1 INTRODUCTION

A holistic health centre development is proposed on the Townsville Aboriginal & Islander Health Service (TAIHS) site at 57 - 59 Gorden St, Garbutt. The site is to be re-developed to include a range of health services and administration services.

The proposed re-development of the site will involve a number of buildings with the location of the proposed development and multiple buildings being illustrated on the overall site development plan below. Some of the existing buildings/facilities are to be retained with a number of the existing buildings to be removed and new buildings constructed.

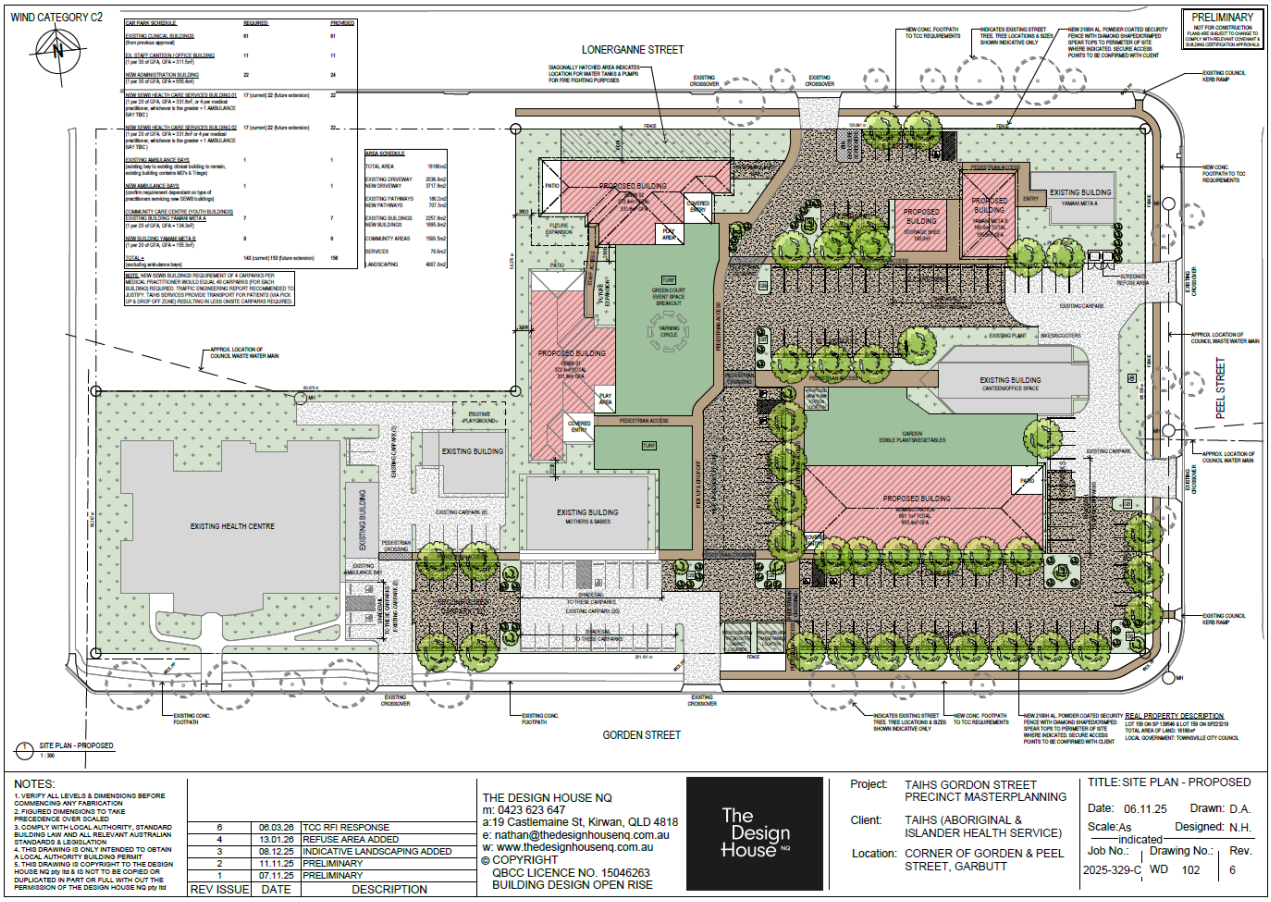


Figure 1.1 - Townsville Aboriginal & Islander Health Service Redevelopment Plan

The various buildings are to be single storey that will house multiple clinic/consultation rooms along with staff offices. The development plans are included in Appendix A.

To ensure the proposed health centre development can be adequately serviced with a potable water supply and sewage system in accordance with Council standards, an assessment of the system capacities have been undertaken. This report summarises the assessment of the existing water and sewerage network with this illustrating:

- The water network modelling shows the existing DN100 reticulation water mains along Gorden St is adequately sized to service the amalgamated development in accordance with Townsville Council standards.
- A new water service and meter is to be connected off the existing DN100 PVC water main on the frontage of the existing TAIHS medical centre on Gorden St. This is likely to be a new DN100 water service and water meter that will replace the existing DN40 water main in this location. The final sizing of the water service and meter will be undertaken as part

of the detailed hydraulic and fire services design for the development to meet any specific building/fire code requirements.

A new “private” water main and fire service to be extended within the development site (from the new water meter) to a new fire booster assembly located adjacent to the driveway to the new health service facility carpark.

The existing DN80 water service and meter off Peel St will be removed.

- A new private package sewage pump station will be constructed to service the development of the TAIHS site as the existing Council gravity sewer system is not deep enough to service all the new buildings. Sewage from the existing buildings that are to remain and the new buildings will be directed to the new private sewage pump station.

  Sewage from the package pump station will be directed via a private DN63 PE pressure main to discharge into new sewer maintenance hole within the development site and on the Peel Street frontage. A short DN150 gravity sewer will extend to the east from the new discharge MH into existing MH 5/11C4A that is located on the western footpath of Peel St. The proposed location of the private package pump station is illustrated on the development figures in Appendix C. The alignment of the private DN63 PE sewer pressure main and the design of the discharge gravity sewer will be determined as part of the hydraulic services design of the new buildings. The existing property sewer connections will be disconnected with all sewage directed to MH 5/11C4A.

The water network modelling and sewer system capacity is summarised in the following report sections. The figure below from the Townsville City Council GIS illustrates the location of the proposed redevelopment of the TAIHS site with the existing water & sewer infrastructure.

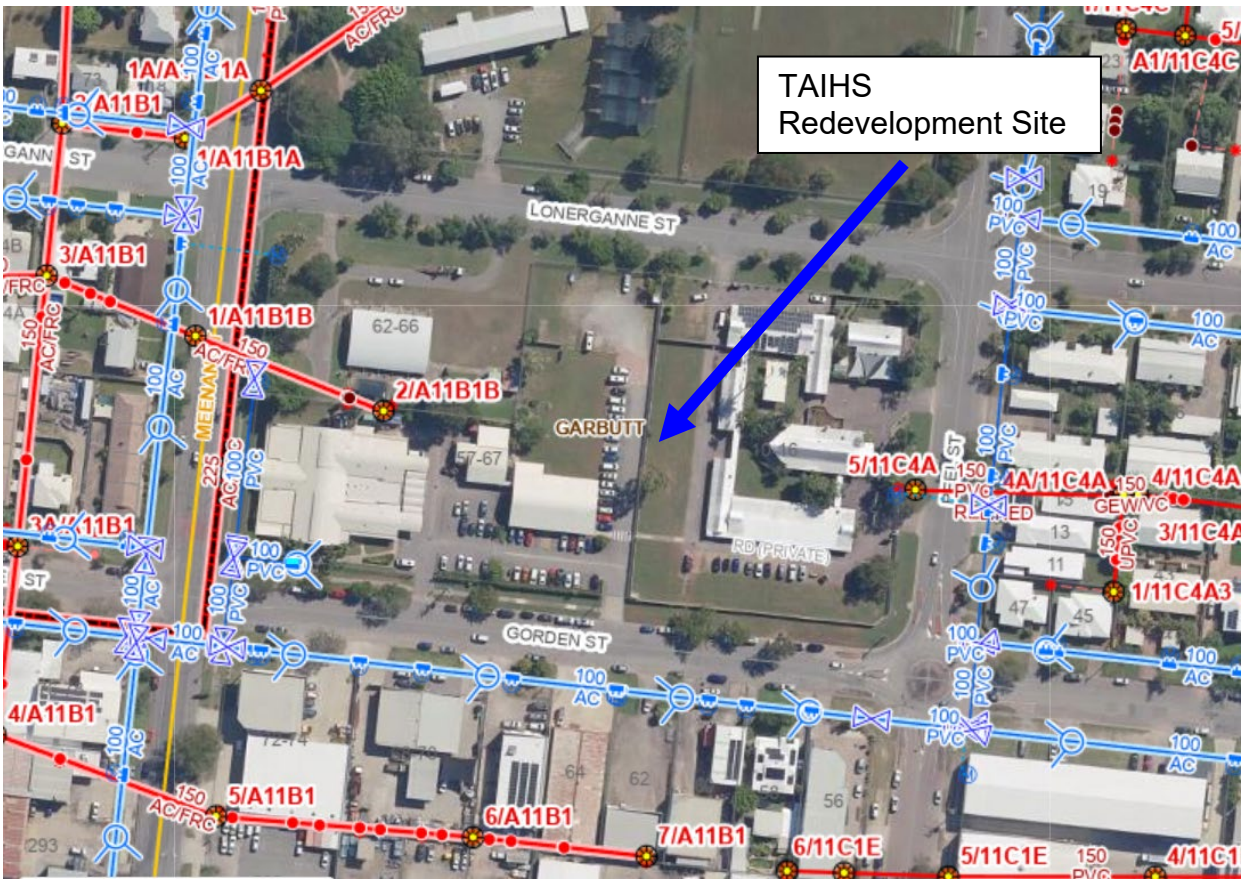


Figure 1.2 – Development Site Location

2 POPULATION ASSESSMENT

The following section provides the equivalent population assessment for the proposed TAIHS site in Garbutt. Two methods have been used to estimate the equivalent population of the existing TAIHS facilities and the proposed redevelopment with these summarised below.

Method 1 – Infrastructure Demand Unit Rates

The equivalent population assessment has been developed based on the unit rates detailed in "Table 8.1 – Infrastructure Demand Unit Rates" of the Local Government Infrastructure Plan – DSS, Definitions & Demands (April 2017) that is extrinsic referenced material to the Townsville CityPlan. The specific details of the equivalent population estimate for the development is provided in the following tables.

The existing facilities and proposed development gross floor areas (GFA) are detailed on the plans in Appendix A. The remainder of the site is carparking and landscaping. The GFA of the existing buildings that will remain along with the proposed buildings has been used to determine the equivalent population loading from the site.

Table 2.1 – Water Equivalent Population Assessment

	Area	Loading Rate	EP
Existing Buildings (Services)	2,258 m^2 GFA	1.35 EP/100m^2	**30.5 EP**
Proposed Health Centre (Services)	1,696 m^2 GFA	1.35 EP/100m^2	**22.9 EP**
Total			**53.4 EP**

Table 2.2 – Sewage Equivalent Population Assessment

	Area	Rate	EP
Existing Buildings (Services)	2,258 m^2 GFA	1.88 EP/100m^2	**42.5 EP**
Health Centre (Services)	1,696 m^2 GFA	1.88 EP/100m^2	**31.9 EP**
Total			**74.4 EP**

Method 2 – Plumbing Loading Units (AS3500)

This method is based on determining the probable simultaneous flows from the existing facilities and proposed development buildings based on the Plumbing & Drainage Code (AS 3500.1). The probable simultaneous flows are then converted to an equivalent population using the water demand rates in the CTM code.

The proposed development plans in Appendix A illustrate the proposed internal development layout of the various redevelopment buildings, including the proposed plumbing fixtures. The plumbing and drainage plans from the existing buildings are also provided in Appendix A to show the existing plumbing fixtures.

The plumbing fixtures have been converted to plumbing loading units (LU) based on the values in Table 3.2.1 of AS3500 as illustrated in the extract below.

Table 3.2.1 — Minimum flow rates and loading units

Fixture/appliance	Flow rate L/s	Flow rate L/min	Loading units
Water closet cistern	0.10	6	2
Bath	0.30	18	8
Basin (standard outlet)	0.10	6	1
Spray tap	0.03	1.8	0.5
Shower	0.10	6	2
Sink (standard tap)	0.12	7	3
Sink (aerated tap)	0.10	6	2
Laundry trough	0.12	7	3
Washing machine/dishwasher	0.20	12	3
Mains pressure water heater	0.20	12	8
Hose tap (20 nom. size)	0.30	18	8
Hose tap (15 nom. size)	0.20	12	4

NOTE 1 In the case of valves and appliances where test information indicates that they will function satisfactorily with a flow rate less than that shown in this table, the tested flow rate may be substituted and the loading units adjusted accordingly.

NOTE 2 Flow rates and loading units given above are taken with cold water flowing from each individual outlet.

Table 2.2 New Development Building Loading Unit Assessment

Fixture Unit Type	Fixture Unit Rating	Number	Total Fixture Units
Toilets (WC)	2 units	15	30 units
Hand basins	1 unit	16	16 units
Showers	2 units	2	4 units
Tub (Cleaners Sink)	3 units	3	9 units
Kitchen (Sink + Dishwasher)	5 units	2	10 units
Hose taps (15 nom size)	4 units	6 (assumed)	24 units
Total			93 units

Table 2.2 Existing Buildings Loading Unit Assessment

Fixture Unit Type	Fixture Unit Rating	Number	Total Fixture Units
Toilets (WC)	2 units	14	28 units
Hand basins	1 unit	28	28 units
Showers	2 units	3	6 units
Sink	2 units	9	18 units
Tub (Cleaners Sink)	3 units	2	6 units
Hose taps (15 nom size)	4 units	2	8 units
Total			94 units

The above assessment shows that the combined existing facilities that are to remain and the propsoed redevelopment buildings will have a combined 187 plumbing loading units (LU).

The conversion of these plumbing loading units to a water demand and therefore equivalent population can be undertaken by converting the loading units to a standard residential property and then applying the probable simultaneous flow rates detailed in Table 3.2.3 of AS3500.

A standard house generally contains 24 loading units so the existing and propsoed facilities at the TAIHS site redevelopment would be equivalent to 187 / 24 = 7.8 houses. Based on Table 3.2.3 of AS3500 (refer to extract below), the probable simultaneous flow would be 1.51 l/s.

Based on the 1.51 l/s from the probable simultaneous flow (PSF) assessment, the EP is:

= PSF / (Peak Day Demand x Commercial Peaking Factor)

= 1.51 / (1125 L/day/EP x 1.5)

= 1.51 / ((1125 / (24*3600)) x 1.5)

= 77.3 EP

Table 3.2.3 — Minimum probable simultaneous demand for dwellings

Number of units or dwellings	Flow rate L/s	Number of units or dwellings	Flow rate L/s	Number of units or dwellings	Flow rate L/s
1	0.48	35	3.74	68	5.79
2	0.70	36	3.81	69	5.85
3	0.88	37	3.88	70	5.91
4	1.03	38	3.95	71	5.96
5	1.17	39	4.01	72	6.02
6	1.30	40	4.08	73	6.08
7	1.41	41	4.14	74	6.13
8	1.53	42	4.21	75	6.19

The above equivalent population assessment shows that the probable simultaneous flow assessment from the plumbing and drainage code (AS3500) provides the higher equivalent population estimate for the existing remaining facilities and the proposed buildings.

The water and sewer assessment undertaken in this report for the TAIHS site in Garbutt has been based on an equivalent population assessment of **77.3 EP**.

WATER SUPPLY PLANNING

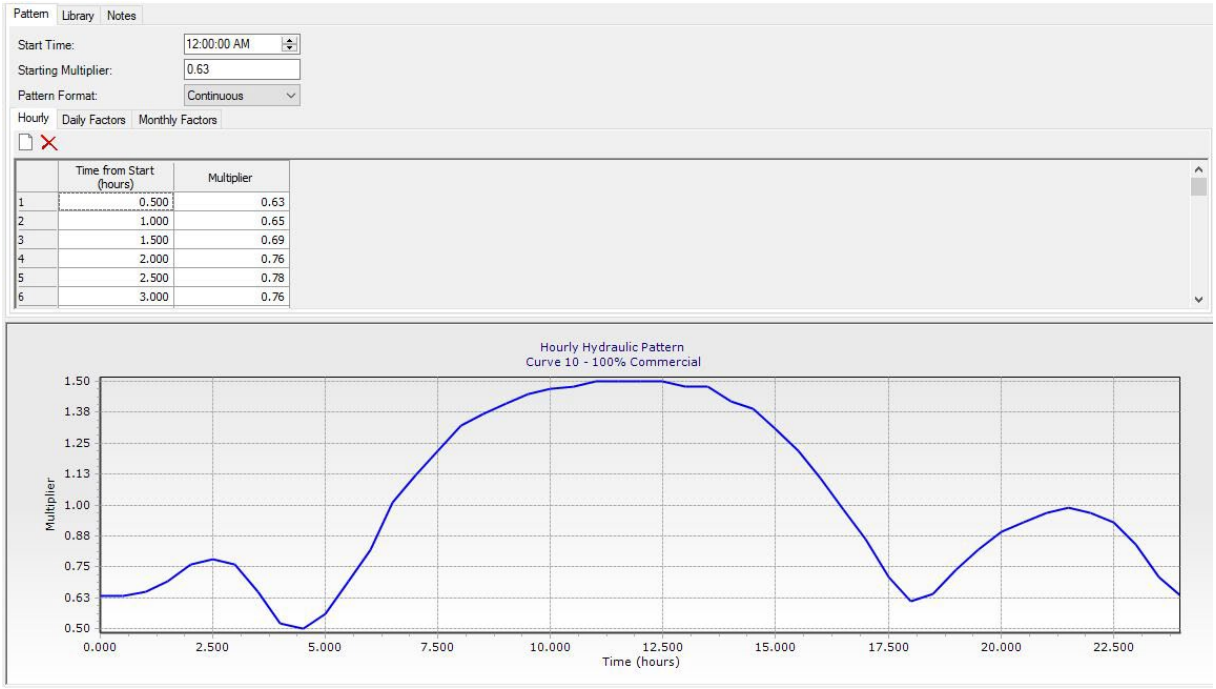
2.1 Water Demand

Water demands have been calculated in accordance with Townsville City Council planning scheme and the CTM Code. The following table provides the "residential" water demand parameters from the CTM Code for each equivalent person (EP).

Table 3.1 – Water Demand Parameters

Parameter	Unit Demand	Peaking Factor
Average Day (AD)	600 L/day/EP	
Mean Day Max Month (MDMM)	900 L/day/EP	1.5 AD
Peak Day (PD)	1125 L/day/EP	1.25 MDMM
Peak Hour (PH)	0.0333 L/s/EP	2.56 PD

Townsville Council also have diurnal water demand patterns that are applied to the various water uses. As the proposed development is commercial, the commercial demand diurnal pattern will be applied. The commercial demand diurnal pattern has a peaking factor of 1.5, instead of the 2.56 peaking factor provided in the above table for residential water demands. The commercial diurnal pattern is illustrated below.



Based on the estimated probable simultaneous flow of 1.51 l/s, the EP is:

= 1.51 / 1125 L/day/EP x 1.5 (commercial peaking factor)

= 1.51 / (1125 / (24*3600)) x 1.5

= 77.3 EP

The water network modelling includes the equivalent population and associated water demands for the existing facilities on the TAIHS site that are being retained along with the proposed redevelopment facilities.

In addition to the above, as the development is commercial a 30 l/s fire flow is required in accordance with Council's design standards. It is noted that the Building Code may require a different fire flow standard depending on the actual building classification. This assessment has not specifically assessed the performance against the building code requirements.

2.2 Water Supply Assessment & Network Modelling

The site for the proposed health services redevelopment is located on the southern side of Lonerganne St in Garbutt. The TAIHS overall site covers the majority of the land parcel that is bounded by Meenan St, Lonerganne St, Peel St and Gorden St in Garbutt. The existing water infrastructure that services the TAIHS site includes:

- A DN475 MSCL trunk main runs parallel to Ingham Rd (southern side of QR line) and to the south of the development site. There are existing offtakes from this trunk water main into the Garbutt area. A DN375 CI trunk water main runs along Percy St to the east of the Garbutt area. There are existing offtakes from this trunk water main into the Garbutt area.
- Both the above two trunk water mains are supplied from the Mt Louisa reservoir site and provide the potable water supply to the Garbutt area.
- The Garbutt area is serviced with a network of DN150 AC/PVC and DN100 AC/PVC reticulation mains that are generally located along both sides of the residential streets.
- There are existing DN100 reticulation mains located on the southern side of Gorden St, western side of Meenan St and eastern side of Peel St. There is also an existing DN100 PVC main that is located on the northern side of Gorden St that services the existing TAIHS Medical Centre at the intersection of Meenan St and Gorden St.
- The following extract from the Council GIS illustrates the existing water infrastructure that services the development site.

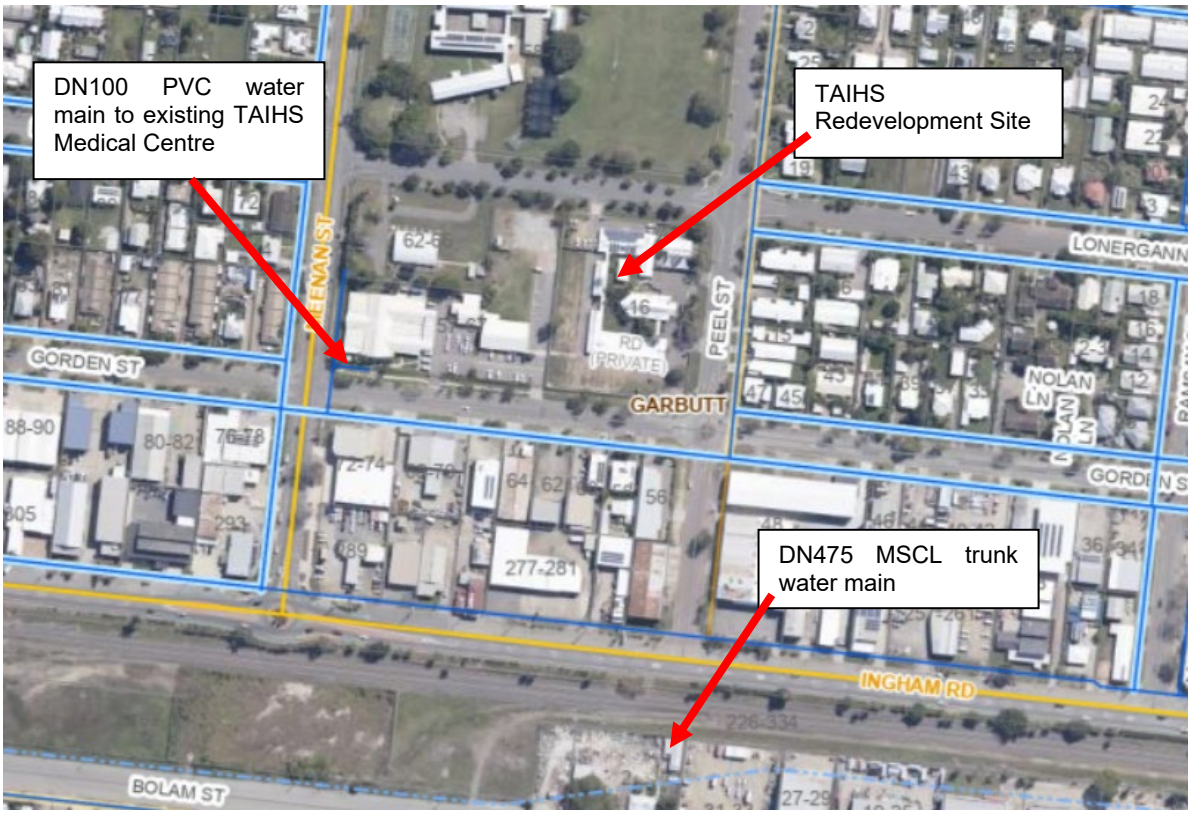


Figure 3.1 – Council GIS Plot

The water supply to the existing remaining TAIHS buildings along with the redevelopment buildings will be as follows, and illustrated on the extract of the site layout plan:

- The existing DN80 water service and meter off the existing DN100 water main on Peel St will be removed and not used for the TAIHS site redevelopment.
- The existing DN40 water service and meter off the existing DN100 PVC water main on the northern side of Gorden St (near the Meenan St intersection) that currently services the existing TAIHS medical centre will be removed and replaced with a new larger water meter and fire service offtake.
- A new water meter and fire service offtake (including RPZD and detector check valve) will be connected to the existing DN100 water main on the northern side of Gorden St (near the Meenan St intersection). The size of the water meter and fire service offtake will be confirmed as part of the building hydraulic and fire system design but is expected to be a DN100 offtake and service.
- A new "private" water and fire service will be constructed within the TAIHS site and will run parallel to Gorden St to the east. A new fire booster assembly will be installed on the Gorden St frontage of the development and adjacent to the new driveway to the health services facility. The new private water/fire main is expected to be DN100 to provide the required fire flows.
- New fire mains will extend from the booster assembly to service the various redevelopment buildings.
- The final location and sizing of the private potable water main and fire service and associated booster assembly will be confirmed as part of the building hydraulic design and certification (by others).

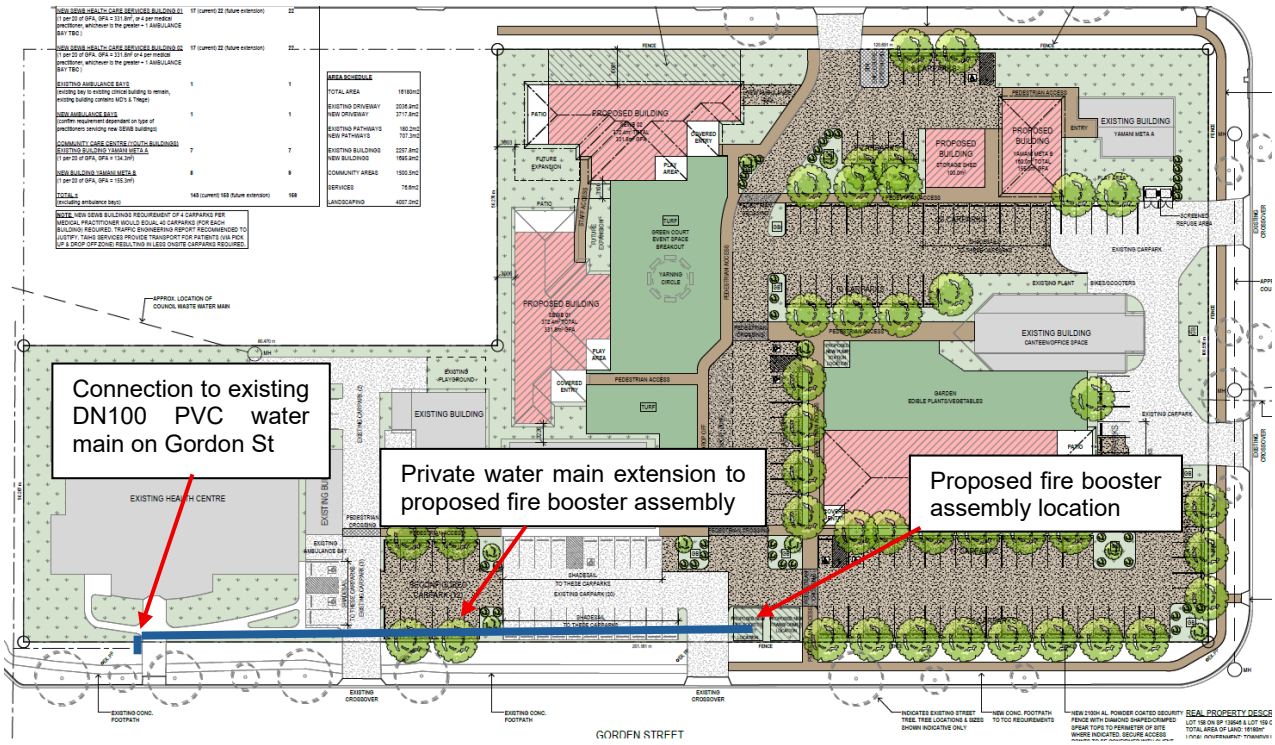


Figure 3.2 – Private Water Supply Concept

Theoretical water network modelling has been performed to assess the capacity of the existing water network. The modelling was undertaken using the Council's WaterGEMS network model for both the peak hour demands and fire flows.

The theoretical WaterGEMS network modelling results with the inclusion of the water demands from the proposed development shows:

- The peak hour pressures at 12 noon (ie the peak commercial demand period) are reduced to 534 kPa on the end of the existing DN100 water main on the northern side of Gorden St (near the Meenan St intersection) where the water will be supplied to the site. This meets the minimum pressure requirement of 220 kPa.

  The water pressures at 12 noon in the surrounding areas are all above 333 kPa.

- The peak hour pressure at 7pm (ie the peak residential demand period) are reduced to 398 kPa on the end of the DN100 Groden St water main. This is a lower pressure and is due to the large areas of residential development in the nearby suburbs. This meets the minimum pressure requirement of 220 kPa.

  The water pressures at 7pm in the surrounding areas are all above 368 kPa.

- The headloss gradient along the existing DN100 PVC water main crossing of Gorden St and along Gordan St to the proposed new water meter offtake is less than 0.001 m/m with the pipe velocities up to 0.20 m/s. These both meet Council design standards. Some of the other reticulation water mains in the Garbutt area have headloss gradients of greater than 0.005 m/m with this being the existing performance of these pipes. The velocities are all less than 1.0 m/s so meet Council standards.

- The fire flow assessment applied 30 l/s fire flow to the end of the existing DN100 PVC water main on Gorden St (where the water service offtake will be located). This is a conservative assessment as the TCC standard allows for the 30 l/s fire flow from up to three hydrants concurrently (ie 10 l/s per hydrant) so the full 30 l/s commercial fire flow would not all be drawn off the end of the single DN100 water main on the frontage of the existing TAIHS medical centre.

- With the inclusion of the 30 l/s fire flow, the water pressures are reduced to 185 kPa within the water mains. This is the pressure at 7pm and is concurrent with the peak residential demand period and meets the Council minimum pressure requirement of 120 kPa.

- The velocity along the DN100 water main along the frontage of the TAIHS site on the northern side of Gorden St is 3.98 m/s based on the full 30 l/s demand from the single hydrant on this main. This meets the Council design standards of being less than 4.0 m/s for fire flows. It is again noted that the full 30 l/s fire flow would not actually be drawn from the end of the existing DN100 PVC water main on the northern side of Gorden St and would be drawn from up to 3 hydrants on multiple water mains around the site so would not have the full 30 l/s flow along this single main. The actual velocity would therefore be lower than this modelled value.

- The WaterGEMS figure and results table are provided in Appendix B.

The above theoretical water network modelling shows that the proposed TAIHS redevelopment site in Garbutt is able to be serviced with a potable water supply that meets Council's standards with no upgrades required. The following figure illustrates the peak hour demands and water pressure at the proposed offtake on the end of the existing DN100 PVC main on Gorden St.

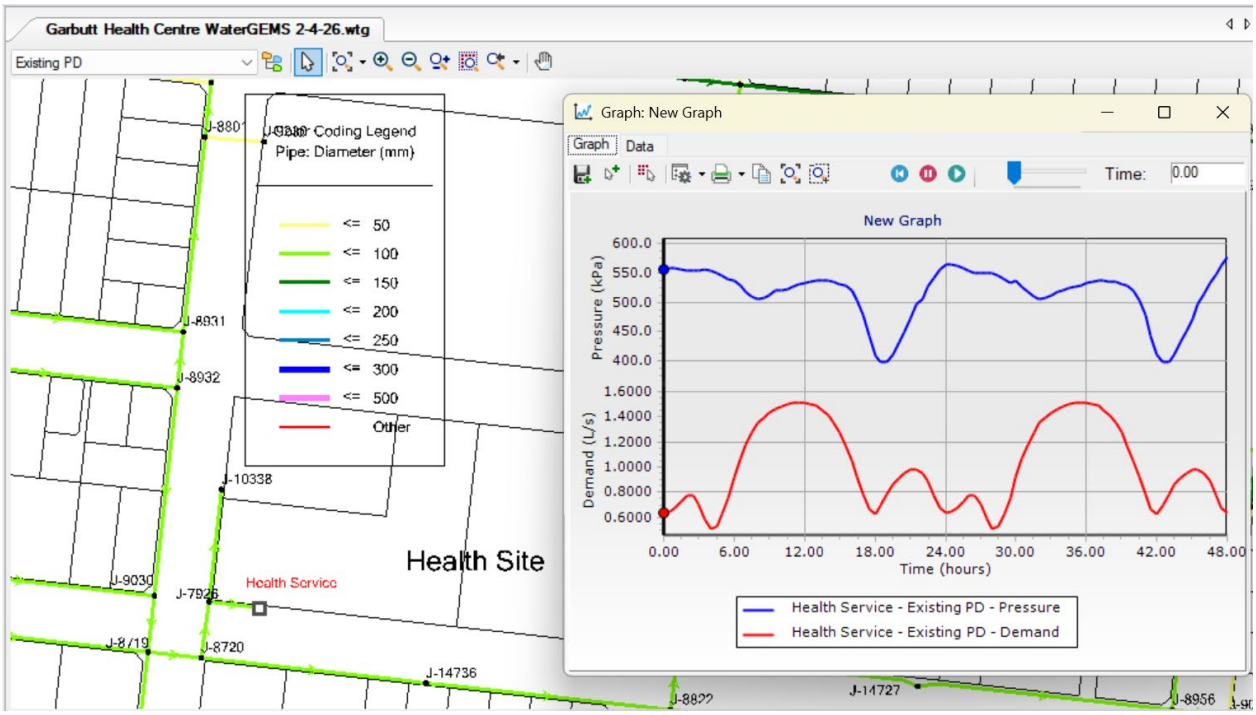


Figure 3.3 – Peak Hour Water Demand & Pressures

It is noted that the fire flow WaterGEMS network modelling is to assess the proposed developments performance against Townsville Council planning standards. Based on the type/classification of the health services site redevelopment, the Building Code may require different fire flow and pressure standards.

The sizing of the “private” water supply and fire booster assembly and the water system performance against the building code requirements has not been considered as part of this assessment.

3 SEWAGE SYSTEM PLANNING

The TAIHS health services site is currently serviced with a gravity sewer system. The existing gravity sewer system is however not deep enough to service all the proposed redevelopment buildings via a gravity sewer extension. The existing sewer system consists of:

- A DN150 AC sewer to the west of the proposed redevelopment buildings. Existing sewer MH 2/A11B1B is located to the north of the existing TAIHS medical facility. This existing MH is only 1.37m deep so is not deep enough for a sewer and/or house drain to service the proposed redevelopment buildings. This sewer is understood to currently service the existing medical clinic building that will remain.
- A DN150 AC sewer to the east of the proposed redevelopment buildings. Existing sewer MH 5/11C4A is located on the western footpath of Peel St, halfway between the intersections of Lonerganne St and Gorden St. The existing MH is only 1.37m deep so is not deep enough for a sewer and/or house drain to service the proposed redevelopment buildings.

The proposed sewer strategy for the health facility redevelopment site is as follows:

- The existing property connection sewers to the existing Council sewer mains will be disconnected. This includes the disconnection of the existing property connection sewers that currently direct sewage from the existing remaining buildings to the TCC gravity sewer system.
- A new private package pump station will be constructed to service the full TAIHS site including the existing buildings that will remain and the proposed redevelopment buildings. The package pump station would have two submersible “grinder” type pumps and would generally be in accordance with the package pump station detailed on the SEQ Standard Drawing SEQ-PSS-1101-1 (refer Appendix C).
- The proposed location of the private pump station is illustrated on the development plans in Appendix A. The proposed private package pump station is centrally located in the proposed redevelopment area adjacent to carparking areas and the proposed garden.
- Sewage from the package pump station would be pumped to the east to a new MH inside the property boundary off Peel St. The sewer pressure main would be DN63 PE (51mm internal diameter) and would be over a length of around 60 m.
- The discharge MH would include a vent pole. A DN150 sewer would extend from the new discharge MH to existing Council MH 5/11C4A that is located on the western footpath of Peel St.

Figure 4.1 below illustrates the sewer strategy for the development site. The final sizing of the package pump station, pressure main and discharge maintenance hole will be undertaken as part of the detailed design of the building and its hydraulic and drainage services.

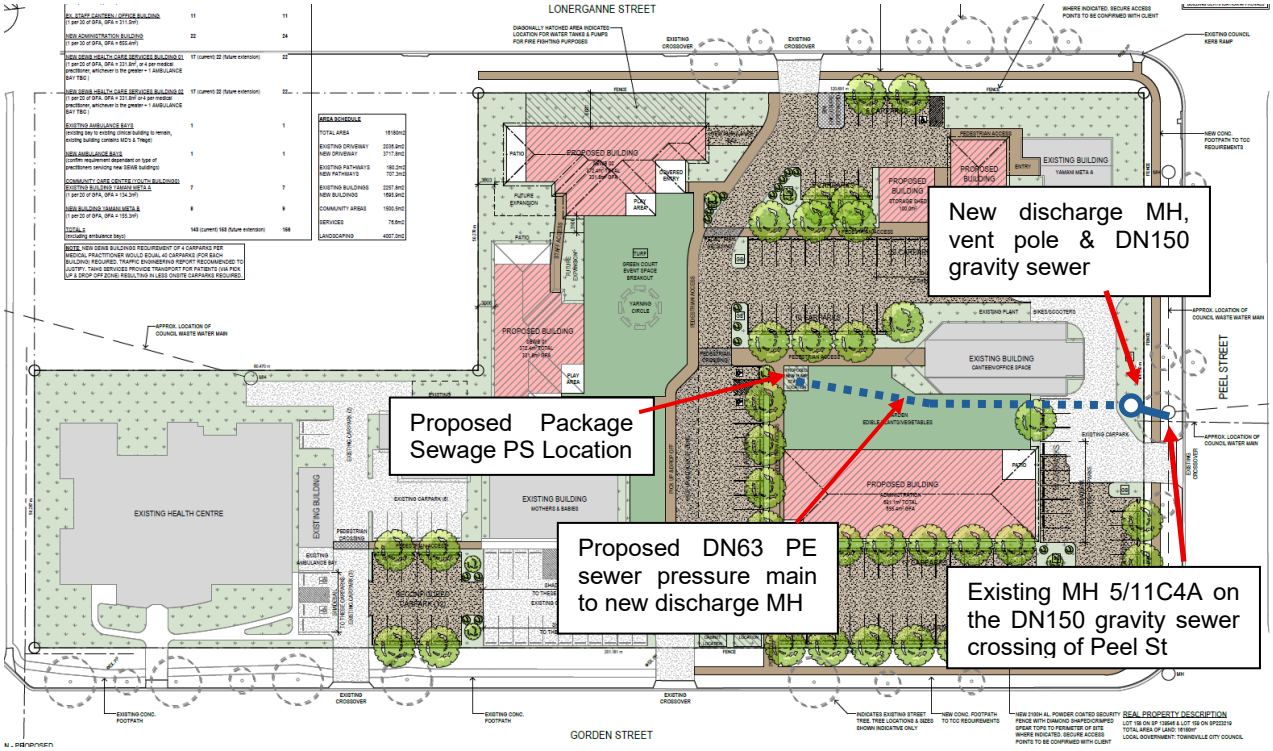


Figure 4.1 – Preliminary Sewer Strategy Figure

The following extract from the Council's GIS illustrates the existing gravity sewer system that would have the sewage from the proposed TAIHS redevelopment pumped into it.

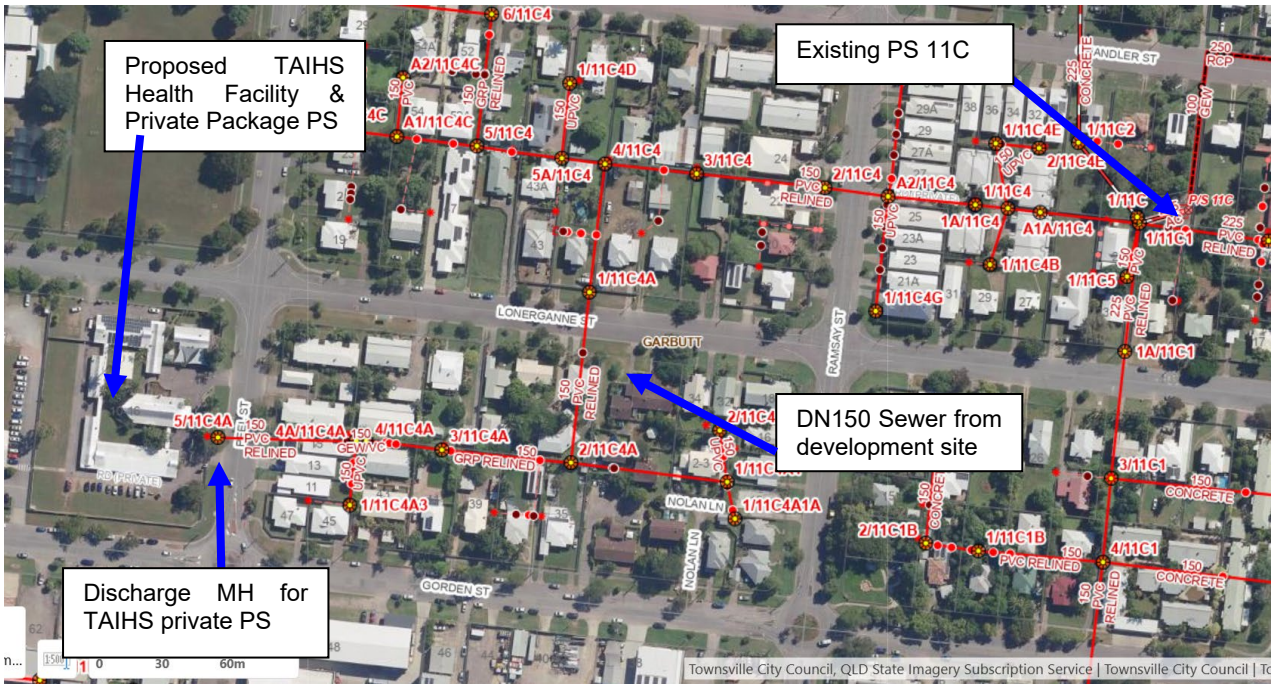


Figure 4.2 – GIS Plot of Existing Sewer System

3.1 Sewage Infrastructure Capacity

The capacity of the existing gravity sewer system to cater for the proposed TAIHS Health facility redevelopment site sewage flows along with the flows from the existing buildings that will remain has been assessed using the SewerGEMS model developed for the Eastern & Western Suburbs sewer system, which PS 11C and its gravity sewer system is part of.

The SewerGEMS model was updated to include the following:

- A preliminary package sewage pump station at the development site.
- DN63 PE pressure main (internal diameter of 51mm) from the pump station to the proposed discharge MH that will be located on the Peel St frontage of the site.
- DN150 gravity sewer from the discharge MH to existing MH 5/11C4A.
- The peak wet weather flow (PWWF) from the TAIHS redevelopment would be:

  PWWF = EP x 230 l/EP/Day x C1

  C1 (Peaking Factor) = $15 \times EP^{-0.1587}$

  PWWF = $77.3 \times 230 \times 15 \times 77.3^{-0.1587}$

  = 133,766 l/Day

  = 1.55 l/s

- The pump rate was set at the above PWWF flow of 1.55 l/s. This pump rate gives a velocity of 0.76 m/s in the proposed DN63 PE100 SDR11 (PN16) pressure main which has an internal diameter of 51mm. This achieves the CTM code minimum velocity of 0.75 m/s.

The extract from the SewerGEMS model is provided on Figure 4.3 below.

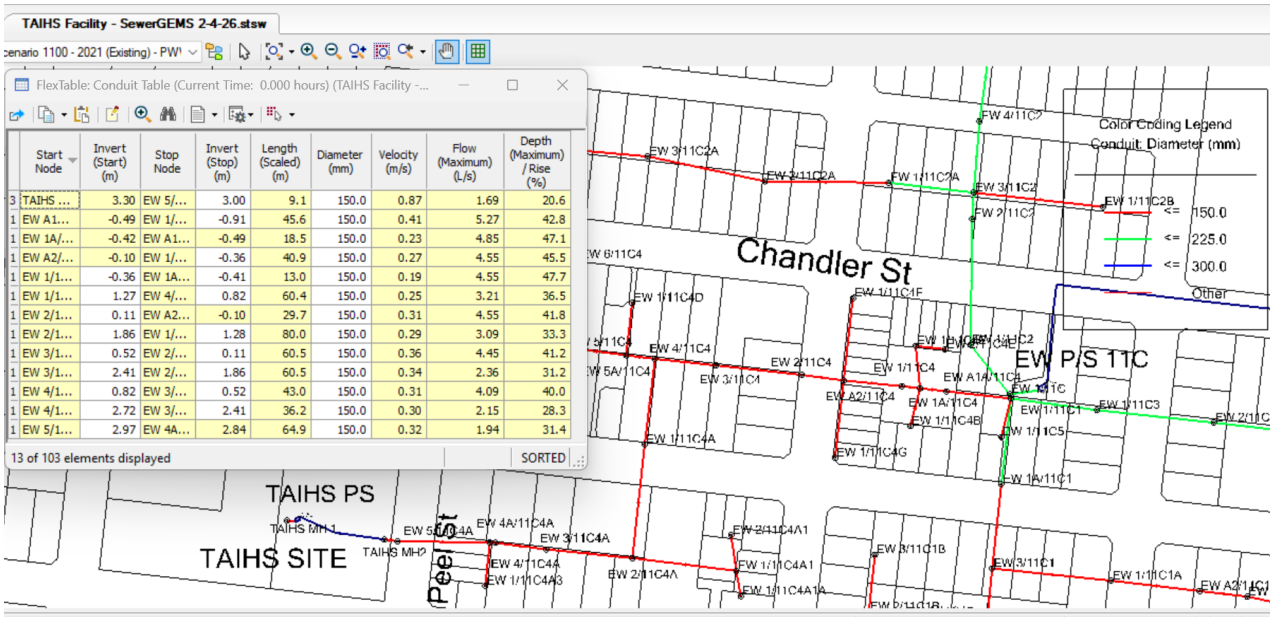


Figure 4.3 – SewerGEMS Modelling Results

With the inclusion of the additional equivalent population loading and the preliminary package sewage pump station, the SewerGEMS model has illustrated:

- The preliminary package PS would be able to discharge the 1.55 l/s along the DN63 PE pressure main with a pump head of around 4.0 m. The final pump duty will be dependent on the invert of the new internal development sewer lines into the pump station and the sewage pump control levels.
- The existing DN150 sewer from MH 5/11C4A (the proposed discharge MH on Peel St) to existing PS 11C (Chandler St) flows up to 48% full for the peak wet weather flows.

- All the existing sewers flow less than 75% full which is the maximum value allowable in the CTM code.

The above Figure 4.3 provides the flows and performance of the existing gravity sewer system with the inclusion of the additional loading from the existing remaining facilities and proposed redevelopment buildings at the TAIHS site. A larger version of the modelling results is provided in Appendix C.

The above assessment illustrates the existing gravity sewer system has sufficient capacity to cater for the pumped flows from the proposed private package sewage pump station that will be required to service the TAIHS redevelopment site on Gordan St, Garbutt.

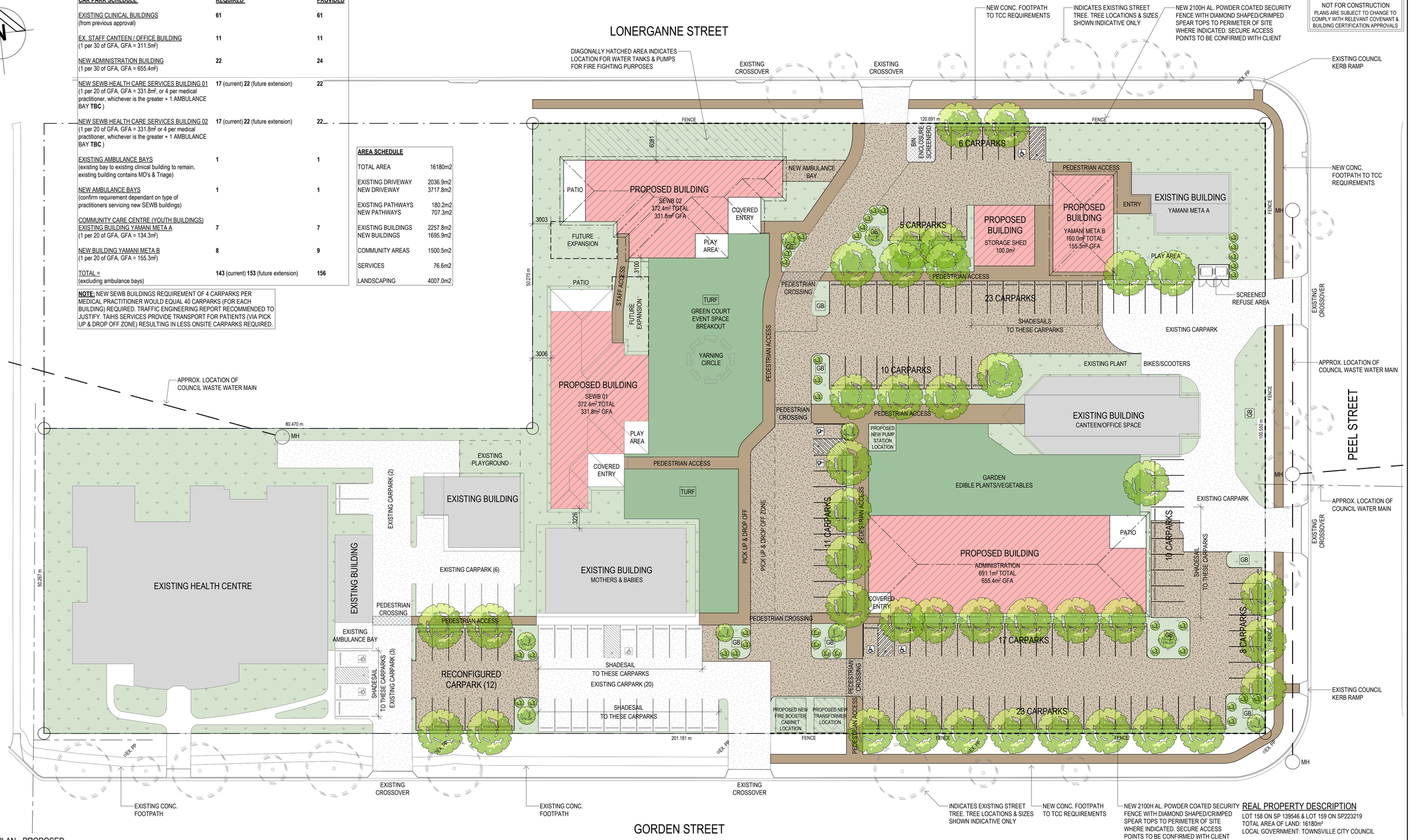
APPENDIX A
TAIHS HEALTH CENTRE PLANS

WIND CATEGORY C2

CAR PARK SCHEDULE	REQUIRED	PROVIDED
EXISTING CLINICAL BUILDINGS (from previous approval)	**61**	**61**
EX. STAFF CANTEEN / OFFICE BUILDING (1 per 30 of GFA, GFA = 311.5m²)	**11**	**11**
NEW ADMINISTRATION BUILDING (1 per 30 of GFA, GFA = 655.4m²)	**22**	**24**
NEW SEWB HEALTH CARE SERVICES BUILDING 01 (1 per 20 of GFA, GFA = 331.8m², or 4 per medical practitioner, whichever is the greater + 1 AMBULANCE BAY **TBC**)	**17** (current) **22** (future extension)	**22**
NEW SEWB HEALTH CARE SERVICES BUILDING 02 (1 per 20 of GFA. GFA = 331.8m² or 4 per medical practitioner, whichever is the greater + 1 AMBULANCE BAY **TBC**)	**17** (current) **22** (future extension)	**22**
EXISTING AMBULANCE BAYS (existing bay to existing clinical building to remain, existing building contains MD's & Triage)	**1**	**1**
NEW AMBULANCE BAYS (confirm requirement dependant on type of practitioners servicing new SEWB buildings)	**1**	**1**
COMMUNITY CARE CENTRE (YOUTH BUILDINGS) EXISTING BUILDING YAMANI META A (1 per 20 of GFA, GFA = 134.3m²)	**7**	**7**
NEW BUILDING YAMANI META B (1 per 20 of GFA, GFA = 155.3m²)	**8**	**9**
TOTAL = (excluding ambulance bays)	**143** (current) **153** (future extension)	**156**

NOTE: NEW SEWB BUILDINGS REQUIREMENT OF 4 CARPARKS PER MEDICAL PRACTITIONER WOULD EQUAL 40 CARPARKS (FOR EACH BUILDING) REQUIRED. TRAFFIC ENGINEERING REPORT RECOMMENDED TO JUSTIFY. TAIHS SERVICES PROVIDE TRANSPORT FOR PATIENTS (VIA PICK UP & DROP OFF ZONE) RESULTING IN LESS ONSITE CARPARKS REQUIRED.

AREA SCHEDULE	
TOTAL AREA	16180m2
EXISTING DRIVEWAY	2036.9m2
NEW DRIVEWAY	3717.8m2
EXISTING PATHWAYS	180.2m2
NEW PATHWAYS	707.3m2
EXISTING BUILDINGS	2257.8m2
NEW BUILDINGS	1695.9m2
COMMUNITY AREAS	1500.5m2
SERVICES	76.6m2
LANDSCAPING	4007.0m2



1 SITE PLAN - PROPOSED
1 : 300

NOTES:

1. VERIFY ALL LEVELS & DIMENSIONS BEFORE COMMENCING ANY FABRICATION
2. FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED
3. COMPLY WITH LOCAL AUTHORITY, STANDARD BUILDING LAW AND ALL RELEVANT AUSTRALIAN STANDARDS & LEGISLATION
4. THIS DRAWING IS ONLY INTENDED TO OBTAIN A LOCAL AUTHORITY BUILDING PERMIT
5. THIS DRAWING IS COPYRIGHT TO THE DESIGN HOUSE NQ pty ltd & IS NOT TO BE COPIED OR DUPLICATED IN PART OR FULL WITH OUT THE PERMISSION OF THE DESIGN HOUSE NQ pty ltd

REV ISSUE	DATE	DESCRIPTION
6	06.03.26	TCC RFI RESPONSE
4	13.01.26	REFUSE AREA ADDED
3	08.12.25	INDICATIVE LANDSCAPING ADDED
2	11.11.25	PRELIMINARY
1	07.11.25	PRELIMINARY

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The Design House NQ

Project: TAIHS GORDON STREET PRECINCT MASTERPLANNING

Client: TAIHS (ABORIGINAL & ISLANDER HEALTH SERVICE)

Location: CORNER OF GORDEN & PEEL STREET, GARBUTT

TITLE: SITE PLAN - PROPOSED

Date: 06.11.25 Drawn: D.A.

Scale: As indicated Designed: N.H.

Job No.: 2025-329-C Drawing No.: WD 102 Rev.: 6

PRELIMINARY
NOT FOR CONSTRUCTION
PLANS ARE SUBJECT TO CHANGE TO COMPLY WITH RELEVANT COVENANT & BUILDING CERTIFICATION APPROVALS

INDICATES EXISTING STREET TREE. TREE LOCATIONS & SIZES SHOWN INDICATIVE ONLY

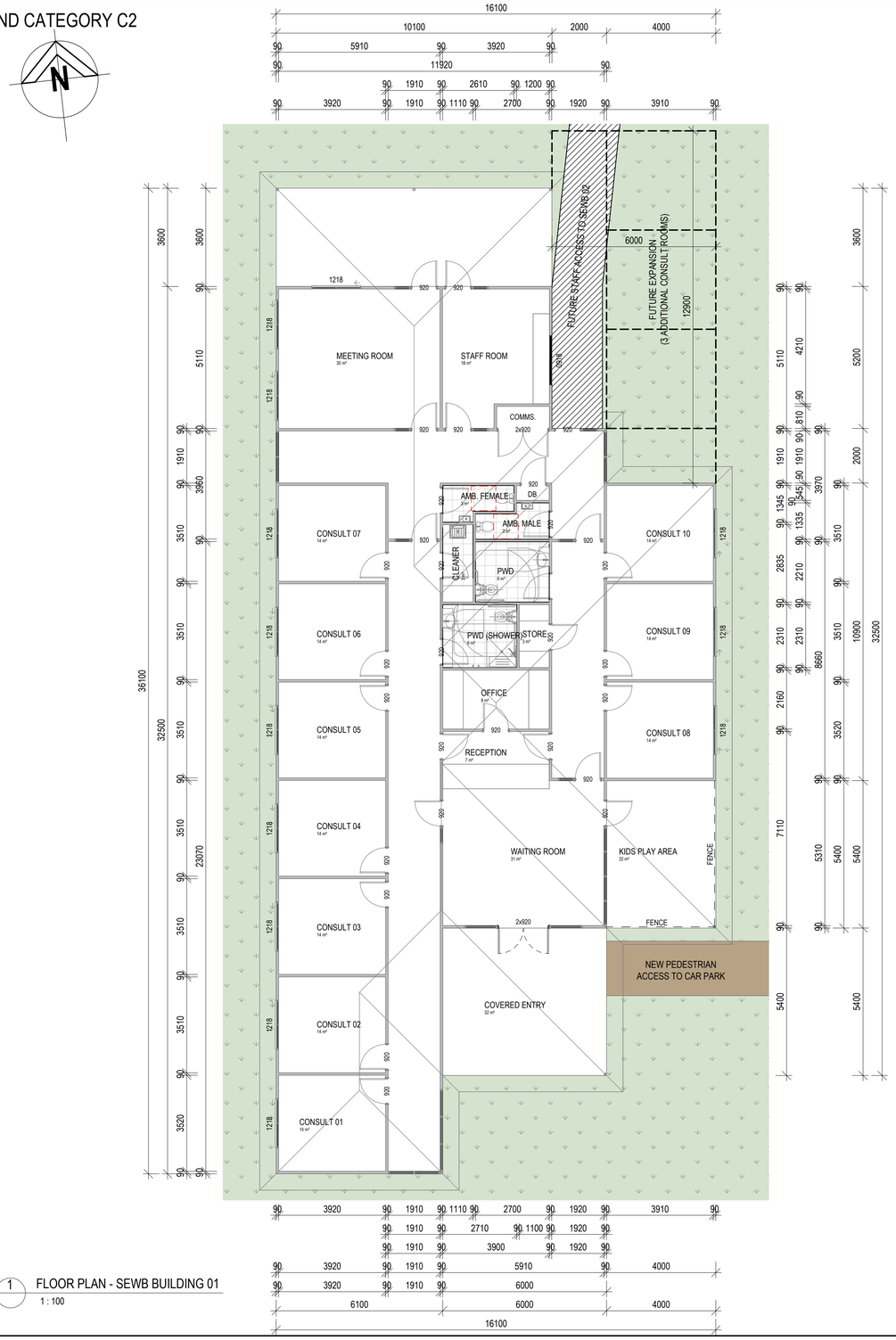
NEW CONC. FOOTPATH TO TCC REQUIREMENTS

NEW 2100H AL. POWDER COATED SECURITY FENCE WITH DIAMOND SHAPED/CRIMPED SPEAR TOPS TO PERIMETER OF SITE WHERE INDICATED. SECURE ACCESS POINTS TO BE CONFIRMED WITH CLIENT

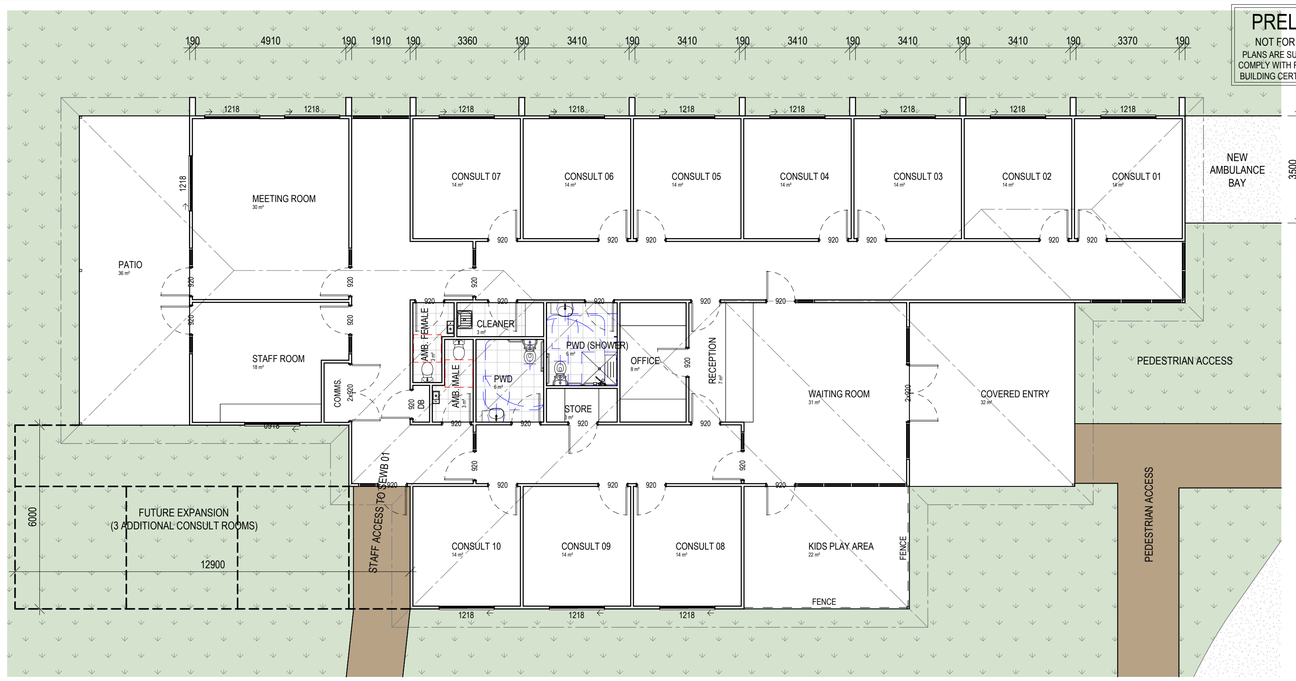
REAL PROPERTY DESCRIPTION
LOT 158 ON SP 139546 & LOT 159 ON SP223219
TOTAL AREA OF LAND: 16180m²
LOCAL GOVERNMENT: TOWNSVILLE CITY COUNCIL

Document Set ID: 28248393
Version: 1, Version Date: 10/04/2026

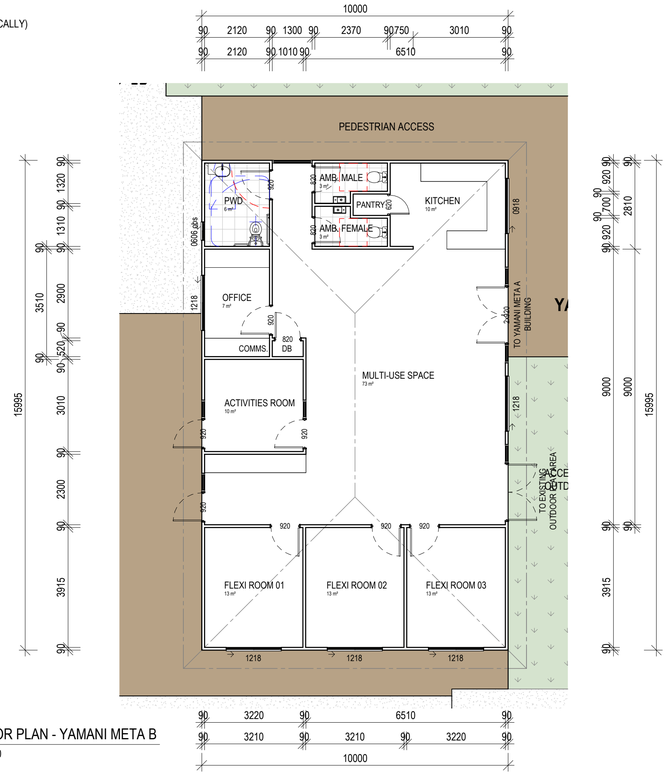
WIND CATEGORY C2



1 FLOOR PLAN - SEWB BUILDING 01
1 : 100



2 FLOOR PLAN - SEWB BUILDING 02
1 : 100
(SIMILAR TO SEWB BUILDING 01, ROTATED & MIRRORED VERTICALLY)



3 FLOOR PLAN - YAMANI META B
1 : 100

PRELIMINARY
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NOTES:
1. VERIFY ALL LEVELS & DIMENSIONS BEFORE COMMENCING ANY FABRICATION
2. FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED
3. COMPLY WITH LOCAL AUTHORITY, STANDARD BUILDING LAW AND ALL RELEVANT AUSTRALIAN STANDARDS & LEGISLATION
4. THIS DRAWING IS ONLY INTENDED TO OBTAIN A LOCAL AUTHORITY BUILDING PERMIT
5. THIS DRAWING IS COPYRIGHT TO THE DESIGN HOUSE NQ pty ltd & IS NOT TO BE COPIED OR DUPLICATED IN PART OR FULL WITH OUT THE PERMISSION OF THE DESIGN HOUSE NQ pty ltd

REV ISSUE	DATE	DESCRIPTION
6	06.03.26	TCC RFI RESPONSE
4	13.01.26	REFUSE AREA ADDED
3	08.12.25	INDICATIVE LANDSCAPING ADDED
2	11.11.25	PRELIMINARY

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The Design House NQ

Project: TAIHS GORDON STREET PRECINCT MASTERPLANNING
Client: TAIHS (ABORIGINAL & ISLANDER HEALTH SERVICE)
Location: CORNER OF GORDEN & PEEL STREET, GARBUTT

TITLE: FLOOR PLANS
Date: 06.11.25 Drawn: D.A.
Scale: 1 : 100 Designed: N.H.
Job No.: 2025-329-C Drawing No.: WD 200 Rev.: 6

WIND CATEGORY C2

PRELIMINARY
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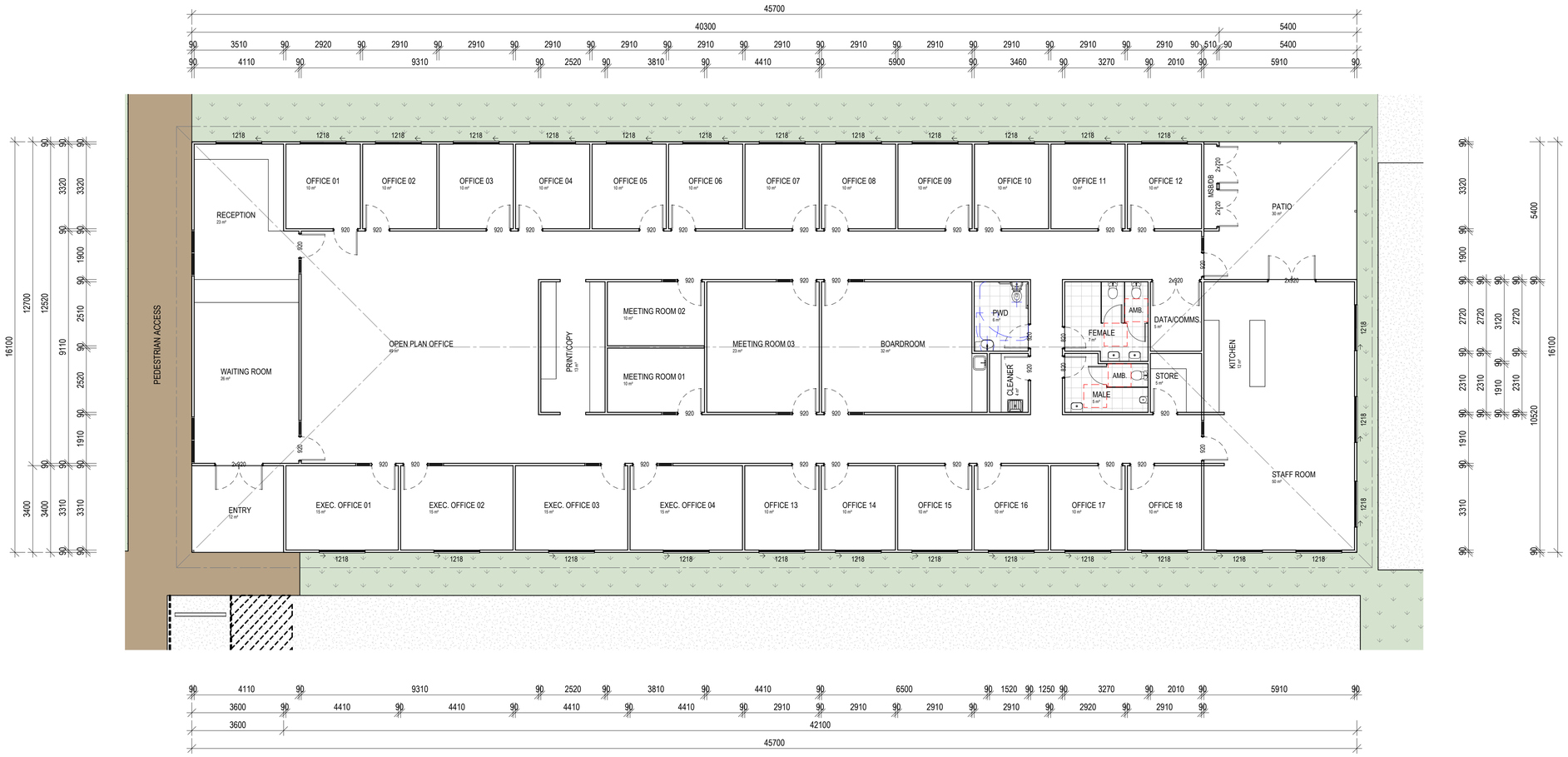
PLANS ARE SUBJECT TO CHANGE TO COMPLY WITH RELEVANT COVENANT & BUILDING CERTIFICATION APPROVALS



1 FLOOR PLAN - ADMINISTRATION BUILDING
1 : 100

NOTES:

1. VERIFY ALL LEVELS & DIMENSIONS BEFORE COMMENCING ANY FABRICATION
2. FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED
3. COMPLY WITH LOCAL AUTHORITY, STANDARD BUILDING LAW AND ALL RELEVANT AUSTRALIAN STANDARDS & LEGISLATION
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REV ISSUE	DATE	DESCRIPTION
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4	13.01.26	REFUSE AREA ADDED
3	08.12.25	INDICATIVE LANDSCAPING ADDED
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The Design House NQ

Project: TAIHS GORDON STREET PRECINCT MASTERPLANNING
Client: TAIHS (ABORIGINAL & ISLANDER HEALTH SERVICE)
Location: CORNER OF GORDEN & PEEL STREET, GARBUTT

TITLE: FLOOR PLANS
Date: 06.11.25 Drawn: D.A.
Scale: 1 : 100 Designed: N.H.
Job No.: 2025-329-C Drawing No.: WD 201 Rev.: 6

24-279 GORDON STREET CLINIC FITOUT TIAHS
HYDRAULIC SERVICES

GENERAL NOTES:

1. ALL WORK TO BE CONSTRUCTED IN ACCORDANCE WITH:-
   - 1.1. PLUMBING AND DRAINAGE ACT
   - 1.2. PLUMBING AND DRAINAGE REGULATION
   - 1.3. STANDARD PLUMBING AND DRAINAGE REGULATION
   - 1.4. BUILDING ACT
   - 1.5. NATIONAL CONSTRUCTION CODE
   - 1.6. AS2419.1:2021
   - 1.7. AS2441:2005
   - 1.8. AS2444:2001
   - 1.9. AS3500:2021 (ALL PARTS)
   - 1.10. QUEENSLAND PLUMBING & WASTEWATER CODE
   - 1.11. TOWNSVILLE CITY COUNCIL REGULATIONS AND REQUIREMENTS and
   - 1.12. ALL OTHER RELEVANT AUSTRALIAN STANDARDS AS REQUIRED
2. CONTRACTOR TO CHECK INTERPRETATION OF BYLAWS WITH COUNCIL
3. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH THE ARCHITECTS, ENGINEERS AND LANDSCAPE CONSULTANT DRAWINGS AND SPECIFICATIONS
4. CONTRACTOR TO VERIFY ALL SURFACE LEVELS, INVERT LEVELS AND COVER OVER WASTE DRAINAGE LINES ARE CORRECT AND OBTAINABLE BEFORE COMMENCEMENT OF WORK ON SITE
5. LOCATIONS OF EXISTING SERVICES ON SITE ARE ONLY APPROXIMATE AND HAVE NOT BEEN VERIFIED, THE CONTRACTOR SHALL VERIFY LOCATIONS AND SIZES OF SERVICES BEFORE COMMENCEMENT OF WORK.
6. CONCEAL ALL PIPEWORK WHERE POSSIBLE
7. ALL PIPES LAID UNDER SLAB TO BE MINIMUM DEPTH OF 400mm TO INVERT LEVEL AND SHALL BE 100mm DIA U.N.O.
8. ALL PIPE SIZES SHOWN ARE NOMINAL BORE UNLESS NOTED OTHERWISE

HOT AND COLD WATER:

1. PIPES LOCATED IN MASONRY WALLS TO BE INSULATED KEMLAG TUBE OR SIMILAR APPROVED
2. LOCATIONS OF CONTROL VALVES ARE SHOWN DIAGRAMMATICALLY ONLY. LOCATE ON SITE IN ACCESSIBLE POSITIONS
3. HOT AND COLD WATER PIPEWORK ON THESE DRAWINGS ARES SHOWN DIAGRAMMATICALLY ONLY.
4. ALL HOT AND COLD WATER LINES TO INDIVIDUAL FIXTURES TO BE A MINIMUM OF 15mm DIA AND 20mm DIA TO TWO OR MORE FIXTURES, OR AS SHOWN ON THE DRAWINGS
5. HOT WATER UNITS TO BE CAPABLE OF ATTAINING AND MAINTAINING TEMPERATURES IN EXCESS OF THOSE REQUIRED AT THEIR POINT OF USE AND INSTALLED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS.
6. MATERIALS:
   - 6.1. COLD WATER SERVICE: COPPER TYPE B - CHROME PLATED WHERE EXPOSED, POLYETHYLENE PEX A
   - 6.2. HOT WATER SERVICE: COPPER TYPE B - CHROME PLATED WHERE EXPOSED, POLYETHYLENE PEX A
   - 6.3. COPPER CRIMPED FITTINGS SHALL BE OF THE VEIGA TYPE WITH DOUBLE "O" RINGS OR APPROVED EQUAL
7. HOT WATER UNITS TO BE LOCATED IN NON-CORROSIVE SAFE TRAY WITH 50mm DIA WASTES IN ACCORDANCE WITH AS.3500.4 DISCHARGING AS SHOWN ON THE DRAWINGS
8. ALL HC's SHALL BE FITTED WITH APPROVED BACKFLOW PREVENTION DEVICES
9. ALL HOT WATER PIPEWORK TO BE INSULATED TO AS.3500.4:2021
   - 9.1. HOT WATER FLOW AND RETURN LINE PIPEWORK SHALL BE FULLY INSULATED WITH 25mm THICK THERMOTEC 4 ZERO INSULATION OR APPROVED EQUAL
   - 9.2. ALL BRANCHES FROM A HOT WATER FLOW AND RETURN LINE SHALL BE INSULATED A MINIMUM OF 1m ALONG EACH BRANCH
   - 9.3. ALL HOT WATER PIPEWORK SHALL BE INSULATED WITH THE CORRECT SIZE FOR THE PIPE IT IS INSULATING

SANITARY PLUMBING AND DRAINAGE:

1. ALL DRAINAGE SHALL BE 100mm DIA. UPVC RUN AT MINIMUM GRADE OF 1:60 U.N.O.
2. ALL VENT PIPES TO TERMINATE IN ACCORDANCE WITH AS.3500.2:2021
3. ALL I.O's UNDER CONCRETE ARE TO BE TAKEN TO SURFACE LEVEL AND FITTED WITH APPROVED BRASS SCREW CAPS
4. ALL FWG's SHALL HAVE 100mm DIA RISERS AND REMOVABLE METAL SCREW GRATES CHROME PLATED WHERE EXPOSED. FWG RISER SHALL BE STRAIGHT WITH NO BENDS OR DEVIATIONS
5. WHERE PVC PIPES PENETRATE OR ARE BUILT INTO WALLS OR SLABS THE PIPES SHALL BE LAGGED WITH APPROVED MATERIALS IN ACCORDANCE WITH AS.3500.2:2021
6. MATERIALS:
   - 6.1. WASTE AND VENT PIPES AND FITTINGS: UPVC CLASS "SN6" SMOOTH WALL PIPE TO AS.1260:2009 AND FITTED WITH FIRE STOP COLLARS WHERE REQUIRED OR COPPER TYPE D TO AS.1432
   - 6.2. HOUSE DRAINAGE: UPVC CLASS "SN6" SMOOTH WALL PIPE TO AS.1260
   - 6.3. TRADEWASTE DRAINAGE: HIGH DENSITY POLY ETHYLENE or REHAU RAUPIANO
7. ALL WC's TO BE SCREW FIXED TO THE FLOOR WITH NYLON PLUGS AND NON-CORROSIVE METAL SCREWS.
8. ALL DISCHARGE PIPES RECEIVING CONDENSATE WASTES INCLUDING TRAPS SHALL BE INSULATED

FIRE SERVICES:

1. FIRE HOSE REELS SHALL BE INSTALLED IN ACCORDANCE WITH AS.2441:2005
2. FIRE HOSE REEL ASSEMBLIES SHALL COMPLY WITH AS.1221:1991
3. MATERIALS:
   - 3.1. FIRE HOSE REEL SYSTEM:
     - 3.1.1. ABOVE GROUND COPPER CLASS "B " IF CONNECTED TO A POTABLE WATER SERVICE
     - 3.1.2. ABOVE GROUND GALVANIZED STEEL MEDIUM GRADE IF CONNECTED TO A FIRE HYDRANT SYSTEM
     - 3.1.3. BELOW GROUND COPPER CLASS "B" or RED STRIPED BLACK POLYETHYLENE
4. MATERIALS :
   - 4.1. FIRE HYDRANT SYSTEM:
     - 4.1.1. ABOVE GROUND GALVANIZED STEEL MEDIUM GRADE
     - 4.1.2. BELOW GROUND BLUE RHINO PVC-M PN16 or RED STRIPED POLYETHYLENE PN16
5. FIRE HYDRANT MAINS SHALL BE 100ø (min) UNLESS SHOWN OTHERWISE.
6. FIRE HOSE REEL MAINS SHALL BE 25ø (min) UNLESS SHOWN OTHERWISE
7. FIRE HYDRANTS ARE REFERRED TO AS SPECIAL FIRE SERVICES
8. THE INSTALLATION OF ALL FIRE SERVICES SHALL BE SIGNED OFF BY A LICENSED INSTALLER, CONTRACTOR TO PROVIDE A COPY OF THE LICENSE HOLDERS INFORMATION AND APPROVAL PRIOR TO COMMENCEMENT OF THE WORKS
9. ALL GASKETS USED IN THE FIRE SERVICES INSTALLATION ARE TO BE EITHER OF THE FIBRE TYPE OR RUBBER TYPE AND BOTH SHALL BE TESTED AND APPROVED FOR USE IN A FIRE SYSTEM INSTALLATIONS. ALL GASKETS ARE TO BE RATED TO A MINIMUM OF 1700KPA OR 1.5 TIMES THE SYSTEMS PRESSURE REQUIREMENTS TO AS.2419.1
10. THE ENTIRE FIRE SYSTEM IS TO BE TESTED AND COMMISSIONED TO AS.3500:2021, QUEENSLAND FIRE AND EMERGENCY SERVICES REQUIREMENTS, AS.2419.1:2021 AND AS.2941 WHERE A FIRE PUMP IS INSTALLED
11. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ANY FIRE HYDRANT BOOSTER ASSEMBLIES, BOOSTER PUMPS, WATER STORAGE TANKS AND PIPEWORK PRIOR TO ORDER AND INSTALLATION
12. THE FIRE HYDRANT SYSTEM or STREET FIRE HYDRANT COVERAGE AND FLOW TESTING SHALL BE APPROVED BY THE REGULATORY AUTHORITY PRIOR TO THE INSTALLATION AND/OR WORKS. QFES REFERRAL SHALL BE PROVIDED AT THE DISCRETION OF THE BUILDING CERTIFIER. IT IS THE CONTRACTORS RESPONSIBILITY TO HAVE APPROVALS IN PLACE PRIOR TO THE START OF THE WORKS.

WATER MANAGEMENT:

1. ALL WC PANS SHALL BE FITTED WITH A 6/3 LITRE DUAL FLUSH TYPE CISTERN AND PAN.
2. ALL TAPWARE OUTLETS TO BE FITTED WITH FLOW CONTROL REGULATORS WITH THE FOLLOWING FLOW RATES:
   - 2.1. SINKS: 9 LITRES PER MINUTE
   - 2.2. SHOWERS: 9 LITRES PER MINUTE
   - 2.3. BASINS: 6 LITRES PER MINUTE
   - 2.4. TUBS: 9 LITRES PER MINUTE
3. ALL FIXTURES AND TAPWARE SHALL BEAR THE MARK OF A WATER MARK APPROVAL

DRAWING SCHEDULE

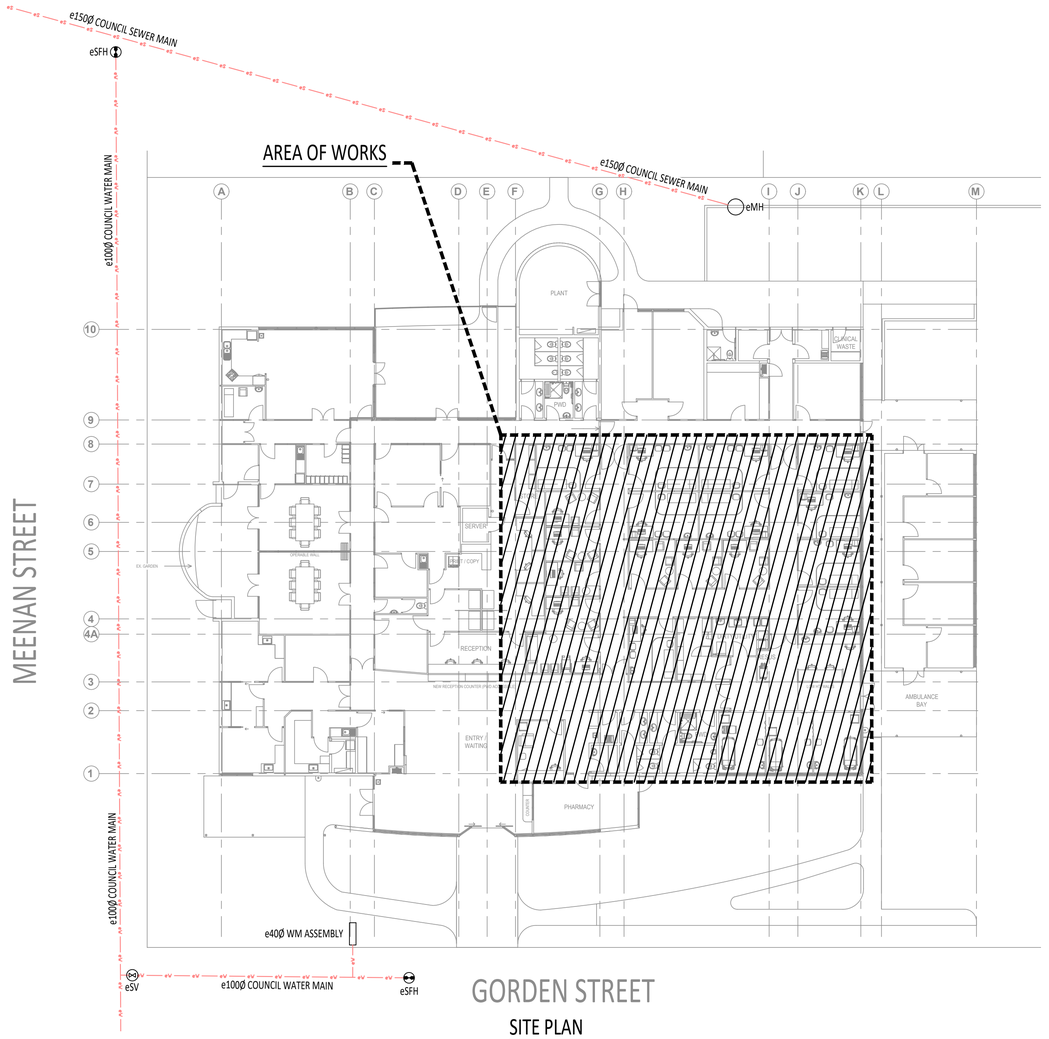
SHEET #	SHEET TITLE	ISSUE
H100	TITLE PAGE & NOTES	A
H200	SANITARY PLUMBING AND DRAINAGE - DEMOLITION	A
H201	SANITARY PLUMBING AND DRAINAGE	A
H300	WATER RETICULATION	A
F100	FIRE HYDRANT COVERAGE	A
F101	FIRE HOSE REEL COVERAGE	A

LEGEND

AAV	AIR ADMITTANCE VALVE	TUB	LAUNDRY TUB
B	BASIN	TV	TEMPERING VALVE
C	COLD	TW	TEPID WATER
COS	CLEAR OUT TO SURFACE	U/G	UNDERGROUND
CS	CLEANERS SINK	UR	URINAL
CW	COLD WATER	V	VENT
DG	DISCONNECTOR GULLY	VP	VENT PIPE
e	EXISTING	WC	WATER CLOSET
FH	FIRE HYDRANT		
FHR	FIRE HOSE REEL		
FJ	FLEXIBLE JOINT		
FWG	FLOOR WASTE GULLY		
H	HOT		
HC	HOSE COCK		
HW	HOT WATER		
IO	INSPECTION OPENING		
MH	MANHOLE		
N.T.S	NOT TO SCALE		
ORG	OVERFLOW RELIEF GULLY		
S	SINK		
SHR	SHOWER		
SV	STOP VALVE		
TD	TUNDISH		
TMV	THERMOSTATIC MIXING VALVE		

LEGEND

COLD WATER	
HOT WATER	
TEPID WATER	
SEWER	
EXISTING SEWER TBA	
EXISTING SEWER	
VENT	
EXISTING VENT TBA	
EXISTING VENT	
FIRE HYDRANT COVERAGE	
FIRE HOSE REEL COVERAGE	



SITE PLAN
Scale: 1:200@A1

A	FOR APPROVAL	26/08/2025
ISSUE	SUBJECT	DATE

AMENDMENTS

PROJECT
GORDON STREET CLINIC FITOUT TIAHS

ADDRESS
57-67 GORDON STREET
GARBUTT Q 4814
LOT 158 ON SP139546

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tippett schrock architects
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HYDRAULIC CONSULTANT
PARKER HYDRAULIC DESIGNS
HYDRAULIC SERVICES & WET FIRE PROTECTION CONSULTANTS
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UNIT 2 / 21 TAVERN STREET
KIRWAN, 4817
PHONE - 07 4766 8363
EMAIL - admin@parkerhydraulicdesigns.com.au

CLIENT
TOWNSVILLE ABORIGINAL & ISLANDER HEALTH SERVICES

TITLE
HYDRAULIC SERVICES
TITLE PAGE & NOTES

JOB No. 24-279	DESIGNED MARK W PARKER		QBCC No. 1292354
DATE 26/08/2025	DRAWN JS	CHECKED MWP	ISSUE A
DWG. No. 24-279-H100			

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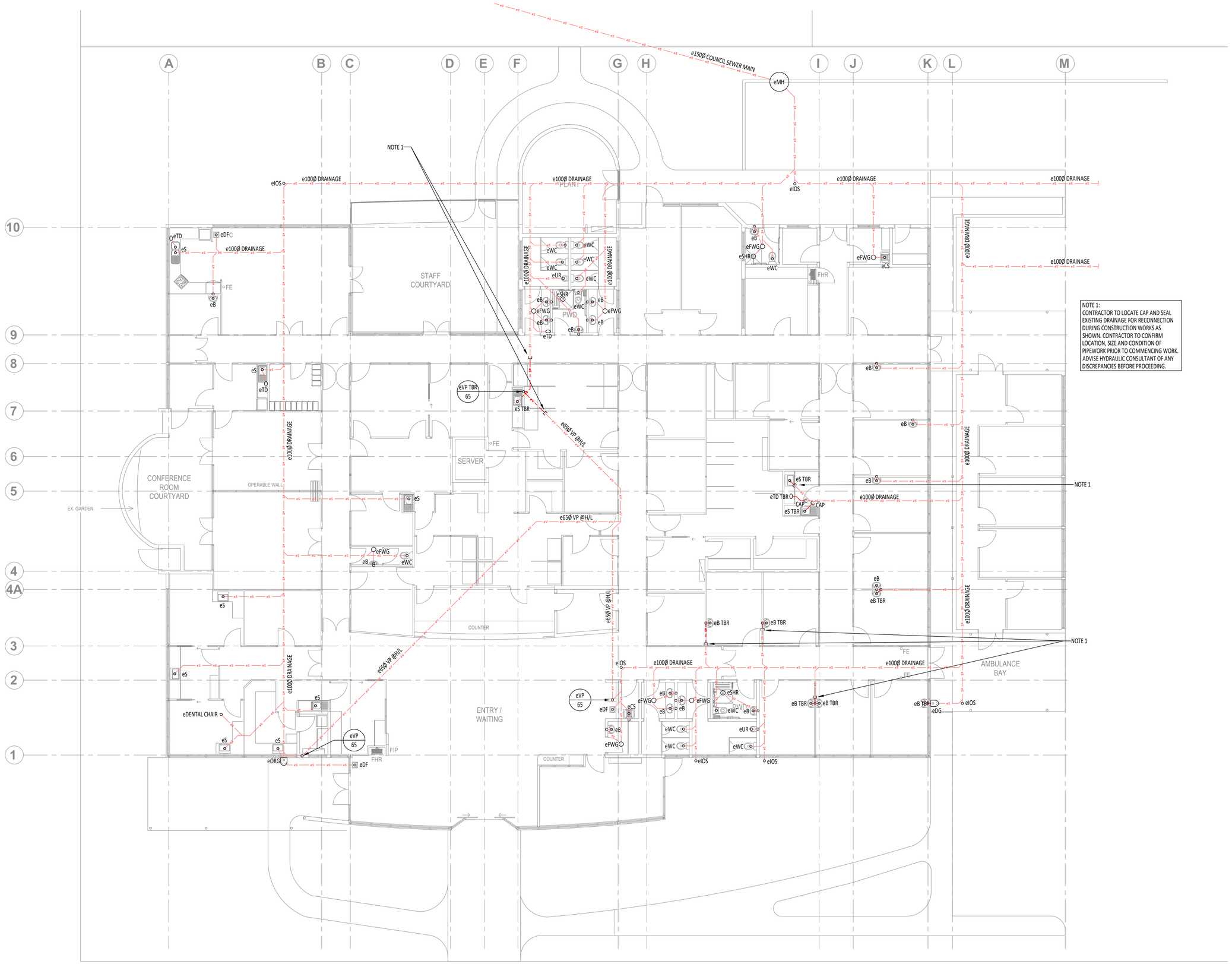

NOTE 1:
CONTRACTOR TO LOCATE CAP AND SEAL EXISTING DRAINAGE FOR RECONNECTION DURING CONSTRUCTION WORKS AS SHOWN. CONTRACTOR TO CONFIRM LOCATION, SIZE AND CONDITION OF PIPEWORK PRIOR TO COMMENCING WORK. ADVISE HYDRAULIC CONSULTANT OF ANY DISCREPANCIES BEFORE PROCEEDING.

SANITARY PLUMBING AND DRAINAGE - DEMOLITION PLAN

Scale: 1:100@A1

A	FOR APPROVAL	26/08/2025
ISSUE	SUBJECT	DATE

AMENDMENTS

PROJECT

GORDON STREET CLINIC FITOUT
TIAHS

ADDRESS

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CLIENT

TOWNSVILLE ABORIGINAL & ISLANDER HEALTH SERVICES

TITLE

HYDRAULIC SERVICES
SANITARY PLUMBING AND DRAINAGE - DEMOLITION

JOB No.	DESIGNED	QBCC No.
24-279	MARK W PARKER	1292354
DATE	DRAWN / CHECKED	ISSUE
26/08/2025	JS / MWP	A

DWG. No.

24-279-H200

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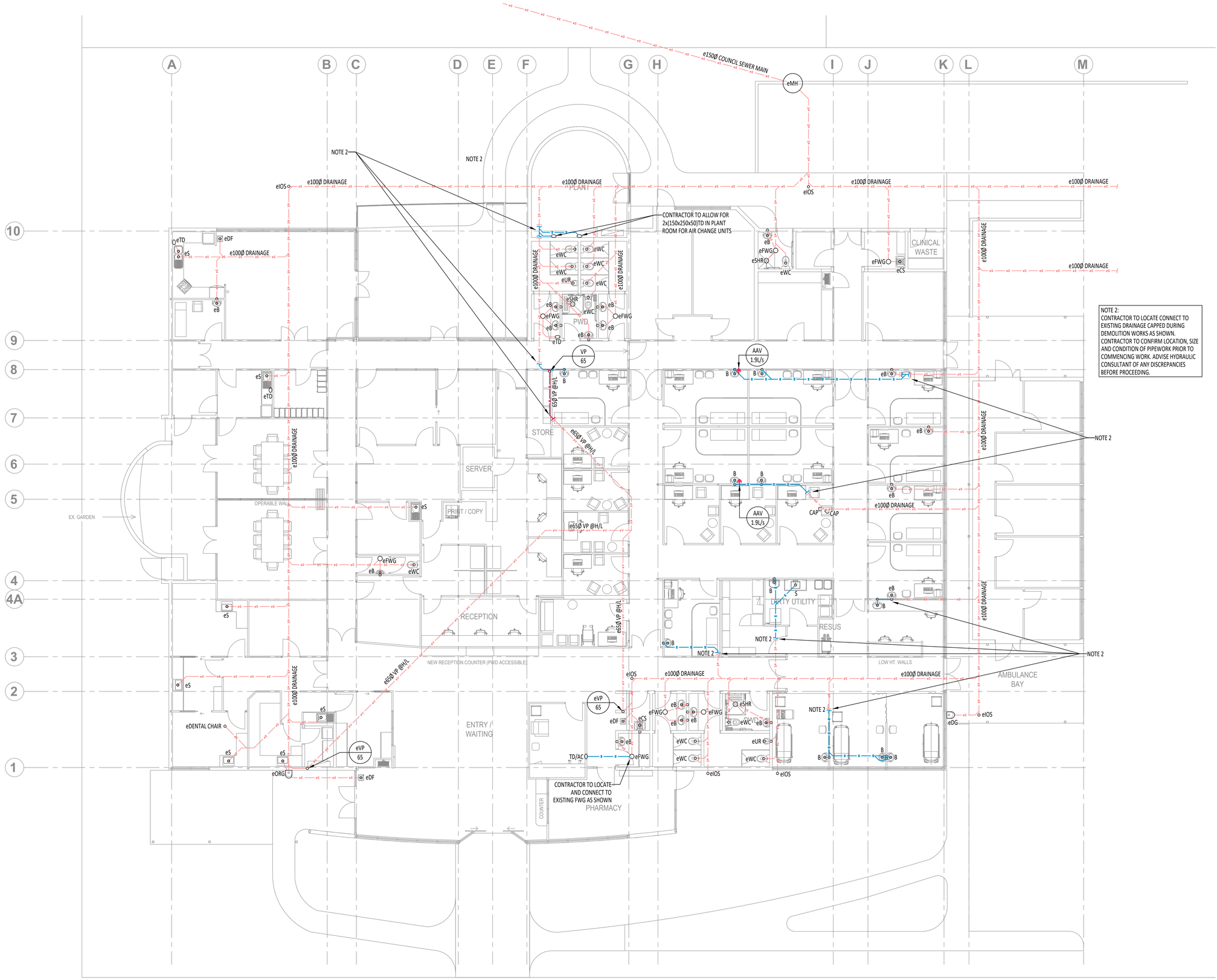

SANITARY PLUMBING AND DRAINAGE PLAN

Scale: 1:100@A1

A	FOR APPROVAL	26/08/2025
ISSUE	SUBJECT	DATE

AMENDMENTS

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HYDRAULIC SERVICES
SANITARY PLUMBING AND DRAINAGE

JOB No.	DESIGNED	QBCC No.
24-279	MARK W PARKER	1292354
DATE	DRAWN / CHECKED	ISSUE
26/08/2025	JS / MWP	A

DWG. No.

24-279-H201

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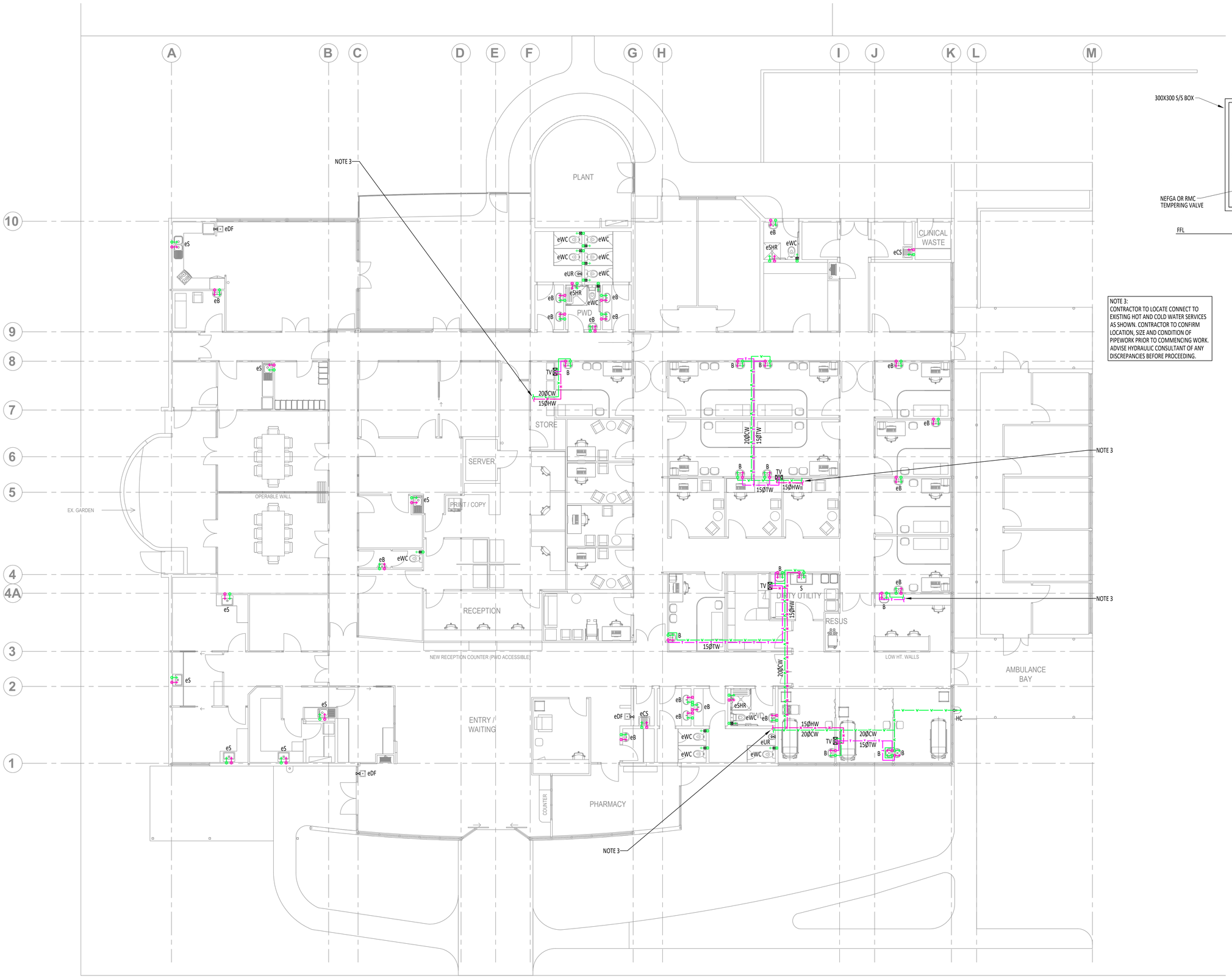
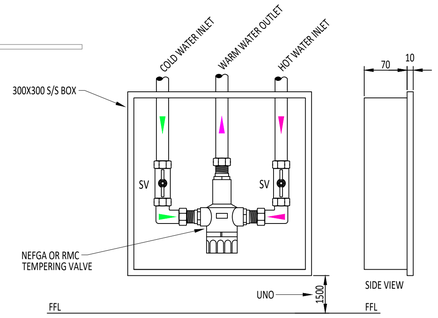
SCALE IN METRES - 1:100



WATER RETICULATION PLAN

Scale: 1:100@A1



TV TYPICAL SETOUT

N.T.S.

NOTE 3:
CONTRACTOR TO LOCATE CONNECT TO EXISTING HOT AND COLD WATER SERVICES AS SHOWN. CONTRACTOR TO CONFIRM LOCATION, SIZE AND CONDITION OF PIPEWORK PRIOR TO COMMENCING WORK. ADVISE HYDRAULIC CONSULTANT OF ANY DISCREPANCIES BEFORE PROCEEDING.

A	FOR APPROVAL	26/08/2025
ISSUE	SUBJECT	DATE

AMENDMENTS

PROJECT

GORDON STREET CLINIC FITOUT
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CLIENT

TOWNSVILLE ABORIGINAL & ISLANDER HEALTH SERVICES

TITLE

HYDRAULIC SERVICES
WATER RETICULATION

JOB No.	DESIGNED		QBCC No.
24-279	MARK W PARKER		1292354
DATE	DRAWN	CHECKED	ISSUE
26/08/2025	JS	MWP	A

DWG. No.

24-279-H300

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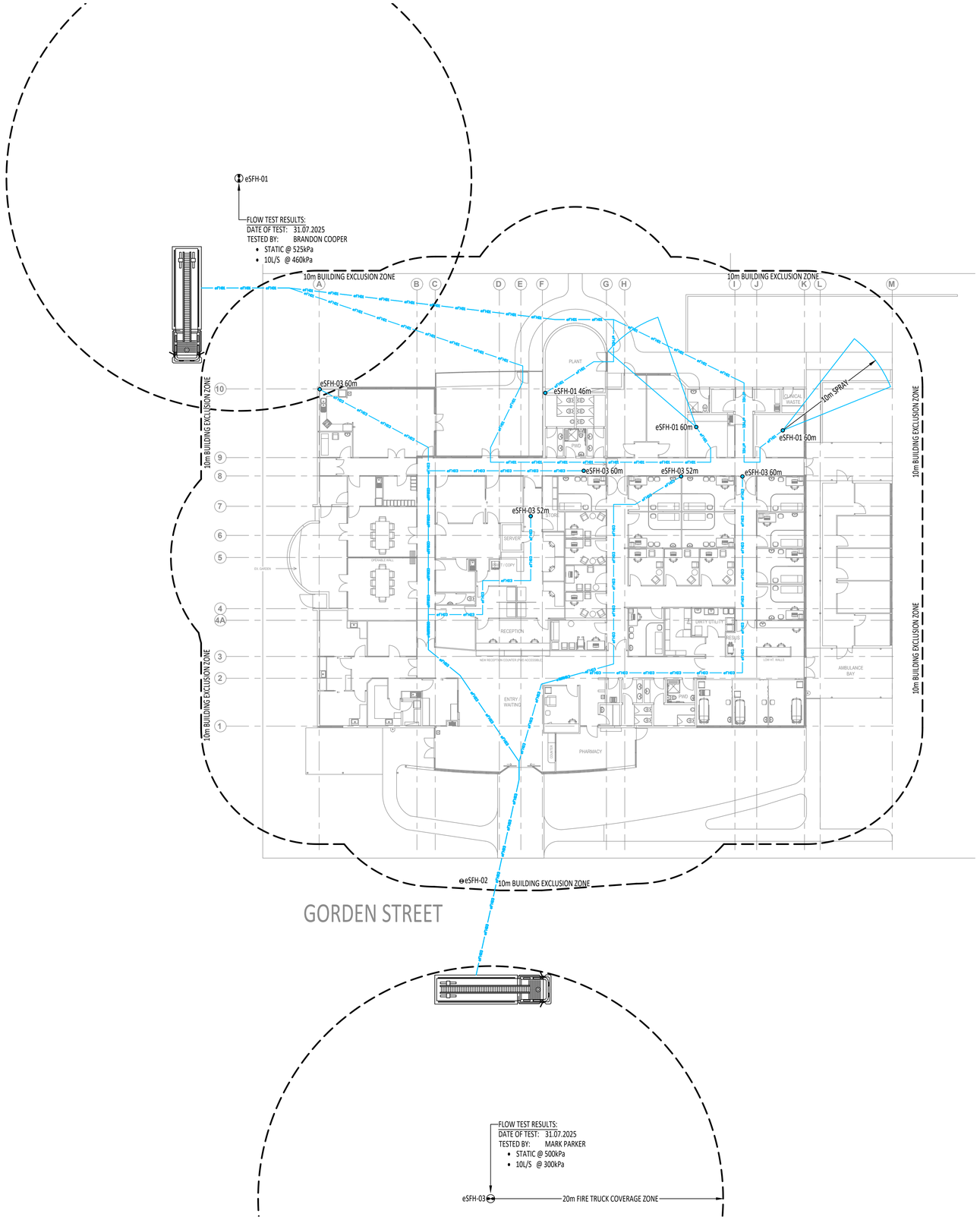

FIRE HYDRANT COVERAGE PLAN

Scale: 1:100@A1

A	FOR APPROVAL	26/08/2025
ISSUE	SUBJECT	DATE

AMENDMENTS

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TIAHS

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CLIENT

TOWNSVILLE ABORIGINAL & ISLANDER HEALTH SERVICES

TITLE

HYDRAULIC SERVICES
FIRE HYDRANT COVERAGE

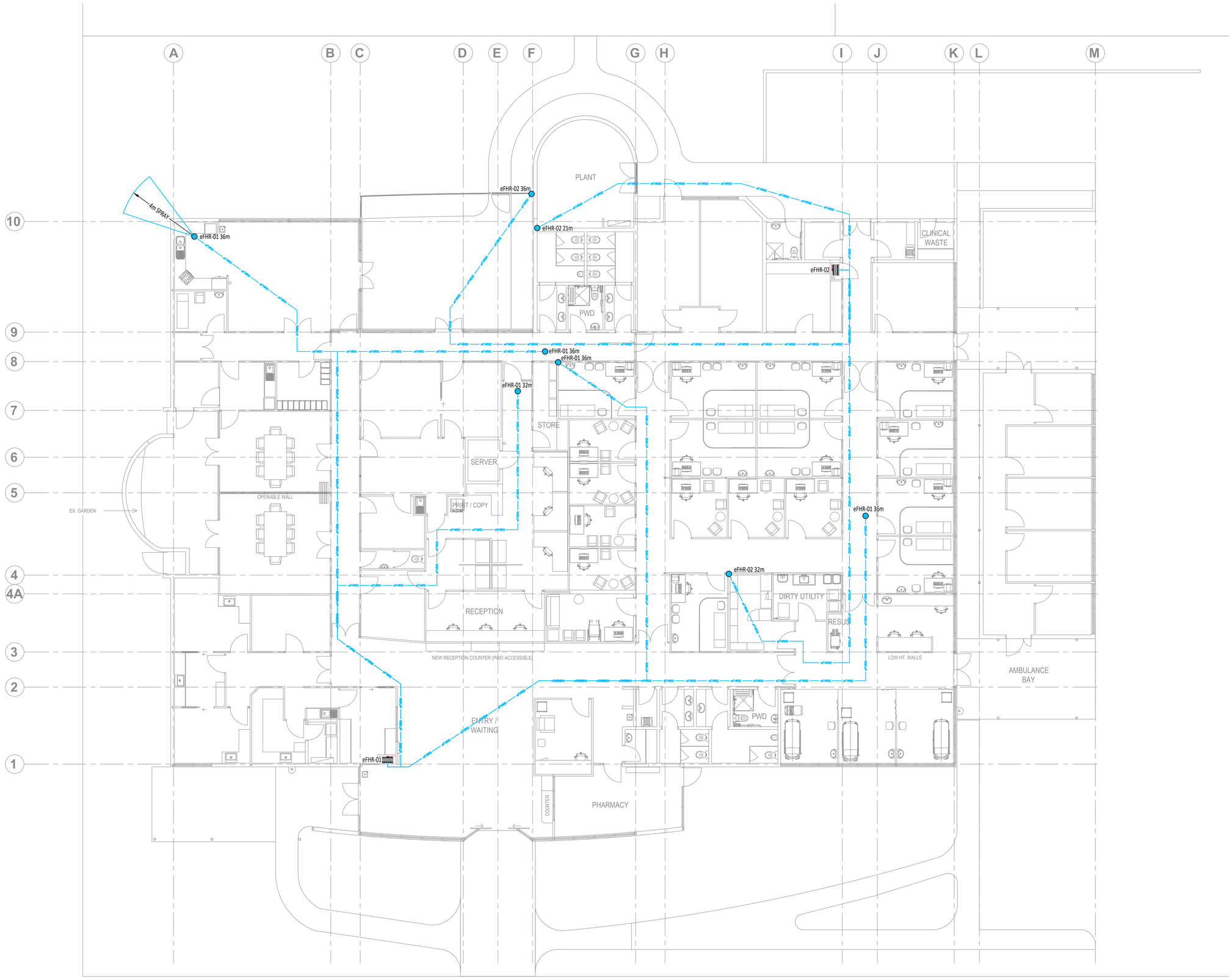
JOB No.	DESIGNED		QBCC No.
24-279	MARK W PARKER		1292354
DATE	DRAWN	CHECKED	ISSUE
26/08/2025	JS	MWP	A

DWG. No.

24-279-F100

0 1 2 3 4 5 6 7 8

SCALE IN METRES - 1:100



FIRE HOSE REEL COVERAGE PLAN

Scale: 1:100@A1

A	FOR APPROVAL	26/08/2025
ISSUE	SUBJECT	DATE

AMENDMENTS

PROJECT

GORDON STREET CLINIC FITOUT
TIAHS

ADDRESS

57-67 GORDON STREET
GARBUTT Q 4814
LOT 158 ON SP139546

ARCHITECT/BUILDING DESIGNER

TELEPHONE (07) 4772 3044
E-MAIL tas@TSArch.com.au
tippett schrock architects
BELROWES PLACE, 49 BUNDOCK ST BELGIAN GARDENS
P.O. BOX 76, BELGIAN GARDENS
QLD 4810

HYDRAULIC CONSULTANT

PARKER
HYDRAULIC DESIGNS
HYDRAULIC SERVICES & WET FIRE PROTECTION CONSULTANTS
ABN 46 658 444 145 QBCC - 15304577 ACN 658 444 145
UNIT 2 / 21 TAVERN STREET
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CLIENT

TOWNSVILLE ABORIGINAL & ISLANDER HEALTH SERVICES

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HYDRAULIC SERVICES
FIRE HOSE REEL COVERAGE

JOB No.	DESIGNED		QBCC No.
24-279	MARK W PARKER		1292354
DATE	DRAWN	CHECKED	ISSUE
26/08/2025	JS	MWP	A

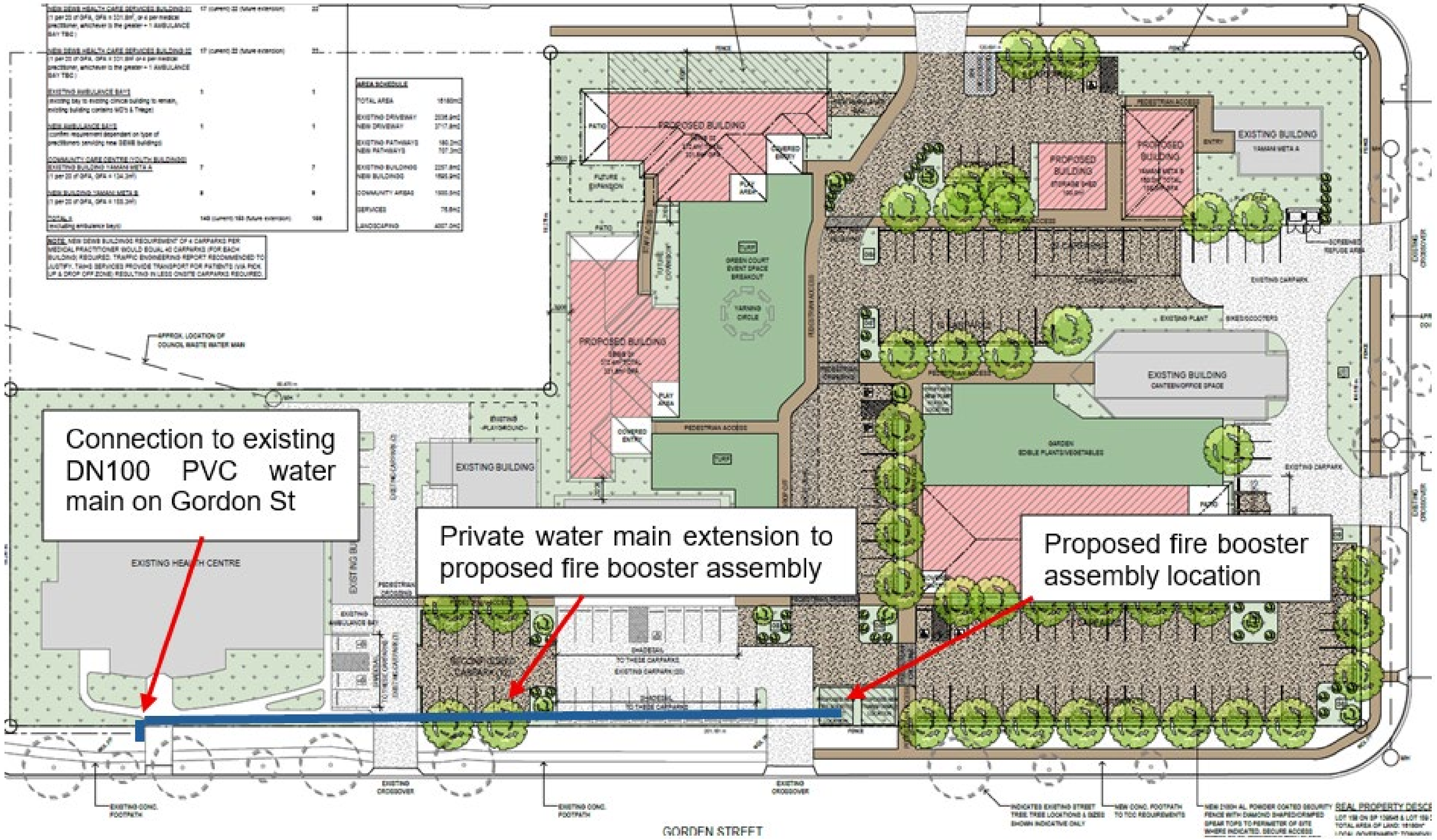
DWG. No.

24-279-F101

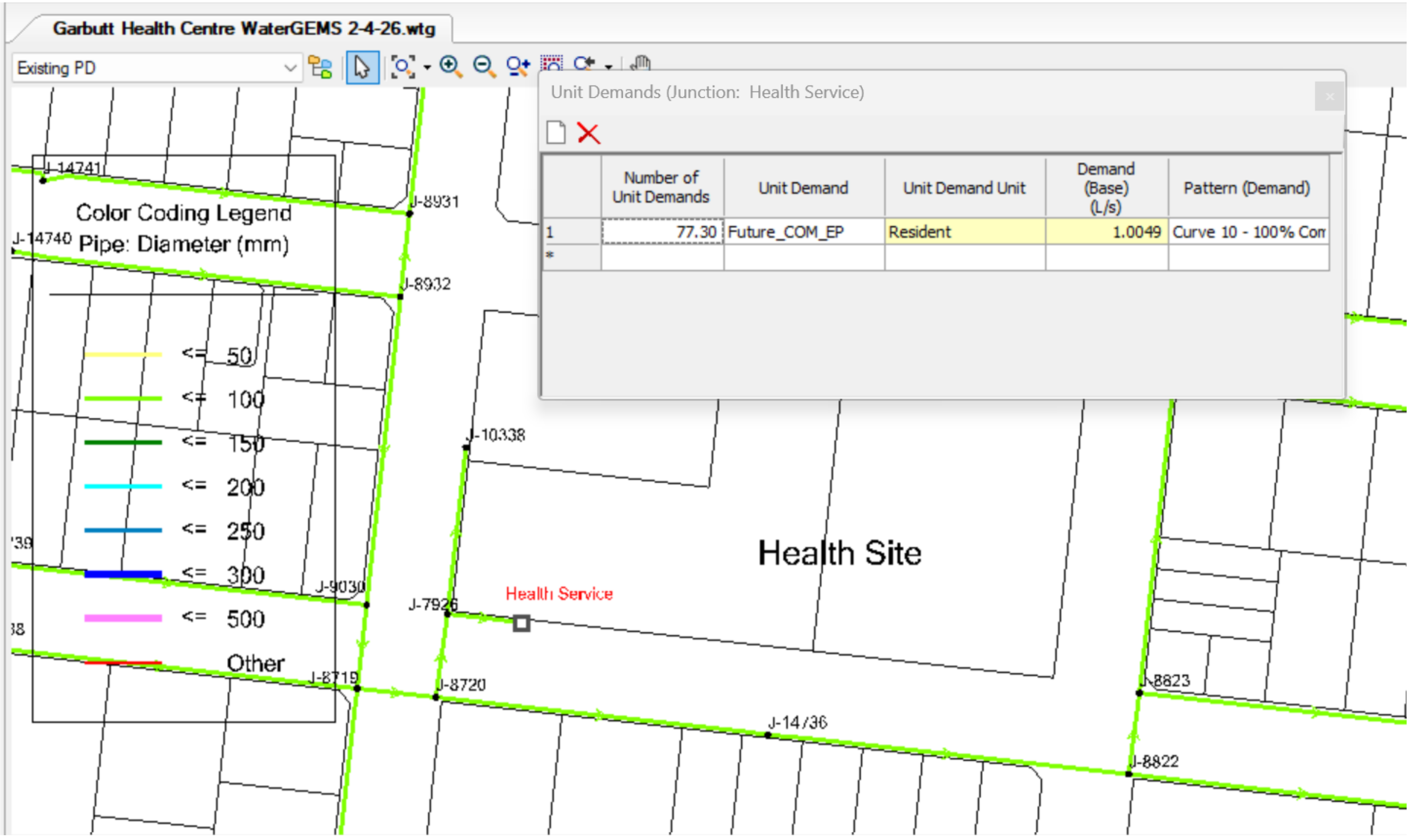
0 1 2 3 4 5 6 7 8

SCALE IN METRES - 1:100

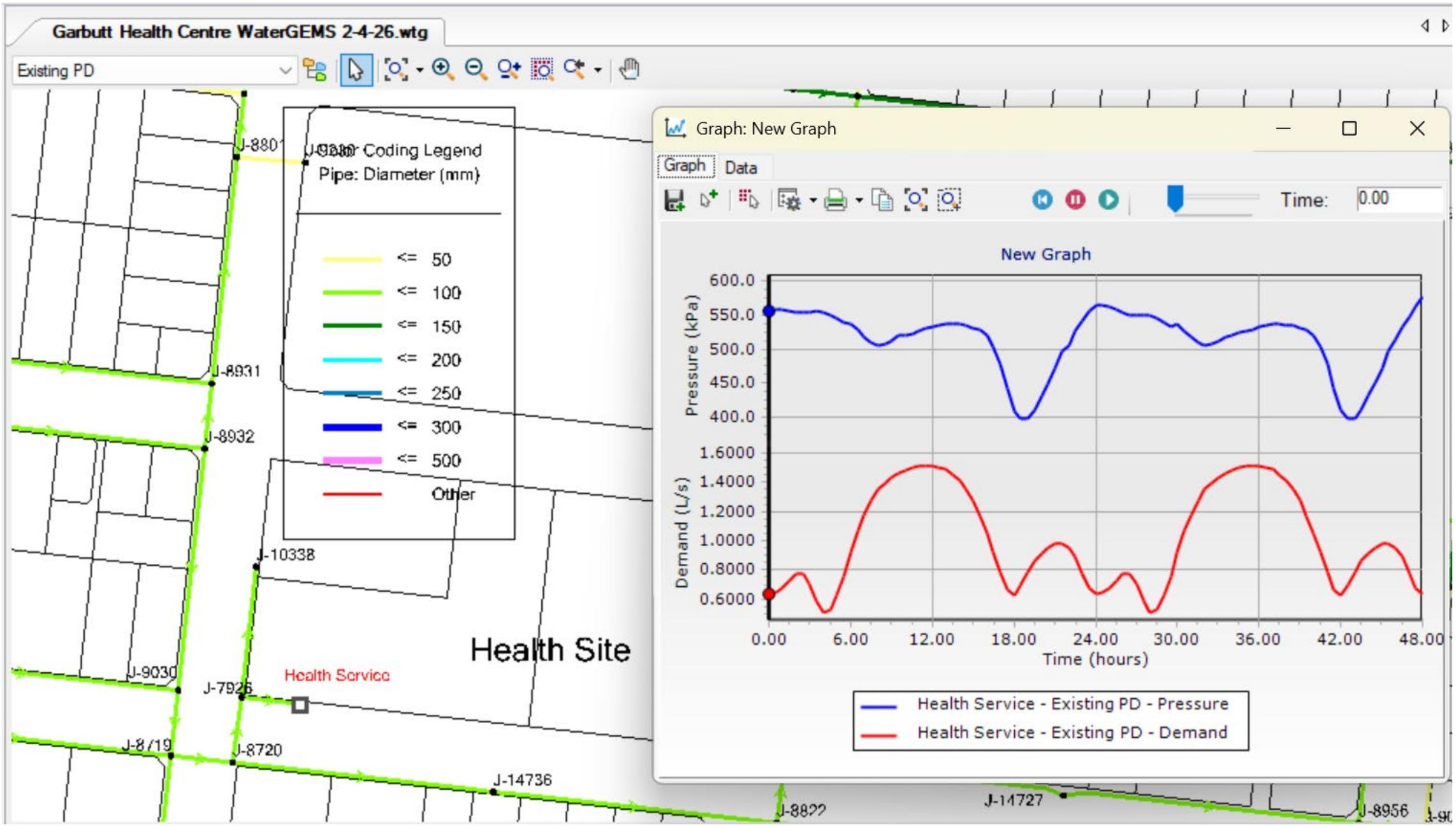
APPENDIX B
WATERGEMS MODELLING RESULTS



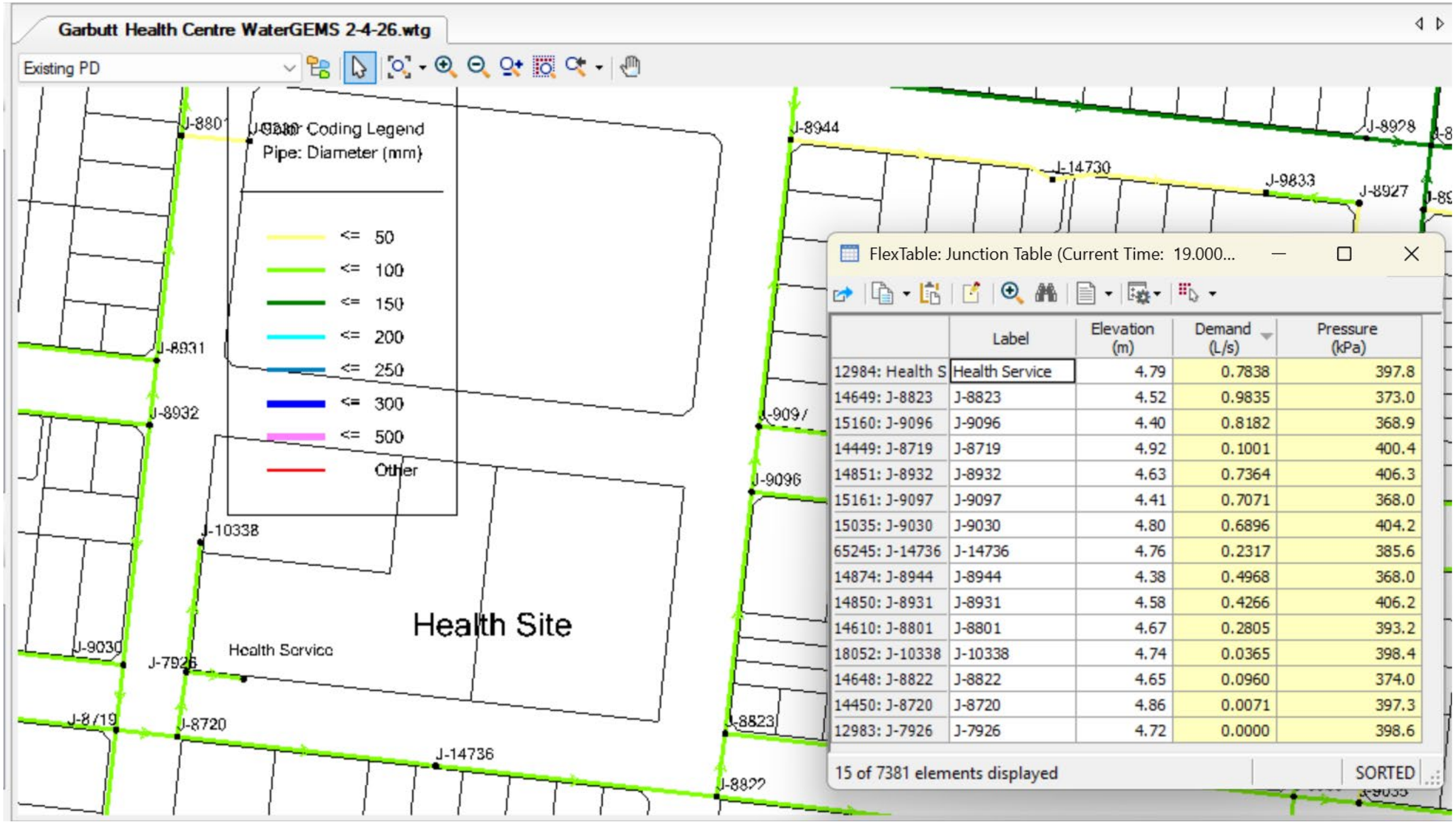
PRIVATE WATER SUPPLY CONCEPT – CONNECTION OFF EXISTING GORDEN ST DN100 PVC MAIN



WATERGEMS Model - Health Service Commercial Water Demand Added

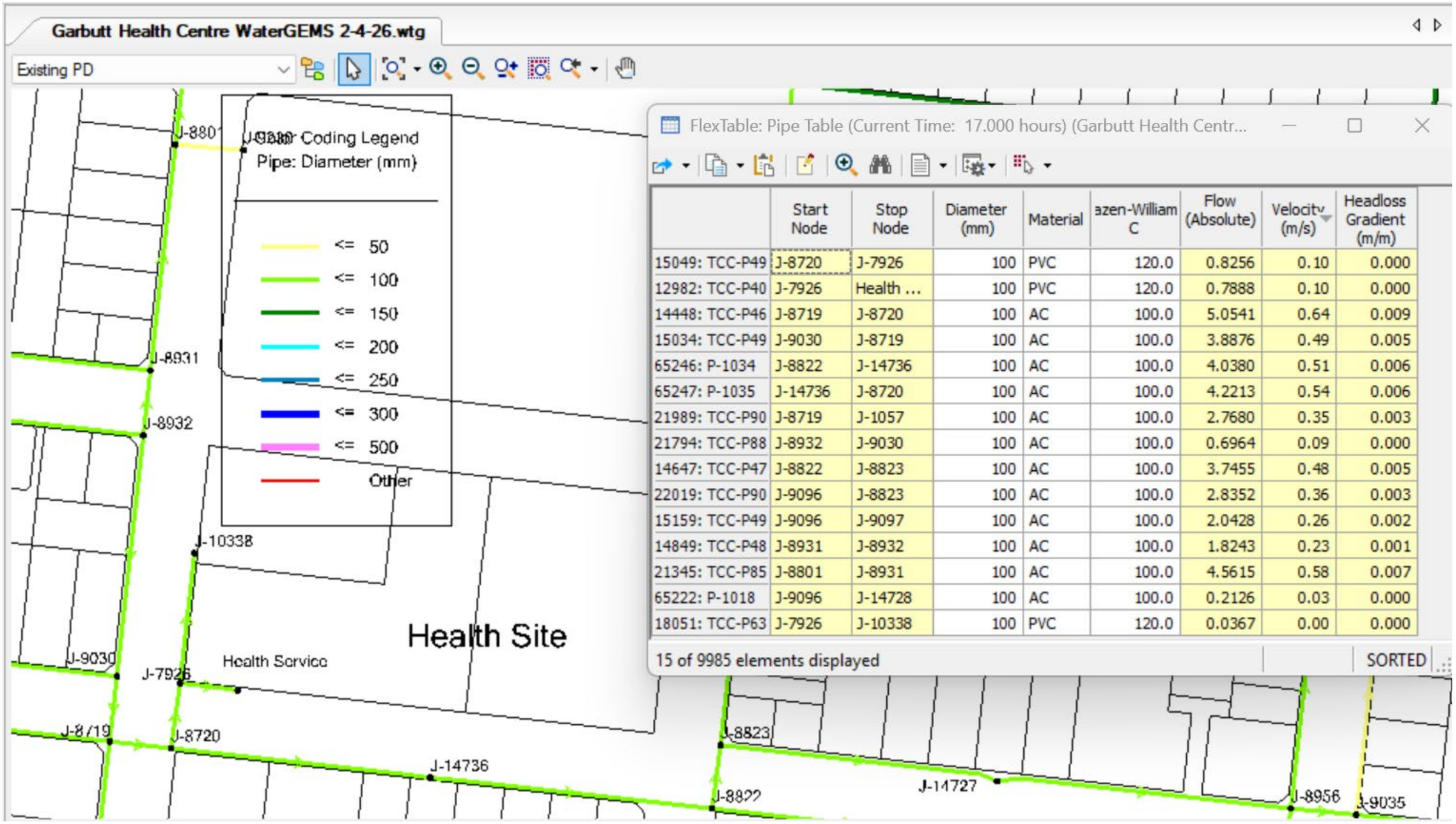


Peak Hour Water Pressure Figure – TAIHS Offtake



	Label	Elevation (m)	Demand (L/s)	Pressure (kPa)
12984: Health S	Health Service	4.79	0.7838	397.8
14649: J-8823	J-8823	4.52	0.9835	373.0
15160: J-9096	J-9096	4.40	0.8182	368.9
14449: J-8719	J-8719	4.92	0.1001	400.4
14851: J-8932	J-8932	4.63	0.7364	406.3
15161: J-9097	J-9097	4.41	0.7071	368.0
15035: J-9030	J-9030	4.80	0.6896	404.2
65245: J-14736	J-14736	4.76	0.2317	385.6
14874: J-8944	J-8944	4.38	0.4968	368.0
14850: J-8931	J-8931	4.58	0.4266	406.2
14610: J-8801	J-8801	4.67	0.2805	393.2
18052: J-10338	J-10338	4.74	0.0365	398.4
14648: J-8822	J-8822	4.65	0.0960	374.0
14450: J-8720	J-8720	4.86	0.0071	397.3
12983: J-7926	J-7926	4.72	0.0000	398.6

Peak Hour Node Modelling Results – 7 pm

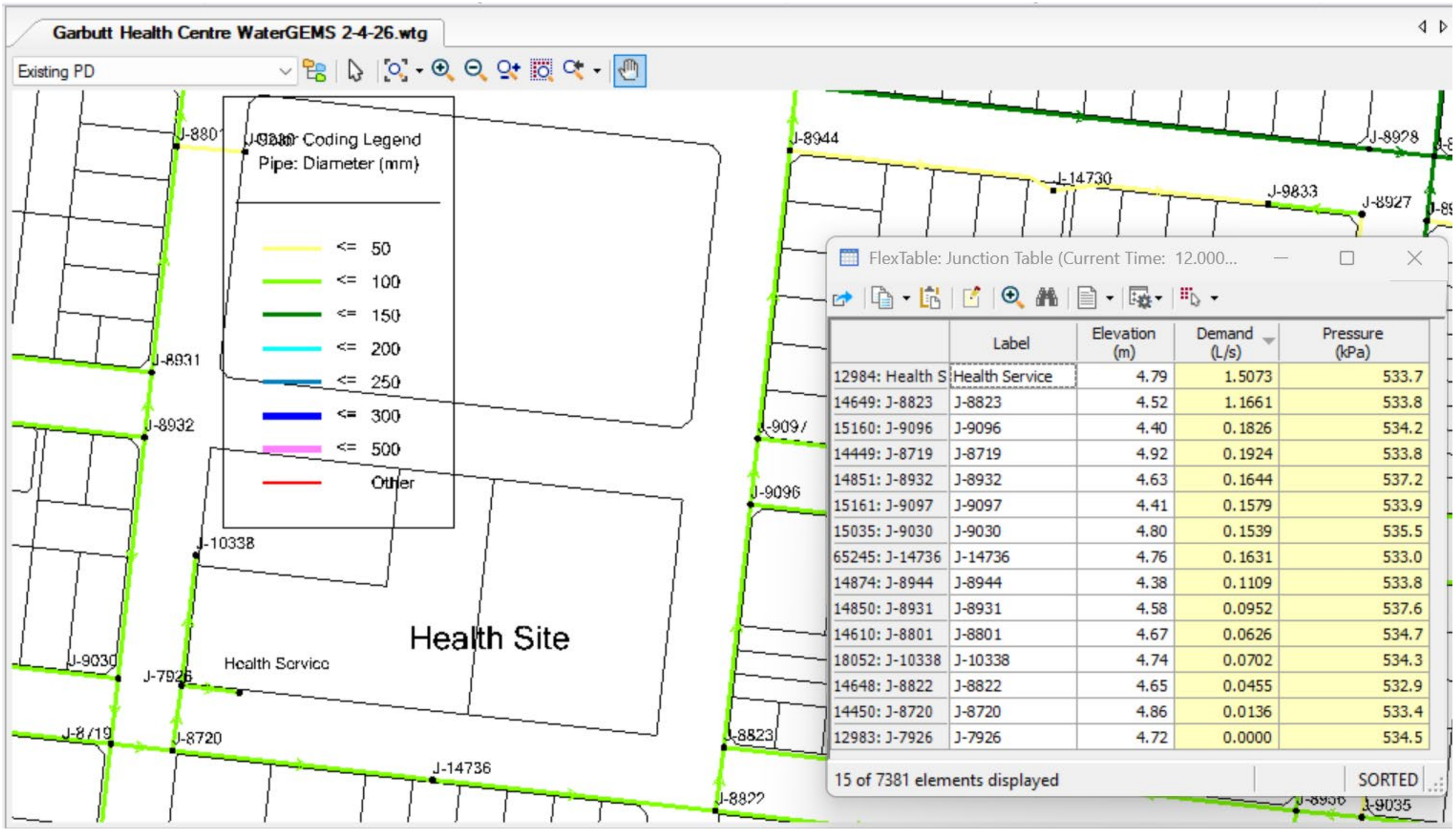


FlexTable: Pipe Table (Current Time: 17.000 hours) (Garbutt Health Centr...

	Start Node	Stop Node	Diameter (mm)	Material	azen-William C	Flow (Absolute)	Velocity (m/s)	Headloss Gradient (m/m)
15049: TCC-P49	J-8720	J-7926	100	PVC	120.0	0.8256	0.10	0.000
12982: TCC-P40	J-7926	Health ...	100	PVC	120.0	0.7888	0.10	0.000
14448: TCC-P46	J-8719	J-8720	100	AC	100.0	5.0541	0.64	0.009
15034: TCC-P49	J-9030	J-8719	100	AC	100.0	3.8876	0.49	0.005
65246: P-1034	J-8822	J-14736	100	AC	100.0	4.0380	0.51	0.006
65247: P-1035	J-14736	J-8720	100	AC	100.0	4.2213	0.54	0.006
21989: TCC-P90	J-8719	J-1057	100	AC	100.0	2.7680	0.35	0.003
21794: TCC-P88	J-8932	J-9030	100	AC	100.0	0.6964	0.09	0.000
14647: TCC-P47	J-8822	J-8823	100	AC	100.0	3.7455	0.48	0.005
22019: TCC-P90	J-9096	J-8823	100	AC	100.0	2.8352	0.36	0.003
15159: TCC-P49	J-9096	J-9097	100	AC	100.0	2.0428	0.26	0.002
14849: TCC-P48	J-8931	J-8932	100	AC	100.0	1.8243	0.23	0.001
21345: TCC-P85	J-8801	J-8931	100	AC	100.0	4.5615	0.58	0.007
65222: P-1018	J-9096	J-14728	100	AC	100.0	0.2126	0.03	0.000
18051: TCC-P63	J-7926	J-10338	100	PVC	120.0	0.0367	0.00	0.000

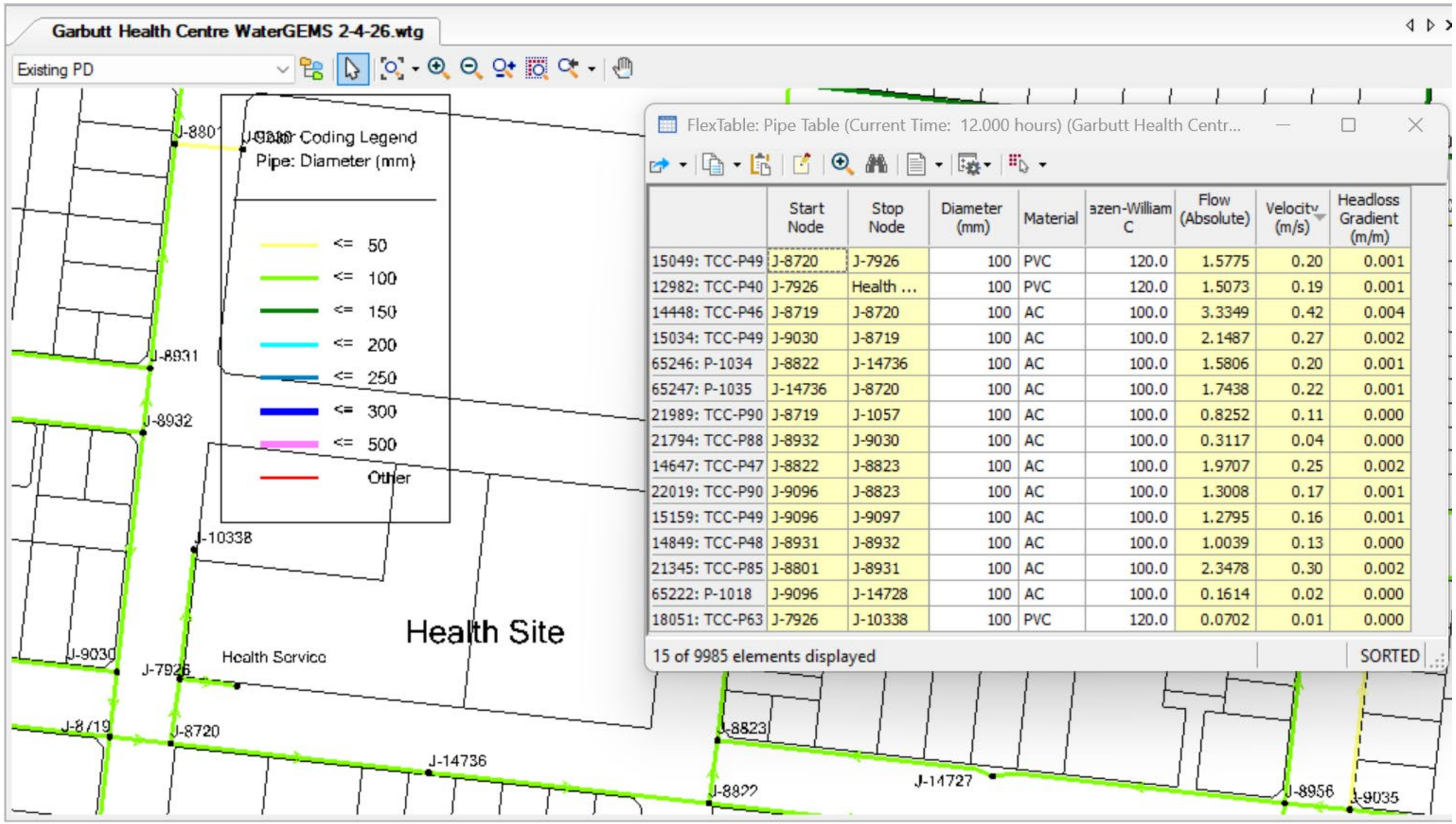
15 of 9985 elements displayed SORTED

Peak Hour Pipes Modelling Results – 7 pm



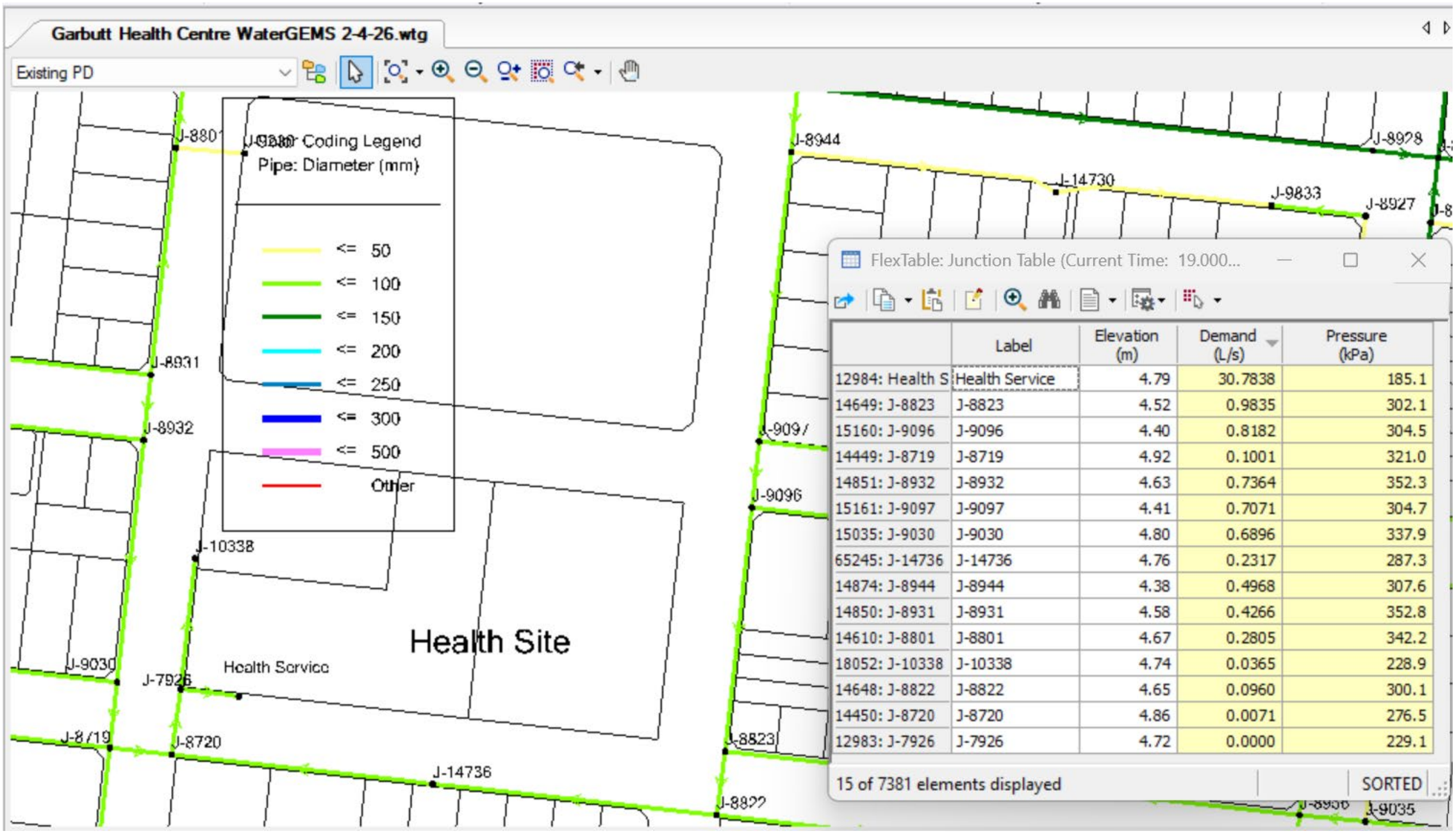
	Label	Elevation (m)	Demand (L/s)	Pressure (kPa)
12984: Health S	Health Service	4.79	1.5073	533.7
14649: J-8823	J-8823	4.52	1.1661	533.8
15160: J-9096	J-9096	4.40	0.1826	534.2
14449: J-8719	J-8719	4.92	0.1924	533.8
14851: J-8932	J-8932	4.63	0.1644	537.2
15161: J-9097	J-9097	4.41	0.1579	533.9
15035: J-9030	J-9030	4.80	0.1539	535.5
65245: J-14736	J-14736	4.76	0.1631	533.0
14874: J-8944	J-8944	4.38	0.1109	533.8
14850: J-8931	J-8931	4.58	0.0952	537.6
14610: J-8801	J-8801	4.67	0.0626	534.7
18052: J-10338	J-10338	4.74	0.0702	534.3
14648: J-8822	J-8822	4.65	0.0455	532.9
14450: J-8720	J-8720	4.86	0.0136	533.4
12983: J-7926	J-7926	4.72	0.0000	534.5

Peak Hour Node Modelling Results – 12 Noon



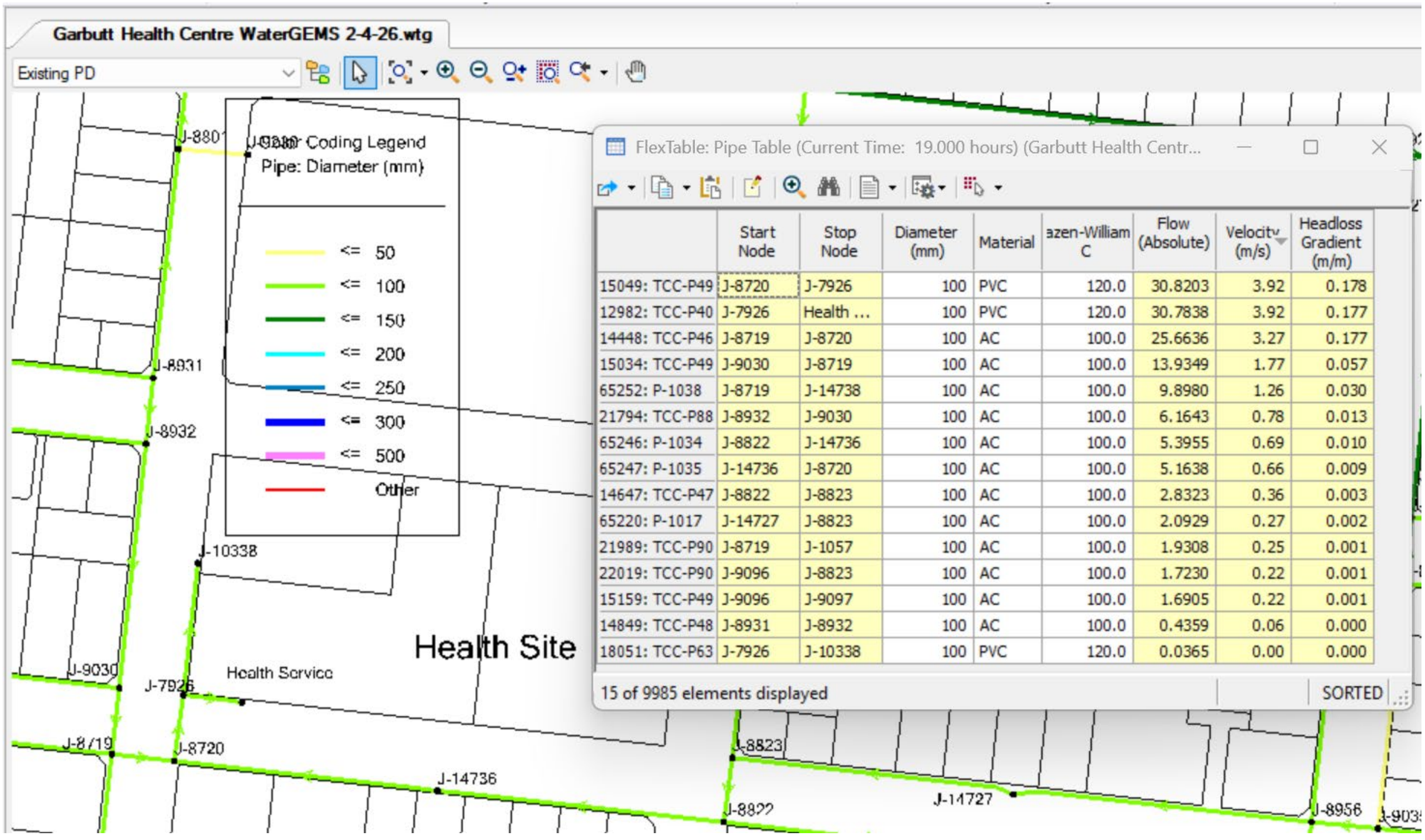
	Start Node	Stop Node	Diameter (mm)	Material	azen-William C	Flow (Absolute)	Velocity (m/s)	Headloss Gradient (m/m)
15049: TCC-P49	J-8720	J-7926	100	PVC	120.0	1.5775	0.20	0.001
12982: TCC-P40	J-7926	Health ...	100	PVC	120.0	1.5073	0.19	0.001
14448: TCC-P46	J-8719	J-8720	100	AC	100.0	3.3349	0.42	0.004
15034: TCC-P49	J-9030	J-8719	100	AC	100.0	2.1487	0.27	0.002
65246: P-1034	J-8822	J-14736	100	AC	100.0	1.5806	0.20	0.001
65247: P-1035	J-14736	J-8720	100	AC	100.0	1.7438	0.22	0.001
21989: TCC-P90	J-8719	J-1057	100	AC	100.0	0.8252	0.11	0.000
21794: TCC-P88	J-8932	J-9030	100	AC	100.0	0.3117	0.04	0.000
14647: TCC-P47	J-8822	J-8823	100	AC	100.0	1.9707	0.25	0.002
22019: TCC-P90	J-9096	J-8823	100	AC	100.0	1.3008	0.17	0.001
15159: TCC-P49	J-9096	J-9097	100	AC	100.0	1.2795	0.16	0.001
14849: TCC-P48	J-8931	J-8932	100	AC	100.0	1.0039	0.13	0.000
21345: TCC-P85	J-8801	J-8931	100	AC	100.0	2.3478	0.30	0.002
65222: P-1018	J-9096	J-14728	100	AC	100.0	0.1614	0.02	0.000
18051: TCC-P63	J-7926	J-10338	100	PVC	120.0	0.0702	0.01	0.000

Peak Hour Pipes Modelling Results – 12 Noon



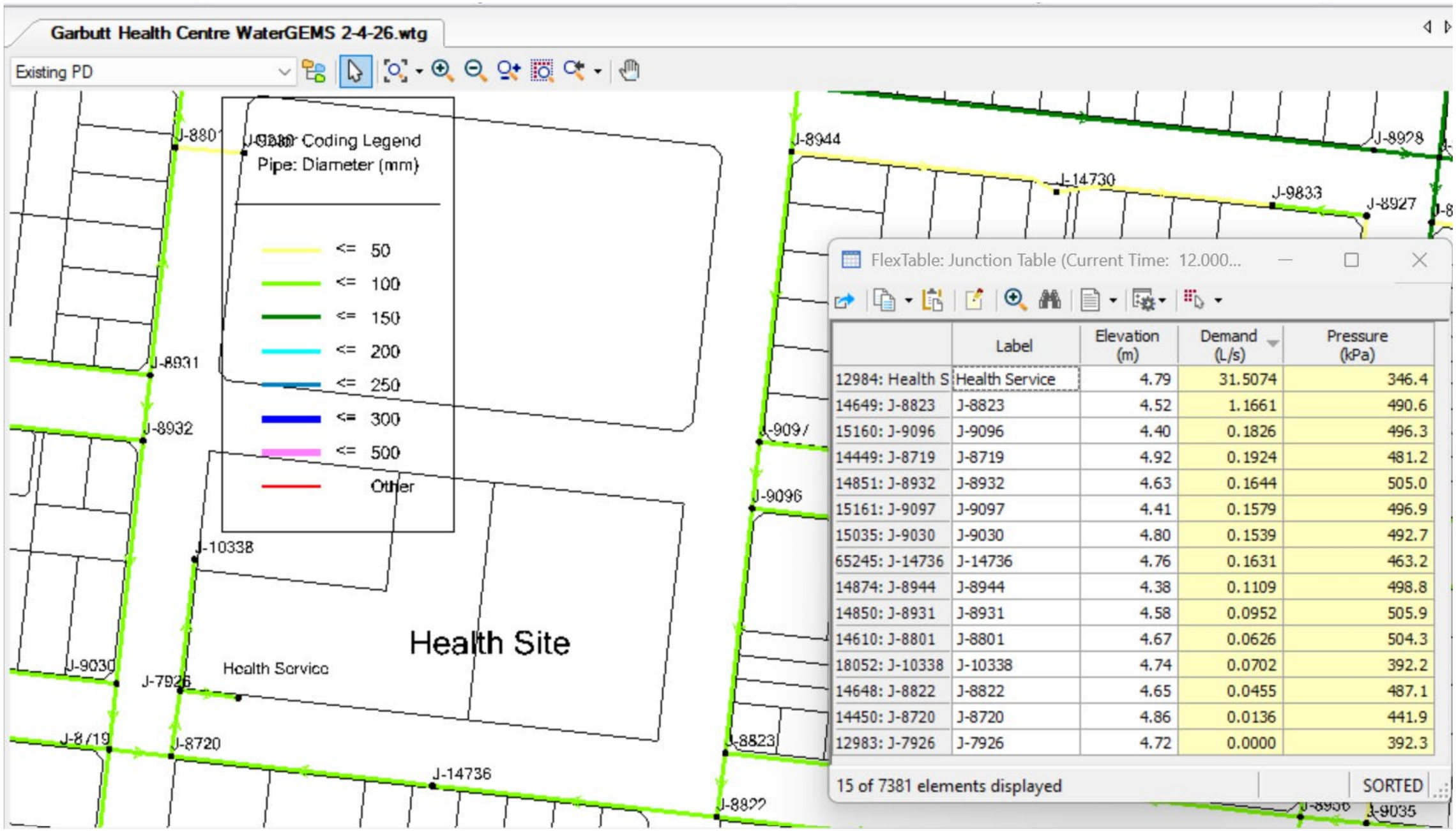
	Label	Elevation (m)	Demand (L/s)	Pressure (kPa)
12984: Health S	Health Service	4.79	30.7838	185.1
14649: J-8823	J-8823	4.52	0.9835	302.1
15160: J-9096	J-9096	4.40	0.8182	304.5
14449: J-8719	J-8719	4.92	0.1001	321.0
14851: J-8932	J-8932	4.63	0.7364	352.3
15161: J-9097	J-9097	4.41	0.7071	304.7
15035: J-9030	J-9030	4.80	0.6896	337.9
65245: J-14736	J-14736	4.76	0.2317	287.3
14874: J-8944	J-8944	4.38	0.4968	307.6
14850: J-8931	J-8931	4.58	0.4266	352.8
14610: J-8801	J-8801	4.67	0.2805	342.2
18052: J-10338	J-10338	4.74	0.0365	228.9
14648: J-8822	J-8822	4.65	0.0960	300.1
14450: J-8720	J-8720	4.86	0.0071	276.5
12983: J-7926	J-7926	4.72	0.0000	229.1

Peak Hour Node + 30 l/s Fire Flow Results – 7 pm



	Start Node	Stop Node	Diameter (mm)	Material	azen-William C	Flow (Absolute)	Velocity (m/s)	Headloss Gradient (m/m)
15049: TCC-P49	J-8720	J-7926	100	PVC	120.0	30.8203	3.92	0.178
12982: TCC-P40	J-7926	Health ...	100	PVC	120.0	30.7838	3.92	0.177
14448: TCC-P46	J-8719	J-8720	100	AC	100.0	25.6636	3.27	0.177
15034: TCC-P49	J-9030	J-8719	100	AC	100.0	13.9349	1.77	0.057
65252: P-1038	J-8719	J-14738	100	AC	100.0	9.8980	1.26	0.030
21794: TCC-P88	J-8932	J-9030	100	AC	100.0	6.1643	0.78	0.013
65246: P-1034	J-8822	J-14736	100	AC	100.0	5.3955	0.69	0.010
65247: P-1035	J-14736	J-8720	100	AC	100.0	5.1638	0.66	0.009
14647: TCC-P47	J-8822	J-8823	100	AC	100.0	2.8323	0.36	0.003
65220: P-1017	J-14727	J-8823	100	AC	100.0	2.0929	0.27	0.002
21989: TCC-P90	J-8719	J-1057	100	AC	100.0	1.9308	0.25	0.001
22019: TCC-P90	J-9096	J-8823	100	AC	100.0	1.7230	0.22	0.001
15159: TCC-P49	J-9096	J-9097	100	AC	100.0	1.6905	0.22	0.001
14849: TCC-P48	J-8931	J-8932	100	AC	100.0	0.4359	0.06	0.000
18051: TCC-P63	J-7926	J-10338	100	PVC	120.0	0.0365	0.00	0.000

Peak Hour Pipes + 30 l/s Fire Flow Modelling Results – 7 pm



	Label	Elevation (m)	Demand (L/s)	Pressure (kPa)
12984: Health S	Health Service	4.79	31.5074	346.4
14649: J-8823	J-8823	4.52	1.1661	490.6
15160: J-9096	J-9096	4.40	0.1826	496.3
14449: J-8719	J-8719	4.92	0.1924	481.2
14851: J-8932	J-8932	4.63	0.1644	505.0
15161: J-9097	J-9097	4.41	0.1579	496.9
15035: J-9030	J-9030	4.80	0.1539	492.7
65245: J-14736	J-14736	4.76	0.1631	463.2
14874: J-8944	J-8944	4.38	0.1109	498.8
14850: J-8931	J-8931	4.58	0.0952	505.9
14610: J-8801	J-8801	4.67	0.0626	504.3
18052: J-10338	J-10338	4.74	0.0702	392.2
14648: J-8822	J-8822	4.65	0.0455	487.1
14450: J-8720	J-8720	4.86	0.0136	441.9
12983: J-7926	J-7926	4.72	0.0000	392.3

Peak Hour Node + 30 l/s Fire Flow Results – 12 noon

Garbutt Health Centre WaterGEMS 2-4-26.wtg

Existing PD

Pipe Coding Legend
Pipe: Diameter (mm)
<= 50
<= 100
<= 150
<= 200
<= 250
<= 300
<= 500
Other

J-8801
J-8931
J-8932
J-10338
J-9030
J-7926
J-8719
J-8720
J-14736
J-8822
J-8823
J-14727
J-8956
Health Site
Health Service

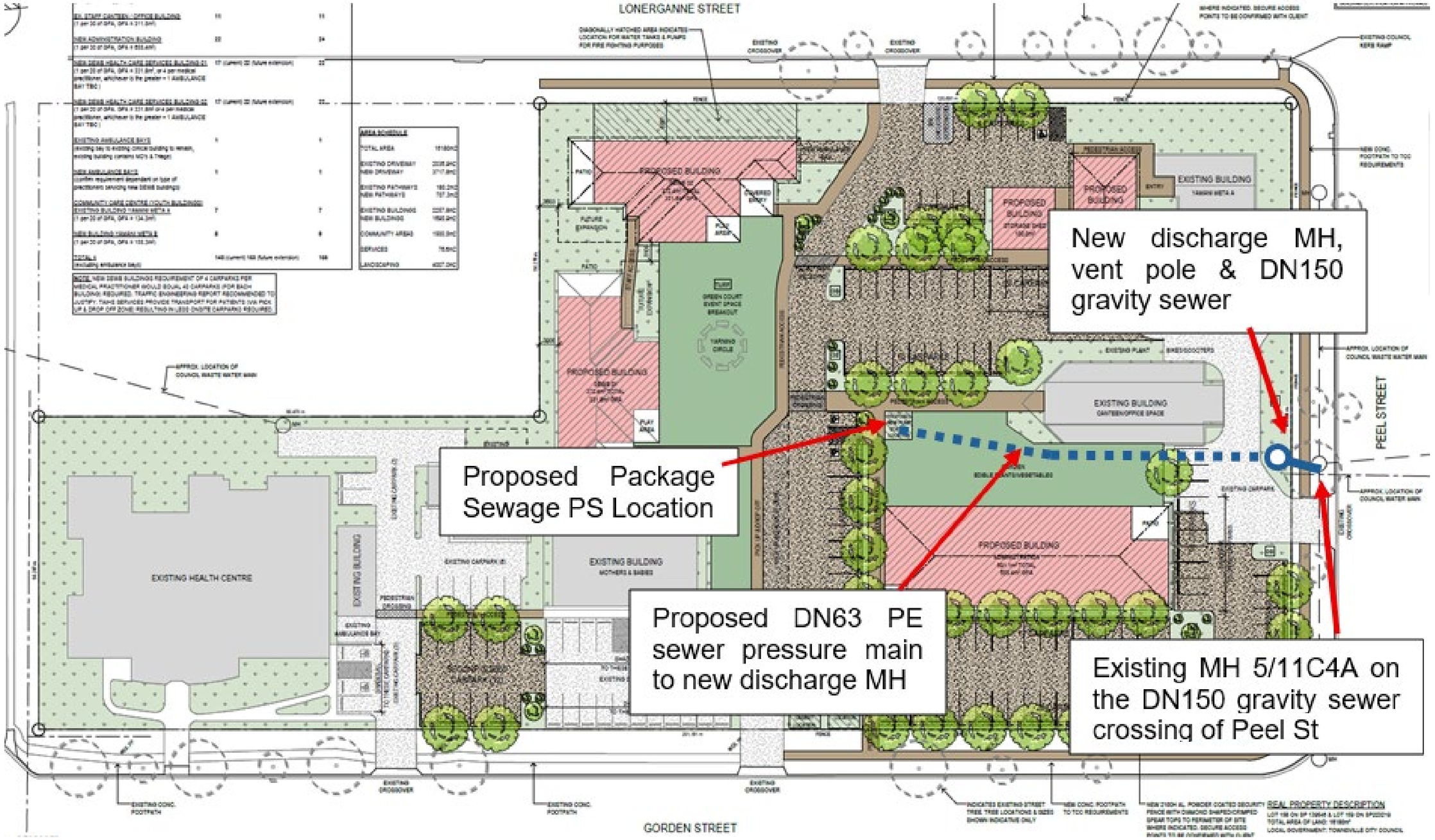
FlexTable: Pipe Table (Current Time: 12.000 hours) (Garbutt Health Centr...

	Start Node	Stop Node	Diameter (mm)	Material	azen-William C	Flow (Absolute)	Velocity (m/s)	Headloss Gradient (m/m)
15049: TCC-P49	J-8720	J-7926	100	PVC	120.0	31.5776	3.98	0.182
12982: TCC-P40	J-7926	Health ...	100	PVC	120.0	31.5074	3.98	0.181
14448: TCC-P46	J-8719	J-8720	100	AC	100.0	23.9844	3.05	0.157
15034: TCC-P49	J-9030	J-8719	100	AC	100.0	11.1501	1.42	0.038
65252: P-1038	J-8719	J-14738	100	AC	100.0	6.9743	0.89	0.016
21794: TCC-P88	J-8932	J-9030	100	AC	100.0	5.5878	0.71	0.011
65246: P-1034	J-8822	J-14736	100	AC	100.0	7.7699	0.99	0.019
65247: P-1035	J-14736	J-8720	100	AC	100.0	7.6068	0.97	0.019
14647: TCC-P47	J-8822	J-8823	100	AC	100.0	4.8566	0.62	0.008
65220: P-1017	J-14727	J-8823	100	AC	100.0	2.4862	0.32	0.002
21989: TCC-P90	J-8719	J-1057	100	AC	100.0	6.0524	0.77	0.012
22019: TCC-P90	J-9096	J-8823	100	AC	100.0	3.5365	0.45	0.005
15159: TCC-P49	J-9096	J-9097	100	AC	100.0	2.5947	0.33	0.003
14849: TCC-P48	J-8931	J-8932	100	AC	100.0	2.0378	0.26	0.002
18051: TCC-P63	J-7926	J-10338	100	PVC	120.0	0.0702	0.01	0.000

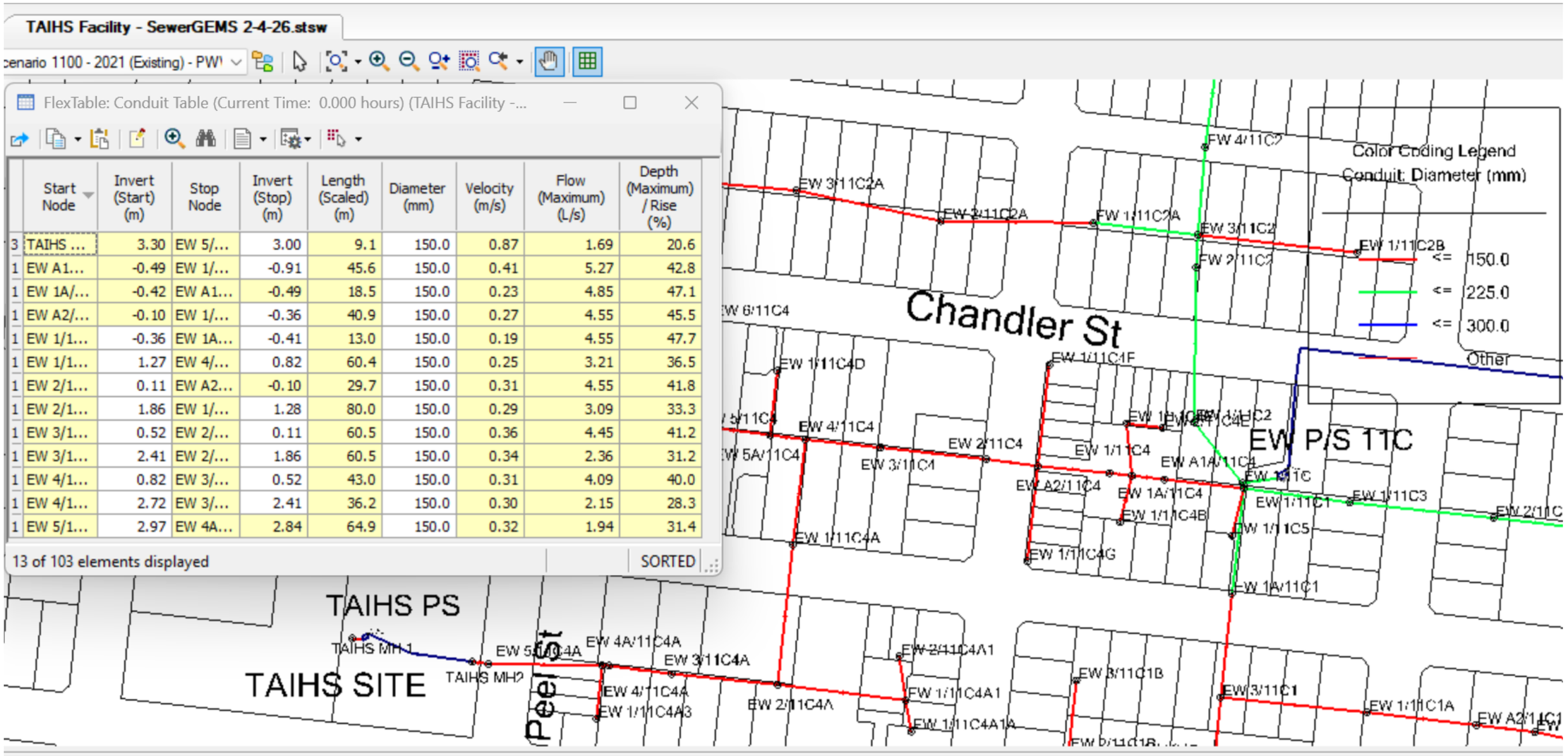
15 of 9985 elements displayed SORTED

Peak Hour Pipes + 30 l/s Fire Flow Modelling Results – 12 noon

APPENDIX C
SEWERGEMS MODELLING RESULTS & FIGURES



PRELIMINARY SEWER STRATEGY FIGURE



PWWF Sewer Capacity Assessment Results