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WATER NETWORK ANALYSIS REPORT

Proposed Townhouse Units at
10 Poole Way, Bushland Beach

TOWN PLANNING
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WATER NETWORK ANALYSIS REPORT

Proposed Townhouse Units at
10 Poole Way, Bushland Beach
for
Poole Way Pty Ltd

B4818E_WAT – Revision A
20th February 2026

JFP Urban Consultants Pty Ltd
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Approved by: Haydn Watson (RPEQ 6200)

Revision History

Revision	Date	Details
A	20/02/2026	Issue for TCC approval.

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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 townhouse development comprising of 20 units at 10 Poole Way, Bushland Beach on Lot 4 SP333154. A Site Layout Plan is shown in Figure 1 and a Site Layout Plan ***Drawing No. 7340-DA03*** by Blackburn Jackson is provided in Appendix A.

Figure 1: Proposed Townhouse Units' Development Layout Plan

2 BACKGROUND

2.1 SITE LOCALITY

The proposed residential is currently located within the TCC Water Service Connection Area within the Bushland Beach area as shown in Figure 2. The site covers 0.47 ha and ranges in elevation from 5.5m AHD to 7.5m AHD. The site currently adjoins a stormwater reserve to the north, a vacant lot to the west, Poole Way to the south and Mount Low Parkway to the east. Figure 3 shows an aerial view of the site with contours.

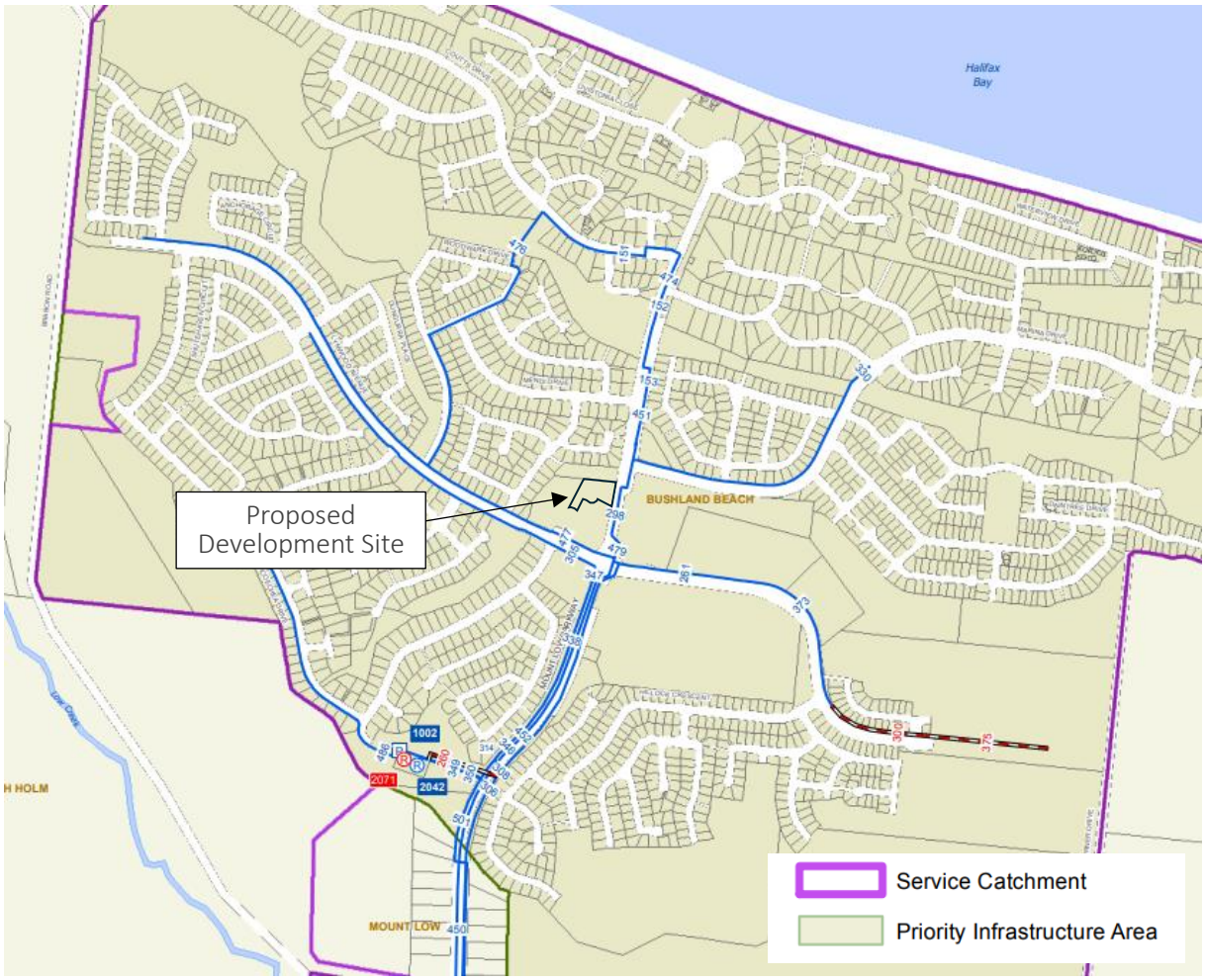

Figure 2: Proposed Development Locality and TCC Water Supply Service Connection Areas

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 water main connection at the site entrance extending from existing DN100 water mains in Poole Way as shown on Figure 6. Internally, private water plumbing mains will extend to service the townhouse units. Notably, there is an existing fire hydrant in Poole Way that extends a 90m radius for firefighting throughout to the townhouse units, on this basis a fire-flow is not assessed on the internal private water plumbing mains. 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. The layout provided may be used as a design basis.

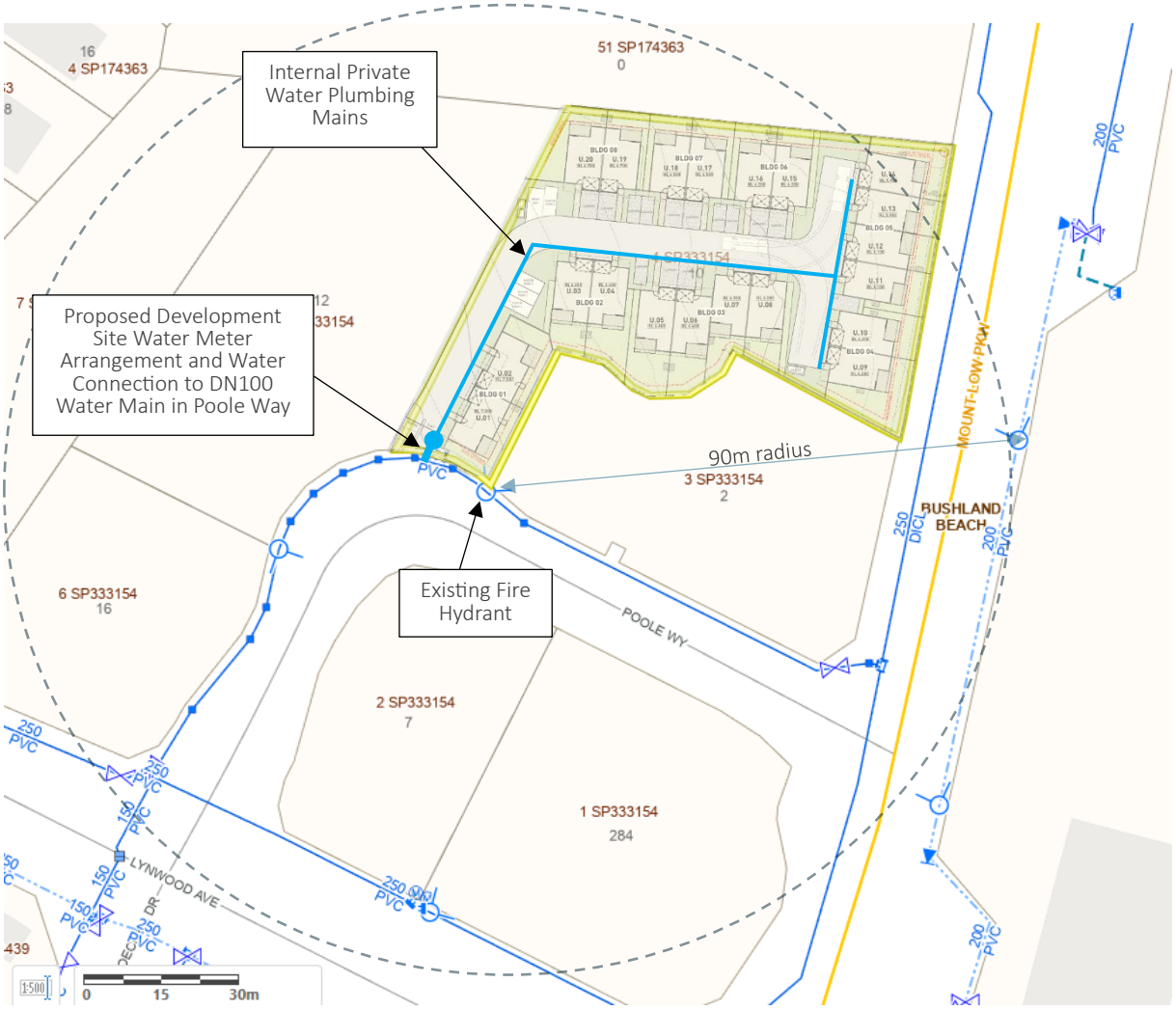

Figure 6: Proposed Development Water Network Connection Strategy

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:

- Housing – 1.8 EP per Unit Dwelling

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 Unit Rate	Type	EP
Townhouse Unit	20	1.8 EP per Unit Dwelling	Res	36
			Total EP	36

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

Fire Fighting (Internal Network – Private Plumbing)

Fire Flow Residential Class Buildings	= 10 l/s
Minimum Residual Pressure at the hydrant	= 20m
Fire Flow Commercial Class Buildings	= 20 l/s
Minimum Residual Pressure at the hydrant	= 20m

Firefighting for internal plumbing is not required to be assessed as part of the network connection. Peak Day (PD) modelling results have been included for information proposes and as a preliminary basis for the hydraulic design consultant. For the purposes of the network analysis 15 l/s fire flow is nominated at the meter connection and is not assessed for the internal private water plumbing mains based on the hydrant in Poole Way extending a 90m radius to service the townhouse units.

6 WATER HYDRAULIC MODELLING

The proposed development water connection and a preliminary internal water main layout 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 14th January 2026, is attached in Appendix B. TCC provided it's water network hydraulic model PH boundary pressures at the node fronting 10 Poole Way on the DN100 water main, adopted for the network analysis. The results are listed in Table 2 below. Figure 7 shows a model screenshot of the development nodes and fixed-head reservoir introduced to simulate the network boundary pressures. Table 3 summarises the added demands.

Table 2: Summary of Network Boundary Condition Pressures at 10 Poole Way

Demand Scenario	Pressure (kPa)	Pressure (m)
Peak Hour @ 19:00	493	50.28
Peak Hour Fire flow (10 L/s)	482	49.16
Peak Hour Fire flow (15 L/s)	473	48.24
Peak Hour Fire flow (20 L/s)	460	46.92

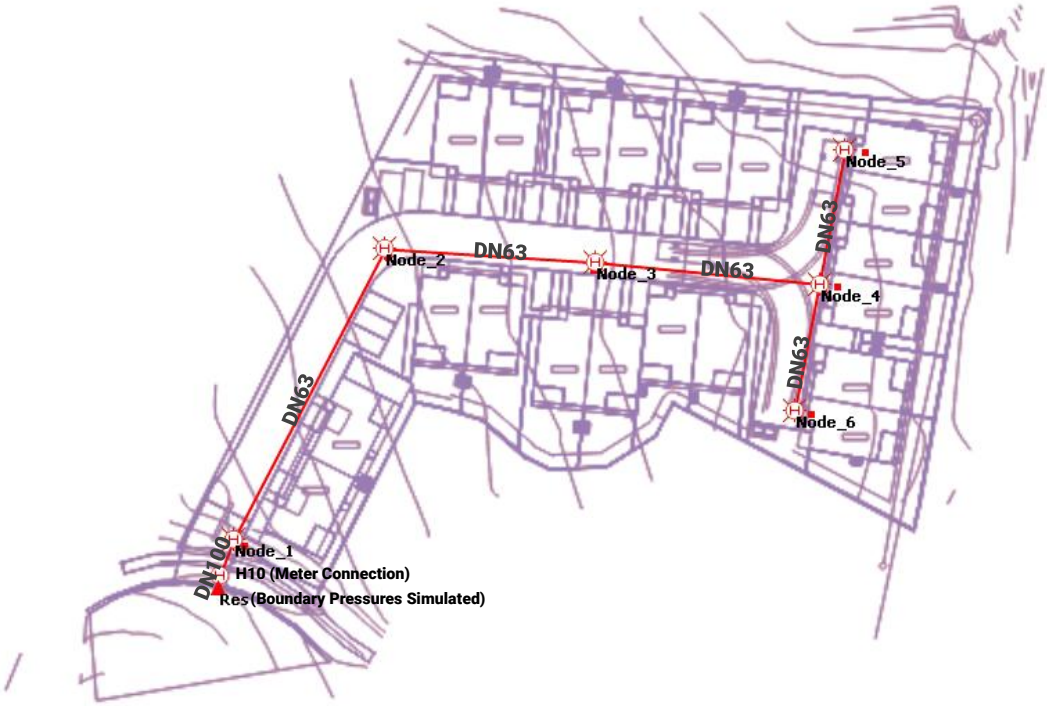

Figure 7: Screenshot of Hydraulic Model – Development Nodes and Pipes

Table 3: Proposed Development Node Demands

Junction ID	Elevation (m ADH)	Demand (EP)	Fire flow Demand (L/s)
H10/ Connection Point	6.8	-	15
Node_1	6.3	3.6	-
Node_2	5.7	7.2	-
Node_3	5.2	14.4	-
Node_4	4.9	3.6	-
Node_5	4.7	3.6	-
Node_6	4.9	3.6	-
		36	

6.1 WATER MODELLING RESULTS

Figure 8 shows the pressure profile for new junctions representing the proposed development during PD scenario with new demands added. The fixed-head reservoir was set to 50.28m to represent the PH boundary pressure from TCC. The graph shows minimum PD operational residual pressure at the connection point will be 43.48m which meets the minimum service requirement of 22m. Internally, pressures will range from 43.48m to 45.58m which is also acceptable.

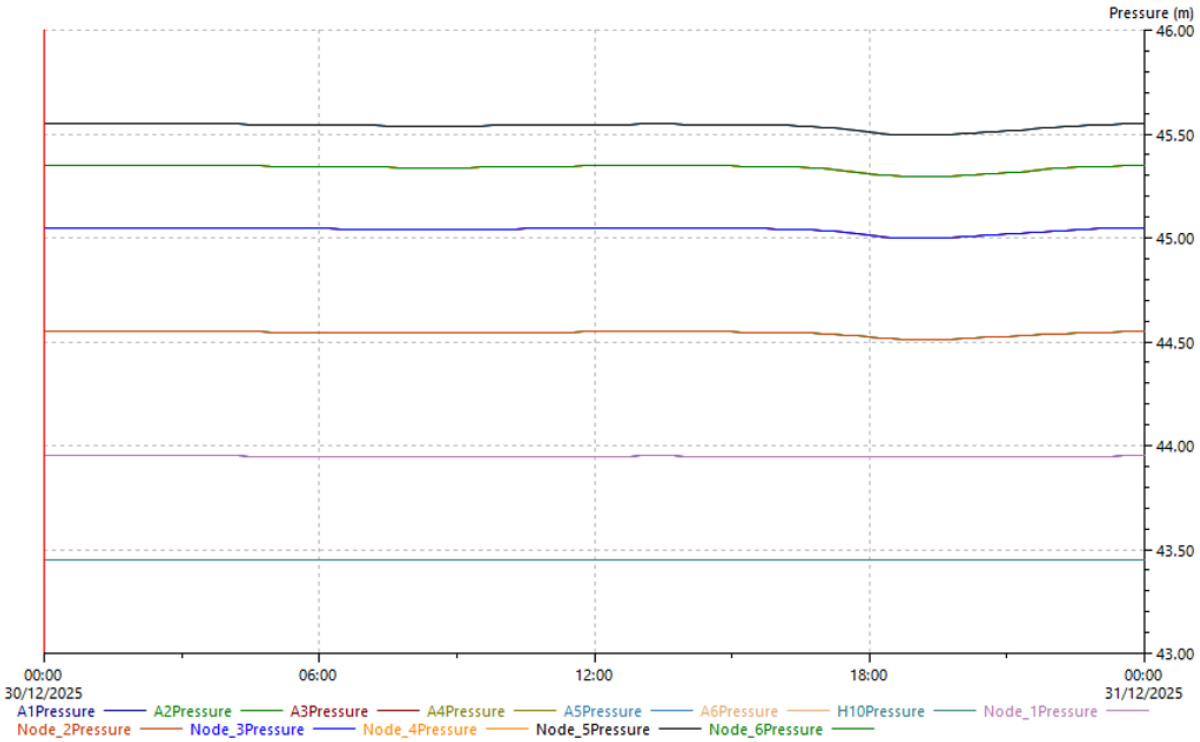

Figure 8: Proposed Development Node Residual Pressures – PD Scenario

Table 4 shows the residual pressure at the meter connection under a fire-fighting PD scenario at PH demand (19:00). Residual pressure at the connection point will be 29.54m which satisfies the minimum required 12m.

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

Node	FF Demand (L/s)	Residual Pressure (m)
H10/ Connection Point	15	29.54

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 to existing DN100 water mains in Poole Way and through the internal water plumbing. 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 townhouse development comprising of 20 units at 10 Poole Way, Bushland Beach on Lot 4 SP333154.

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

- The proposed residential 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 water main connection at the site entrance extending from existing DN100 water mains in Poole Way. Internally, private water plumbing mains will extend to service the townhouse units. Notably, there is an existing fire hydrant in Poole Way that extends a 90m radius for firefighting throughout to the townhouse units, on this basis a fire-flow is not assessed on the internal private water plumbing mains. 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 20 townhouse units represents a total 36 EP.

- The proposed development water connection and a preliminary internal water main layout 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 their water network hydraulic model PH boundary pressures at the node fronting 10 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 to existing DN100 water mains in Poole Way and through the internal water plumbing. 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. 7340-DA03

02 SITE PLAN LEVEL 1
1:200

PROPOSED TOWNHOUSE DEVELOPMENT , 10 POOLE WAY, BUSHLAND BEACH

POOLE WAY PTY LTD

SITE PLAN LEVEL 1

PRELIMINARY
scale : 1:200 @A1 1:400@A3
issue : 04 date : 22-10-25

7340-DA03

north

BLACKBURNE JACKSON
ARCHITECTURE | LANDSCAPE | INTERIOR | PROJECT MANAGEMENT

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: 14/1/2026 TCC Reference: 22446724

Application details:

Name:	Rowell Umale
Contact No:	0433952999
Development name and address:	JFP Urban Consultants Pty Ltd & 10 Poole Way Bushland Beach
Development type:	MCU25/0084

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.

MCU25/0084 - Multiple Townhouse Dwelling (20 x 3 Bedroom Units)

Location:	10 Poole Way
	Water pressure (kPa)
Peak hour @19:00	493 kPa
Peak hour fireflow	482 kPa @ 10L/s 473 kPa @ 15L/s 460 kPa @ 20L/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.

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)
2A/WB12F	1/WB12F	150	23.6	0.52
1/WB12F	1A/WB12F	150	23.6	0.3
1A/WB12F	6/WB12	150	20.9	0.53
6/WB12	5/WB12	150	21.3	0.45
5/WB12	4/WB12	225	18.1	0.53
4/WB12	3/WB12	225	20.3	0.43
3/WB12	2/WB12	225	22.1	0.45
2/WB12	1/WB12	225	21.1	0.44
1/WB12	0/WB12	225	20.7	0.46
0/WB12	P/S WB12	225	19.6	0.63

- For Existing PWWF scenario:

U/S MH	D/S MH	Diameter (mm)	Max Depth of Flow (%D)	V (m/s)
2A/WB12F	1/WB12F	150	55.7	0.81
1/WB12F	1A/WB12F	150	55.7	0.46
1A/WB12F	6/WB12	150	47.8	0.83
6/WB12	5/WB12	150	49.0	0.7
5/WB12	4/WB12	225	41.0	0.67
4/WB12	3/WB12	225	46.8	0.7
3/WB12	2/WB12	225	51.7	0.7
2/WB12	1/WB12	225	49.0	0.68
1/WB12	0/WB12	225	47.9	0.72
0/WB12	P/S WB12	225	44.8	0.99

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 itspublished 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 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.