Local Infrastructure Servicing Assessment

Bassendean Precinct Structure Plan

19 September 2025

→ The Power of Commitment

Project name		Bassendean Precinct Structure Plan					
Document title		Local Infrastructure Servicing Assessment					
Project number		12637475					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	A	F Nishad U Raza	N Lo A Wood	On file	A Augustson	On file	15.08.25
S4	B	F Nishad U Raza	N Lo A Wood	On file	A Augustson	On file	19.09.25

GHD Pty Ltd | ABN 39 008 488 373
999 Hay Street, Level 10
Perth, Western Australia 6000, Australia
T +61 8 6222 8222 | **E** permail@ghd.com | **ghd.com**

Contents

Table index

Figure index

Appendices

1. Introduction

1.1 Purpose

The Town of Bassendean (Town) local planning framework, namely the Town's Local Planning Strategy, recognises the potential for development of the Bassendean Precinct to accommodate medium to high-density, mixed-use development with increased functions in housing, employment, and activity. The Town has resolved to prepare a Precinct Structure Plan (PSP) to support and guide this development. The PSP will apply to the Bassendean Activity Centre and Success Hill Frame area, depicted on Figure 1. This area is herein referred to as 'the Precinct'.

This Local Infrastructure Servicing Report has been prepared to assist with the compilation of the PSP and to guide development outcomes. The following services infrastructure were investigated in this report:

– Sewer reticulation
– Water reticulation
– Power
– Telecommunications
– Gas
– Stormwater drainage.

The key objectives of this report are to:

– Identify the existing services infrastructure, analyse the impacts arising from the proposed redevelopment and detail the key infrastructure capacity constraints within the precinct area and surrounds.
– Investigate future servicing requirements across sewer, water, electrical (power and telecommunications), gas and drainage networks to support redevelopment in the Precinct.

The investigations and preparation of the report are primarily based on public domain information of utility network information available from the service providers, Before You Dig Australia (BYDA) data and preliminary advice received through liaisons with relevant Service Authorities. The information is current as of this report and may subject to change as development proceeds in this locality.

1.2 Background

The Town of Bassendean (the Town) engaged GHD to prepare a Precinct Structure Plan for the Bassendean Town Centre and Success Hill Frame (the Precinct) consistent with the Western Australian Planning Commission (WAPC) State Planning Policy (SPP) 4.2 – Activity Centres, SPP 7.2 Precinct Design (SPP7.2), and the Western Australia Planning Manual Guidance for Structure Plans (WA Planning Manual).

The Bassendean Precinct Structure Plan has been prepared to address the vision, planning principles, objectives and community priorities expressed in the Town's Local Planning Strategy (the Strategy).

The Strategy was endorsed in 2020 and enshrines key land use planning and development priorities of the Town's community.

To support and inform the development of the Precinct Structure Plan, GHD has prepared this Local Infrastructure Servicing Report.

1.3 Scope and Limitations

This report has been prepared by GHD for Town of Bassendean and may only be used and relied on by Town of Bassendean for the purpose agreed between GHD and Town of Bassendean as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Town of Bassendean arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

1.4 Qualifications

The following qualifications made for this report:

– The service capacity assessment for the Precinct is based on a desktop study/information only. No site visit has been undertaken as part of the preparing this report. GHD has liaised with relevant Service Authorities as required and included comments in this report.
– GHD has prepared this report based on information provided by Town of Bassendean and others who provided information to GHD (including Government authorities). GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.
– This report does not include any service capacity analysis calculations, given GHD is not privy to the overarching planning information from the Service Authorities.

2. Precinct overview

2.1 Location

This Precinct Structure Plan applies to all the land depicted as being within the precinct boundary, shown in Figure 1, on the adjacent Precinct Area Plan. The Precinct Structure Plan is to apply to development within the:

– Bassendean Town Centre
– Success Hill Frame

The combination of the Bassendean Town Centre and the Success Hill Frame is referred to as the 'Precinct'.

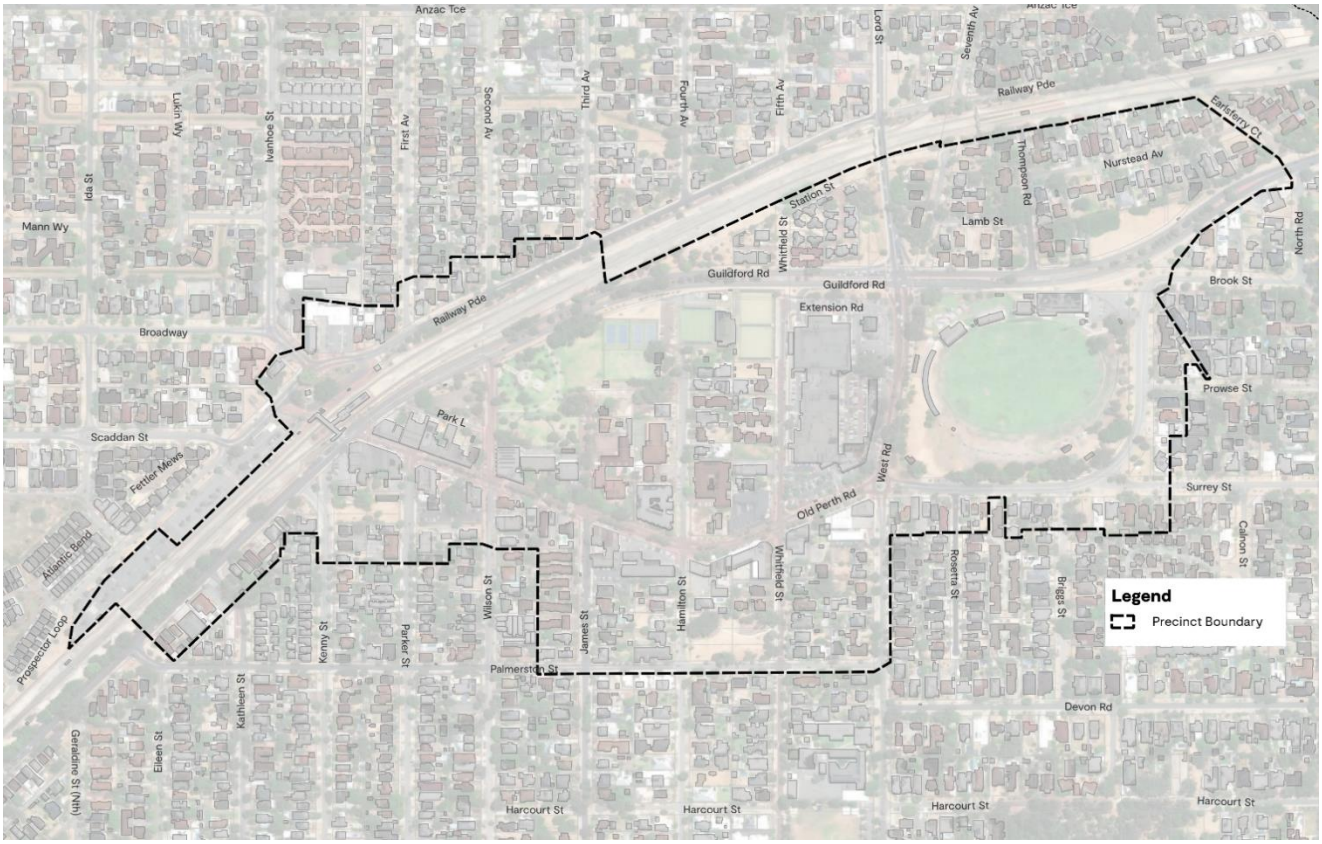

Figure 1 Precinct boundary

The Precinct is positioned in Perth's eastern suburbs, forming part of a series of connected centres along the Perth-Midland railway line, as shown in Figure 2. Connected to major centres like Maylands, Bayswater and Midland, the Bassendean Precinct plays an important role in connecting residents of Bassendean, Ashfield and Success Hill to wider transport networks, areas of employment and activity and natural amenity.

The Precinct is well located to enable current and future residents to leverage employment opportunities at major employment hubs like Ashfield, Bayswater, Midland and Morley. The Swan River significantly curtails the Precinct's catchment to the south and to a lesser extent to the east, dividing the Bassendean Precinct from otherwise nearby locations such as Redcliffe/Perth Airport, Hazelmere, Guildford and the lower Swan Valley.

Despite these limits, the Precinct's location approximately 10 km from the Perth CBD positions Bassendean well to leverage the opportunities from a growing population, growing employment and activity.

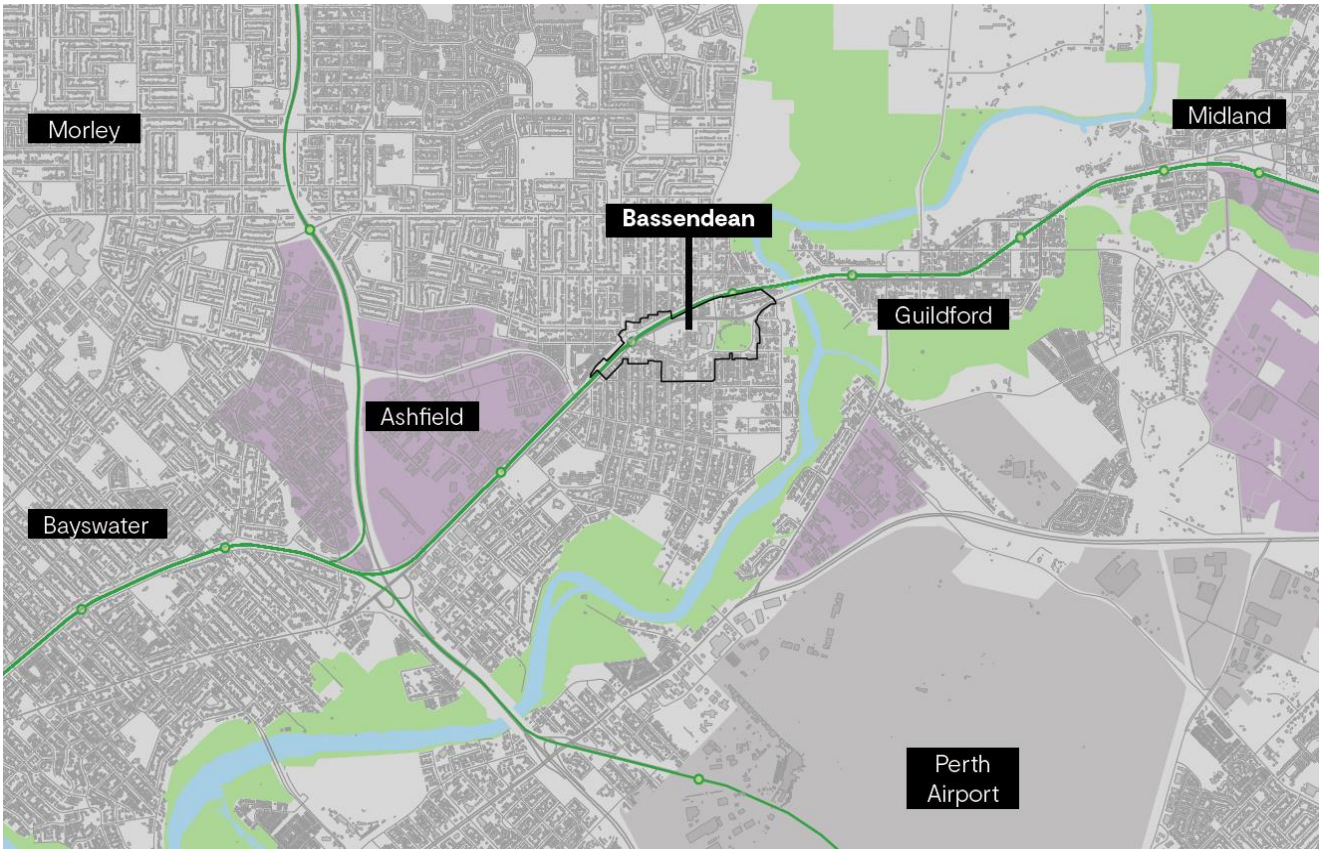

Figure 2 Precinct regional context

2.1.1 Residential growth

There are approximately 557 dwellings within the Precinct. As outlined in Table 1, the Precinct Structure Plan is estimated to provide for dwelling growth of at least 1,368 additional dwellings by 2050; consistent with the Town's Local Planning Strategy. Dwelling growth and types within land zoned District Centre is expected to be in the form of mixed-use, mid-rise developments, with ground floor dwellings occurring on streets other than Old Perth Road. In the Success Hill Frame, growth is expected to be almost entirely residential, with a mix of mid-rise apartments, townhouses and villas to provide dwelling growth.

It is noted that the growth assumptions that have informed the servicing network capacity review in this assessment are based on the estimated ultimate growth described in this section. The Precinct Structure Plan includes provisions that enable additional height and building scale (and consequently more dwellings) above those stated in the table below. The level of growth permitted by the additional height provisions is broadly aligned with the mid-range growth target expressed in the Town's Local Planning Strategy.

Table 1 Dwelling growth estimates

Land use types	Additional dwellings (10 years)	Additional dwellings (ultimate)
R40, R60	94	154
R80+ (including R-AC codes)	699	1,214
TOTAL	**793**	**1,368**

2.1.2 Non-residential growth

Projections indicate that the Precinct could support approximately 18,000 m^2 of Shop/Retail floorspace by 2050. This represents an increase of approximately 6,000 m^2 over the coming decades. A further 15,000 m^2 of non-shop commercial floorspace is forecasted, representing a considerable increase in demand in the professional

service industry. Projected floorspace need across Shop/Retail and Non-Shop categories is summarised in Table 2 below.

Table 2 Commercial floorspace need projection (m^2)

Category	2024 (approx.)	2029	2034	2039	2044	~2050
Shop/retail	11,980	13,134	14,068	15,189	16,398	17,984
Non-shop	10,656	16,992	23,133	24,130	25,205	26,616

Given the extent of land tenure fragmentation within the Precinct, development is expected to occur on an ad-hoc basis. The Precinct Structure Plan includes provisions that:

– Incentivise development on opportunity sites, encouraging new development at these locations early and as a priority for the Precinct overall.
– Built-form provisions that recognise development will occur slowly over several decades and transition.

2.2 Strategic context

2.2.1 Perth & Peel @ 3.5 million and Central Sub-Regional Planning Framework

The Perth and Peel @ 3.5 million suite of strategic land use and infrastructure plans, including four Sub-regional Planning Frameworks (north-west, north-east, central and south metropolitan Peel), seek to guide the future growth of the Perth and Peel regions as a compact, consolidated and connected city that can accommodate a population of 3.5 million by 2050.

The Central Sub-regional Planning Framework provides high level guidance for the growth of the Central sub-region of the Perth metropolitan area, and forms part of the 'Perth and Peel @ 3.5 million' suite of strategic land use and infrastructure plans. The framework provides high-level guidance regarding where new homes and jobs will be located, how to make best use of existing and proposed infrastructure and how best to protect the natural environment to allow sustainable growth within the central sub-region.

2.2.2 Town of Bassendean Local Planning Strategy

The Town's Local Planning Strategy was endorsed in February 2023. The Strategy sets out the long-term planning direction for land use and development within the Town; principle of which is planning for the Precinct.

Consistent with the principles of urban consolidation, the Strategy identifies six planning areas for land use intensification. For the Bassendean Precinct, this includes accommodating between 1,209 and 2,175 additional dwellings by the middle of the century. The Strategy includes actions to prepare a Precinct Structure Plan for the precinct, based primarily on the findings and community aspirations expressed through the Town Centre Masterplan.

2.2.3 Town Centre Masterplan

In 2021, the Town endorsed the Bassendean Town Centre Masterplan following extensive community and external stakeholder engagement. The Masterplan provides a high-level vision for the Precinct and is intended to be implemented through preparation of this Precinct Structure Plan. Objectives identified in the Masterplan relevant to transport and movement outcomes for the Precinct are as follows:

– Improved pedestrian mobility and accessibility;
– Transit-oriented development and locating high density development in proximity to train stations; and
– Appropriate management of parking supply and demand.

2.3 Physical context

2.3.1 Existing development

For the purpose of this servicing assessment and reporting, the Precinct is split into three sub-precincts — Western, Central, and Eastern, as depicted in Figure 3. The area features a diverse mix of retail shops, commercial services, cafes, sporting amenities and community facilities, as well as key prominent elements such as the Swan Districts Football Club (Bassendean Oval), Hawaiian's Bassendean shopping centre, Bassendean Memorial Library, and Bassendean Community Centre.

Across the precinct, approximately 557 existing residential dwellings are distributed within the established neighbourhoods. The area is well-serviced by public transport, with both Bassendean and Success Hill train stations located within the precinct, and multiple bus routes operating along Guildford Road and Old Perth Road. Major roads including Guildford Road, Old Perth Road, Palmerston Street, and Railway Parade provide strong connectivity within the precinct and to the wider region. Significant public open spaces and heritage sites further contribute to the precinct's role as a vibrant and accessible urban centre within the Town of Bassendean.

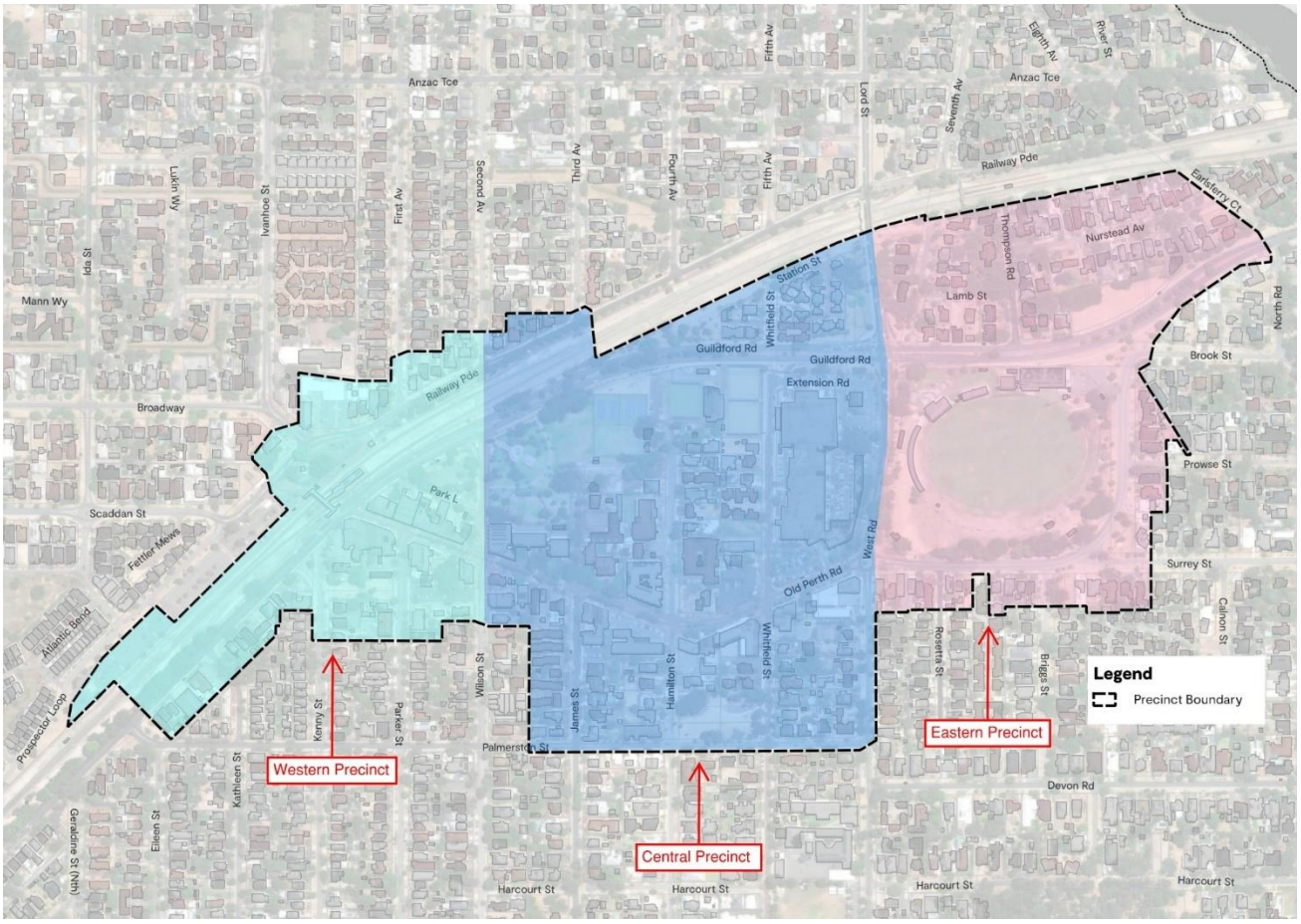

Figure 3 *Precinct sub-boundary*

2.3.2 Topography

The Precinct spans gently undulating terrain, with ground levels ranging from RL 6 m AHD in the eastern sections to RL 24 m AHD in the southwestern quadrant. The detailed topographical data for each sub-precinct is summarised below, refer to Figure 4 for an overview of the existing ground levels in Australian Height Datum (AHD).

2.3.2.1 Western precinct

The western portion of the Precinct, bounded generally between Guildford Road, the railway corridor, Palmerston Street and Wilson Street, exhibits the highest elevation within the entire precinct. Contour levels range from RL 19 m AHD along Guildford Road, rising to RL 24 m AHD along Kenny Street. The landform demonstrates a consistent eastward slope, directing overland flow towards the central and eastern precincts. For the area north of the railway corridor, ground levels are relatively consistent and flat, which sits around RL 18 – 19 m AHD.

2.3.2.2 Central precinct

The central precinct, located between Wilson Street and West Road, encompasses the Bassendean town centre, public open spaces (POS) and community spaces, as well as adjacent residential streets. Elevations vary from RL 10 m AHD along West Road to RL 18 m AHD in the vicinity between of Old Perth Road and Guildford Road. Contour lines indicate a generally convex landform, with localised ridgelines in between Wilson Street and Whitefield Street and gentle falls toward the north and south. This area features a transitional slope between the higher western precinct and the lower-lying east.

2.3.2.3 Eastern precinct

The eastern portion of the precinct, bounded by North Road and West Road, is the most low-lying area of the Precinct site. Ground levels fall significantly, ranging from RL 12 m AHD near the intersection of Guildford Road and West Road, to a low of RL 6 m AHD near Surrey Street and Brooke Street. The Steel Blue Oval reserve is prominently situated in this sub-precinct, sitting around RL 8 – 10 m AHD. This portion of the precinct gently grades eastward (past North Road), ultimately towards the Swan River. In contrast, the land parcel north of Guildford Road, between Lord Street and Earlsferry Crescent, is situated on higher terrain, with levels starting from approximately RL 19 m AHD on Lord Street and grading eastwards.

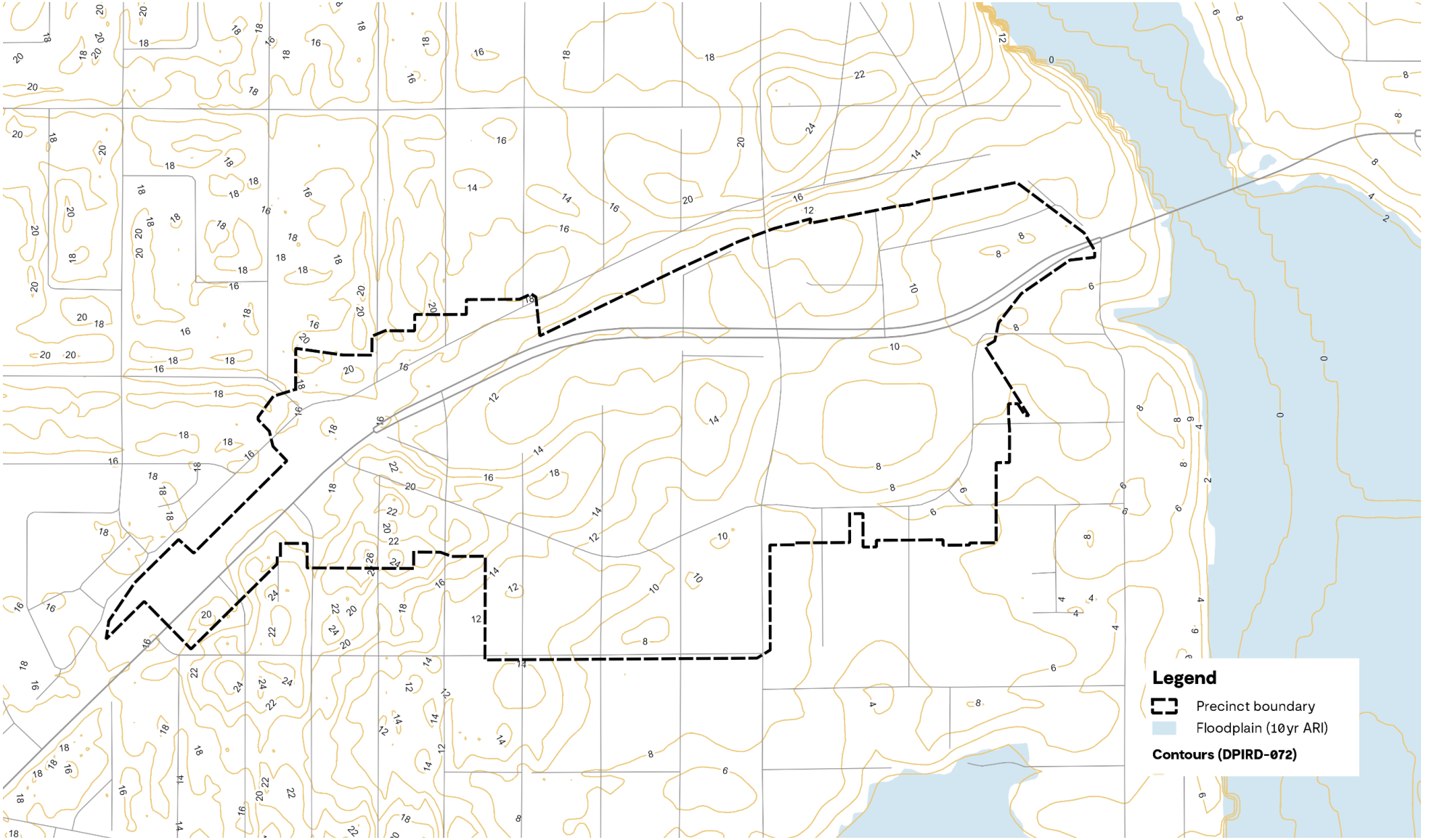

Figure 4 *Overview of the Precinct topography*

3. Sewer

3.1 Existing infrastructure

The Water Corporation's existing gravity sewer reticulation system within the Precinct comprises a network of DN150, DN230 and DN305 vitrified clay (VC), polyvinyl chloride (PVC-U), and reinforced concrete (RC) gravity mains, with the majority discharging into a regional DN305 RC sewer located along Guildford Road. The DN305 RC sewer continues eastward and then further south of the Precinct, ultimately discharging into a pump station *'PS008-01*' located on 42 Hyland Street (Lot 192), which is approximately 1km south of Guildford Road. Maintenance shafts and access chambers are distributed throughout the street network. Figure 5 represents an overview of the gravity sewer network within the Precinct.

In addition, an existing DN305 RC Bridge Street diversion pressure main runs across the north side of the precinct, commencing at James Street and following Guildford Road eastward; however, this asset is now redundant and is replaced by DN450 glass reinforced plastic (GRP) centrifugally cast (GRP-CC) pressure mains running through Nurstead Avenue, Lamb Street, Station Street and ultimately westward along Guildford Road.

Within the western precinct, multiple DN150 gravity sewer mains are identified within the road reserves of Kenny Street, Kathleen Street and Park Lane. These sewer mains are predominantly VC pipes, which connects into the downstream DN305 RC sewer main on Guildford Road. North of Railway Parade, the sewer network consists mainly of DN150 VC pipes that flow northward to a DN305 VC collection pipe located below Anzac Terrace, forming a separate catchment that contributes to the northern network.

The central precinct features a reticulated network comprising of DN150 VC mains parallel to Whitfield Street, Hamilton Street, James Street, West Road and Old Perth Road. The majority of the network (north of Old Perth Road) discharges downstream via the DN305 RC sewer main on Guildford Road to the sewer pump station located on Hyland Street, as shown in Figure 6. The DN150 VC sewer lines along the rear of properties on Hamilton Street and Whitfield Street also leads south into the pump station. On the contrary, along the rear of properties on Wilson Street and James Street, a DN460 RC pipe continues onto Palmerston Street and further south, forming a separate network for the south-western catchment.

In the eastern precinct, the sewer network mainly consists of DN150 VC pipes. All sewer mains north of Guildford Road connect to a DN230 VC pipe on Nurstead Avenue, which then links to the DN305 RC main on Guildford Road, eventually discharging south to the sewer pump station on Hyland Street. Similarly, the DN150 VC pipes south of Old Perth Road connect to DN305 RC sewer running parallel to Briggs Street, which also leads south to the same pump station on Hyland Street.

3.2 Future upgrades and planned infrastructure

Advice from Water Corporation's 'Land Planning and Service' branch confirms that reticulated sewerage is available to the Precinct (refer **Appendix B**). However, the proposed redevelopment will impact on the current wastewater network with respect to the increased long-term sewer flows.

Based on Water Corporation's planning advice, the proposed development yields exceed the capacity considered in their current long-term planning (refer Figure 7). While upgrades have been previously identified, they are not currently included in the Corporation's 5-Year Capital Investment Program. In the long term, the existing DN305 gravity sewer that services the broader catchment (approximately 1,800m length) will require upsizing to DN375 to accommodate the ultimate development. Water Corporation will continue to monitor development activity and identify the appropriate trigger to program the upsizing when required.

Water Corporation also advised that the Hyland Pump Station *'PS008-01*' long-term pump rate has increased. While the pump station has sufficient capacity to cater for the revised long-term rate, the higher flows increase the required emergency storage. This will impact the staging of storage upgrades, which will be reviewed when zoning changes are endorsed and further informed by the scale and timing of development within the R-AC coded areas.

Note: Servicing advice provided by Water Corporation is valid for 6 months only, is subject to review, and may change. Water Corporation will need to be re-consulted at the time of development to confirm that the information remains current.

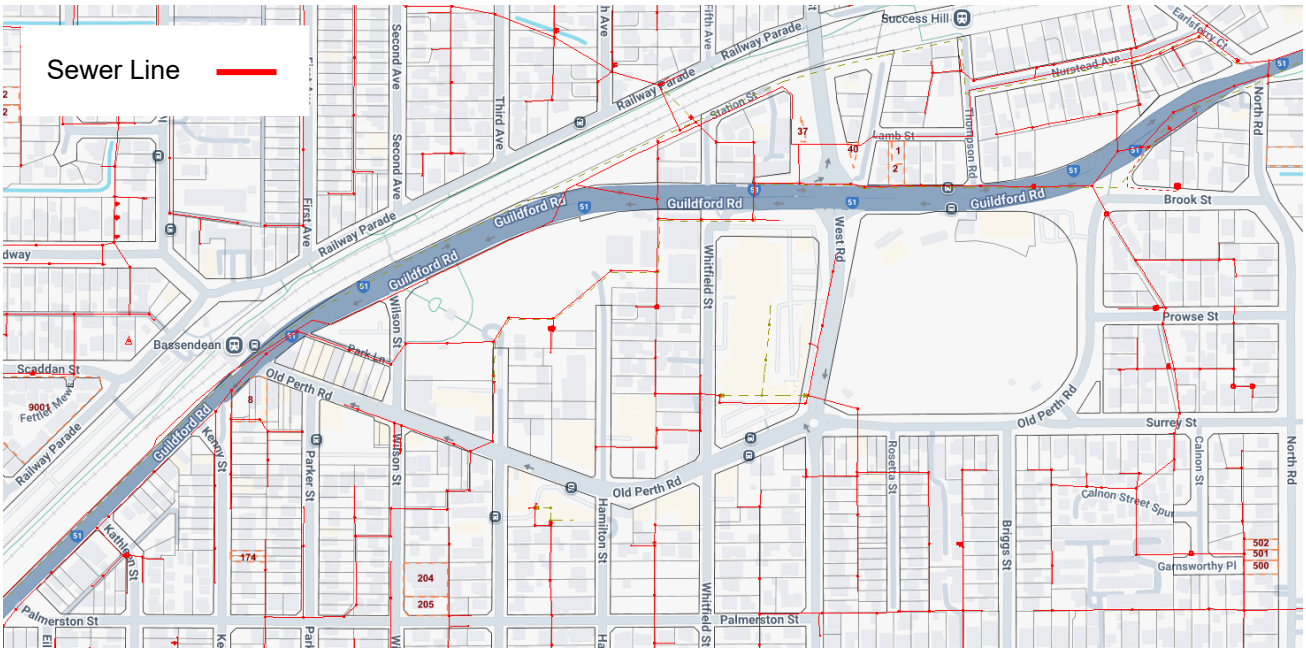

Figure 5 Sewer Infrastructure Network (Water Corporation myWorld Esinet, July 2025)

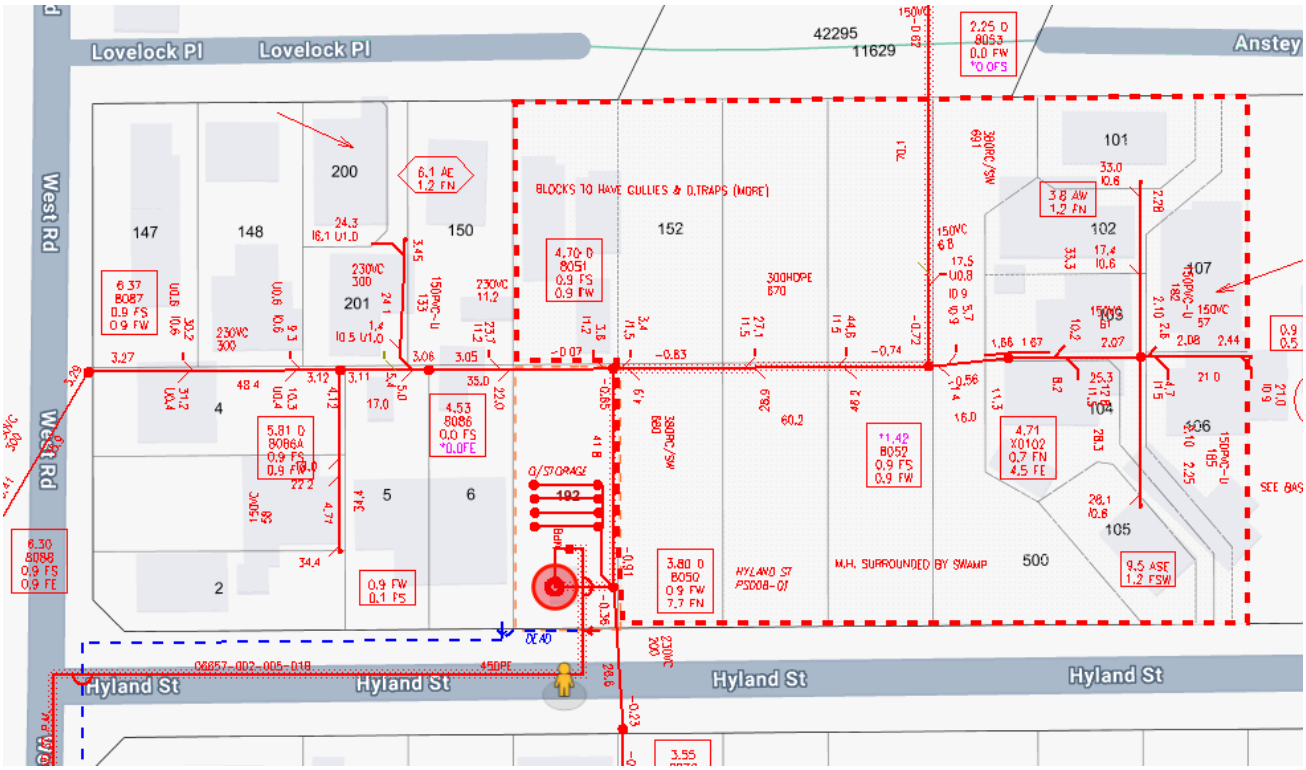

Figure 6 Downstream Sewer Pump Station on Hyland Street (Water Corporation myWorld Esinet, July 2025)

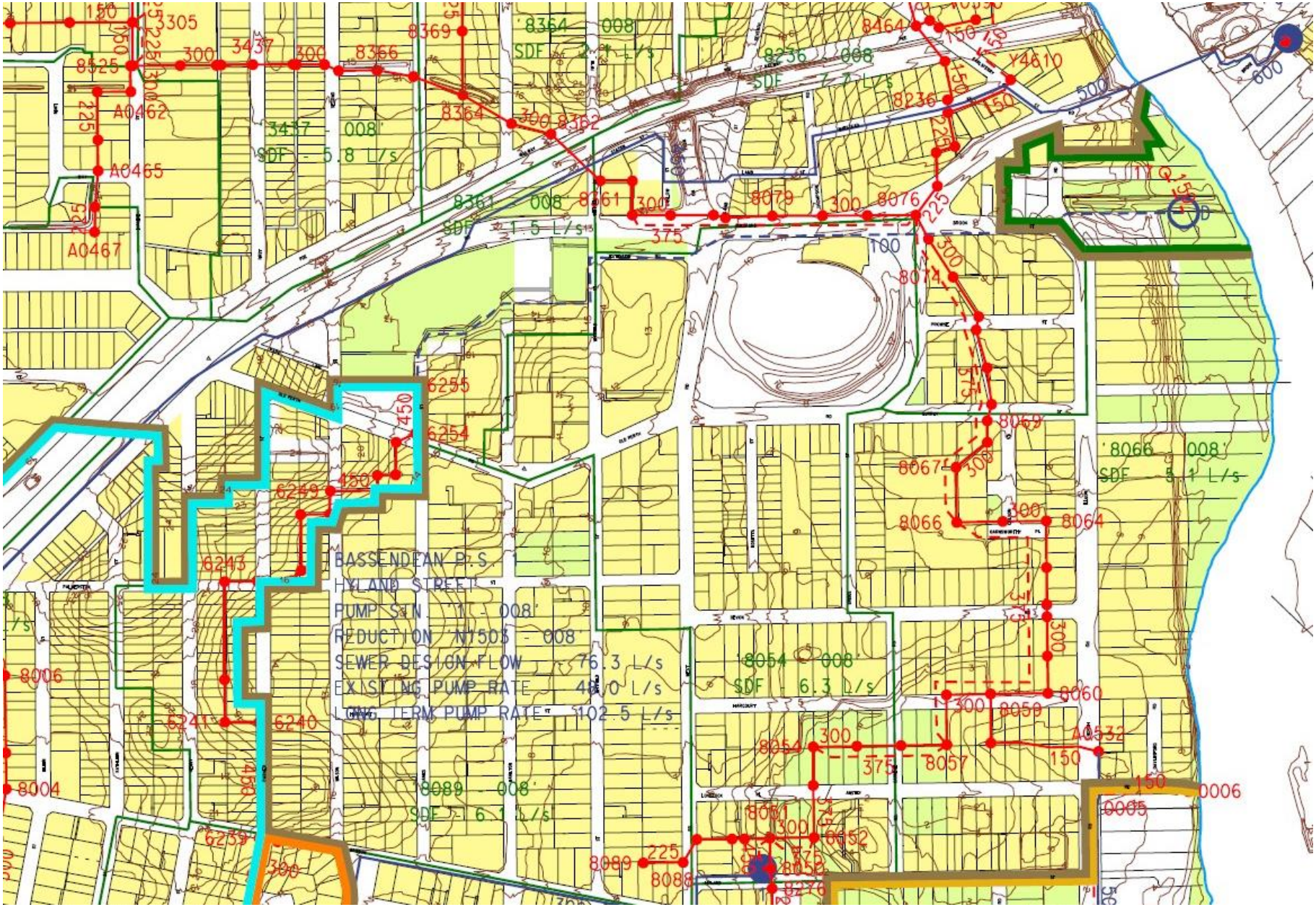

Figure 7 Water Corporation current long term planning scheme for wastewater (Water Corporation, September 2025)

4. Water

4.1 Existing infrastructure

The Water Corporation's existing water supply infrastructure within the Bassendean Precinct comprises a reticulated distribution network consisting of DN75, DN90, DN100, DN150, and DN205 water mains. These assets include a combination of asbestos cement (AC), cast iron (CI), steel (S), and polyvinyl chloride (PVC) pressure pipes. The network services residential, commercial, and civic land uses across the precinct and connects into regional trunk supply infrastructure located along surrounding arterial roads. Fire protection is provided by a distributed system of fire hydrants positioned in accordance with Water Corporation servicing standards. Figure 8 represents an overview of the water network within the Precinct.

In the western precinct, the network comprises DN100 CI mains with a section of DN100 P-12 PVC pipe linking Palmerston Street to a DN205 CI main on Guildford Road. A DN150 CI main is also present along Old Perth Road, forming part of the local distribution loop. Additionally, a DN205 water main is located along Guildford Road, supporting broader supply to the surrounding area. The water main is predominantly CI pipes and transitions to steel mains after the intersection of Guildford Road and Old Perth Road. Fire hydrants are located at regular intervals throughout the precinct, providing compliant fire coverage to residential properties.

In the central precinct, between Wilson Street and West Road, the water network comprises DN100 CI mains along Whitfield, Hamilton, and James Streets, which are intersected by a DN150 CI main running along Old Perth Road. A DN205 CI main extends along West Road and Lamb Street, forming a key north–south linkage between the reticulation networks servicing the residential lots within the northern and southern land parcels of Guildford Road. The water main runs across Lord Street and along Station Street, then crosses the railway corridor and connects to the northern network on Railway Parade. It is also noted that a DN90 AC main runs along Wilson Street (approximately 140 m length), servicing the adjacent residential lots.

In the eastern precinct, the network includes DN75, DN100, and DN150 CI mains along Brook Street, Prowse Street, and Surrey Street, with sections of DN100 P-12 PVC mains servicing residential lots along Nurstead Avenue and Lamb Street. These connect into a DN100CI main running on Earlsferry Ct and North Road, which continues south beyond the precinct boundary as part of the regional reticulation network. Fire hydrants and valve controls are provided throughout the network in accordance with Water Corporation requirements.

4.2 Future servicing requirements

Based on Water Corporation's preliminary advice (refer Appendix B), the projected development yields exceed the capacities considered in current long-term planning. While the need for upgrades has been identified, these works are not presently included in Water Corporation's 5-Year Capital Investment Program. Given the ad-hoc nature of staging for this redevelopment, Water Corporation advised that a definitive timing plan cannot be provided; however, all identified reticulation upgrades would be required prior to redevelopment to address existing capacity constraints.

To support the proposed development, Water Corporation has indicated a program of reticulation improvements across the precinct. Along Hamilton Street, approximately 130 m of DN90 AC reticulation main is to be replaced with DN100 PVC reticulation. On Lamb Street, approximately 40 m of DN40 CU is to be decommissioned (or replaced with DN100, subject to development requirements). At Prospector Loop, a new DN100 loop is to be constructed to connect to the existing DN100 reticulation main.

At Brook Street and Old Perth Road, approximately 370 m of DN75 CI reticulation main is to be replaced with DN100 PVC pipes, with an extension of the DN100 main by approximately 30 m along Old Perth Road to connect to the upgraded main at Prowse Street. Along Railway Parade, a new DN200 reticulation main is to be constructed between Broadway and Third Avenue, with connections to the DN150 AC reticulation and DN305 CI distribution main at Broadway, the DN150 AC at Second Avenue, and the DN90 AC and DN305 CI distribution mains at Third Avenue. Any existing and future customer meters along this section of Railway Parade are to be connected to the new DN200. In addition, approximately 220 m of DN75 AC reticulation main on First Avenue is to be replaced with DN100 PVC reticulation and connected to the new DN200 at the southern end.

On Guildford Road, approximately 32 m of DN25 CU reticulation main is to be decommissioned near the intersection of Old Perth Road. Along Old Perth Road (between Guildford Road and Surrey Street), approximately 1,000 m of DN150 CI reticulation main is to be replaced with DN200 PVC pipes; all existing cross-connections are to be reinstated and the short DN75 CI road crossing at Briggs Street replaced with DN100 PVC pipes. On Whitfield Street, approximately 100 m of DN205 CI is to be replaced with DN250 PVC, including a cross connection to the DN460 S rail crossing.

These upgrades are expected to provide the additional capacity necessary to support the proposed development; detailed design will confirm connections, operating pressures and fire-flow performance.

Note: Servicing advice provided by Water Corporation is valid for 6 months only, is subject to review, and may change. Water Corporation will need to be re-consulted at the time of development to confirm that the information remains current.

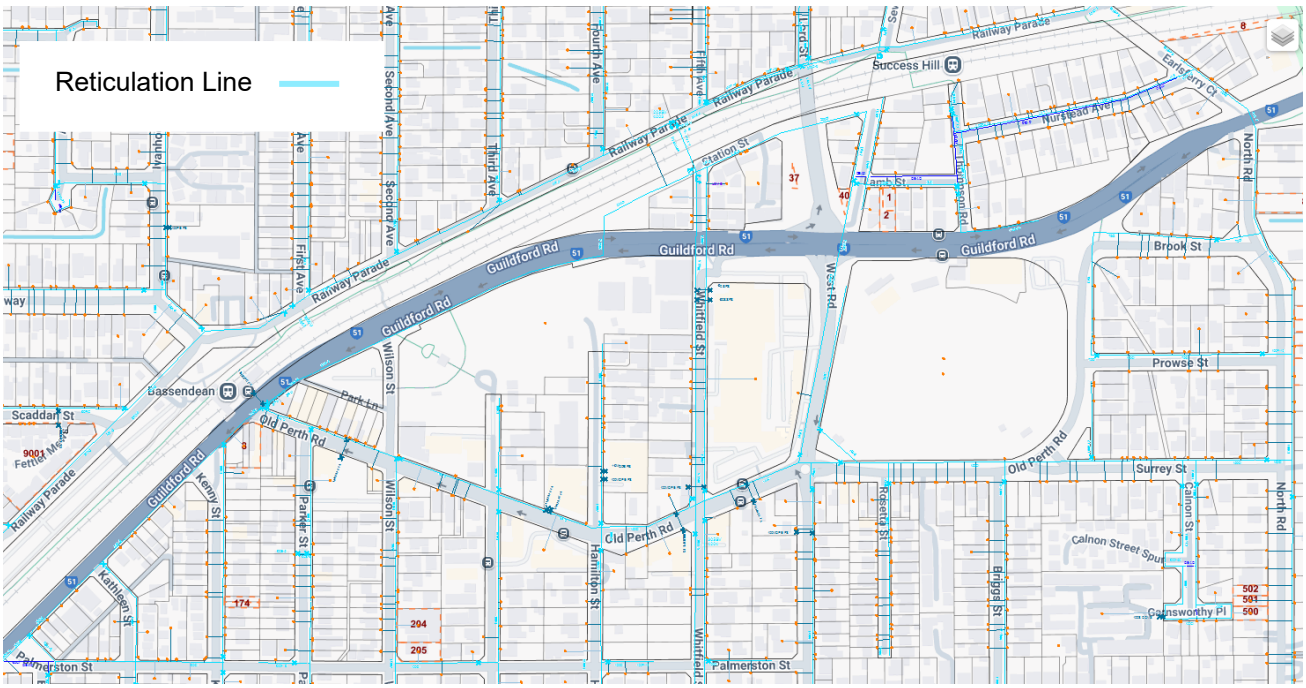

Figure 8 Water Infrastructure Network (Water Corporation myWorld Esinet, July 2025)

5. Power

5.1 Existing infrastructure

The Precinct is located approximately 11km away from the Perth City and 1km from Hadfield's (NCR) Zone Substations. As per the Western Power Network Capacity Mapping Tool report published in October 2024, the Hadfield's (NCR) Zone Substation (Z/S) had approximately 77MVA of total capacity and 20MVA spare capacity with a medium utilisation of 74% in 2024, and a forecast moderately highly utilisation of 82% by 2034.

The Precinct is currently serviced by the three phase underground and overhead 22kV Western Power network that is supplied from the 132kV Hadfield's (NCR) Zone Substation (Z/S) on the North-East of the Perth City (refer Figure 9).The Hadfield's (NCR) Zone Substation has 3% of large commercial load, 11% of small commercial load and 86% of residential load with total number of 17283 properties connection. All the lots within the precinct area are serviced with a Low Voltage (LV) supply via mini pillars, uni pillars, overhead connections or direct connections from transformers on the lot. Most of the Precinct is currently serviced by three underground/overhead High Voltage (HV) feeders that have a maximum permissible load of 5MVA on each leg of the Y configuration, with a total capacity of 15MVA on each HV feeder. However, these feeders are interconnected with other HV feeders from the Morley (MO) Zone Substation and Beechboro (BCH) Zone Substations on the North and West sides of the Precinct that enables switching of loads and HV network reconfiguration.

The precinct comprises of a mix of residential housing as well as commercial properties. As a result, this area has been serviced by many distribution substations with transformers of varying sizes. This area has various distribution substations installed outdoors overhead/underground with the potential to upgrade the smaller substations if required.

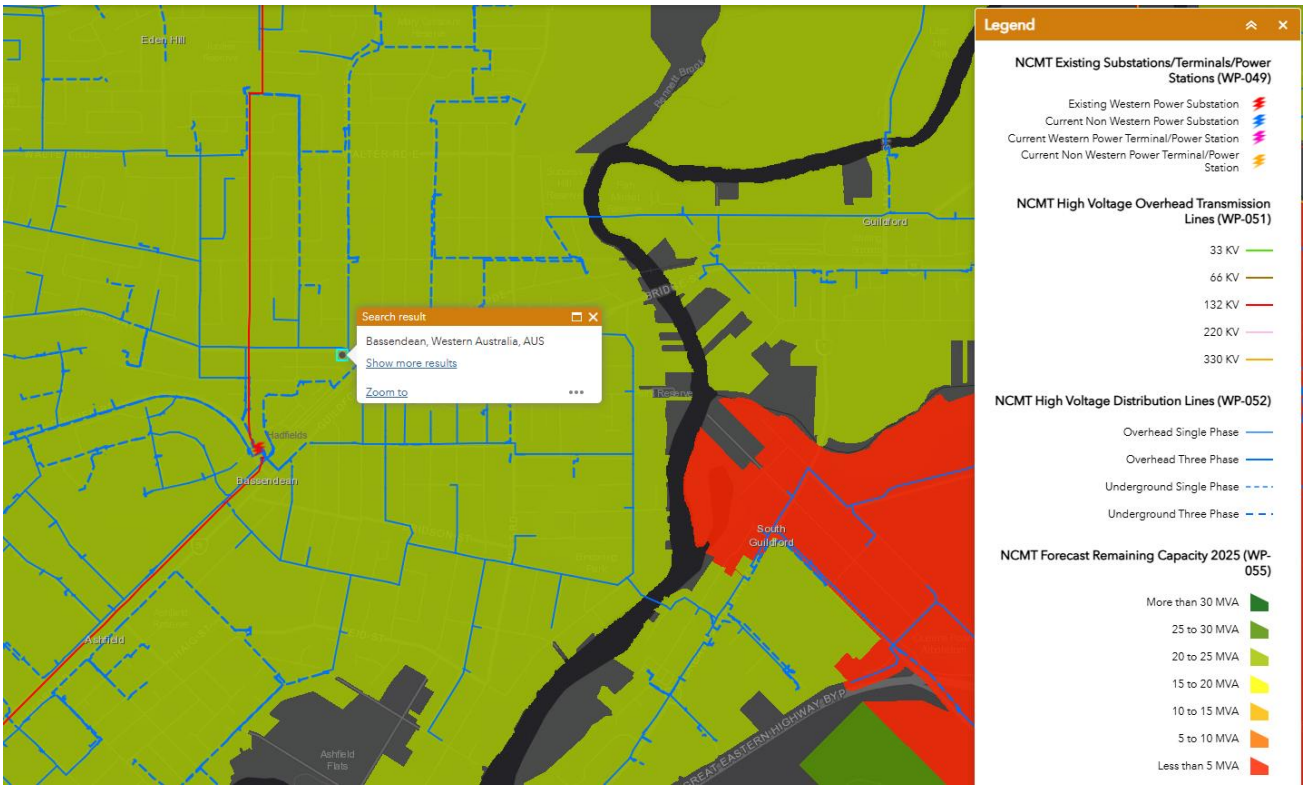

Figure 9 Existing HV Infrastructure

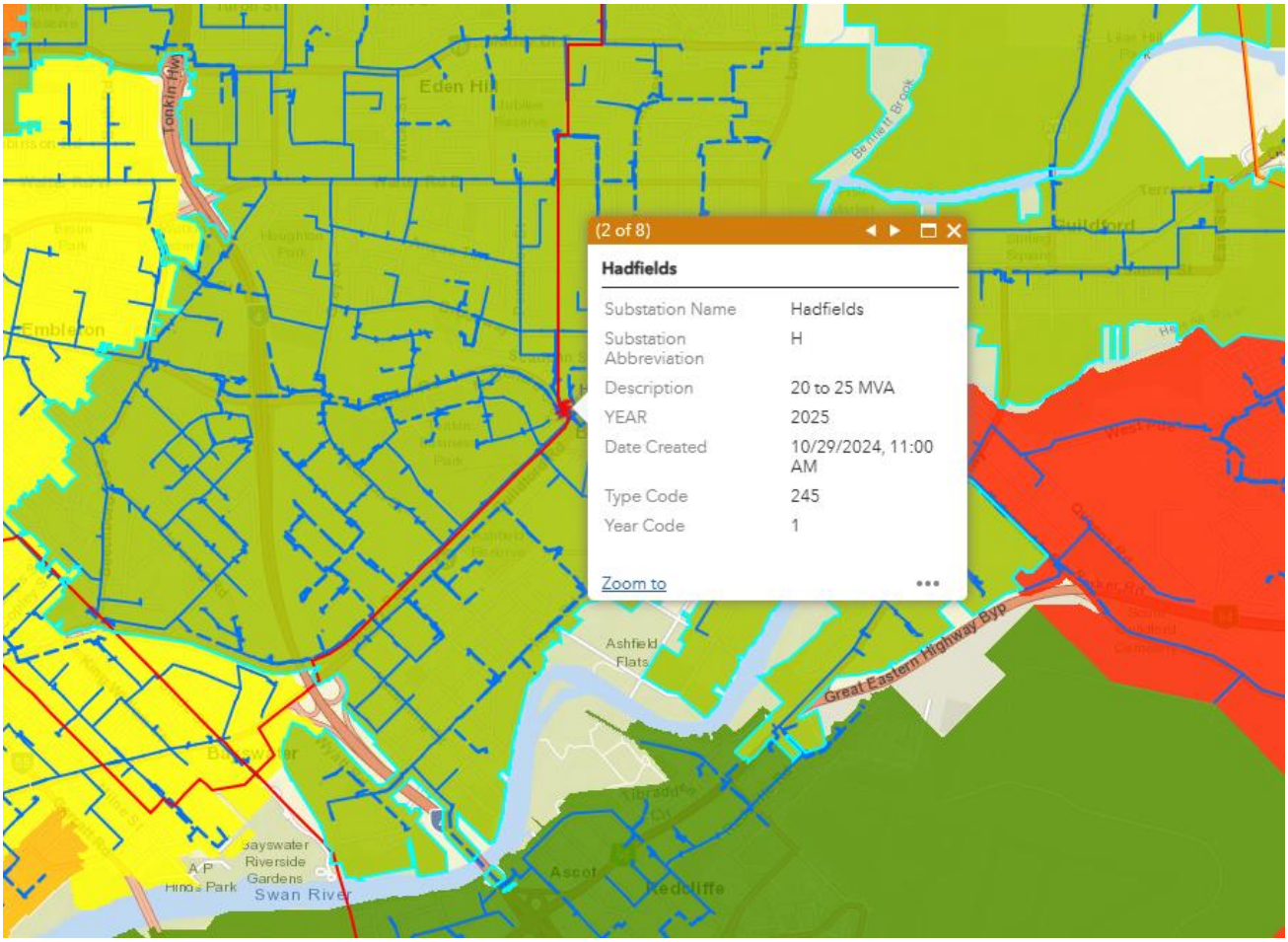

Figure 10 Western Power Network Capacity Mapping Tool (October 2024)

5.2 Future requirements

Western Power's minimum design requirements for commercial and industrial developments are currently 200kVA per hectare as specified within the *Underground Distribution Schemes* (UDS) manual.

Western Power are likely to require a minimum designed network capacity of 0.360MVA to service the total developable commercial area under a conventional subdivision servicing arrangement, unless specific loading requirements for individual lots can be confirmed at the time of servicing. As per Western Power's Maximum Demand (DADMD) Calculator a supply of 4.7kVA for Single to Quadruplex, 3.5kVA for 5 to 10 units, and 3.1kVA for more than 10 units is required for residential developments within Bassendean. Western Power are therefore likely to require a minimum designed network capacity of 6.42MVA to service the potential future residential growth in the area.

Based on the minimum final load demand of 6.78MVA, there is sufficient capacity at the Hadfield's (NCR) Zone Substation to service future redevelopment, however, the limiting factor will be the 5MVA maximum permissible load on each of the leg of the Y configuration of the HV feeders.

As per the Western Power Network Capacity Mapping Tool Report 2024, the Hadfield's (NCR) Zone Substation (refer Figure 11) had 20MVA of spare capacity. HV network reconfiguration may be required to ensure each leg of the Y configuration does not exceed 5MVA, nor 15MVA of the total HV feeder capacity. Some of the loads on the HV feeders that interconnect with the Morley (MO) Zone Substation HV feeder to the East and the Beechboro (BCH) Zone Substation HV feeder to the North may be offloaded to create more spare capacity on the HV feeders.

Further assessment and network reinforcement/ augmentation will need to be assessed by Western Power to determine the suitability of this option.

DISCLAIMER

It is important to note that the table below only presents the spare capacity and utilisation figures at zone substation level. Any connection assessment and associated reinforcement requirements will need to consider the availability of capacity at transmission network level in the wider load area and the localised distribution feeder network.

LEGEND		
	Under utilised	below 40%
	Medium Utilised	40% & <75%
	Moderately Highly Utilised	75% & <95%
	Highly Utilised	95% & <110%
	Over Utilised	110% & <120%
	Significantly Over Utilised	above 120%

							Forecast Demand - PoE10									
Region	Terminal Substation	Zone Substation Name	Substation Abbrev'n	Capacity criteria	Existing substation capacity (MVA)	Mitigation	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Metro North	Northern Terminal	Hadfield	H	NCR	77		74%	74%	75%	75%	76%	77%	78%	79%	80%	82%

Figure 11 Zone Substation Forecast Demands

6. Telecommunications

6.1 Existing infrastructure

Existing telecommunications infrastructure in Town of Bassendean Centre Precinct is owned by numerous telecommunications providers including Optus, Nextgen, Vocus, TPG Telecom, NBN Co, Superloop, Aussies Broadband Pty Ltd and Telstra, with most assets being held by Telstra.

These assets take the form of an extensive network of cable mains, cables, and pits spread throughout the Precinct (refer Figure 12). The Town of Bassendean Centre Precinct area is located within an existing nbn™ fixed line service area and is therefore serviced by nbn™ Fibre to The Node (FTTN) or Fibre to the Premises (FTTP) technology.

6.2 Future requirements

Developers are indirectly bound to provide telecommunications to new properties under the *Telecommunications Act 1997* (Cth). Developers can choose a telecommunications carrier to service their developments, there is no prescribed telecommunications requirement, and this is up to the lot developer to determine.

The default infrastructure provider for broadband Australia wide is nbn™.

The Town of Bassendean Centre Precinct area is identified on the nbn™'s rollout map as a '*service available area*'. This means that a developer can apply to nbn™ to provide infrastructure to their development, and there is a standard process for this. Should nbn™ be the chosen carrier, the developer is required to install and fund a pit and pipe system to nbn™ requirements (if not already existing) and then transfer ownership of this infrastructure to nbn™ via the execution of a Developer's Agreement in exchange for provision of data infrastructure within that pit and pipe.

As the Precinct is already well established and within several existing extensive telecommunications networks with fibre cables, it is anticipated that the existing pit and pipe network will be able to support the telecommunications demand of the future population.

Figure 12 Bassendean Area Telstra Cable Plan

7. Gas

7.1 Existing infrastructure

The existing gas network within the Precinct is owned and operated by ATCO Gas. An extensive network of medium pressure (MAOP 70kPa) PVC and PE gas reticulation mains are present throughout the Precinct, with service connections provided to numerous properties. Standard network infrastructure such as service valves (SV), meters, and property connections are distributed throughout the existing network.

The Precinct area is serviced by multiple medium pressure mains, as follows:

– DN100 PVC 0.8/1.5/21/28 (MAOP 70kPa)
– DN155 PVC 1.7 (MAOP 70kPa) and DN80 PVC 1.5 (MAOP 70kPa)
– DN50 PVC 1.5 (MAOP 70kPa)
– DN63 PE 0.9 and DN63 PE 1.5 (MAOP 70kPa)
– Service lines (typically 20–25mm PVC or PE)

Based on the BYDA plans, proposed gas infrastructure is identified on several sections where indicates proposed PE gas mains (e.g., PROP 63 PE, PROP 160 PE, PROP 40 PE and PROP 63 PE [MAOP 70kPa] NG) along Guildford Road, Old Perth Road, James Street, Lamb Street and associated side streets.

Critical assets are also highlighted, such as the DN80 ST steel distribution pipelines with a higher MAOP (1900kPa) along Railway Parade (referenced as “CRITICAL ASSET IN THE VICINITY” on plans).

Refer to **Appendix A** for reference of BYDA infrastructure plans.

7.2 Future upgrades

ATCO Gas has been contacted for preliminary advice on whether the existing network has sufficient capacity to supply the proposed development growth.

ATCO Gas’ asset services team has undertaken modelling assessment of the new development scenario and provided the following advice. Refer **Appendix C**.

ATCO's existing gas distribution network has sufficient capacity to accommodate additional 1,368 residential dwellings at the Bassendean Precinct. This was based on assumptions below:

– Full gas connection by the end of 2050
– No increase/ change in number of meters for commercial properties (non-residential)

It is noted that there will be no increase anticipated to the number of meters as the commercial properties are not intended to be further subdivided as part of the Precinct development growth.

Note: Servicing advice provided by the ATCO Gas is based on the assumptions mentioned above, and the existing gas infrastructure network remains unchanged during the redevelopment. ATCO Gas will need to be reconsulted at the time of development to confirm if the information remains valid and further modelling will be required close to the connection date.

8. Drainage

8.1 Existing infrastructure

The existing stormwater drainage infrastructure within the Bassendean precinct comprises a network of pits and pipes to convey runoff across the area. The upstream section of the system is located in the elevated western portion near Guildford Road and Park Lane, where multiple connections converge and flow eastward along Old Perth Road. The drainage network continues through central Bassendean, intersecting with various pits and interconnecting pipes along streets such as Hamilton Street, James Street, and Whitfield Street. These systems ultimately discharge toward the lower-lying eastern boundary near North Road, aligning with the natural topography of the area. Additionally, there is a localised drainage network in the southern section, servicing the Palmerston Street catchment. Figure 13 represents an overview of the stormwater drainage network in the vicinity of the Precinct site.

In addition to the local network, a Water Corporation owned drainage system services the northern catchment. This network traverses the northern extent of the precinct, running primarily along Guildford Road through to Brook Street and extending eastwards. It ultimately discharges into the Swan River, forming a critical outfall for upstream flows. Refer to Figure 14 for context.

Further information on the stormwater strategy can be found in the Local Water Management Strategy for this Precinct Structure Plan submission and is summarised in the following sub-sections.

Local Water Management Strategy findings

In 2014, the Town commissioned a Town-wide ‘Drainage Network Desktop Assessment’. Three upgrades within the precinct were identified:

– Ø300 line at Lamb Street and Thompson Road, connecting to existing infrastructure on Guildford Road
– Upgrade to existing Ø300 pipe connecting Nurstead Avenue to the network at North Road.
– New lines to address a trapped low point in the vicinity of the intersection at Guildford Road and North Road.

These upgrades were identified to address existing drainage management requirements and do not appear to have been implemented.

A further ‘Drainage Review and Assessment’ was undertaken for the Town in 2016, followed by an updated ‘Drainage Network Review and Flood Modelling’ assessment in 2023. The assessment identifies primary areas of concern for flooding and provides recommendations for future works to ensure the maintenance of drainage standards and prevent or mitigate future flooding. Both the 2016 and 2023 identified substantial portions of the Town (and some portions of the precinct) that were susceptible to flooding and insufficiently serviced by the drainage network.

The 2023 assessment made the following recommendations:

– Implement the following pipe upgrades, as these appear to effectively mitigate the inundation of key areas of concern:
    - A Ø750 pipeline is modelled from the wetland discharge upstream to the point that the greatest capacity is needed.
    - The anomalous Ø375 pipes were replaced with Ø450 to match the upstream pipes.
    - Similarly, the pipes connecting the living stream/swale were increased to Ø450.
    - The small pipes to the east of 125 Old Perth Road on Briggs Street were increased to Ø375 to the tie into Surrey Street drainage with the specific aim of alleviating the local inundation in this area.
– Undertake further investigation of lot-scale contingency measures at 125 Old Perth Road and 6 Surrey Street, as the residual impacts at these locations are due to the relatively low elevation of these lots and this is unlikely to be remedied by the capacity of the Town’s drainage network.

– Assuming that the Success Hill subsurface storage is implemented, provide an overflow pathway to the Swan River for runoff more than the proposed storage capacity. The design of this overland flow pathway should incorporate erosional control measures given the steep slope from the reserve to the river, and should consider larger infrequent storm events i.e. up to the 1% AEP event.
– Further assessment of the 1% AEP event is recommended to ensure that the Town is fully aware of risks proposed to infrastructure and residents.

Both studies have consistently highlighted the insufficient capacity of the Town's drainage network and identified the need for upgrades to mitigate localised flooding and manage stormwater more effectively. The recommended upgrades include replacement of stormwater pipes with bigger sizes to cater for the need of additional capacity, subsurface storage within Success Hill Reserve, and provision of an overflow pathway to the Swan River for extreme events. Despite these findings, localised flooding continues to be observed, particularly around Old Perth Road, Whitfield Street, and Bassendean Oval, demonstrating that significant portions of the precinct remain insufficiently serviced by the existing drainage system.

8.2 Proposed infrastructure requirements

The Town of Bassendean's Local Planning Policy No. 14 – Stormwater publication (reviewed March 2024) mandates the disposal of stormwater generated on private property to be contained on site and designed to cater for a 1 in 20 year event (or relevant Building Code of Australia Standard). This includes all runoff from buildings and hardstand surfaces within the site.

Development within the Precinct will need to make provision to contain and infiltrate any additional runoff onsite. Improved management of stormwater flows on-site are intended to reduce overall pressure on the Town's drainage network. Greater implementation of infiltration systems will reduce flows over time and diminish demand for further drainage network upgrades. The Precinct Structure Plan adopts other approaches that seek to minimise discharge into the drainage network:

– Incentives, or in some cases require, the capture of water on-site for re-use, instead of disposal into the drainage network. This is achieved through requirements that development meet rating criteria of the Green Building Council of Australia's Green Star rating tool, or an equivalent system.
– Increased levels of landscaping and infiltration on private land, as well as in public realm areas. The Precinct Structure Plan includes provisions for development to contribute to improved public realm, including contributions that relate to necessary civil and service infrastructure upgrades.

As the precinct develops, localised upgrades to stormwater and drainage infrastructure can occur within immediate proximity of the development. As a next step, it is recommended that the Town prioritise the implementation of the key pipe upgrades and storage solutions identified in the 2022–2023 assessments, alongside further investigation into lot-scale contingency measures for low-lying properties. Consideration should also be given to developing a staged implementation strategy that aligns with available funding, community risk priorities, and integration with future development or infrastructure upgrades, ensuring both short-term flood mitigation and long-term network resilience. This staging should extend to situations where public realm upgrades adjacent to 'Opportunity sites' are expected and upgrades to drainage infrastructure can occur concurrently.

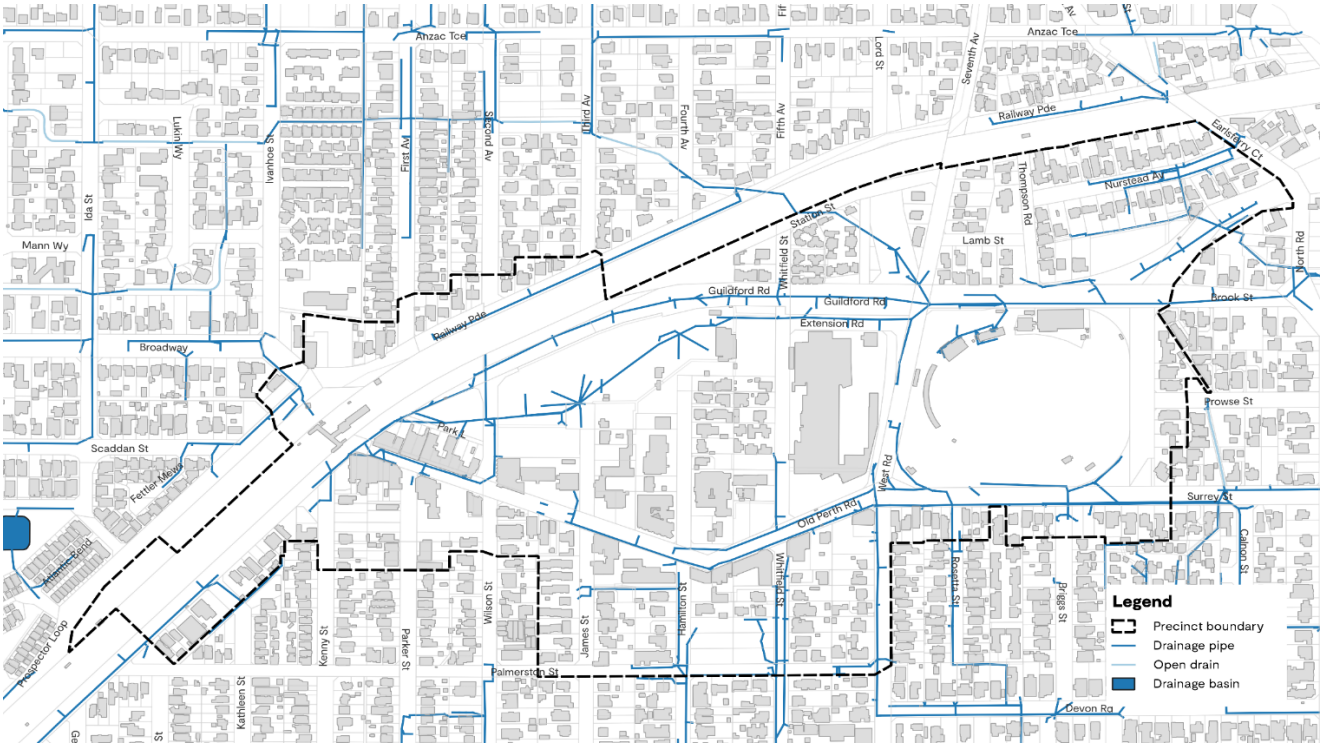

Figure 13 Existing Drainage Network

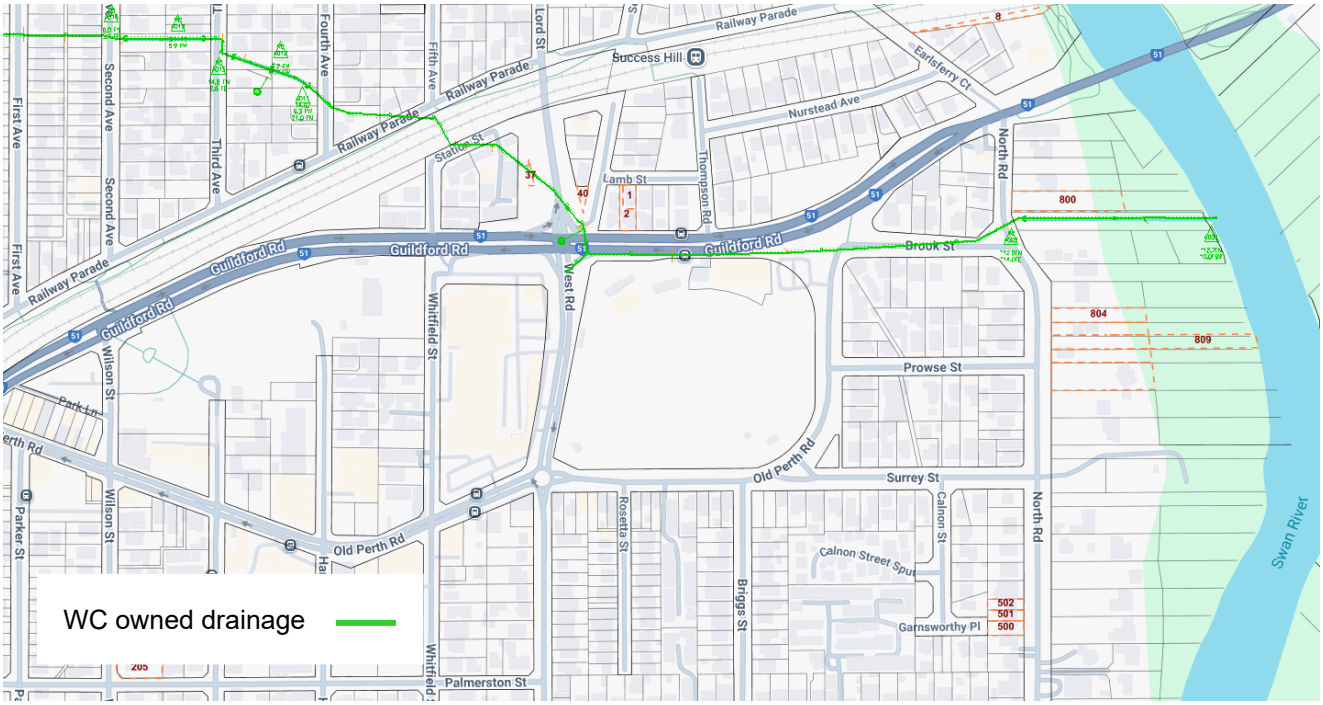

Figure 14 Existing Water Corporation owned Drainage Network

9. Conclusion

The Precinct is currently well serviced with power, water, wastewater/sewer, telecommunications and gas reticulation, based on the current land use status. While the area is well serviced to meet current demands, several upgrades will be required to meet the ultimate development requirements. These include:

– Significant upgrades to sewer reticulation, per advice from Water Corporation.
– Multiple upgrades and replacement required to water reticulation, per advice from Water Corporation.
– Potential requirement for HV network reconfiguration, subject to further assessment by Western Power.
– Drainage infrastructure.

Water Corporation has advised that while the existing DN305 gravity sewer main has been identified for long-term upsizing to DN375, this work currently sits outside of their 5-year capital program and will only be triggered by future development demand. The Hyland Pump Station has sufficient capacity to cater for the revised long-term pump rate; however, the increase in flow will necessitate additional emergency storage, with staging of this upgrade to be reviewed once zoning changes are endorsed, and development scale is clearer.

Given the ad-hoc nature of redevelopment in the area, Water Corporation cannot provide a definitive staging plan or timing for reticulation upgrades at this stage but confirmed that all upgrades will need to be completed prior to redevelopment, including specific reticulation sections identified as having capacity constraints. The required water infrastructure upgrades are summarised in the table below, comprising both upsizing works to accommodate additional demands and replacement of reticulation mains that do not comply with the current Water Corporation design standards.

Table 3 Proposed water infrastructure upgrades

Location (Affected roads)	Upgrade requirements
Hamilton Street	Replace approx. 130m of 90-AC retic main with DN100.
Lamb Street	Decommission approx. 40m of 40-CU (or replace with DN100 depending on development requirements)
Prospector Loop	New DN100 loop to connect to existing 100-P retic main
Brook Street & Old Perth Road	Replace approx. 370m of 75-CI retic main with DN100. Extend 100-P (approx. 30m) on Old Perth Rd to connect to above new retic main at Prowse Street.
Railway Parade	Construct new DN200 retic main along Railway Parade between Broadway and Third Avenue. Connect to 150-AC retic and 305-CI distribution main at Broadway, 150-AC at Second Avenue and 90-AC & 305-CI distribution main at Third Avenue. Any existing and future customer meters along this section of Railway Pde should be connected to the new DN200. Replace approx. 220m of 75-AC retic main on First Ave with DN100. Connect to new DN200 retic main on southern end.
Guildford Road	Decommission approx. 32m 25-CU retic main on Guildford Road near the intersection of Old Perth Rd.
Old Perth Road	Replace approx. 1,000m of 150-CI retic main (between Guildford Road & Surrey Street) with DN200. Reinstate all existing cross connections and replace short section of 75-CI road crossing at Briggs Street with DN100.
Whitfield Street	Replace approx. 100m of 205CI with DN250, including cross connection to 460-S rail crossing.

ATCO has confirmed that the existing gas distribution network has sufficient capacity to support the additional residential dwellings in the Precinct, based on the assumption of full gas connection by 2050 and no change to the number of meters for commercial properties, as no further subdivision of non-residential lots is anticipated as part of the Precinct's development.

Western Power requires a minimum design capacity of 200kVA per hectare for commercial developments, equating to 0.360MVA for the proposed commercial area, and approximately 6.42MVA for future residential growth in Bassendean based on current loading assumptions. While the Hadfield's Zone Substation has sufficient spare capacity (20MVA), the key constraint is the 5MVA load limit on each leg of its HV feeder Y-configuration. To support future redevelopment, HV network reconfiguration may be required—such as offloading some feeder loads to adjacent substations. Further assessment by Western Power will be necessary to confirm network augmentation needs.

The Precinct is identified as a 'service available area' on nbn™'s rollout map, allowing developers to apply for infrastructure connection through a standard process. If nbn™ is selected as the carrier, developers must install and fund pit and pipe infrastructure (if not already present) to nbn™ standards and transfer ownership via a Developer's Agreement. Given the area's established nature and proximity to existing fibre networks, the current pit and pipe infrastructure is expected to adequately support future telecommunications demand.

A series of drainage assessments undertaken since 2014 have consistently highlighted deficiencies within the Town's drainage network and identified the need for upgrades to mitigate localised flooding and manage stormwater more effectively. While early recommendations focused on specific pipe upgrades to address existing management issues, subsequent technical studies (2022–2023) reinforced the need for additional capacity through pipe enlargements, subsurface storage within Success Hill Reserve, and provision of an overflow pathway to the Swan River for extreme events. Despite these findings, localised flooding continues to be observed, particularly around Old Perth Road, Whitfield Street, and Bassendean Oval. Targeted upgrades are required to reduce flood risk and ensure the network can adequately support both current and future conditions. Improvements to infiltration rates (both in the public and private domain) aim to incrementally reduce drainage flowrates over time.

Staging the development of the Bassendean Precinct presents a practical and strategic approach to achieving the long-term planning objectives. By delivering the development in stages, the Town can manage growth in a coordinated manner that aligns with infrastructure capacity, protects environmental values, and reflects community aspirations. This approach enables efficient use of existing and proposed infrastructure, supports sustainable land use intensification, and allows flexibility to adapt to evolving housing demand over time, ultimately contributing to the broader vision of a compact, connected, and consolidated metropolitan region.

Appendix A

BYDA Information

Appendix B

Water Corporation Advice

Appendix C
ATCO Gas Advice

ghd.com

→ The Power of Commitment