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Golden Bay
ENGINEERING SERVICING REPORT
Local Structure Plan
Lots 23 – 26, 28, 161 & 162 Sawley Close, Golden Bay

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Golden Bay LSP
Engineering Servicing Report

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1. EXECUTIVE SUMMARY

This report has been prepared by Cossill & Webley Pty Ltd (CW) to support the Local Structure plan for Lots 23 – 26, 28, 161 & 162 Golden Bay. It summarises the results of a review of the civil engineering issues which have informed and support the future servicing of the land development.

This report provides details for each major infrastructure type and a servicing strategy for implementation required for development. The level of detail is consistent with the requirements of an overarching engineering servicing investigation and acknowledges further more detailed work will be required at the time of land subdivision.

The engineering review covers siteworks, roadworks, stormwater drainage, sewerage, water supply and utility services.

The investigation has found the land is capable of development with logical progressive extension of infrastructure and base capacity.

The ground conditions will not limit the proposed development.

The existing roads to the west and north will provide good access with the external arterial road system.

Sewer is proposed to discharge to the existing sewer network west in Golden Bay.

Water can be serviced off the existing network west and north of the Site. The Water Corporation has advised there is a high level service restriction of RL20m AHD, which will dictate the maximum level of development.

Power, telecommunications and gas will be provided via an extension of the existing infrastructure in Golden Bay and Secret Harbour with no offsite infrastructure upgrades anticipated.

The investigations and preparation of this report is largely based on preliminary advice from the various service authorities. The information is current as of June 2025.

2. INTRODUCTION

This report is prepared by Cossill & Webley Pty Ltd (CW) to support the Local Structure Plan for Lots 23-26, 28, 161 & 162 Sawley Close, Golden Bay. It summarises the results of a review of the civil aspects which have informed and support the proposed planning layout.

The engineering review covers siteworks, roads, stormwater drainage and utility services for the proposed development which is anticipated to yield approximately 142 residential allotments.

We note that Lot 28 is intended to be reserved for Parks and Recreation, and hence will not require connection to utility services.

The investigations and preparation of the report is largely based on preliminary advice from the various service authorities and is current as of June 2025.

The location of the proposed Site is presented below in Figure .

Figure 1 - Site Plan (MNG Access, April 2024)

3. SITE DESCRIPTION

The Site is approximately 16.5 Hectares and is located in the City of Rockingham, approximately 14.5km north of Mandurah, and 8.5km south of Rockingham City Centre. The Site is bounded by residential housing to the north and west and rural lots to the south. Sawley Close abuts the southern section of the Site.

The location of the Site will require a coordinated approach for development with the existing Golden Bay development to the west in order to extend and connect roads and services.

The site is covered with vegetation that consists of medium sized trees, shrubs and grasses, with mature trees in the southern portion of the Site in the vicinity of Sawley Close.

Figure 2 - Site Plan (MNG Access, June 2025)

3.1 Topography

The Site consists of undulating dunal landforms over the majority of its area. High points of RL 25m-27m AHD exist in the north and west, with the site generally grading down to RL 3m AHD in the south around Sawley Close. The existing topography is presented below in Figure 3.

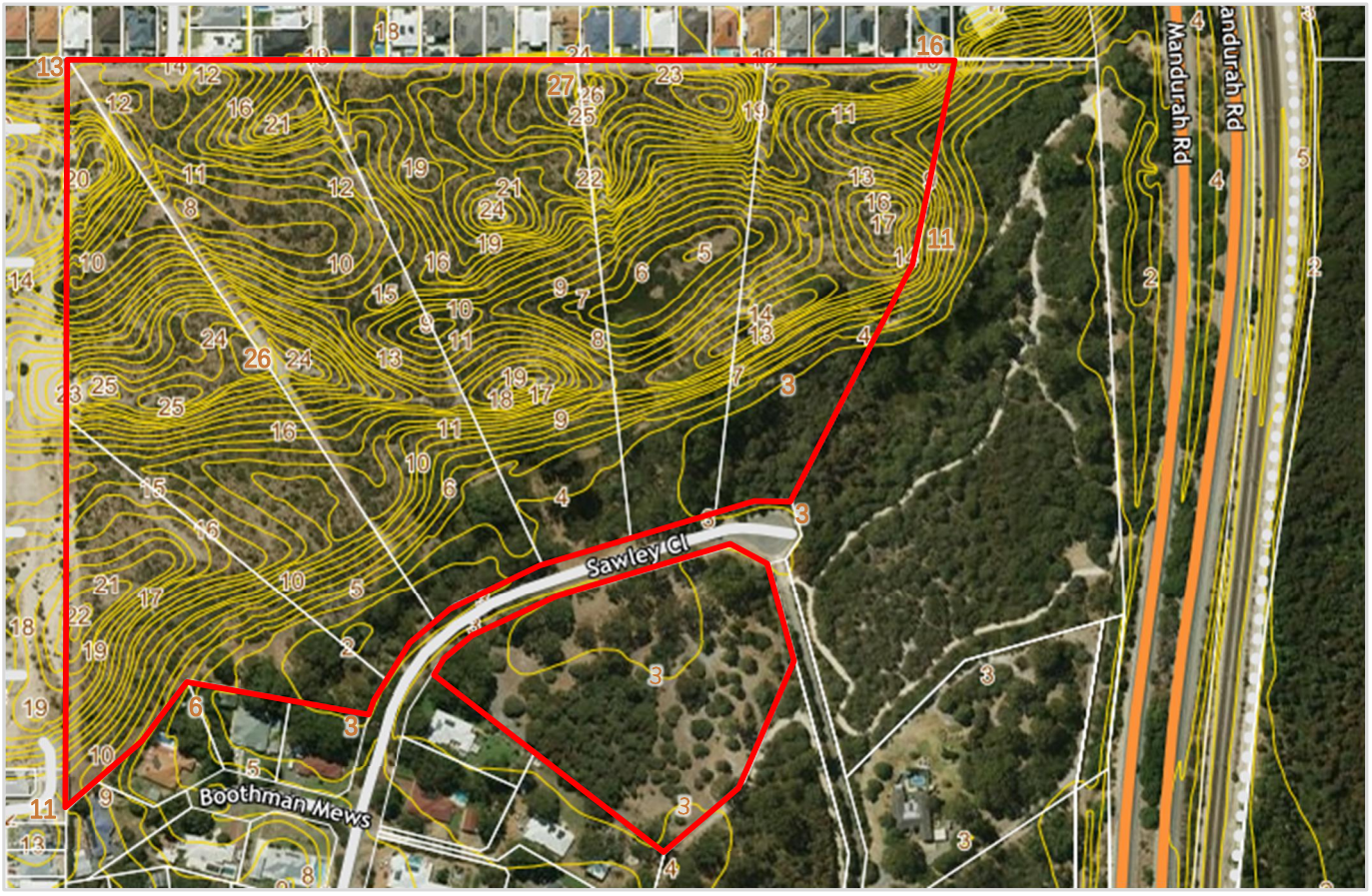

Figure 3 - Topographical Mapping (MNG Access, June 2025)

3.2 Geology

The 1:50,000 Environmental Geology series map, excerpt in Figure 4 below, indicates that the majority of the Site is largely underlain by Safety Bay Sands, described as calcareous white sand, with high permeability. The southern section, in the vicinity of Sawley Close, is yellow sand derived for Tamala Limestone and has moderate permeability.

The geological mapping indicates the area on the south-eastern boundary of the Site, may contain limestone at depth.

Based on our understanding of the regional geotechnical conditions, the majority of the Site is suitable for a classification of "Class A", in accordance with AS2870-1996, "Residential Slab and Footings".

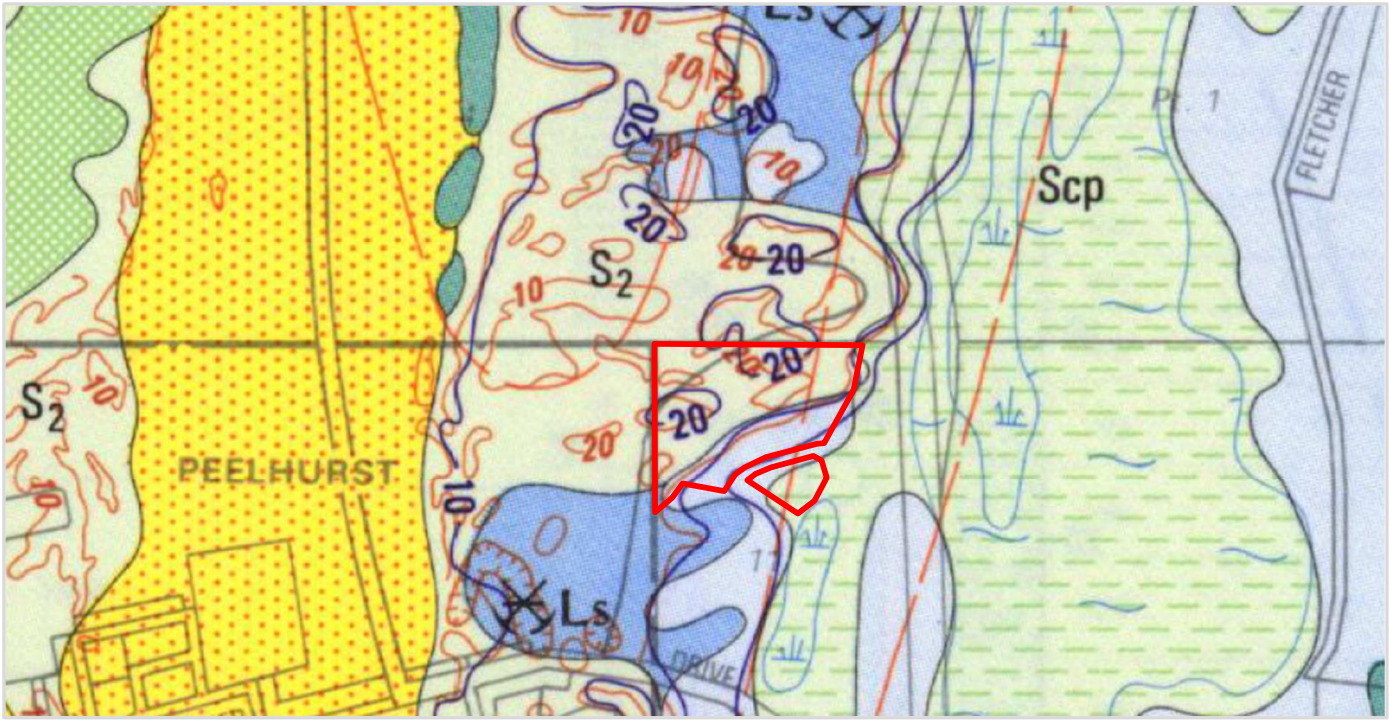

Figure 4 – Environmental Geology series map for the Golden Bay region

S_2	CALCAREOUS SAND – white, medium grained, rounded, quartz and shell debris, well sorted, sub-rounded quartz, moderately well sorted of eolian origin
S_7	SAND – pale yellowish brown, medium to course-grained, sub-angular quartz, trace of feldspar, moderately sorted of residual origin
LS_1	LIMESTONE – pale yellowish brown, fine to course-grained, sub-angular to well rounded quartz, trace of feldspar, shell debris, variable lithified, surface kankar, of eolian origin
Scp	CLAYEY SAND – black, fine to medium grained quartz sand with clay matrix, variable organic matter, of lacustrine origin

Based on our experience on similar projects within the area, the Site is well suited for future urban development in terms of topography and geotechnical conditions. The free draining soils will provide a suitable foundation for roads, infrastructure and residential development.

3.3 Groundwater

Groundwater monitoring by Strategen was undertaken in 2017, and indicates the maximum ground water level at the Site is less than RL 2m AHD. Typically, a minimum clearance of 1.5m to the water table is recommended. Therefore, the area identified for residential development has adequate clearance to groundwater.

In the southern part of the Site where clearance to groundwater is minimal, public open space is proposed.

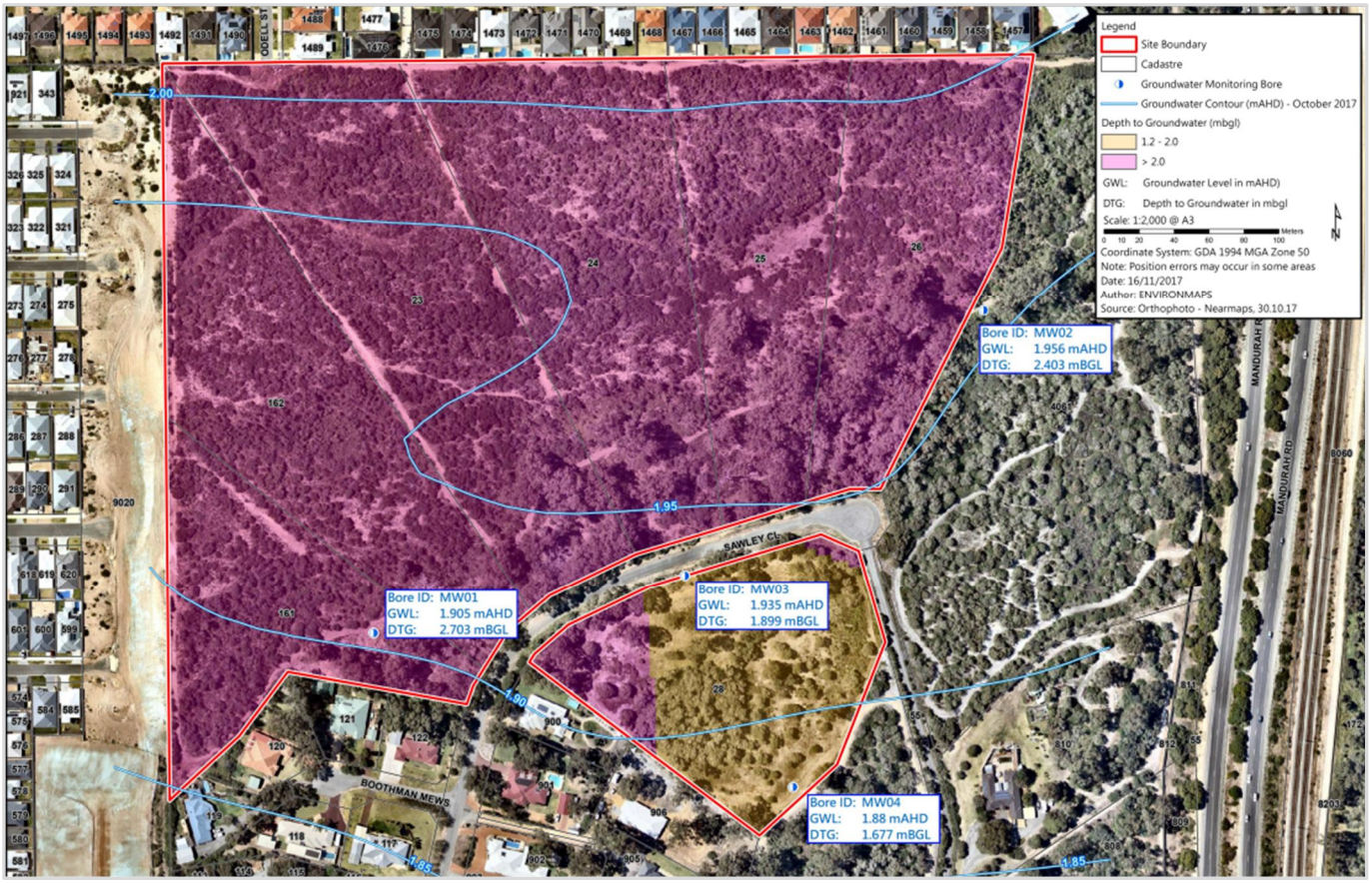

Figure 5 – Strategen Ground Water Monitoring (Golden Bay Baseline Groundwater Monitoring Report, 2018)

4. SITE WORKS & EARTHWORKS

Siteworks for urban development at Golden Bay will generally comprise the clearing of existing vegetation where necessary, and the earthworking of existing ground to facilitate future development.

In Perth it is often the case that the extent of siteworks is dictated by the density and nature of development and by the finished ground shape required for building houses. Increased densities and decreasing lot sizes has led to a current trend for the development areas to be fully earthworked to create level lots which are terraced utilising inter-allotment retaining walls.

This approach provides a number of positive outcomes:

- It reduces house building costs;
- It rationalises retaining wall layouts and designs consistent with Local Authority specifications;
- It enables lots to be terraced up natural slopes to maintain elevation and views.

A site responsive earthworks approach is proposed to integrate development pads into the sloping landform. The general intent is to match into the existing Secret Harbour and Golden Bay interface and minimise the extent of off-site fill, whilst ensuring drainage, roadworks and servicing requirements are met.

Finished lot levels for development are typically dictated or controlled by the following design considerations/factors:

- Cutting high points to below the Water Corporation's high water service level (RL20m AHD);
- Interface with the existing developments to the west and north;
- Sewer control levels;
- Desired Geotechnical Site Classification;
- Hydraulic grade line of drainage system;
- Separation from groundwater table;
- Retention of vegetation within the proposed POS/ROS area south and east of the Site.

Wherever possible, the earthworks design for roads and building pads will likely involve a cut-to-fill operation to allow for grading roads, drainage and services and to meet the Water Corporation's high water level service constraint. Retaining walls may be installed to provide level pads for future housing construction.

5. STORMWATER DRAINAGE

5.1 Integrated Urban Water Management

A Local Water Management Strategy (LWMS) has been prepared by Hyd2O and accompanies the rezoning application. This provides an overview of drainage quality and quantity management and includes strategies for total water management including the minimisation of scheme water use and the maximisation of recharge of stormwater runoff.

Stormwater drainage management is proposed by adopting a Water Sensitive Urban Design (WSUD) approach. Objectives of WSUD include:

- Detention of stormwater rather than rapid conveyance;
- Use of stormwater to conserve potable water;
- Use of vegetation for filtering purposes; and
- Water efficient landscaping.

The main WSUD practices which will be incorporated into the detailed design include:

5.1.1 Stormwater Management

The Golden Bay Development will adopt WSUD principles so that any incident rainfall is collected and disposed of into the natural sands of the area in order to mimic the natural recharge of aquifers prior to the development.

Stormwater recharge of the shallow aquifer will be maximised through the adoption of 'Best Management Practices', which promote the dispersion and infiltration of runoff. These include the diversion of runoff into road-side swales, drainage soakwells to infiltrate runoff from buildings and private open space areas and the disposal of road runoff into infiltration basins within the POS area.

5.1.2 Water Quality Management

Recharge water quality will be maximised through the adoption of "Best Management Practices", which promote the disposal of runoff via water pollution control facilities (including vegetated swales and basins, detention storage and gross pollutant traps) and the implementation of non-structural source controls (including urban design, street sweeping, community education, low fertiliser landscaping regimes, etc.).

5.2 Stormwater Collection and Management

The Golden Bay Development consists of highly permeable sand subgrade which readily disposes of incidental rainfall. It is intended to use localised stormwater systems which rely on a combination of soakwells within lots and swales within open space areas and verges to dispose of stormwater.

Based on existing ground contours, there is sufficient clearance to the groundwater table (>2 metres) to facilitate on site disposal of stormwater via soakwells and swales.

Drainage from public roads and lanes can be managed in a number of ways depending on the nature of the adjacent land uses, the extent of traffic and pedestrians and the objectives for drainage management.

Infiltration could also be via gully pits with permeable bases, slotted drainage pipes, porous road pavements or under road storages subject to the City of Rockingham approval.

The Golden Bay Development will adopt water sensitive design principles so that any incident rainfall is collected and disposed of into the natural sands of the area in order to mimic the natural recharge of aquifers prior to the development.

Run-off from less frequent major events, up to 1% AEP recurrence intervals will be catered for in an overland flow system designed to ensure that building pads remain flood-free during these severe events. Roads will drain via overland flow to the POS south of the development.

6. ROADWORKS AND FOOTPATHS

6.1 Connection to Local Roads

The Site has good access to the surrounding road network via connections to the west within Golden Bay and north within Secret Harbour. Provision has been made for a northern connection at Odell Street within Secret Harbour and a future road abutting the western boundary (Dayhurst Road) will provide good unfettered access to the west.

Adjacent connecting roads are all local roads single carriageway, kerbed and drained, in good condition.

6.2 Development Roads

New roads will likely consist of standard Access Street D roads in accordance with Liveable Neighbourhoods and the City of Rockingham standards.

In all cases the road cross-sections will be designed to cater for utility services on standard verge alignments and street trees.

The engineering design of roads will be carried out to comply with the Department of Planning's Liveable Neighbourhoods recommendations for design speeds and sight distances and with the requirements of the City of Rockingham.

It is proposed that the development roads be designed to suit lower vehicle operating speeds to ensure safer operation and improved pedestrian movement. The lower speeds on local roads will also support initiatives to adopt smaller street truncations and associated intersection curve radii where suitable.

6.3 Footpaths

Footpaths will be provided in accordance with Liveable Neighbourhoods and the City of Rockingham standards and will consist likely of one path in every road.

6.4 Public Transport

There are existing bus routes that run along Frenchmans Crecent and Bluestone Parkway, within 700m from the Site.

7. WASTEWATER

The Site is within the Water Corporation's sewer reticulation area and they have confirmed the existing network to the west and north has capacity to accept flows form the new proposed development with no off-site infrastructure upgrades anticipated. The existing sewer network adjacent to the site is presented below in Figure 6. Sewer inverts are of a sufficient depth to service the proposed future development.

The existing Golden Bay sewer network to the west discharges to a DN600dia main in Warnbro Sound Avenue, which feeds into the existing Bluestone Parkway sewer pump station in Secret Harbour. No upgrades to this headwork infrastructure is anticipated as part of this development.

Standard Water Corporation sewer headworks will apply.

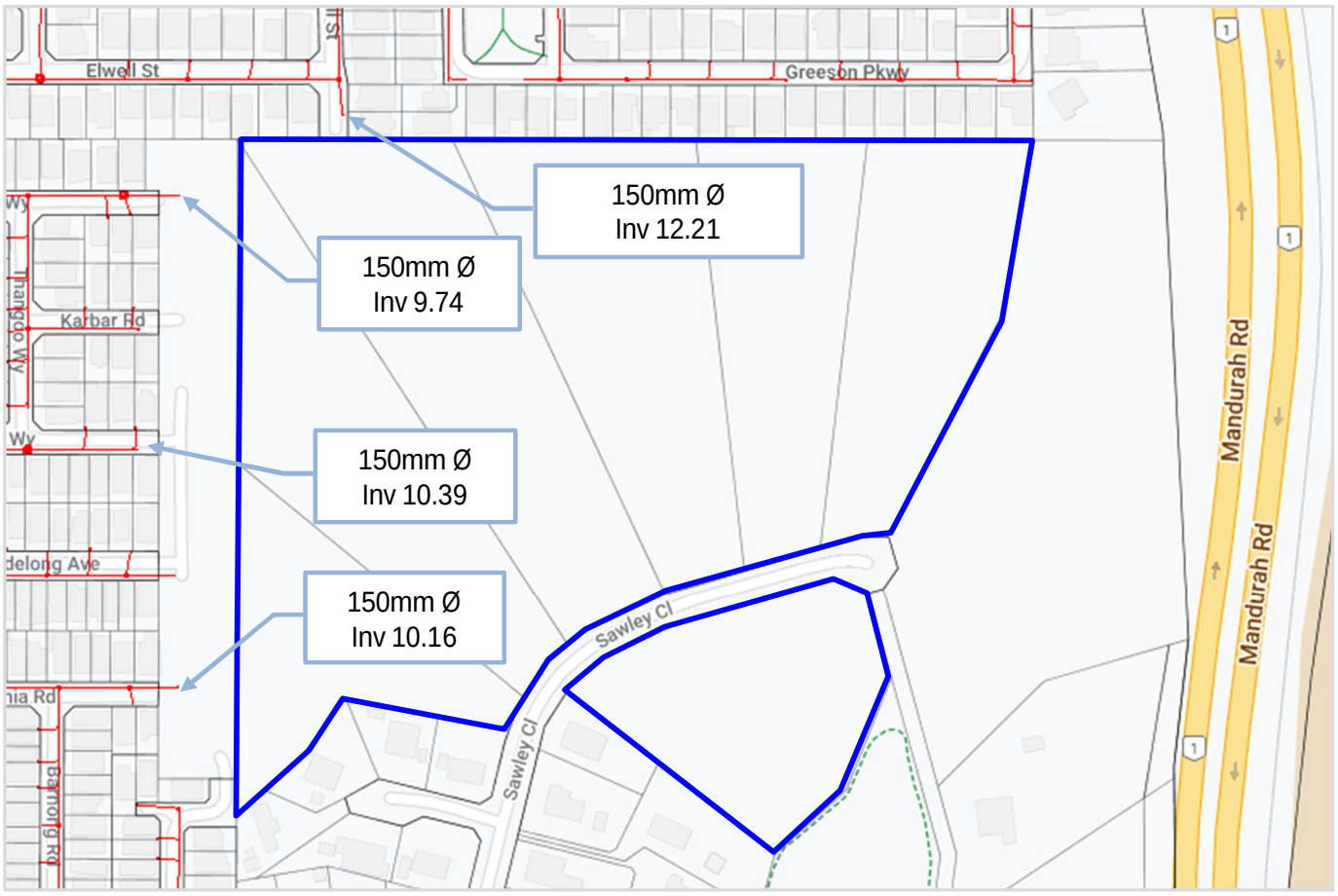

Figure 6 - Existing Water Corporation Water Network (Esinet, 2025)

8. WATER SUPPLY

The Site is within the Water Corporation's water supply scheme, and they have confirmed there is capacity in the existing surrounding network to service the proposed development. The existing water network surrounding the Site is presented below in Figure 7. No off-site infrastructure upgrades will be required to service this development.

The Water Corporation has advised the existing system has a high level constraint restricting the maximum height of lots within the development to RL20m AHD. Lots between RL15mAHD and 20mAHD will have marginal pressure that does not meet the new Water Corporation's 22m minimum pressure requirement as outlined in their "Criteria for Drinking Water Supply" manual. Lots higher than RL15mAHD will require a Section 70A notification on Title alerting new owners to the potential that water pressures may not meet the new Water Corporation minimum standards during peak usage.

Standard Water Corporation Water Headworks will apply.

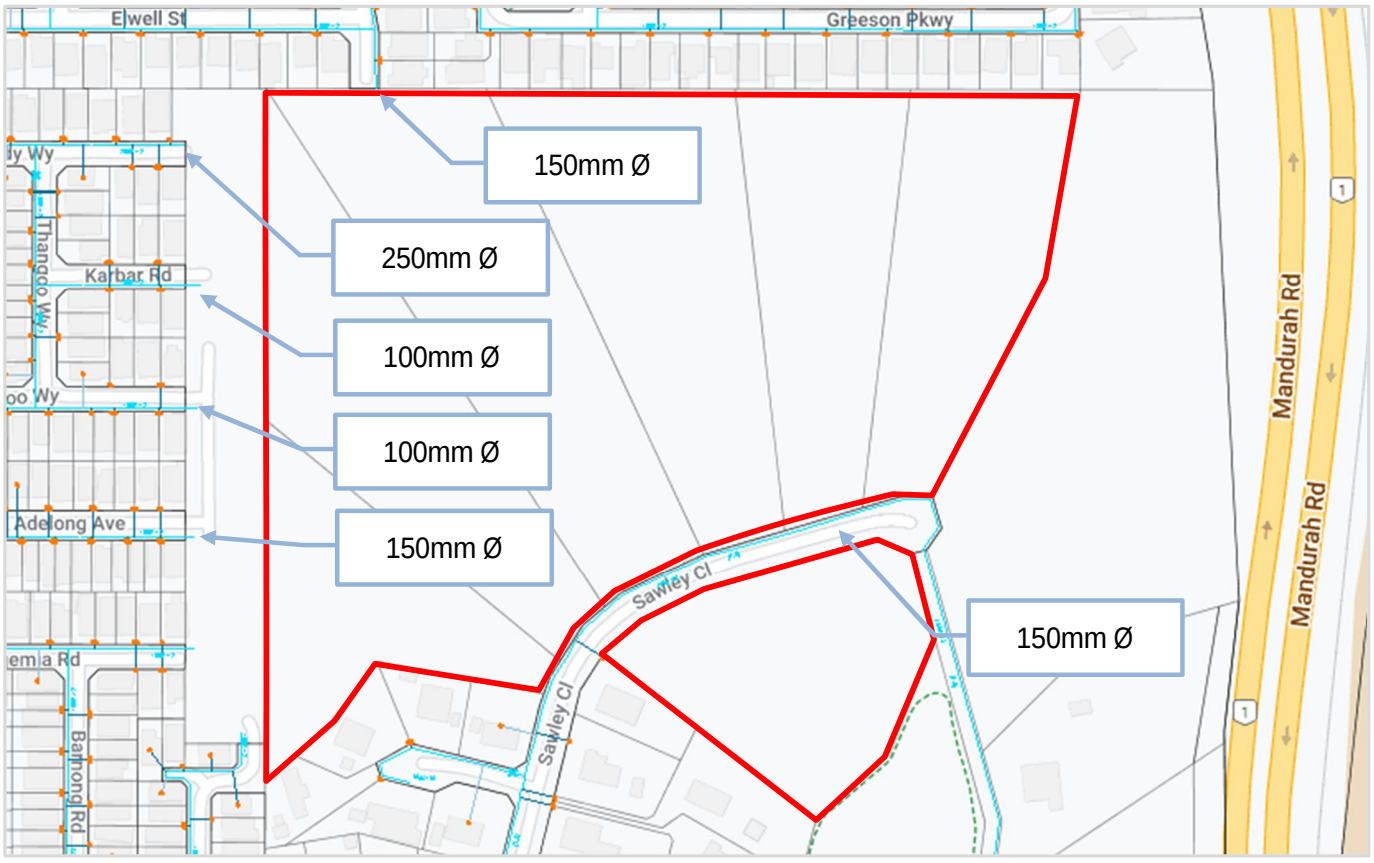

Figure 7 - Existing Water Corporation Water Network (Esinet, 2025)

9. GAS SUPPLY

There is an existing high pressure gas main in Odell Street, and medium pressure gas mains in the roads to the west, which will be capable of supporting the proposed development. The existing gas infrastructure surrounding the Site is presented below in Figure 8.

No off-site gas headwork upgrades are anticipated to service this development.

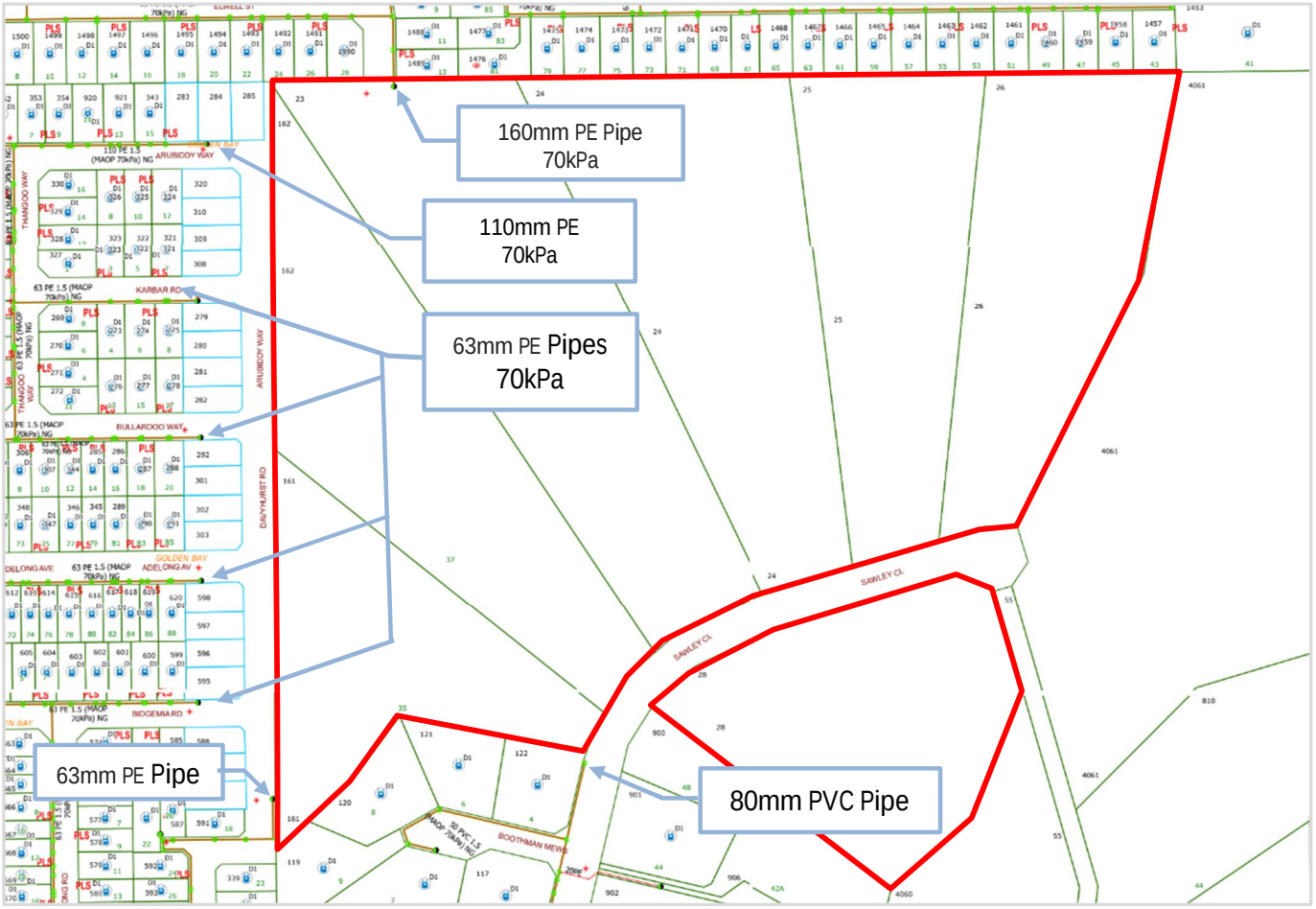

Figure 8 - Existing Water Corporation Water Network (Esinet, 2025)

10. ELECTRICAL SUPPLY

There is existing capacity with the existing high voltage power network surrounding Golden Bay and Secret Harbour to service the proposed development. The development falls in to Western Power's Meadow Springs Substation catchment, which is located off Kirland Way, Meadow Springs to the south.

Western Power's Network Capacity Mapping Tool indicates the 2025 Forecast remaining capacity is 15MVA across the development area. Based on an anticipated 150 lots at a load of 4.7kVa per lot, 0.70MVA will be required, indicating there will be sufficient capacity to service the development with no off-site headwork upgrades required.

There is existing high voltage underground power network surrounding the development (presented below in Figure 9) which can readily be extended to service the development.

We anticipate there will be some local land requirements for transformer and switch gear sites, which will be determined at detailed subdivision stage.

We anticipate Western Power Street Vision lighting will be incorporated throughout.

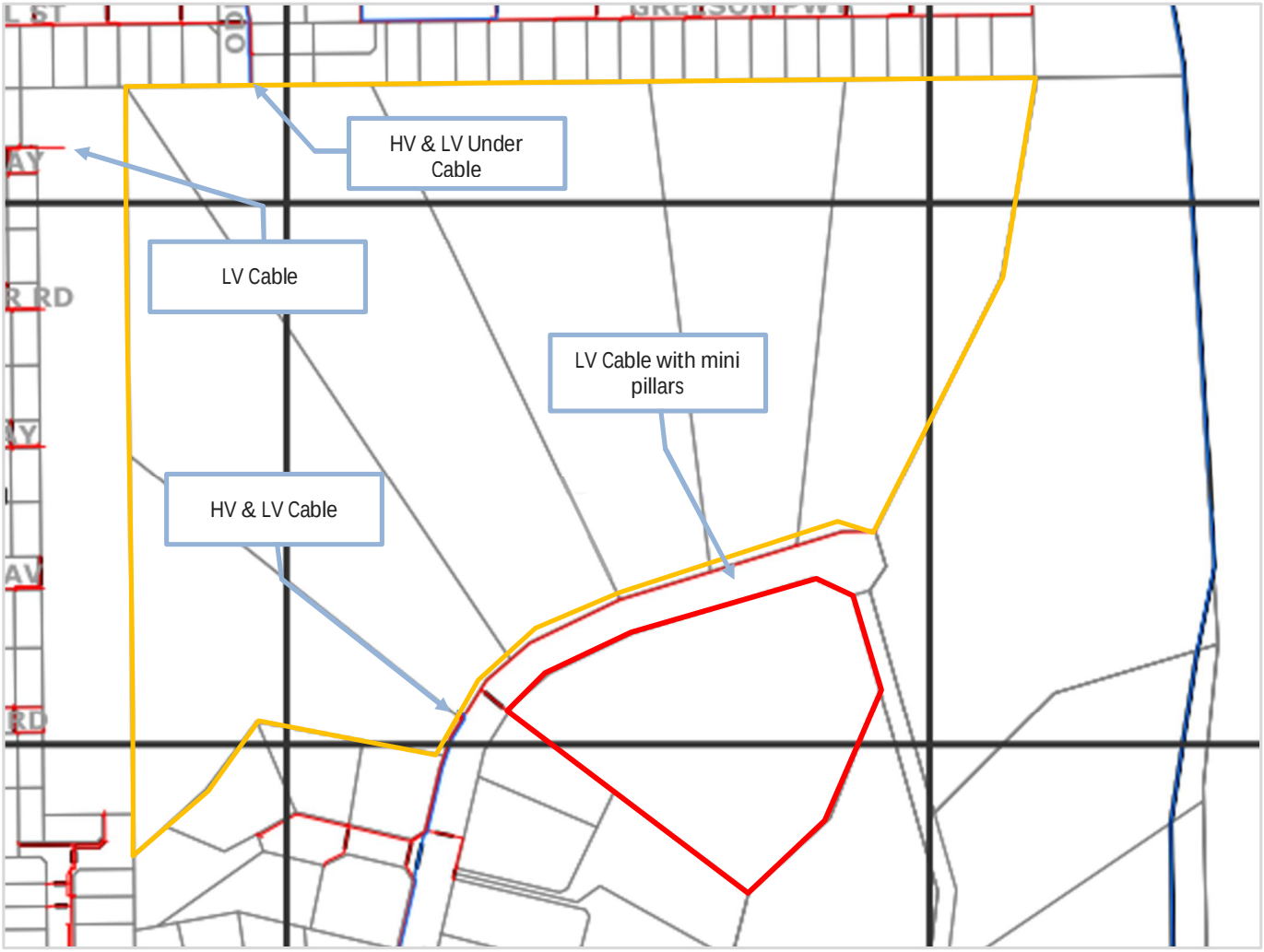

Figure 9 - Western Power Existing Underground Infrastructure (Before You Dig, April 2025)

11. TELECOMMUNICATIONS

The Site is within NBN's fixed line footprint, and hence can be serviced with optic fibre under their roll-out scheme for greenfield developments.

There is NBN pit and pipe infrastructure within the roads network surrounding the Site which can readily be extended to service the development.

Under the Federal Government's Telecommunications in New Developments Policy, developers are responsible for contributing to the cost of delivering the NBN network in new developments. This includes contributing to part of the costs of the build (installing pit & pipe) as well as a $600 per lot deployment change.

Through the NBN, the ownership issues of delivering the wholesale fibre to the home system have been transferred to the Government with over 100 Retail Service Providers offering services over the network. There are other private communication providers that can also offer similar services.

Developers of new residential estates have the option to pay NBN or an alternative service provider for provision of a high-speed broadband network. In either case the developer will install pit and pipe infrastructure that can accommodate a future high speed broadband network.

The current design practice for road reserves, pavement and verge provisions will make adequate allowance for services including broadband in accordance with the agreed Utilities Service Providers handbook. There will be some local land requirements for equipment sites, similar to current provisions which will be accommodated at detailed subdivision stage.

12. CONCLUSION

Lots 23-26, 28 & 161-162 Sawley Close, Golden Bay has planned strategies for all public utility services. The Site is frontal to all services, which can readily be extended to service the proposed development area.

The Site has good access to the existing road network west and north, and there are no engineering impediments to the development. From an engineering perspective, the site is well suited to future development.