

JFP URBAN CONSULTANTS

SEWER NETWORK ANALYSIS REPORT

Proposed Mixed-Use Development at
16 Poole Way, Bushland Beach



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Proposed Mixed-Use Development at
16 Poole Way, Bushland Beach
for
Poole Way No. 2 Pty Ltd ATF Bushland Beach 2 Unit Trust

M3306E_SEW – Revision A
23rd April 2026

JFP Urban Consultants Pty Ltd

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Approved by: Haydn Watson (RPEQ 6200)



Revision History

Revision	Date	Details
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1 INTRODUCTION

JFP Urban Consultants Pty Ltd was engaged to carry out a sewer network analysis and prepare a report to accompany a Townsville City Council (TCC) connection application for a proposed mixed-use development comprising a medical centre, retail building and 2 dual occupancy units at 16 Poole Way, Bushland Beach on Lot 6 SP333154. A Site Layout Plan is shown in Figure 1 and a Site Layout Plan *Drawing No. 5819-DA02 Issue 07* by Blackburne Jackson is provided in Appendix A.

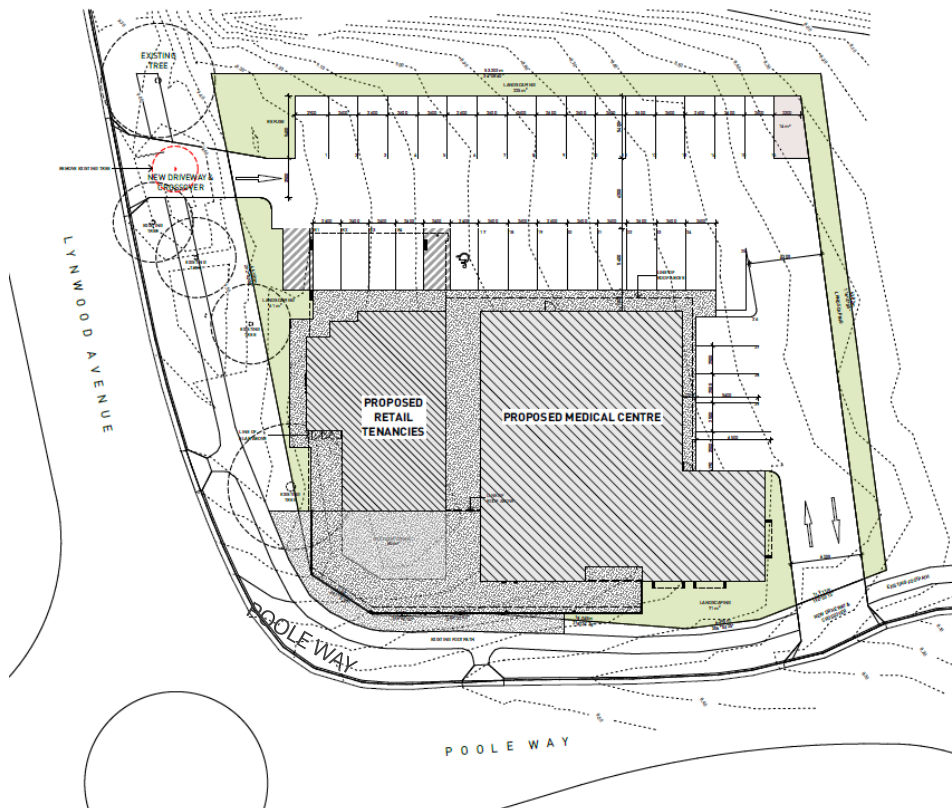


Figure 1: Proposed Development Site Layout Plan

2 BACKGROUND

2.1 SITE LOCALITY

The proposed development site is currently located within the TCC Sewer Service Connection Area for the WB12 catchment area as shown in Figure 2. The site covers 0.24 ha and ranges in elevation from 8m AHD to 9.5m AHD. The site currently adjoins a stormwater reserve to the west, a vacant lot to the north, Poole Way to the east and Lynwood Avenue to the south. Figure 3 shows an aerial view of the site with contours.



Figure 2: Proposed Development Locality and TCC Sewer Service Connection Areas



Figure 3: Proposed Development Site Aerial View and Contours

2.2 SEWER NETWORK INFRASTRUCTURE

2.2.1 EXISTING NETWORK

The proposed development is located in the Mount St John Wastewater Treatment Plant (WWTP) network catchment. The proposed development will discharge into network gravity mains within Sewage Pump Station (SPS) P/S WB12 catchment. PS/WB12 receives the flows and pumps directly to the Mount St John WWTP via a common rising main. The common rising main services multiple pump stations throughout the WWTP network within the Mount St John, Bohle, Burdell, Mount Low and Bushland Beach areas. The downstream path from the proposed development site to the WWTP is shown on Figure 4.



Figure 4: Proposed Development Site Downstream Path to WWTP

Figure 5 shows the sewer reticulation network near the vicinity of the site, in particular highlighting the downstream DN150 and DN225 sewer gravity mains from the proposed development site to P/S WB12.

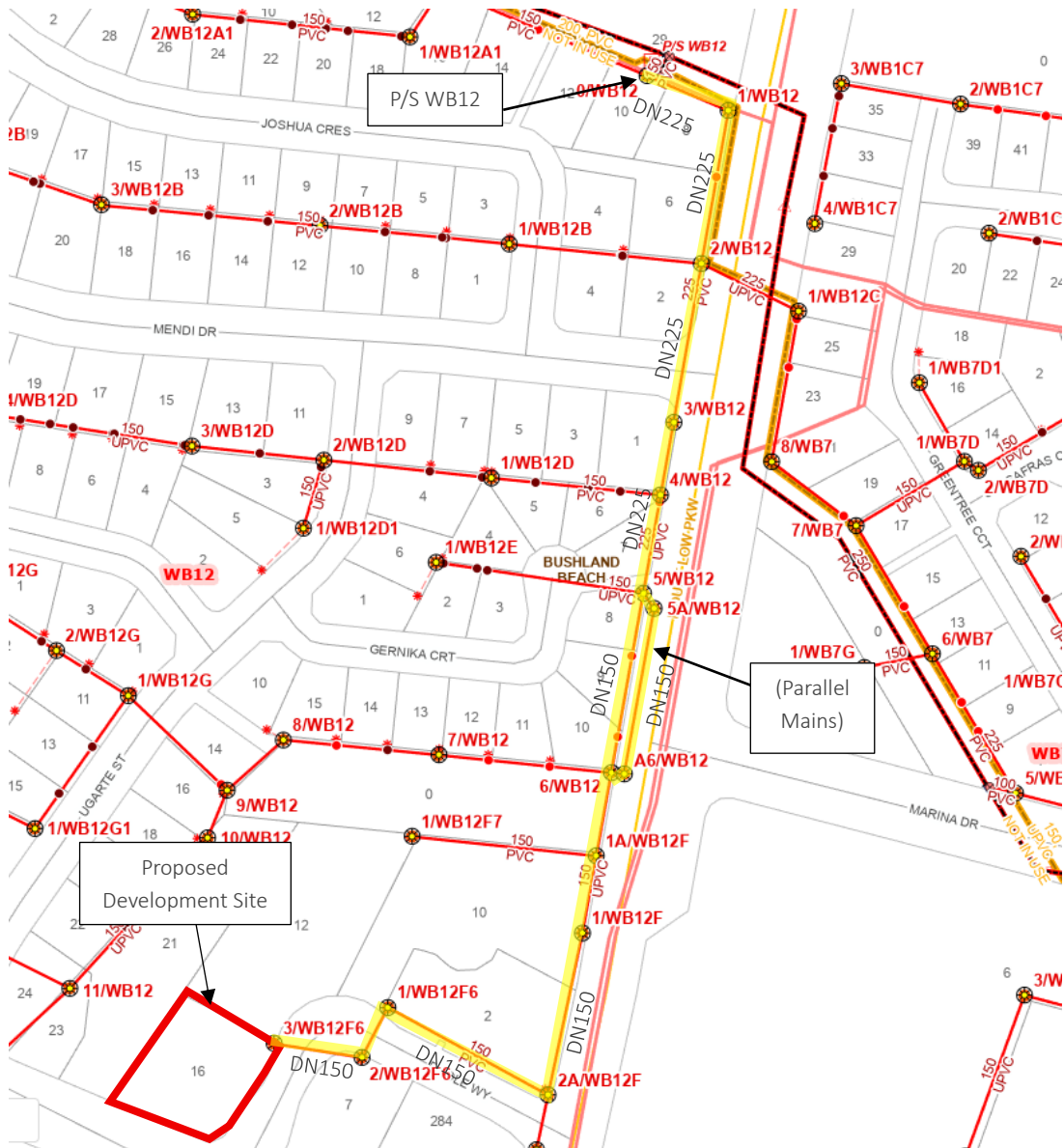


Figure 5: Sewer Reticulation Network near the Proposed Development Site

2.2.2 PLANNED NETWORK AUGMENTATIONS

There are no planned upgrades identified for the P/S WB12 catchment identified from the TCC Planning Scheme LGIP schedule of works trunk upgrade mapping.

3 SEWER CONNECTION STRATEGY

The proposed development will have a single sewer branch connection onto the DN150 sewer gravity mains adjacent to the site. Based on the site contours existing manhole 3/WB12F6 at the site low point to the north-east of the site would be suitable to accommodate internal plumbing sewers extending to service the proposed development buildings. This manhole has been nominated as the site connection for the purposes of the network analysis. The arrangement is shown on Figure 6.

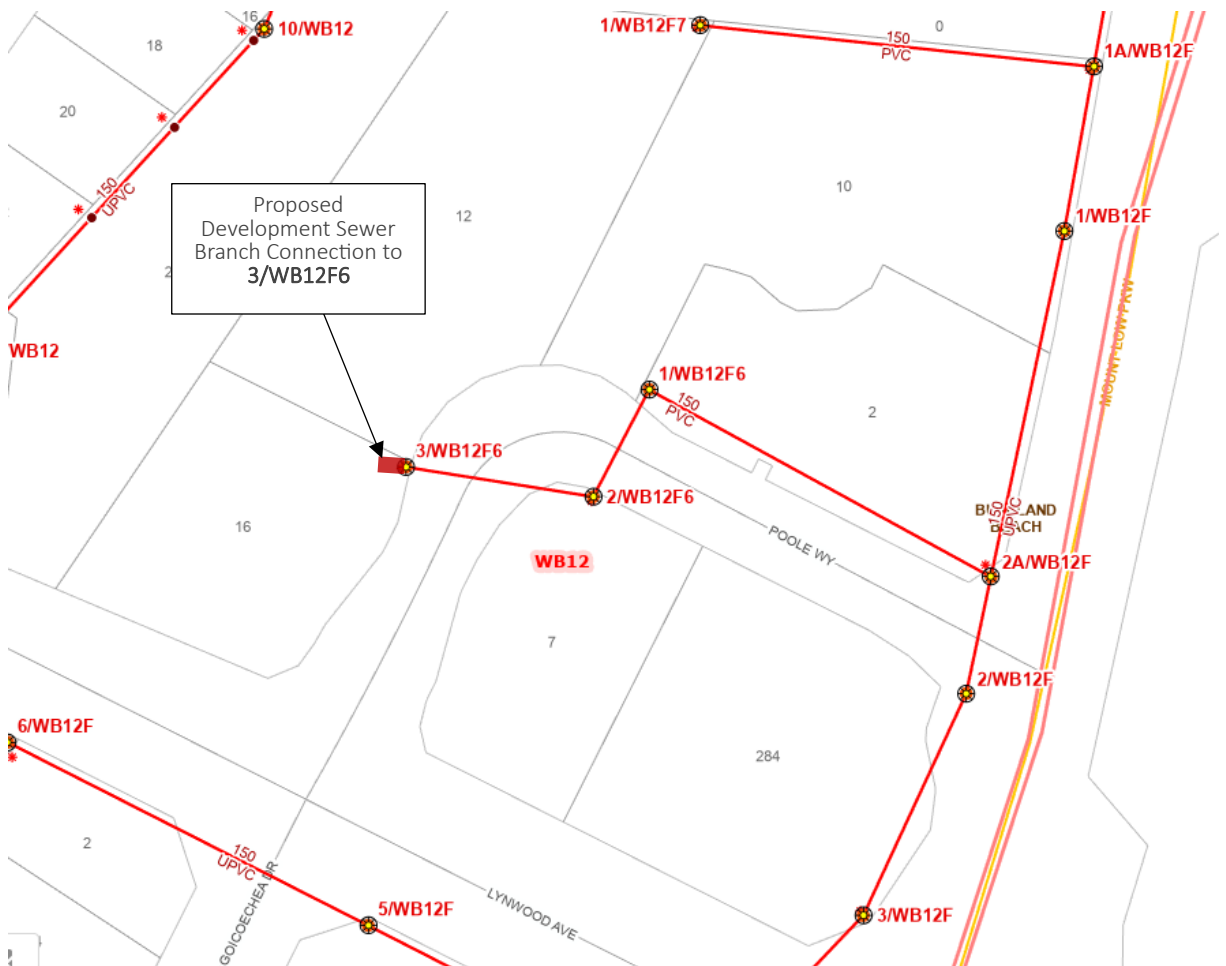


Figure 6: Proposed Development Sewer Network Connection

4 SEWAGE LOAD ESTIMATE

Equivalent Persons (EPs) was used as the base unit to determine the expected sewage loading of the proposed development. The TCC Planning Scheme Local Government Infrastructure Plan (LGIP) Extrinsic Material includes an LGIP Projections and Densities 2019 document which lists the following loading conversions adopted for the network analysis:

- Housing Units – 1.8 EP per dwelling
- Employment Retail – 2.74 EP per 100m² GFA
- Employment Professional – 1.0 EP per 100m² GFA

Table 1 below summaries the EP calculation for the proposed development based on the figures above.

Table 1: Summary of Proposed Development Sewage EP Estimate

Development Description	No.	EP Loading	Type	EP
Dual Occupancy Units	2	1.8 EP per unit	Res	3.6
Retail Building	153 m ²	2.74 EP per 100m ² GFA	Non-Res	4.19
Medical Center	480 m ²	1.0 EP per 100m ² GFA	Non-Res	4.8
Total Res EP				3.6
Total Non-Res EP				8.99
Total EP				12.59

5 SEWER NETWORK DESIGN CRITERIA

The sewer network was modelled in accordance with the CTM Water Alliance Design and Construction Code (CTM Water Code) design parameters as listed below:

- Average Dry Weather Flow (ADWF) = 230 L/EP/day
- Peak Dry Weather Flow (PDWF) = $C_2 \times \text{ADWF}$
Where $C_2 = 4.7 \times \text{EP}^{-0.105}$
- Peak Wet Weather Flow (PWWF) = $5 \times \text{ADWF}$ or $C_1 \times \text{ADWF}$ (whichever is larger)
Where $C_1 = 15 \times \text{EP}^{-0.1587}$
- Depth of flow at PWWF for new sewers = less than 0.75 of pipe diameter
- Minimum gravity main slope
 - DN150 = 1:100m for the first 10 allotments
 - = 1:180m remaining lengths
 - DN225 = 1:300m
- Minimum velocity gravity mains at PWWF = 0.75 m/s
- Target velocity in rising main = 0.75 to 1.5 m/s
- Maximum velocity in rising mains = 2.5 m/s

The proposed development 12.59 EP represents the following flowrates based on 230 L/ EP/day:

- Average Dry Weather Flow (ADWF) = 0.03 l/s
- Peak Wet Weather Flow (PWWF) = 0.34 l/s ($C_1 \times \text{ADWF}$, $C_1 = 15 \times \text{EP}^{-0.1587} = 10.04$)

6 SEWER HYDRAULIC MODELLING

A sewer network boundary conditions request was issued to TCC and a copy of the response, dated 1st April 2026, is attached in Appendix B. TCC provided the existing ADWF and PWWF flow depths for the DN150/DN225 sewer gravity main from existing MH 3/WB12F6, near the site, to SPS P/S WB12 wet well (shown on Figure 5). Based on the PS/WB12 catchment area appearing to be fully developed with recent residential subdivisions, it is expected that the existing flow depths will be suitable to assess the proposed development connection based on no additional major loading in the catchment or zone density increase for the area in future.

The subject line was created in a new InfoWorks ICM model based on TCC's online GIS infrastructure mapping as shown on Figure 7 to assess the network performance. Sewage loading was added onto the line to replicate the existing PWWF flow depths nominated on the TCC Boundary Conditions Response. Table 2 shows a summary of the depths and comparison to the model results. The model results were within 3% of the flow depths and considered acceptable to carry out the network analysis, except for the first section of DN150 from the proposed development site which was modelled at 13% flow depth, 3.6% above the Boundary condition 9.4% flow depth. This was considered acceptable due to the relatively low depth, minimal loading of the proposed development and that this is the end of sewer line. P/S WB12 was modelled as an outflow. P/S WB12 was not assessed based on TCC not providing capacity information for assessment in the Boundary Conditions Response. It is also noted that the proposed development site is within the P/S WB12 catchment area and expected to be included in P/S WB12 design capacity.



Figure 7: Hydraulic Model Screenshot – Modelled Sewer Gravity Main from MH 3/WB12F6 to P/S WB12

Table 2: Sewer Gravity Main Comparison of Flow Depths Boundary Conditions vs. Modelled

U/S MH	D/S MH	Diameter (mm)	Boundary Conditions Max Depth of Flow (%D)	Modelled Max Depth of Flow (%D)	Difference (%D)
3/WB12F	2/WB12F6	150	9.4	13.0	3.6
2/WB12F6	1/WB12F6	150	17.1	17.0	-0.1
1/WB12F6	2A/WB12F	150	34.6	35.0	0.4
2A/WB12F	1/WB12F	150	51.8	51.0	-0.8
1/WB12F	1A/WB12F	150	56.0	56.0	0.0
1A/WB12F	6/WB12	150	57.8	55.0	-2.8
6/WB12	5/WB12	150	55.0	55.0	0.0
5/WB12	4/WB12	225	45.6	45.0	-0.6
4/WB12	3/WB12	225	52.1	51.0	-1.1
3/WB12	2/WB12	225	57.7	55.0	-2.7
2/WB12	1/WB12	225	54.1	55.0	0.9
1/WB12	0/WB12	225	52.9	54.0	1.1
0/WB12	P/S WB12	225	48.9	51.9	3.0



6.1 SEWER MODELLING RESULTS

The proposed development estimated 12.59 EP PWWF loading was added onto the line at MH 3/WB12F6. The resultant maximum Hydraulic Grade Line (HGL) Profile is shown on Figure 8 and the pipe depths are shown on Table 3. The graph shows that maximum flow depths will not exceed the maximum 75% of pipe depths network criteria. The highest depth of flow will be 56%. The results show the existing sewer gravity main will have adequate capacity to accommodate the proposed development connection.

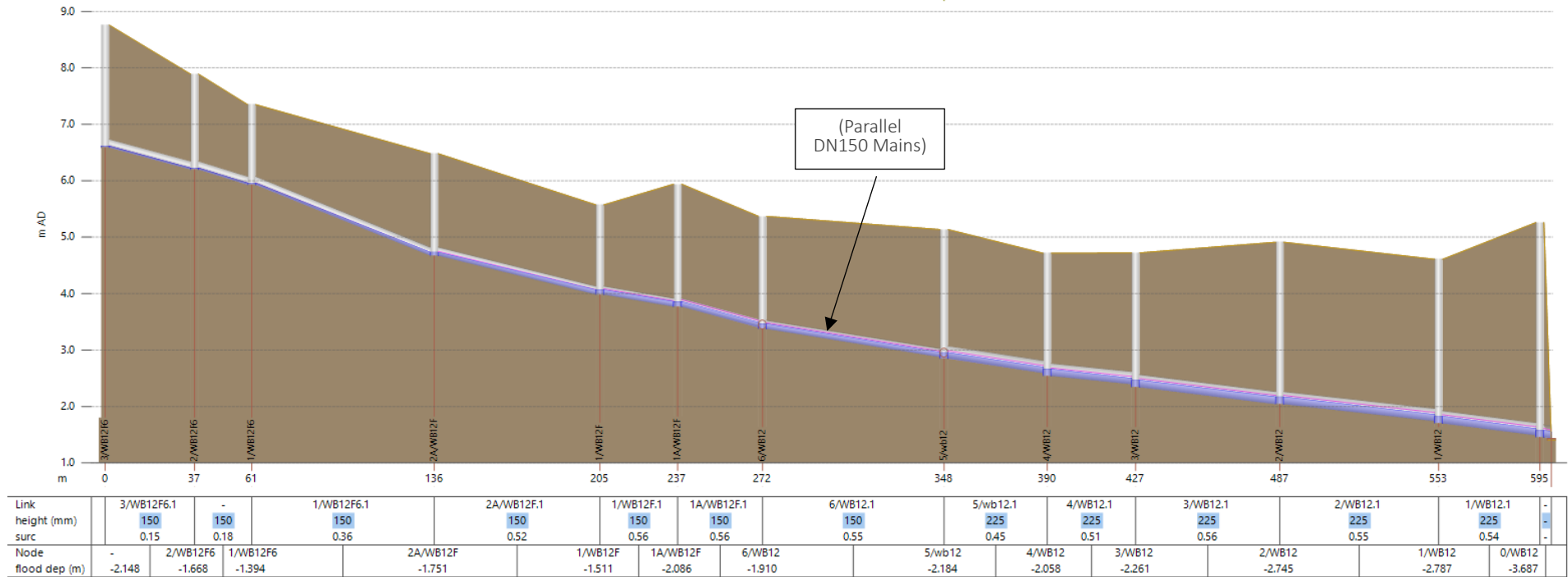


Figure 8: Maximum HGL – SGM Line MH 3/WB12F6 to P/S WB12 – PWWF Scenario – Development Loading Added

Table 3: Pre and Post Development Maximum Depth of Flow

U/S MH	D/S MH	Pre-Dev Max Depth of Flow (%D)	Post-Dev Max Depth of Flow (%D)	Difference (%D)
3/WB12F	2/WB12F6	13	15	2
2/WB12F6	1/WB12F6	17	18	1
1/WB12F6	2A/WB12F	35	36	1
2A/WB12F	1/WB12F	51	52	1
1/WB12F	1A/WB12F	56	56	0
1A/WB12F	6/WB12	55	56	1
6/WB12	5/WB12	55	55	0
5/WB12	4/WB12	45	45	0
4/WB12	3/WB12	51	51	0
3/WB12	2/WB12	55	56	1
2/WB12	1/WB12	55	55	0
1/WB12	0/WB12	54	54	0
0/WB12	P/S WB12	52	52	0

6.2 SEWER NETWORK INFRASTRUCTURE REQUIREMENTS

Based on the sewer network analysis, there are no new external sewer network augmentations required in the network to cater for the proposed development connection.

7 CONCLUSIONS AND RECOMMENDATIONS

JFP Urban Consultants Pty Ltd was engaged to carry out a sewer network analysis and prepare a report to accompany a Townsville City Council (TCC) connection application for a proposed mixed-use development comprising a medical centre, retail building and 2 dual occupancy units at 16 Poole Way, Bushland Beach on Lot 6 SP333154.

The conclusions and recommendations of the network analysis are listed below:

- The proposed development site is currently located within the TCC Sewer Service Connection Area for the WB12 catchment area.
- The proposed development is located in the Mount St John Wastewater Treatment Plant (WWTP) network catchment. The proposed development will discharge into network gravity mains within Sewage Pump Station (SPS) P/S WB12 catchment. PS/WB12 receives the flows and pumps directly to the Mount St John WWTP via a common rising main. The common rising main services multiple pump stations throughout the WWTP network within the Mount St John, Bohle, Burdell, Mount Low and Bushland Beach areas.

There are no planned upgrades identified for the P/S WB12 catchment identified from the TCC Planning Scheme LGIP schedule of works trunk upgrade mapping.

- The proposed development will have a single sewer branch connection onto the DN150 sewer gravity mains adjacent to the site. Based on the site contours existing manhole 3/WB12F6 at the site low point at the north-east of the site would be suitable to accommodate internal plumbing sewers extending to service the proposed development buildings. This manhole has been nominated as the site connection for the purposes of the network analysis.
- Equivalent Persons (EPs) was used as the base unit to determine the expected sewage loading of the proposed development. The proposed development represents a total of 12.59 EP which represents the following design flowrates.

Average Dry Weather Flow (ADWF)	= 0.03 l/s
Peak Wet Weather Flow (PWWF)	= 0.34 l/s

- A sewer network boundary conditions request was issued to TCC and a copy of the response, dated 1st April 2026, is attached in Appendix B. TCC provided the existing ADWF and PWWF flow depths for the DN150/DN225 sewer gravity main from existing MH 3/WB12F6, near the site, to SPS P/S WB12 wet well.

The subject line was created in a new InfoWorks ICM model based on TCC's online GIS infrastructure mapping to assess the network performance. Sewage loading was added onto the line to replicate the existing PWWF flow depths nominated on the TCC Boundary Conditions

Response and the proposed development estimated 12.59 EP PWWF loading was added onto the line at MH 3/WB12F6. P/S WB12 was not assessed based on TCC not providing capacity information for assessment in the Boundary Conditions Response. It is also noted that the proposed development site is within the P/S WB12 catchment area and expected to be included in P/S WB12 design capacity.

- The sewer modelling results on the subject line shows that maximum flow depths will not exceed the maximum 75% of pipe depths network criteria. The highest depth of flow will be 56%. The existing sewer gravity main will have adequate capacity to accommodate the proposed development connection.

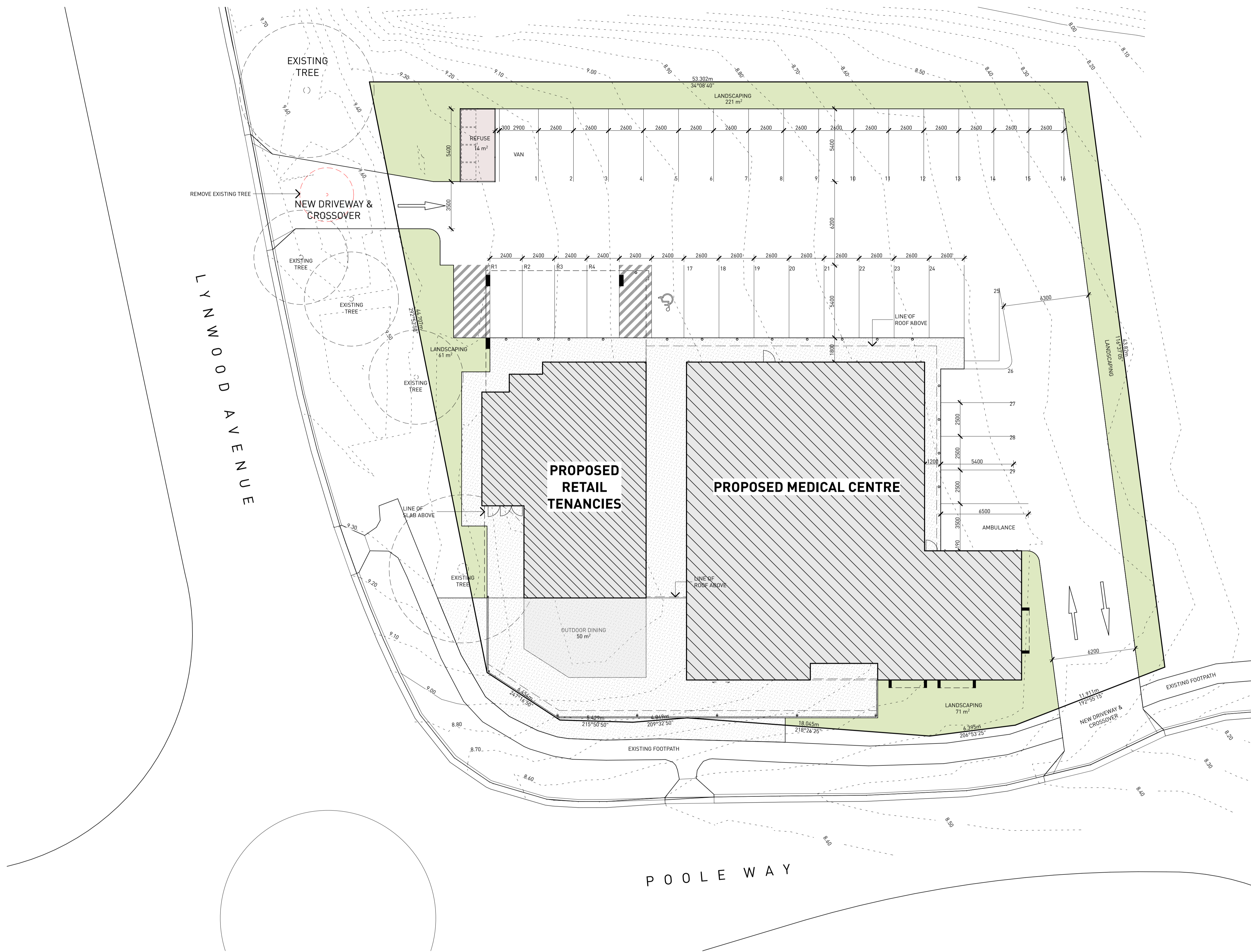
There are no new external sewer network augmentations required in the network to cater for the proposed development connection.

It is recommended that the sewer connection application for the proposed development be approved based on the conclusions and recommendations of the above sewer network analysis.



8 APPENDICES

8.1 APPENDIX A: DRAWING NO. 5819-DA02



01 SITE PLAN
1:150

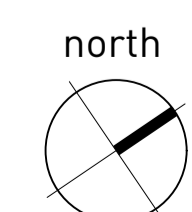
PROPOSED MIXED USE DEVELOPMENT,
16 POOLE WAY, BUSHLAND BEACH

POOLE WAY 2 PTY LTD

SITE PLAN

DEVELOPMENT APPROVAL
scale : 1:150 @A1 1:300 @A3
issue : 07 date : 13-04-26

5819-DA02



The designs, drawings and specification are copyright and always remain the property of Blackburne Jackson Design Pty Ltd.



8.2 APPENDIX B: TCC NETWORK MODEL BOUNDARY CONDITIONS RESPONSE

Appendix A Form for provision of Water and Sewer Network Boundary Condition Advice

This form can be modified to suit individual applications. The form is for the provision of boundary condition advice by TCC in response to a request for boundary conditions by an external stakeholder via Form M1: Request for Network Modelling Information.

Council advises that the water network model used to determine the boundary condition advice and commentary provided herein has not been calibrated. Results obtained via the use of the model have not been physically verified.

This advice does not include an assessment of available network storage reserves, nor does it include advice or commentary on the suitability of existing available reserves in the network for the purpose of satisfying published service standards for firefighting or any other condition.

Boundary condition advice or any other advice obtained via the use of the model for any purpose remains solely at the risk of the applicant. Verification of boundary condition advice resides solely with the applicant. The provision of this report to the applicant infers that the applicant has reviewed, acknowledged and accepted the Advice Conditions presented herein.

Date: 30/3/2026

TCC Reference:

22645476

Application details:

Name:	Rowell Umale
Contact No:	0433952999
Development name and address:	JFP Urban Consultants Pty Ltd & 16 Poole Way Bushland Beach
Development type:	MCU26/0003

Water boundary condition advice:

Townsville City Council will provide the peak hour boundary conditions. Any modelling and analysis will need to be completed by the applicant's engineering team.

MCU26/0003 - MIXED USE DEVELOPMENT

Location:	16 Poole Way
	Water pressure (kPa)
Elevation:	RL10 @ hydrant
Peak hour @19:00	474 kPa
Peak hour fireflow	467 kPa @ 10L/s 460 kPa @ 15L/s 428 kPa @ 30L/s

Note: these are theoretical values and it is the responsibility of the applicant to verify values via flow and pressure test undertaken on site during peak hour at the closest point to the development.

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Sewer boundary condition advice:

Townsville City Council (TCC) will provide existing Average Dry Weather Flow (ADWF) and existing Peak Wet Weather Flow (PWWF) boundary conditions. Any modelling and analysis will need to be completed by the applicant's engineering team.

- For Existing ADWF scenario:

U/S MH	D/S MH	Diameter (mm)	Max Depth of Flow (%D)	V (m/s)
3/WB12F6	2/WB12F6	150	4.2	0.00
2/WB12F6	1/WB12F6	150	7.8	0.36
1/WB12F6	2A/WB12F	150	15.2	0.37
2A/WB12F	1/WB12F	150	22.2	0.54
1/WB12F	1A/WB12F	150	23.5	0.46
1A/WB12F	6/WB12	150	24.4	0.50
6/WB12	5/WB12	150	23.4	0.48
5/WB12	4/WB12	225	19.8	0.56
4/WB12	3/WB12	225	22.1	0.46
3/WB12	2/WB12	225	24.0	0.47
2/WB12	1/WB12	225	22.9	0.46
1/WB12	0/WB12	225	22.5	0.48
0/WB12	P/S WB12	225	21.1	0.66

- For Existing PWWF scenario:

U/S MH	D/S MH	Diameter (mm)	Max Depth of Flow (%D)	V (m/s)
3/WB12F6	2/WB12F6	150	9.4	0.00
2/WB12F6	1/WB12F6	150	17.1	0.58
1/WB12F6	2A/WB12F	150	34.6	0.60
2A/WB12F	1/WB12F	150	51.8	0.85
1/WB12F	1A/WB12F	150	56.0	0.72
1A/WB12F	6/WB12	150	57.8	0.78
6/WB12	5/WB12	150	55.0	0.74
5/WB12	4/WB12	225	45.6	0.88
4/WB12	3/WB12	225	52.1	0.70
3/WB12	2/WB12	225	57.7	0.73
2/WB12	1/WB12	225	54.2	0.71
1/WB12	0/WB12	225	52.9	0.75
0/WB12	P/S WB12	225	48.9	1.03

Advice conditions:

- At no time does the supplying of theoretical data from the Townsville City Council hydraulic network model/s lessen the applicant's responsibility for the quality and integrity of their analysis.
- Townsville City Council cannot guarantee water pressures and flows in excess of its published service standards.
- The information provided is based on the best available information at the time of publication and is subject to variation over time.
- Network models are verified with limited data and conditions in the field may

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vary from modelling assumptions.

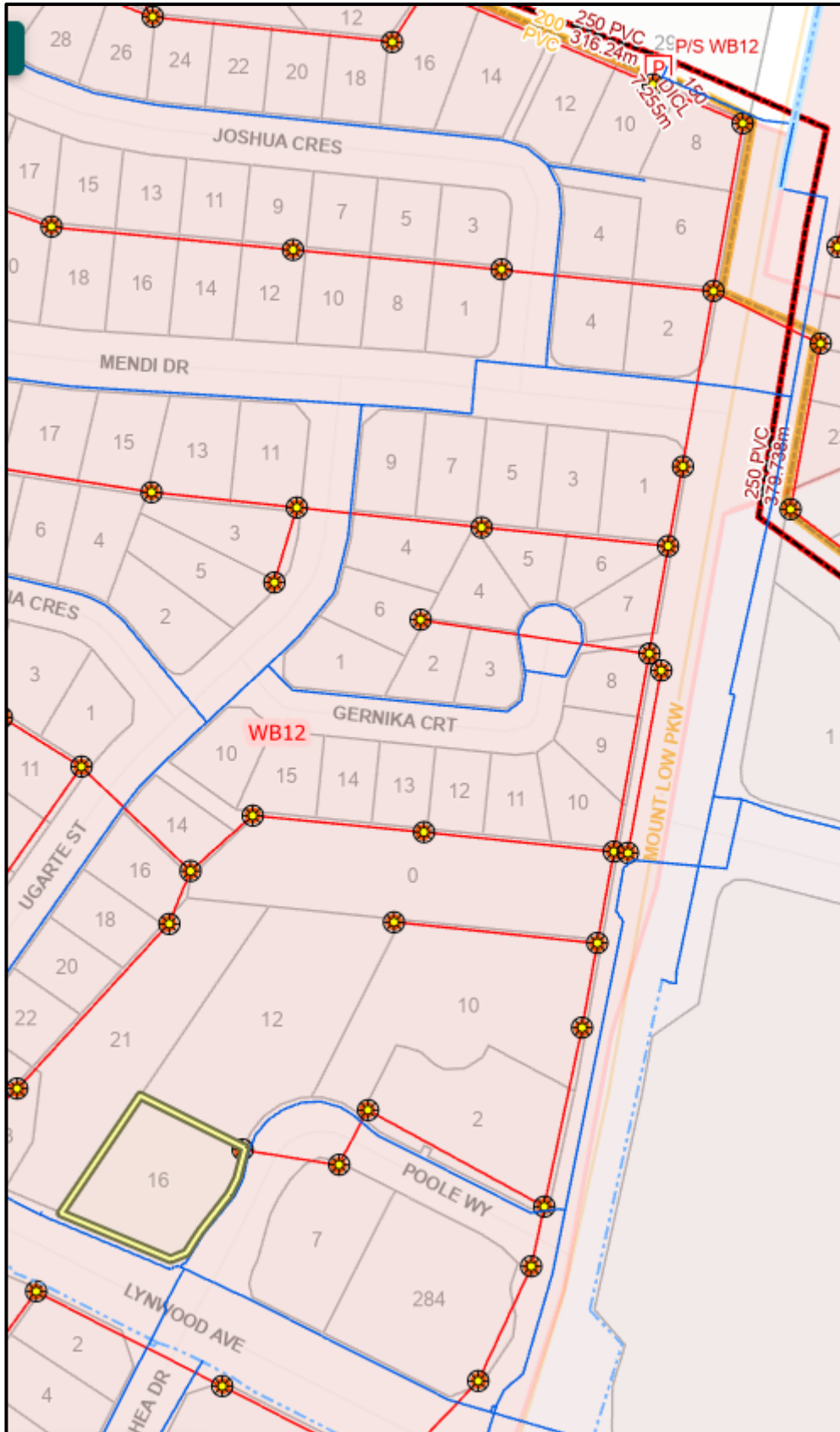
- Field investigations and inspections should be undertaken to satisfy the user that the data is suitable for its intended purpose.
- Tests should also be undertaken during peak demand periods to verify existing conditions within the network.
- Users relying on hydraulic modelling information do so at their own risk.

Hydraulic designers shall also note:

- Pressure in the network can fluctuate due to a large number of factors:
 - Normal daily variations due to time of day water use patterns, tank water level fluctuations, hydraulic transients, valve operation, and cycling of pumps.
 - Short-term emergencies due to fires, pipe breaks, system components out of service for rehabilitation and repair, power outages, and flows from sprinklers to fight fires.
 - Long-term system changes due to water main construction, changes in pressure regulating valve settings, addition of new pumps, corrosion and scale in piping, and changes in pressure zone boundaries.
 - Long-term variations in water use patterns, including new users and changes in usage for existing users.

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