

JFP URBAN CONSULTANTS



WATER NETWORK ANALYSIS REPORT

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

WATER NETWORK ANALYSIS REPORT

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

M3306E_WAT – Revision A
23rd April 2026

JFP Urban Consultants Pty Ltd

Prepared by: Elizabeth Kenneally & Rowell Umale

Approved by: Haydn Watson (RPEQ 6200)



Revision History

Revision	Date	Details
A	23/04/2026	Issue for TCC approval.

TABLE OF CONTENTS

1	INTRODUCTION.....	1
2	BACKGROUND.....	2
2.1	SITE LOCALITY	2
2.2	WATER NETWORK INFRASTRUCTURE.....	3
2.2.1	EXISTING NETWORK.....	3
2.2.2	PLANNED NETWORK AUGMENTATIONS	5
3	WATER CONNECTION STRATEGY	6
4	WATER DEMAND ESTIMATE.....	7
5	WATER NETWORK DESIGN CRITERIA.....	8
6	WATER HYDRAULIC MODELLING.....	9
6.1	WATER MODELLING RESULTS.....	10
6.2	WATER NETWORK INFRASTRUCTURE REQUIREMENTS.....	10
7	CONCLUSIONS AND RECOMMENDATIONS	11
8	APPENDICES.....	13
8.1	APPENDIX A: DRAWING NO. 5819-DA02.....	13
8.2	APPENDIX B: TCC NETWORK MODEL BOUNDARY CONDITIONS RESPONSE	14

1 INTRODUCTION

JFP Urban Consultants Pty Ltd was engaged to carry out a water 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 on Figure 1 and a Site Layout Plan *Drawing No. 5819-DA02 Issue 07* by Blackburne Jackson is provided in Appendix A.

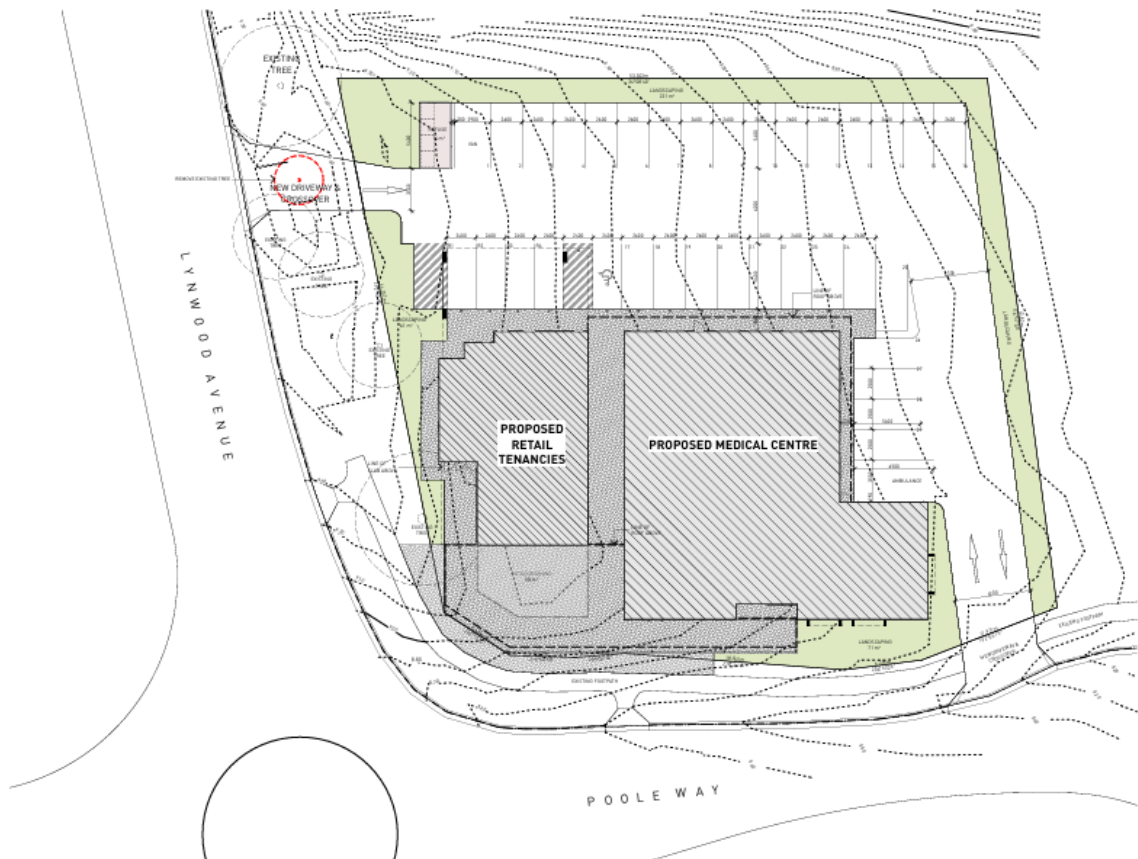


Figure 1: Proposed Development Site Layout Plan

2 BACKGROUND

2.1 SITE LOCALITY

The proposed development site is currently located within the TCC Water Service Connection Area within the Bushland Beach area as shown on Figure 2. The site 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.

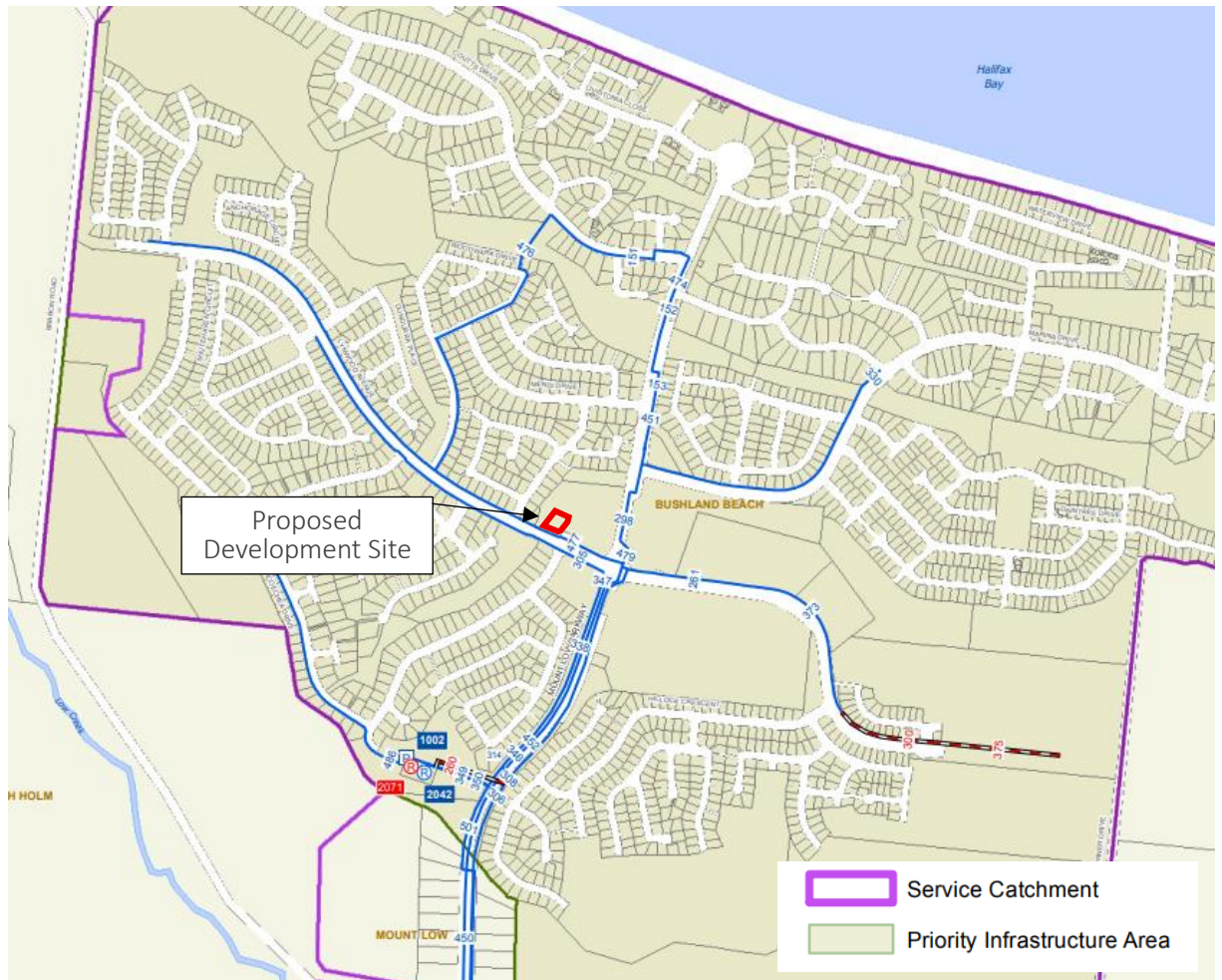


Figure 2: Proposed Development Locality and TCC Water Service Connection Areas



Figure 3: Proposed Development Site Aerial View and Contours

2.2 WATER NETWORK INFRASTRUCTURE

2.2.1 EXISTING NETWORK

The proposed development is located in the Bushland Beach general water servicing area. The area is supplied via a parallel DN375 and DN300 trunk water main extending from the south along Mount Low Parkway and the Bruce Highway. Water reticulation mains extend from the trunk mains to service the area and also to the reservoir site at Mount Low Parkway that acts as storage for the area. The arrangement is shown on Figure 4.

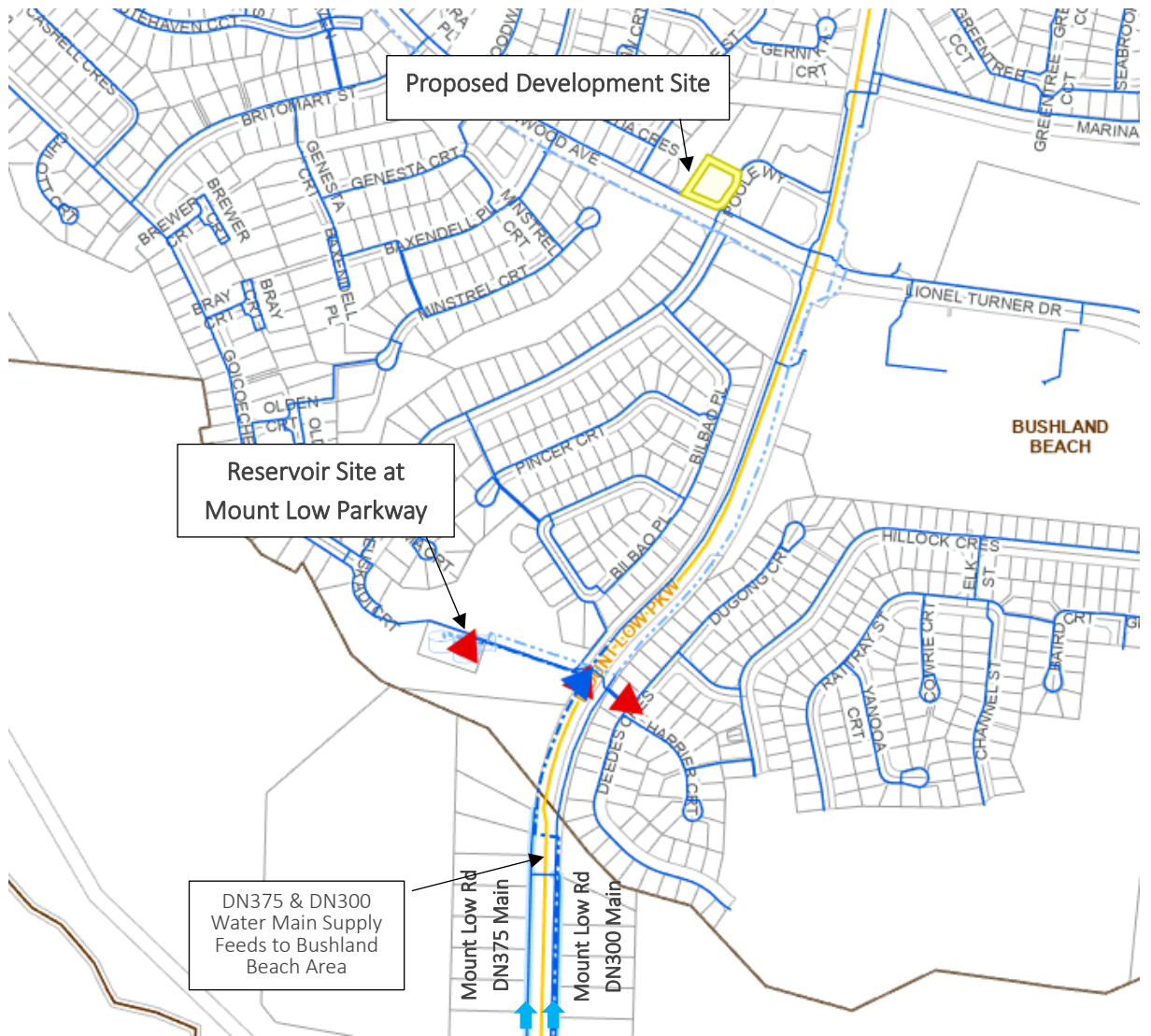


Figure 4: Water Network Northern Beaches General Servicing Area

Figure 5 shows the water reticulation network near the vicinity of the site.



Figure 5: Water Reticulation Network near the Proposed Development Site

2.2.2 PLANNED NETWORK AUGMENTATIONS

It was identified on the TCC LGIP Schedule of Works that a renewal of Water Tank 1 at the Mount Low Parkway Reservoir site is expected. The TCC website announced works were expected to commence in November 2025. Tank 2 will remain in operation during the works, it is not expected that the planned works will impact on network capacity for the area.

3 WATER CONNECTION STRATEGY

The proposed development site will have a single water meter arrangement and DN150 water main connection near the site entrance extending from existing DN100 water mains in Poole Way as shown on Figure 6. The existing DN100 water mains in Poole Way will not need to be increased in size to meet the minimum DN150 water connection, as stipulated in the WSA Code 3.1-2011-3.1, as it is a looped connection to the DN250 water mains in Lynwood Avenue and Bushland Beach, drawing flows from both directions. Internally, private water plumbing mains will extend to service the development buildings. A hydraulic consultant will be responsible to ensure that the internal plumbing lines and hydrant locations are appropriately designed to meet the requirements of AS2419.1 Fire Hydrant Installations.

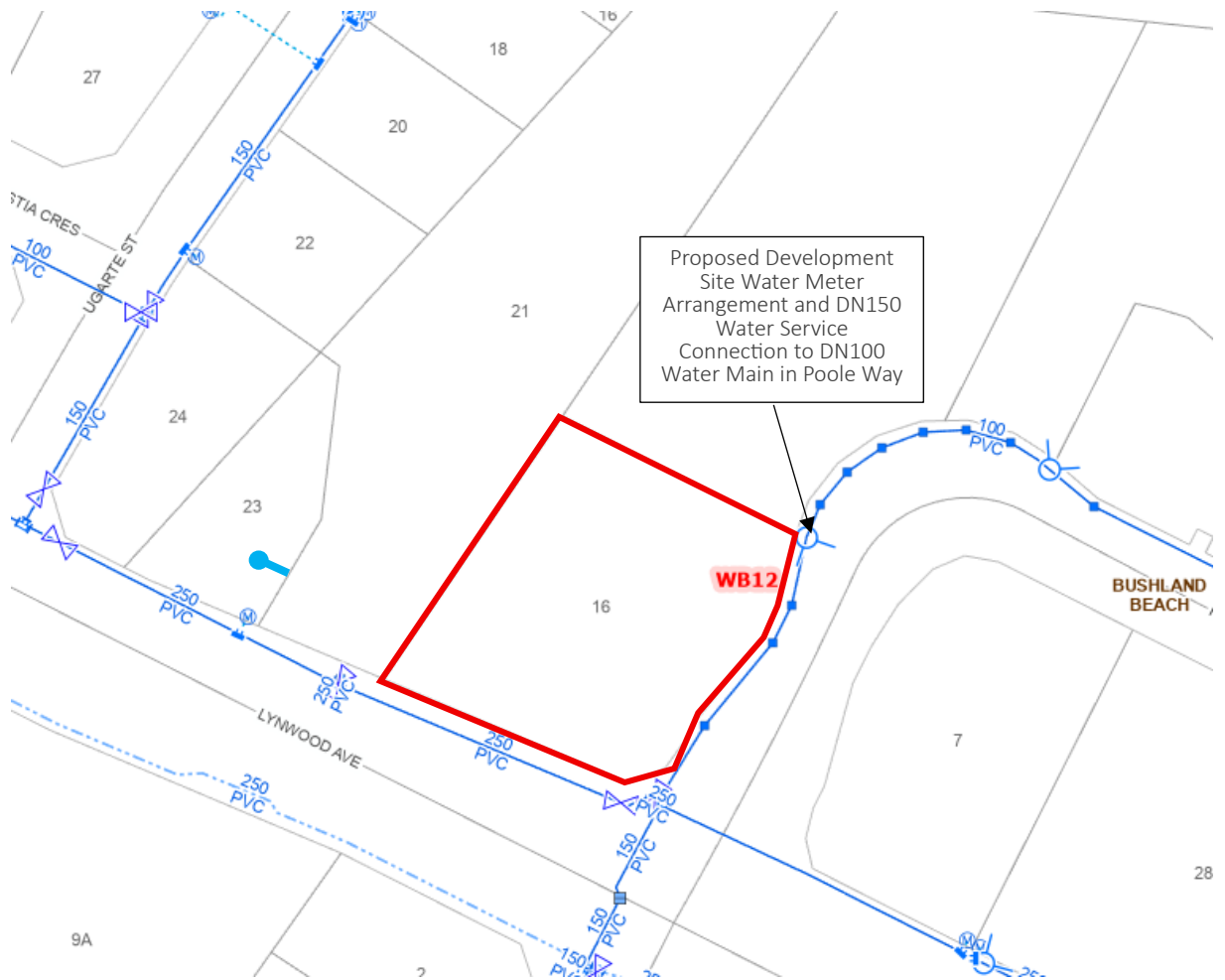


Figure 6: Proposed Development Water Network Connection Strategy

4 WATER DEMAND ESTIMATE

Equivalent Persons (EPs) was used as the base unit to determine the expected water demand 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:

- Unit Housing – 1.8 EP per dwelling
- Retail – 2.11 EP per 100m² GFA
- Professional – 1.11 EP per 100m² GFA

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

Table 1: Summary of Proposed Development Water EP Estimate

Development Description	No.	EP Demand	Type	EP
Dual Occupancy Units	2	1.8 EP per unit	Res	3.60
Retail Building	153 m ²	2.11 EP per 100m ² GFA	Non-Res	3.23
Medical Center	480 m ²	1.11 EP per 100m ² GFA	Non-Res	5.33
Total Res EP				3.60
Total Non-Res EP				8.56
Total EP				12.16

5 WATER NETWORK DESIGN CRITERIA

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

Peaking Factors

Average Day Demand (AD)	= 660 L/EP/day for residential
Peak Day (PD) to AD ratio	= 1.875
Peak Hour (PH) to AD ratio	= 4.8 (residential)
Diurnal Pattern	= As listed in TCC LGIP Schedule SC6.4.11

Peak Hour Flow

Minimum Residual Pressure	= 22m
Maximum Pressure	= 80m
Maximum velocity in main	< 2.5 m/s
Maximum allowable headless	< 5m/km for DN≤150mm < 3m/km for DN>=200mm

Hazen Williams Friction Factor	≤ 150mm, C = 100 >150-300mm, C = 110 >300, C = 120
--------------------------------	--

Fire Fighting (TCC Network)

Fire Flow at PH Background	=15 l/s for residential developments =30 l/s for commercial / industrial developments = 7.5 l/s for rural residential developments = 15 l/s for rural commercial / industrial developments
Minimum Residual Pressure at the hydrant	= 12m
Minimum Pressure elsewhere	= 6m
Maximum velocity in main	< 4 m/s

For the purposes of the network analysis 30 l/s fire flow is nominated at the meter connection.

6 WATER HYDRAULIC MODELLING

The proposed development DN150 water connection was created in a new InfoWater WS Pro model to assess the development Peak Day (PD) operational pressures and fire flow demand residual pressures at Peak Hour (PH). A water 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 its water network hydraulic model PH boundary pressures at the node fronting 16 Poole Way on the DN100 water main, adopted for the network analysis. The results are listed in Table 2 below.

Table 2: Summary of Network Boundary Condition Pressures at 16 Poole Way, Bushland Beach

Demand Scenario	Pressure (kPa)	Pressure (m)
Peak Hour @ 19:00	474	48.33
Peak Hour Fire flow (10 L/s)	467	47.62
Peak Hour Fire flow (15 L/s)	460	46.91
Peak Hour Fire flow (30 L/s)	428	43.64

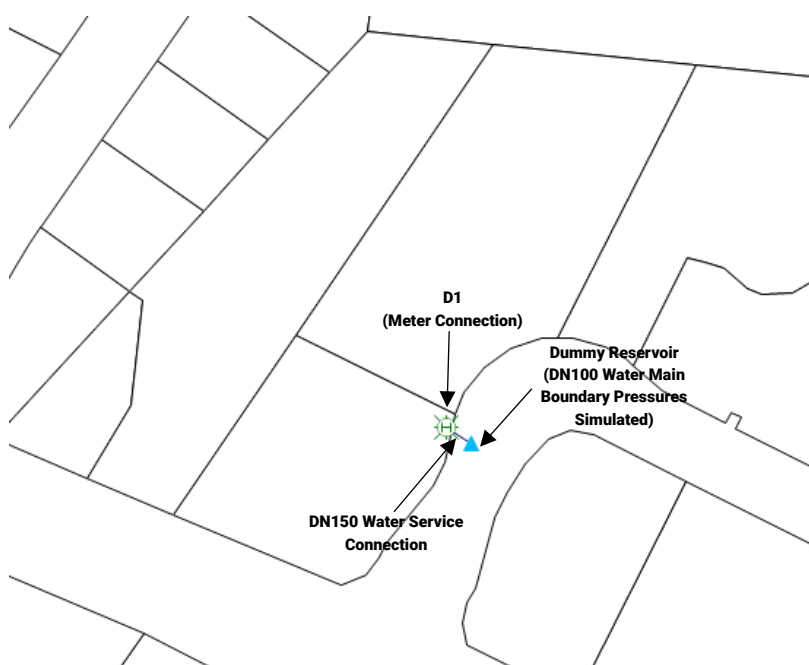


Figure 7: Screenshot of Hydraulic Model – Development Nodes and Pipes

Table 3: Proposed Development Node Demands

Junction ID	Elevation (m ADH)	Demand (EP)	Fire flow Demand (L/s)
D1 (Meter Node)	7.9	12.16	30

6.1 WATER MODELLING RESULTS

Figure 8 shows the pressure profile for the new junction representing the proposed development during PD scenario with new demand added. The fixed-head reservoir was set to 48.33m to represent the PH boundary pressure from TCC. The graph shows minimum PD operational residual pressure at the connection point will be 43.43m which meets the minimum service requirement of 22m.

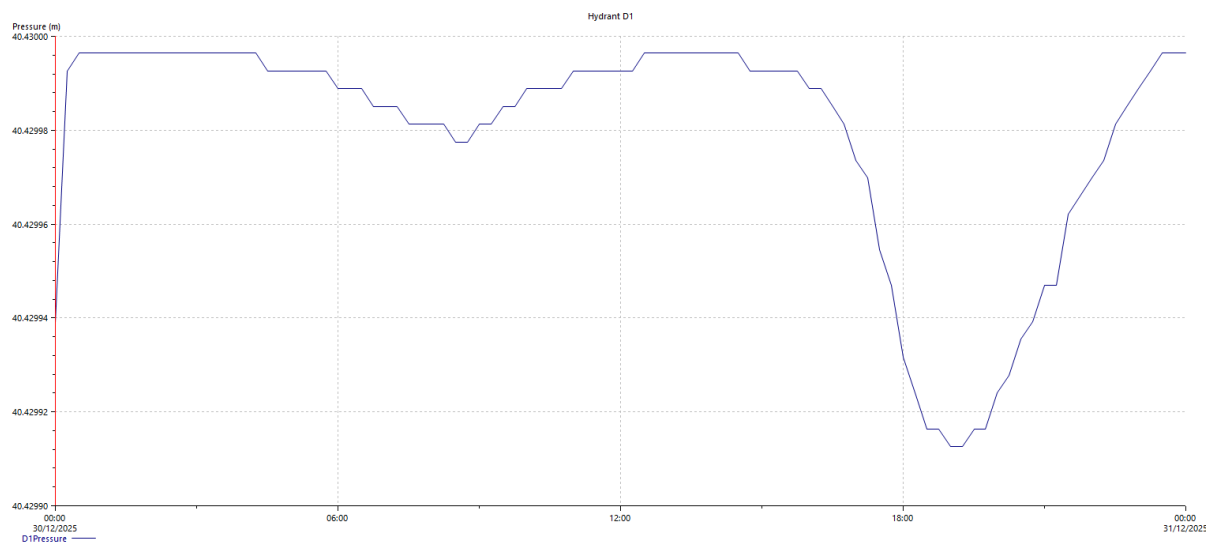


Figure 8: Proposed Development Node Residual Pressures – PD Scenario

Table 4 shows the residual pressure at the meter connection under a fire-fighting demand PD scenario at PH demand (19:00). Residual pressure at the connection point will be 35.15m which satisfies the minimum required 12m.

Table 4: Proposed Development Fire Flow Residual Pressure – PD Scenario

Node	FF Demand (L/s)	Residual Pressure (m)
D1/ Connection Point	30	35.15

6.2 WATER NETWORK INFRASTRUCTURE REQUIREMENTS

Based on the water network modelling results, there are no new external water network augmentations required to cater the proposed development water connection. Minimum Peak Day 22m residual pressure will be observed at the meter connection and DN150 service connection to existing DN100 water mains in Poole Way. 12m minimum residual pressure will be available for a fire-fighting demand scenario at Peak Hour at the meter connection.

7 CONCLUSIONS AND RECOMMENDATIONS

JFP Urban Consultants Pty Ltd was engaged to carry out a water 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 is currently located within the TCC Water Service Connection Area within the Bushland Beach area.
- The proposed development is located in the Bushland Beach general water servicing area. The area is supplied via a parallel DN375 and DN300 trunk water main extending from the south along Mount Low Parkway and the Bruce Highway. Water reticulation mains extend from the trunk mains to service the area and also to the reservoir site at Mount Low Parkway that acts as storage for the area.

It was identified on the TCC LGIP Schedule of Works that a renewal of Water Tank 1 at the Mount Low Parkway Reservoir site is expected. The TCC website announced works were expected to commence in November 2025. Tank 2 will remain in operation during the works, it is not expected that the planned works will impact on network capacity for the area.

- The proposed development site will have a single water meter arrangement and DN150 water main water main connection near the site entrance extending from existing DN100 water mains in Poole Way. The existing DN100 water mains in Poole Way will not need to be increased in size to meet the minimum DN150 water connection, as stipulated in the WSA Code 3.1-2011-3.1, as it is a looped connection to the DN250 water mains in Lynwood Avenue and Bushland Beach, drawing flows from both directions. Internally, private water plumbing mains will extend to service the development buildings. A hydraulic consultant will be responsible to ensure that the internal plumbing lines and hydrant locations are appropriately designed to meet the requirements of AS2419.1 Fire Hydrant Installations.
- Equivalent Persons (EPs) was used as the base unit to determine the expected water demand of the proposed development. The proposed development represents a total 12.16 EP.
- The proposed development DN150 water connection was created in a new InfoWater WS Pro model to assess the development Peak Day (PD) operational pressures and fire flow demand residual pressures at Peak Hour (PH). TCC provided its water network hydraulic model PH boundary pressures at the node fronting 16 Poole Way on the DN100 water main, adopted for the network analysis.
- Based on the water network modelling results, there are no new external water network augmentations required to cater the proposed development water connection. Minimum Peak Day 22m residual pressure will be observed at the meter connection and DN150 service



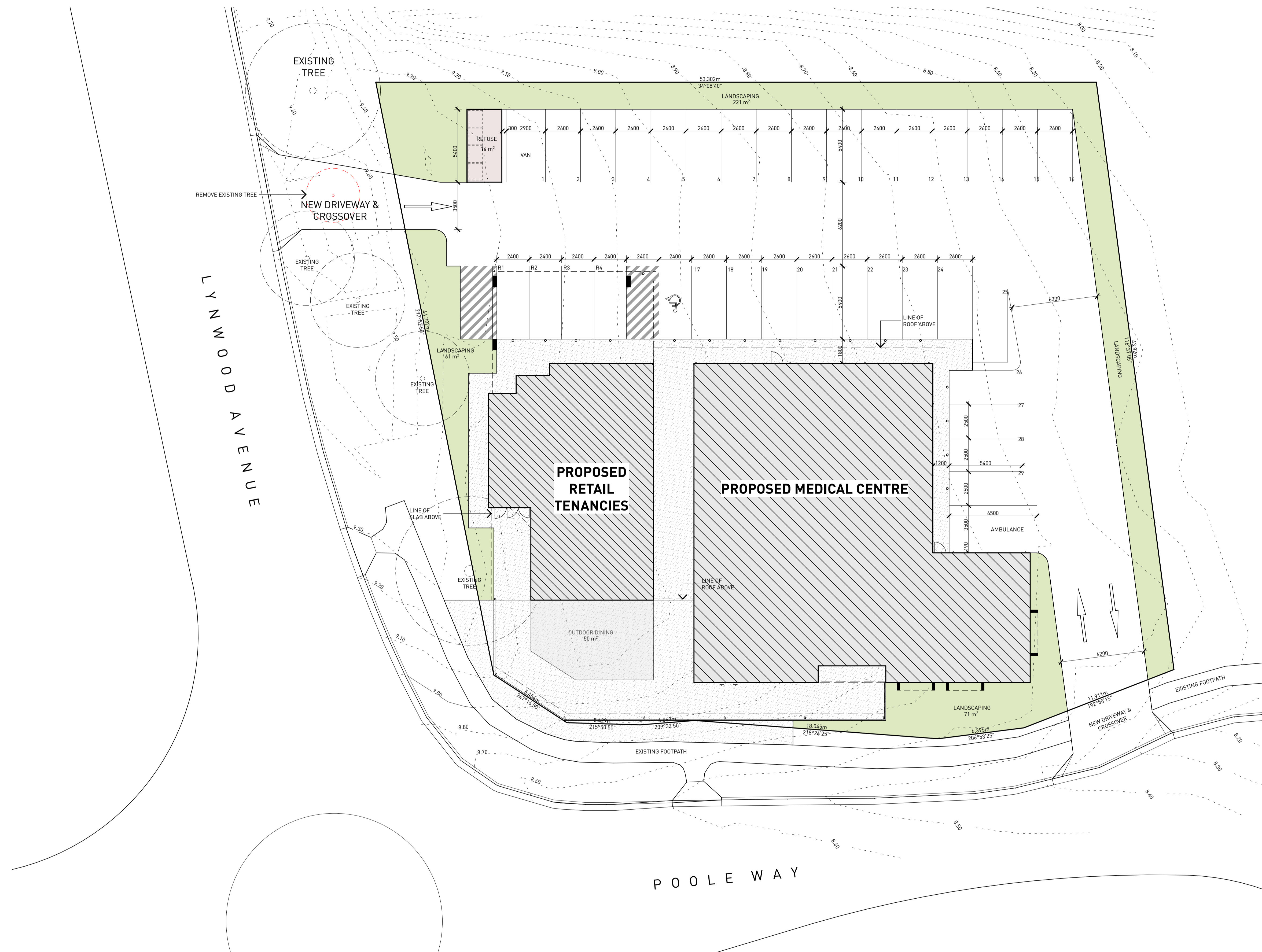
connection to existing DN100 water mains in Poole Way. 12m minimum residual pressure will be available for a fire-fighting demand scenario at Peak Hour at the meter connection.

Is it recommended that TCC approve the connection application for the proposed development based on the conclusions and recommendations of this network analysis.



8 APPENDICES

8.1 APPENDIX A: DRAWING NO. 5819-DA02



01 SITE PLAN
1:150

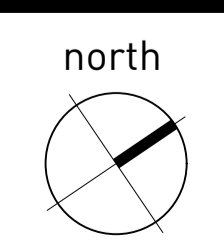
PROPOSED MIXED USE DEVELOPMENT,
16 POOLE WAY, BUSHLAND BEACH

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.

ENGINEERING, ASSET & INFRASTRUCTURE PLANNING

Strategic Planning

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

ENGINEERING, ASSET & INFRASTRUCTURE PLANNING

Strategic Planning

vary from modelling assumptions.

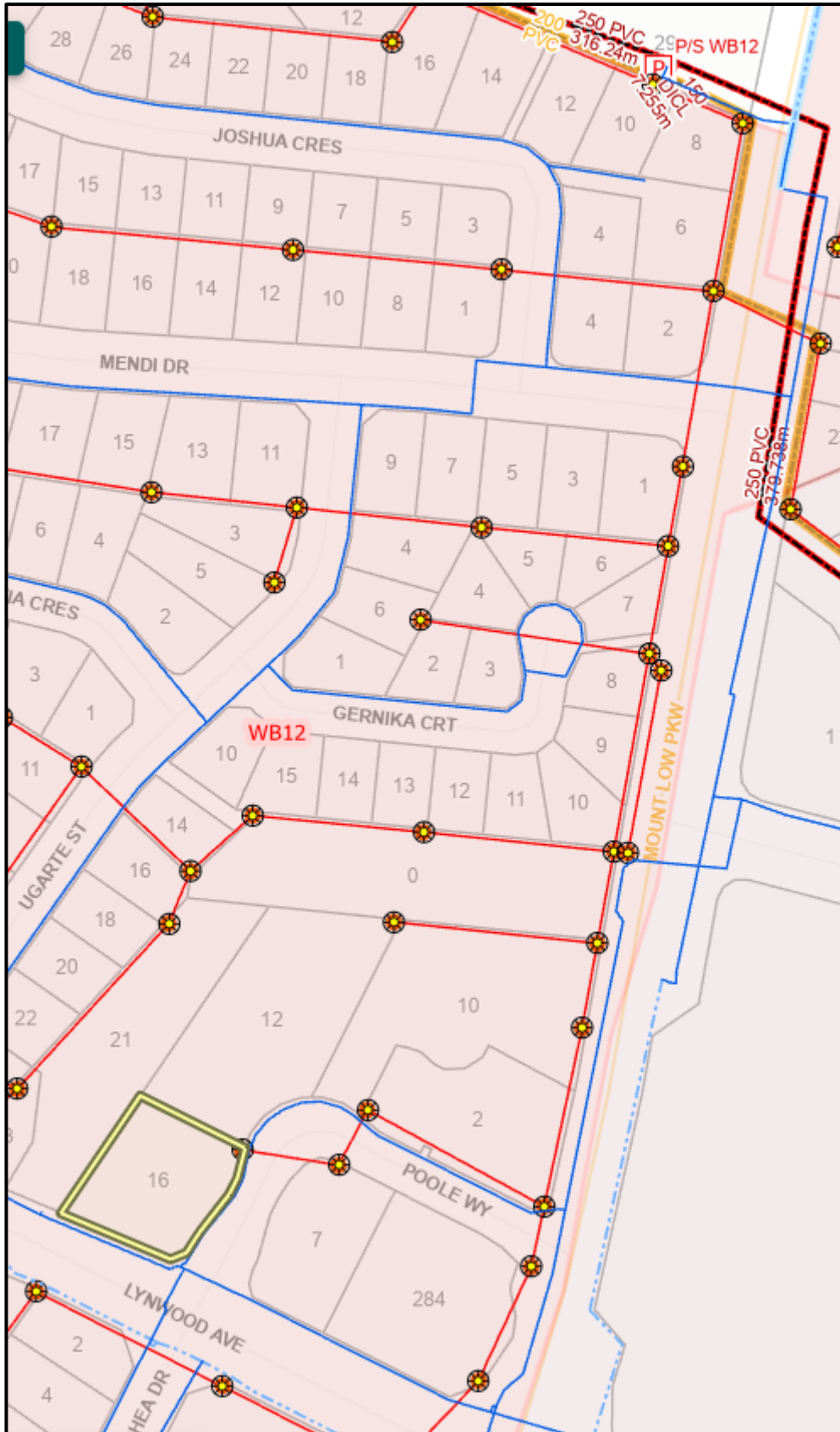
- Field investigations and inspections should be undertaken to satisfy the user that the data is suitable for its intended purpose.
- Tests should also be undertaken during peak demand periods to verify existing conditions within the network.
- Users relying on hydraulic modelling information do so at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

ENGINEERING, ASSET & INFRASTRUCTURE PLANNING

Strategic Planning



ENGINEERING, ASSET & INFRASTRUCTURE PLANNING

Strategic Planning

