	100	0.19	0.88
WCS_DA_P10	WCS Network	67.77	100	100	0.09	0.25
WCS_DA_P11	WCS Network	44.54	100	100	0.08	0.18
WCS_DA_P12	WCS Network	60.43	100	100	0.06	0.12
WCS_DA_P13	WCS Network	44.03	100	100	0.05	0.07
WCS_DA_P14	WCS Network	68.02	100	100	0.08	0.17
WCS_DA_P15	WCS Network	42.27	100	100	0.06	0.12
WCS_DA_P16	WCS Network	43.31	100	100	0.15	0.49
WCS_DA_P17	WCS Network	39.91	100	100	0.13	0.40
WCS_DA_P18	WCS Network	24.6	100	100	0.01	0.01
WCS_DA_P19	WCS Network	80.15	100	100	0.10	0.25
WCS_DA_P20	WCS Network	39.82	100	100	0.04	0.04
WCS_DA_P21	WCS Network	46.25	100	100	0.02	0.02

ID (Char)	DESCRIPT (Char)	LENGT H (m)	DIAMETER (mm)	ROUGHNESS (Double)	Max.Velocit y (m/s)	Max.Headloss (m/k-m)
WCS_DA_P22	WCS Network	58.02	100	100	0.05	0.07
WCS_DA_P23	WCS Network	41.62	100	100	0.04	0.04
WCS_DA_P25	WCS Network	40.56	100	100	0.02	0.01
WCS_DA_P26	WCS Network	38.88	100	100	0.01	0.00
WCS_DA_P27	WCS Network	46.57	100	100	0.01	0.00
WCS_DA_P28	WCS Network	36.34	100	100	0.02	0.02
WCS_DA_P29	WCS Network	53	100	100	0.04	0.05
WCS_DA_P30	WCS Network	46.2	100	100	0.06	0.11
WCS_DA_P31	WCS Network	74.73	100	100	0.12	0.39
WCS_DA_P32	WCS Network	40.59	100	100	0.05	0.07
WCS_DA_P33	WCS Network	77.11	100	100	0.01	0.00
WCS_DA_P36	WCS Network	80.12	100	100	0.04	0.05
WCS_DA_P37	WCS Network	86.57	100	100	0.09	0.21
WCS_DA_P38	WCS Network	43.82	100	100	0.04	0.06
WCS_DA_P39	WCS Network	32.06	100	100	0.03	0.03
WCS_DA_P40	WCS Network	42.89	100	100	0.01	0.01
WCS_DA_P41	WCS Network	35.11	100	100	0.01	0.01
WCS_DA_P42	WCS Network	34.6	100	100	0.00	0.00
WCS_DA_P43	WCS Network	64.88	100	100	0.01	0.00
WCS_DA_P44	WCS Network	29.99	100	100	0.01	0.01
WCS_DA_P45	WCS Network	75.62	100	100	0.04	0.06
WCS_DA_P46	WCS Network	65.38	100	100	0.23	1.33
WCS_DA_P47	WCS Network	54.71	100	100	0.05	0.09
WCS_DA_P48	WCS Network	44.06	100	100	0.05	0.06
WCS_DA_P49	Future Connection	43.01	100	100	0.42	3.32
WCS_DA_P52	WSSIP19 AUGMENTATION	282.08	100	100	0.17	0.74

APPENDIX B: SEQ WS&S D&C CODE FAILURES (WATER SUPPLY)

Peak Hour Minimum Pressure

2021 w/ Additional DAs & Proposed Development	
ID	Residual Pressure (m)
11100622733	21.52
11100622718	20.21

2026 w/ Additional DAs	
ID	Residual Pressure (m)
11100622718	20.92

2026 w/ Additional DAs & Proposed Development	
ID	Residual Pressure (m)
11100622733	19.55
11100622718	18.24

2031 w/ Additional DAs	
ID	Residual Pressure (m)
11100622733	20.61
11100622718	19.30

2031 w/ Additional DAs & Proposed Development	
ID	Residual Pressure (m)
11100622742	21.43
11100622733	18.42
11100622718	17.11

2036 Existing WSSIP	
ID	Residual Pressure (m)
11100622718	21.44

2036 w/ Additional DAs	
ID	Residual Pressure (m)
11100622733	19.56
11100622718	18.25

2036 w/ Additional DAs & Proposed Development	
ID	Residual Pressure (m)
11100622742	19.87
11100622733	16.86
11100622718	15.55

2041 Existing WSSIP	
ID	Residual Pressure (m)
11100622733	20.53
11100622718	19.22

2041 w/ Additional DAs	
ID	Residual Pressure (m)
11100622737	20.18
11100622742	18.05
11100622733	15.04
11100622718	13.73

2041 w/ Additional DAs & Proposed Development	
ID	Residual Pressure (m)
11100622737	19.57
11100622742	17.44
11100622733	14.43
11100622718	13.12

**APPENDIX C: PROPOSED INTERNAL WATER SUPPLY AND
SEWER LAYOUT**

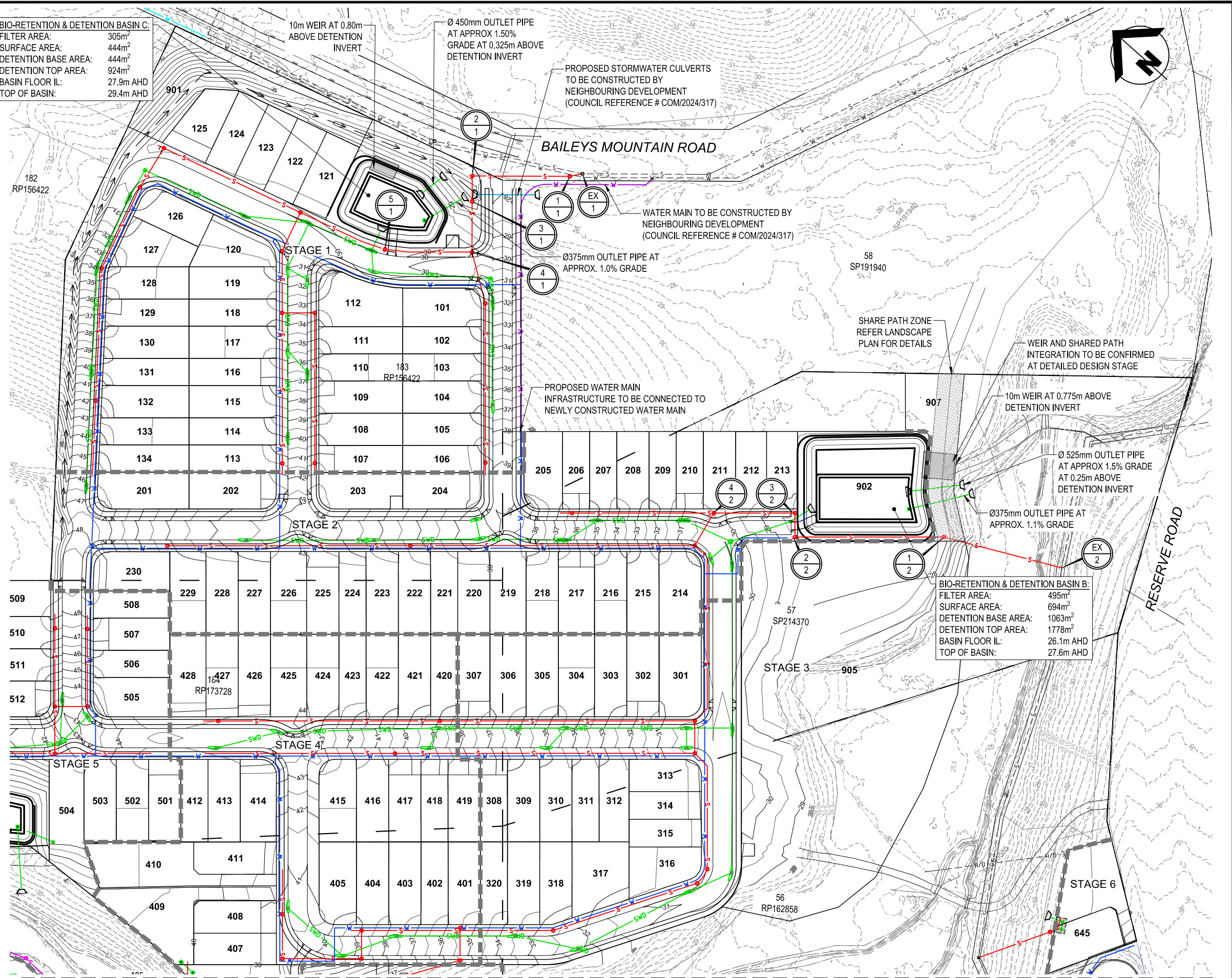
LEGEND

- PROPOSED SEWER MAIN
- PROPOSED TRUNK SEWER MAIN
- PROPOSED WATER MAIN
- PROPOSED TRUNK WATER MAIN
- PROPOSED STORMWATER DRAINAGE
- 80.0 FINISHED SURFACE CONTOURS
- 80.0 EXISTING SURFACE CONTOURS
- STAGE BOUNDARY
- PROPOSED SEWER MAIN (CONSTRUCTED BY OTHERS)
- PROPOSED WATER MAIN (CONSTRUCTED BY OTHERS)
- PROPOSED STORMWATER MAIN (CONSTRUCTED BY OTHERS)
- PROPOSED SERVICE EASEMENTS
- MAINTENANCE HOLE NUMBER

EXISTING SERVICES LEGEND

- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING STORMWATER PIPE
- EXISTING TELECOMMUNICATIONS CABLE
- EXISTING ELECTRICAL CABLE

BIO-RETENTION & DETENTION BASIN C:
 FILTER AREA: 305m²
 SURFACE AREA: 444m²
 DETENTION BASE AREA: 444m²
 DETENTION TOP AREA: 924m²
 BASIN FLOOR IL: 27.9m AHD
 TOP OF BASIN: 29.4m AHD



APPROVAL ISSUE
 NOT FOR CONSTRUCTION
 UNLESS STAMPED

CONTRACTOR TO DETERMINE AND
 LOCATE ALL EXISTING SERVICES PRIOR
 TO COMMENCEMENT OF WORKS

FOR CONTINUATION REFER SHEET 2

ISSUE NO.	DATE	AMENDMENT	CLIENT	DESIGN	DRAWN	APPROVED	TITLE	PROJECT NO.
C	26-08-25	ISSUED FOR REPORT	NORFOLK ESTATES PTY LTD	DR	MS	DC	PRELIMINARY SERVICES LAYOUT PLAN - SHEET 1 OF 2	OSK6521
B	11-12-24	ISSUED FOR APPROVAL	PROJECT PROPOSED RESIDENTIAL SUBDIVISION 31-53 COURTNEY DRIVE UPPER COOMERA, QLD, 4209				SCALE 1:750 AT A1 1:1500 AT A3	DWG NO. P040
A	06-12-24	ISSUED FOR INFORMATION					0 15 30 45 60m	ISSUE C
OSKA CONSULTING GROUP								

LEGEND

- PROPOSED SEWER MAIN
- PROPOSED TRUNK SEWER MAIN
- PROPOSED WATER MAIN
- PROPOSED TRUNK WATER MAIN
- PROPOSED STORMWATER DRAINAGE
- 80.0 FINISHED SURFACE CONTOURS
- 80.0 EXISTING SURFACE CONTOURS
- STAGE BOUNDARY
- PROPOSED SEWER MAIN (CONSTRUCTED BY OTHERS)
- PROPOSED WATER MAIN (CONSTRUCTED BY OTHERS)
- PROPOSED STORMWATER MAIN (CONSTRUCTED BY OTHERS)
- PROPOSED SERVICE EASEMENTS
- MAINTENANCE HOLE NUMBER

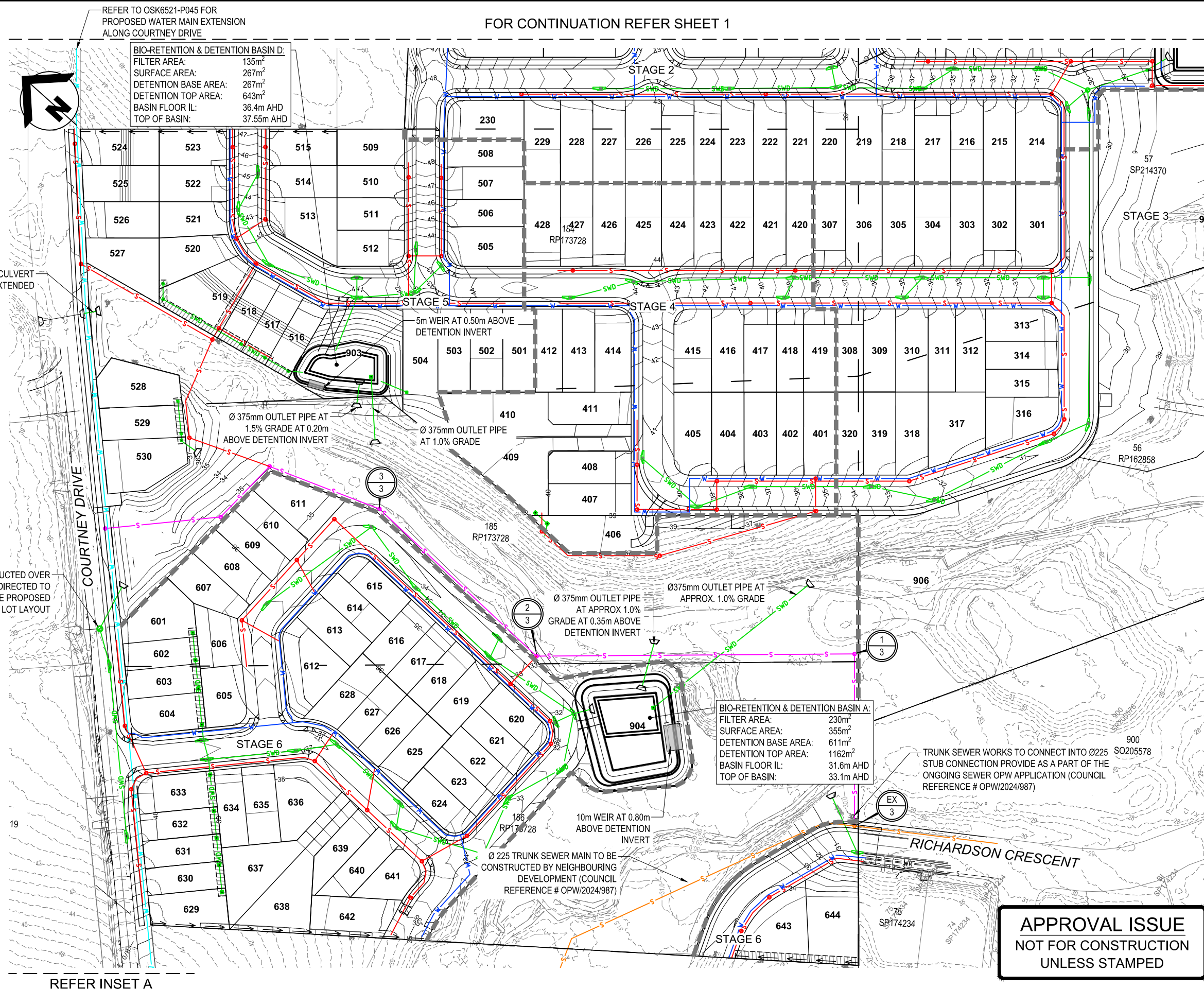
EXISTING SERVICES LEGEND

- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING STORMWATER PIPE
- EXISTING TELECOMMUNICATIONS CABLE
- EXISTING ELECTRICAL CABLE



INSET A
SCALE 1:750 AT A1

CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS



REFER INSET A



CLIENT
NORFOLK ESTATES PTY LTD

PROJECT
PROPOSED RESIDENTIAL SUBDIVISION
31-53 COURTNEY DRIVE
UPPER COOMERA, QLD, 4209

DESIGN
DR

DRAWN
MS

APPROVED
DC

TITLE
PRELIMINARY SERVICES
LAYOUT PLAN - SHEET 2 OF 2

SCALE
1:750 AT A1
1:1500 AT A3

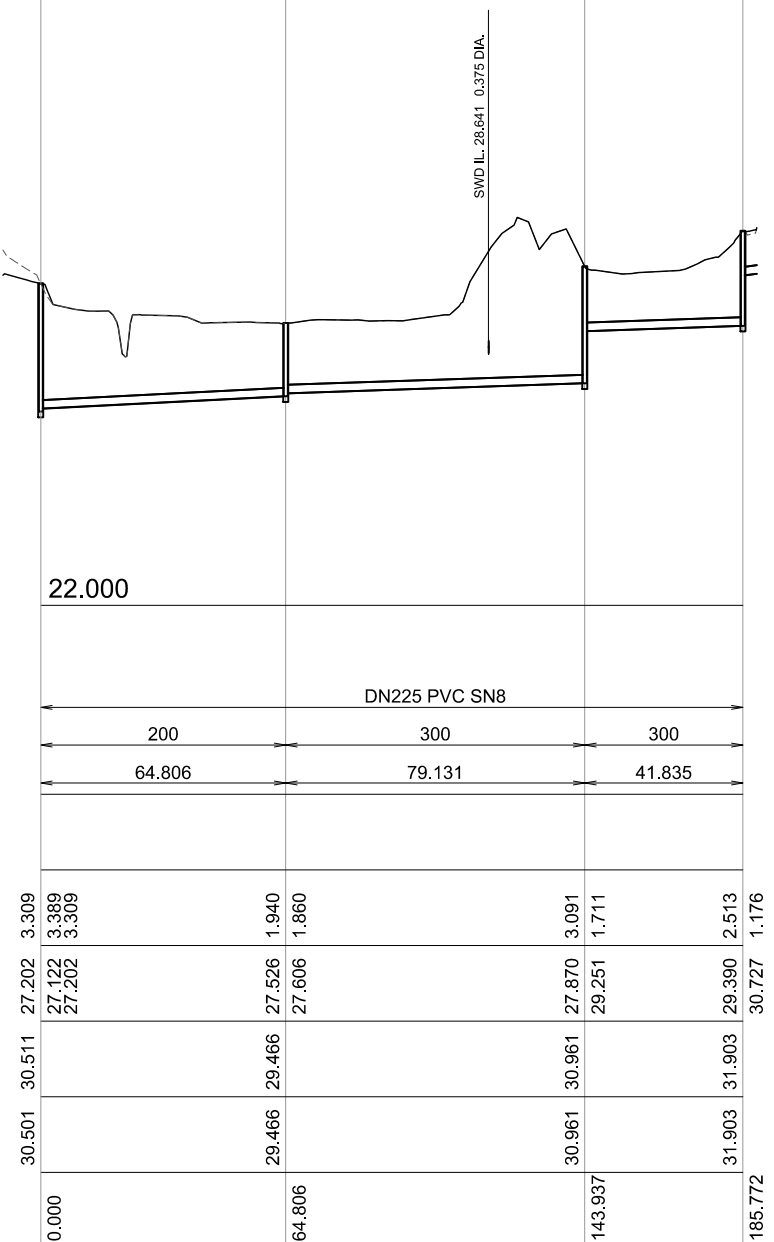
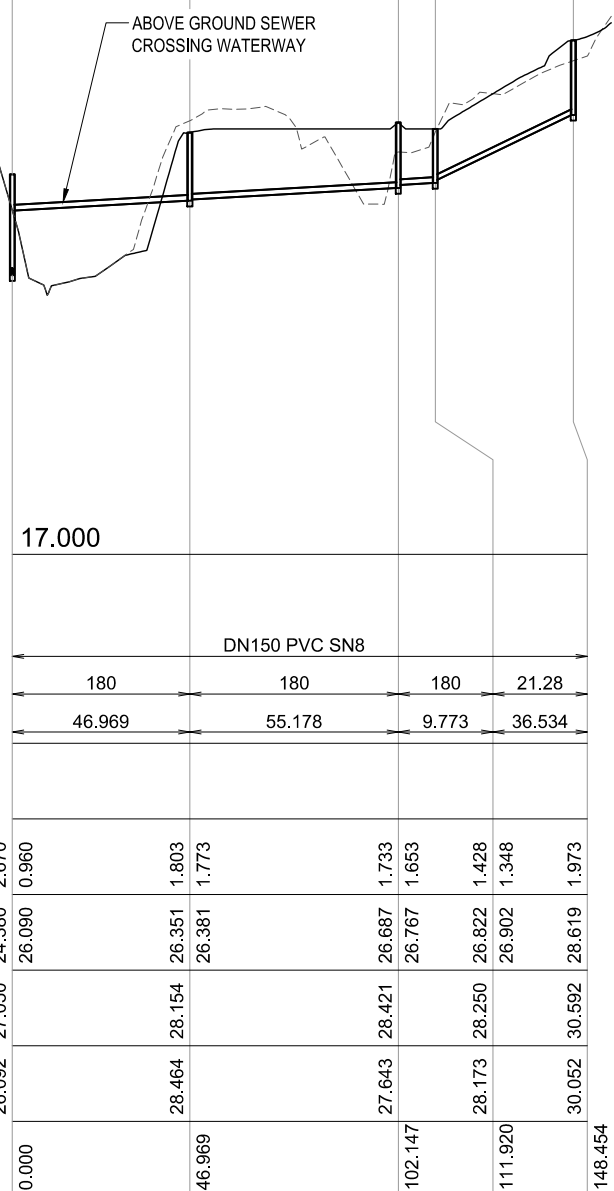
PROJECT NO.
OSK6521

DWG NO.
P041

ISSUE
C

3/3

CONTRACTOR TO DETERMINE AND
LOCATE ALL EXISTING SERVICES PRIOR
TO COMMENCEMENT OF WORKS



LINE 3

1:1000 AT A1 (1:2000 AT A3) 0 20 40 60 80 100m HOR

1:100 AT A1 (1:200 AT A3) 0 2 4 6 8 10m VERT

				CLIENT	DESIGN	DRAWN	APPROVED	TITLE	PROJECT NO.
				NORFOLK ESTATES PTY LTD	DR	MS	DC	PRELIMINARY SEWER LONGITUDINAL SECTIONS	OSK6521
				PROJECT					DWG NO.
				PROPOSED RESIDENTIAL SUBDIVISION					ISSUE
				31-53 COURTNEY DRIVE					
A	26-06-25	ISSUED FOR REPORT	UPPER COOMERA, QLD, 4209					SCALE	P042
ISSUE No.	DATE	AMENDMENT							A

LEGEND

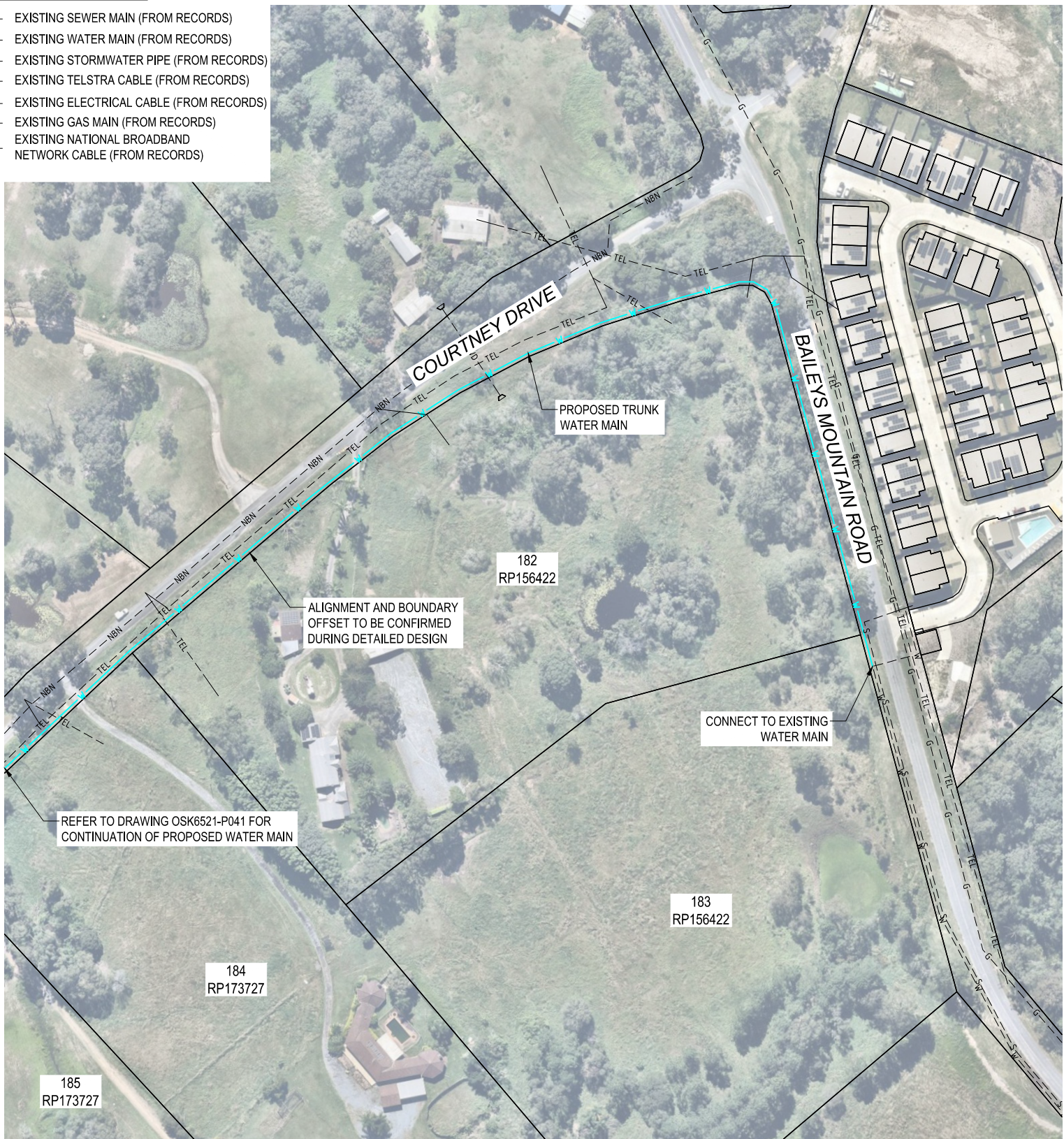
PROPOSED TRUNK WATER MAIN

EXISTING SERVICES LEGEND

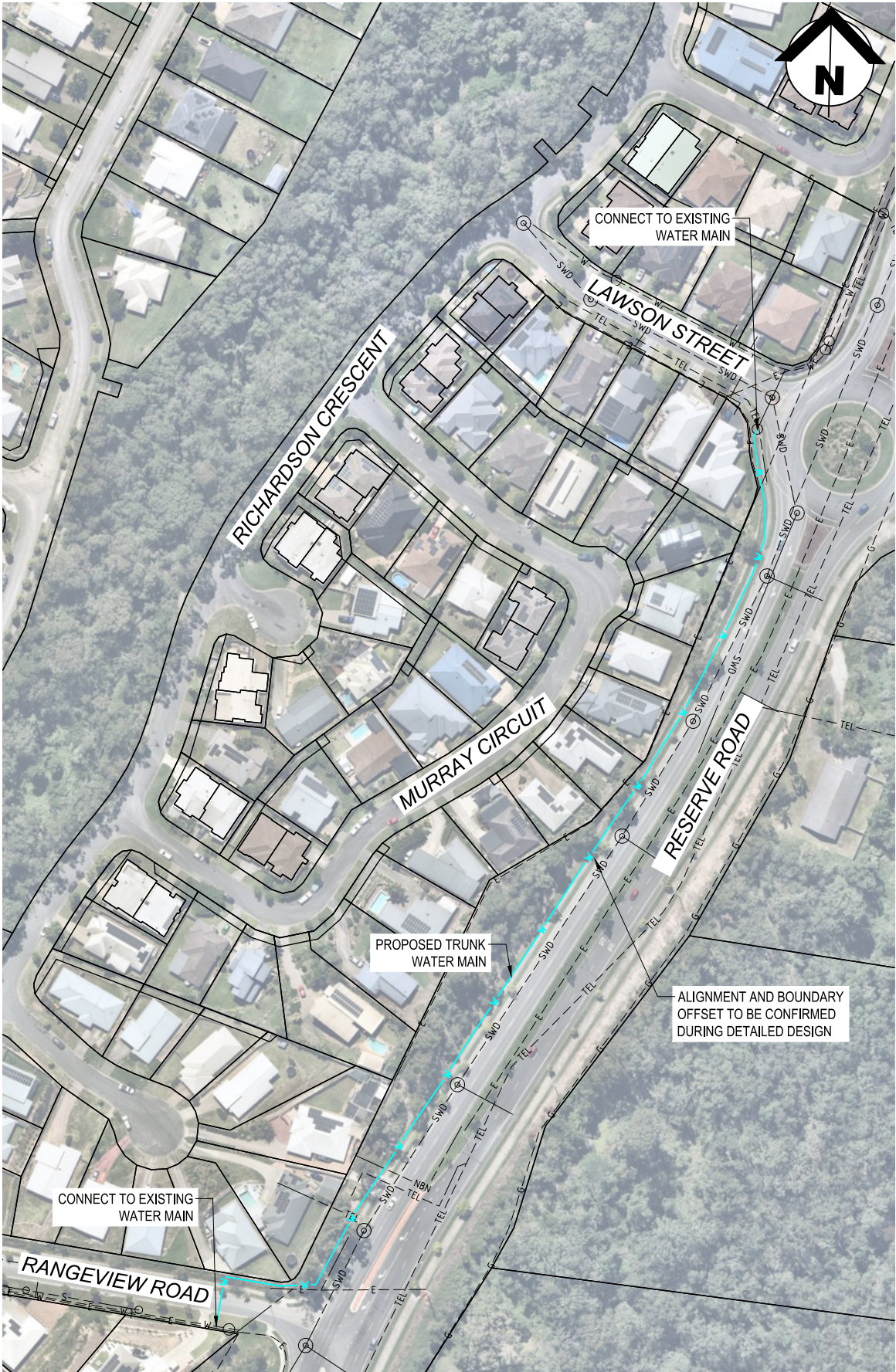
- EXISTING SEWER MAIN (FROM RECORDS)
- EXISTING WATER MAIN (FROM RECORDS)
- EXISTING STORMWATER PIPE (FROM RECORDS)
- EXISTING TELSTRA CABLE (FROM RECORDS)
- EXISTING ELECTRICAL CABLE (FROM RECORDS)
- EXISTING GAS MAIN (FROM RECORDS)
- EXISTING NATIONAL BROADBAND NETWORK CABLE (FROM RECORDS)

APPROVAL ISSUE
NOT FOR CONSTRUCTION
UNLESS STAMPED

EXISTING SERVICES REALIGNMENT TO BE CONFIRMED
AT DETAILED DESIGN STAGE AND INCLUDED IN TRUNK
CREDITS AWARDED FOR DEVELOPMENT



COURTNEY DRIVE x BAILEYS MOUNTAIN ROAD
SCALE 1:1000 AT A1



RANGEVIEW ROAD x RESERVE ROAD x LAWSON STREET
SCALE 1:1000 AT A1

CONTRACTOR TO DETERMINE AND
LOCATE ALL EXISTING SERVICES PRIOR
TO COMMENCEMENT OF WORKS

A	26-06-25	ISSUED FOR REPORT
ISSUE No.	DATE	AMENDMENT



CLIENT
NORFOLK ESTATES PTY LTD
PROJECT
PROPOSED RESIDENTIAL SUBDIVISION
31-53 COURTNEY DRIVE
UPPER COOMERA, QLD, 4209

DESIGN DR
DRAWN MS
APPROVED DC

TITLE
PRELIMINARY TRUNK WATER MAIN EXTENSION
PLAN
SCALE
1:1000 AT A1
1:2000 AT A3
0 20 40 60 80 100m

PROJECT NO.
OSK6521
DWG NO.
P045
ISSUE
A