DARDANUP PARK PTY LTD

DARDANUP PARK

ENGINEERING SERVICING REPORT

NOVEMBER 2021

WML
Consulting Engineers

Distribution Record

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1. EXECUTIVE SUMMARY

This report summarises the availability of services to the planned Dardanup Park Estate as well as commenting on required service upgrades, road network and drainage management concepts.

In terms of servicing, the site is only likely required to have power and comms connections, with water being provided from rainwater tanks and sewer from onsite effluent disposal. Power connections are available, with comms likely to be served via fixed wireless.

2. PROJECT SUMMARY

WML have been engaged to undertake preliminary engineering investigations into the serviceability of the Dardanup Park development area shown below. The site is located within the Shire of Dardanup and is bound by Venn Road and Harold Douglas Drive to the north, Keenan Road to the West and the Dardanup town site to the east.

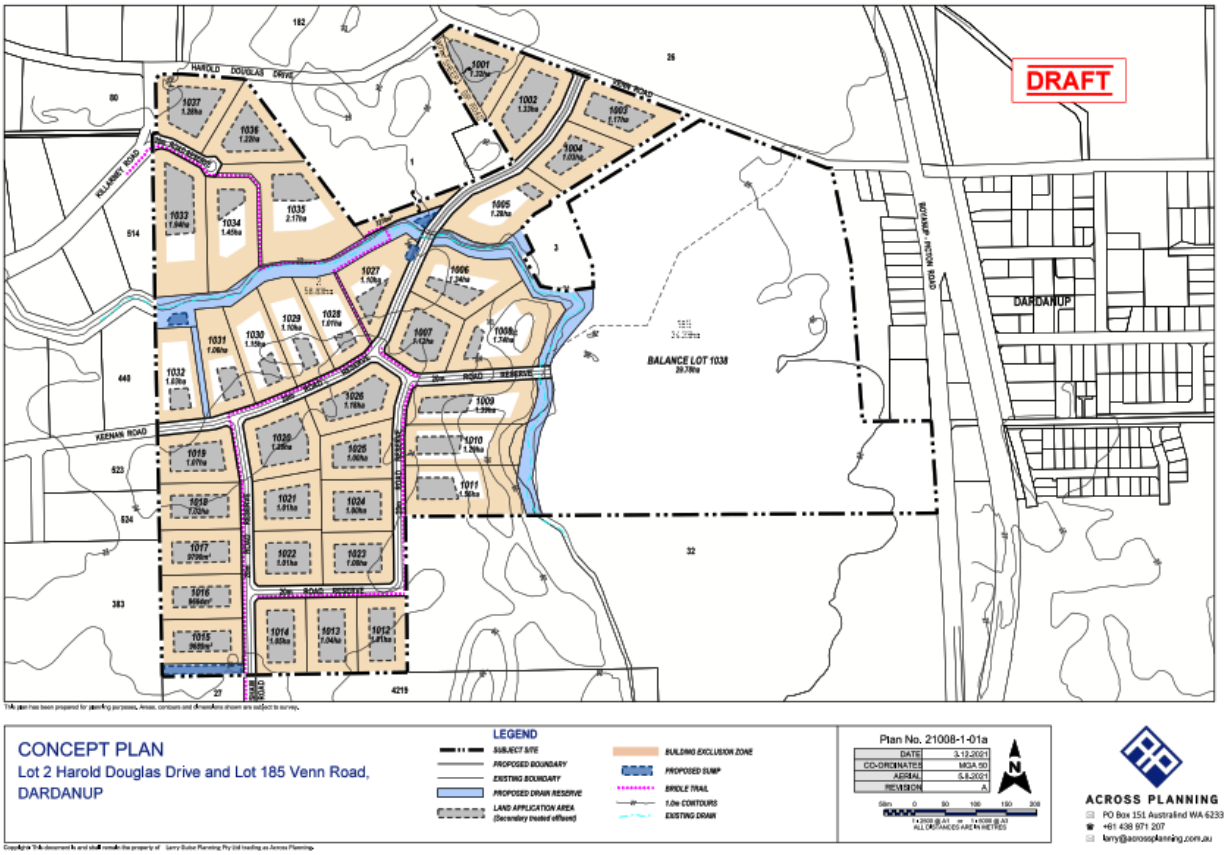

Figure 1: Dardanup Park Concept Plan

3. SITE DESCRIPTION

At the time of the investigation, the site was typical farmland and included a residential house, several shed structures, one permanent bridge structure, a few temporary drain crossings, and water tanks. The remaining area comprised typical paddocks and was covered predominantly by grass and large trees. An open-drain intersected the site, entering from the south-eastern corner and exiting at the western boundary of the site. A series of smaller north-south and east- west trending drainage ditches were noted within the site, typically along with the existing fencing that divided the site into smaller paddocks. The existing ground surface was observed to be relatively flat within the majority of the site, and the current ground level is understood to be between about RL 22 m AHD and about RL 24 m AHD. A small sand dune was noted within lots 1008, 1009, 1010 and 1011, where ground levels were up to about 4 m higher than the rest of the site (up to about RL 28 m AHD).

4. GEOTECHNICAL AND HYDROLOGY

The 1:50,000 scale Geological Map 'Bunbury-Burekup' indicates that the site is underlain by three geological units: BASSENDEAN SAND (Qpb), GUILFORD FORMATION (Qpa) and BASSENDEAN SAND over GUILFORD FORMATION(Qpb/Qpa).

Sub-surface Profile

The site can be broken down into three zones based on the geology of the existing soils:

Zone 1: Bassendean Sand

This zone comprises low dunes of SAND (SP), generally fine to medium-grained, pale grey, grey and pale yellow mottled grey, but also yellow and yellow-orange, generally loose to medium dense, moist to wet and typically encountered to the test pit termination depths of between 1.6 m and 2.1 m below ground surface. At three test pit locations (TP 7, 14 and 16), an indurated sand layer was observed at the end of the test pit, commonly called 'Coffee Rock'. This layer was only visually identified immediately prior to the test pit collapse or was excavated as sand/gravel/cobble mix until test pit collapse.

Zone 2: Guildford Formation

This zone comprises mainly Alluvium represented by the variable type of soils, including Sandy CLAY (CL, CI, CH), Clayey SAND (SC), SAND (SP) and CLAY (CI, CH). There was no consistency in the structure of the layers or their thickness. The soils were typically brown mottled orange and grey, with a trace of fine-grained gravel, moist to wet, soft to very stiff (clays), or loose to dense (sands). At TP 1 and TP 2, Clayey SAND and Sandy CLAY with fine to medium-grained lateritic gravel were encountered from a depth of 2.1 m and 1.6 m, respectively.

A soft ORGANIC CLAY layer (OL) was encountered in TP 23 below the topsoil layer, to a depth of 0.9 m below the ground surface.

Zone 3: Shallow Bassendean Sand over Guilford Formation

This zone was observed only in one test pit, TP 1, and comprised SAND (SP) to a depth of 0.9 m below the ground surface underlain by 'Coffee Rock' excavated as Sandy GRAVEL (GP) to a depth of 1.3 m, which in turn was underlain by Sandy CLAY (CH) and Clayey SAND (SC) of Guilford Formation to the test pit termination depth of 2.5m.

Topsoil was encountered at all test pit locations to a depth of between 0.1 m and 0.45 m below the existing ground surface.

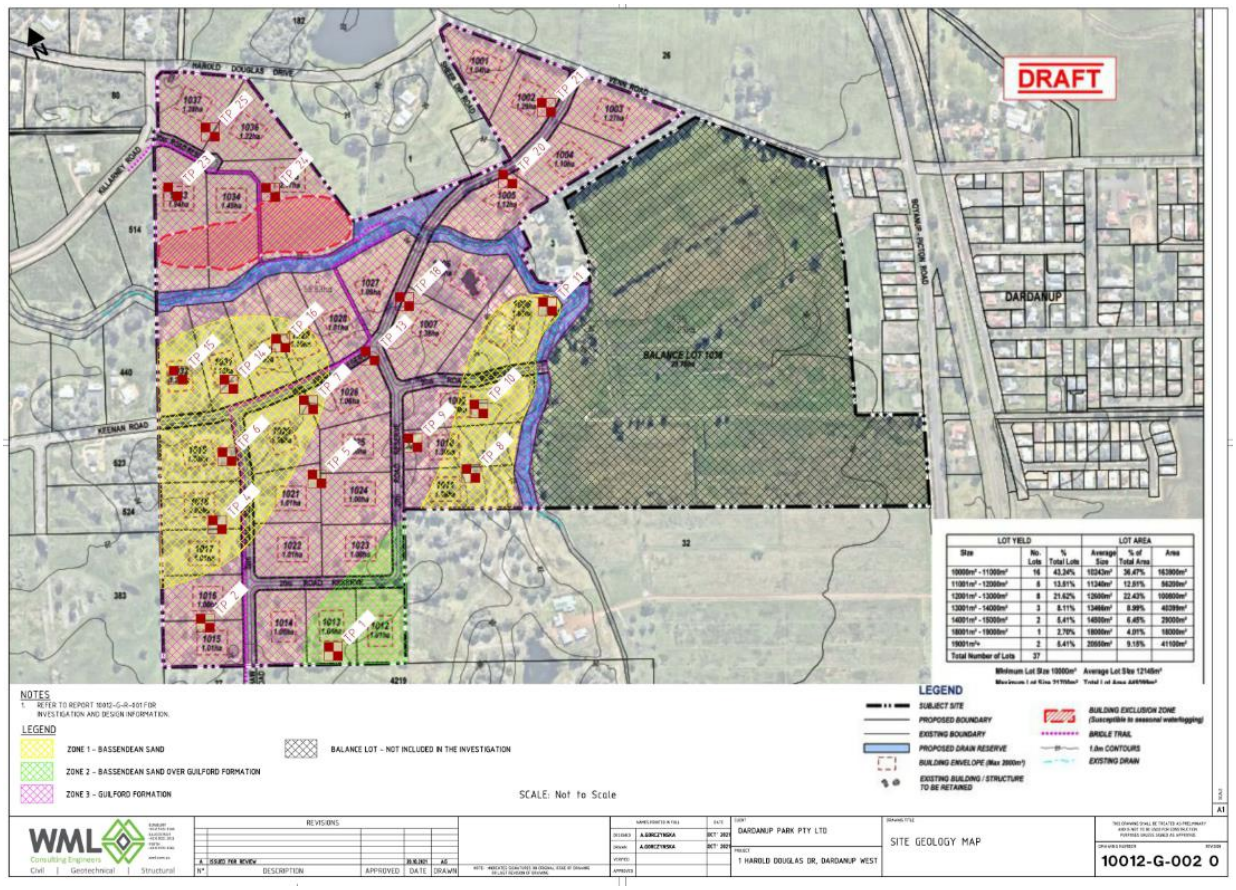

Figure 2: Geotechnical Bore Locations

GROUNDWATER

At the time of the investigation fieldwork (beginning of September 2021), groundwater seepage was observed in 12 of the 20 test pits at depths between 0.6 m and 1.5 m below the existing ground surface. No stabilized water table was observed during the investigation.

Based on the information provided by the Client, ten (10) groundwater monitoring wells were installed on site in the past, with the maximum recorded groundwater levels for 2021 (20 September 2021) between 0.13 m and 1.33 m below existing ground level.

A large portion of the site is susceptible to seasonal waterlogging due to the clayey nature of the topsoil within those areas and/or the underlying clay layer on top of which stormwater is ponding during the wet season and during/following heavy rainfall events. Therefore, groundwater is expected to influence the proposed development.

For the design of the drainage system, the pre-development peak groundwater level shall be considered at the existing ground surface for the majority of the site, except the elevated sand dune area located within the south-eastern portion of the site.

5. ROAD NETWORK SUMMARY

The proposed primary access to the development will be from Venn Road and will be an extension of the existing Keenan Road. There is a future road connection to the undeveloped road reserve of Shaw Road to the south. A

Traffic Impact Assessment completed by Cardno has indicated that it would be desirable for a future extension of Keenan Road through the northern Lot 26 once it is developed although not necessary for this development. This will change the ultimate exit from the development on to the Boyanup Picton Road to a 3 way intersection. The roads will be constructed to a sealed standard with open drainage on one or both sides of the road.

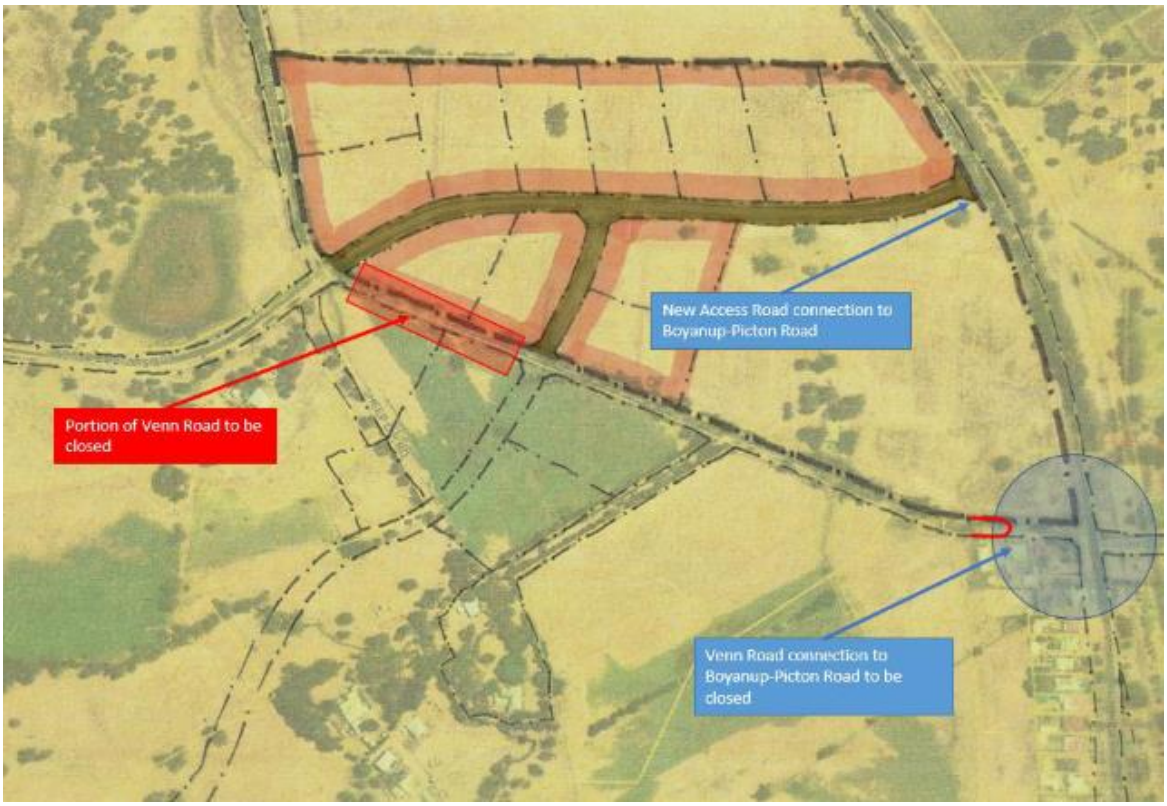

Figure 3: Extract from Cardno TIA showing future road Extension

6. STORMWATER MANAGEMENT

Gavins Gully will be the key discharge point for stormwater within the site. Stormwater will be conveyed via road side swales to detention basins which will discharge to Gavins Gully. There is a small portion of developable area to the south of the site that will be required to discharge south given the natural slope of the land to this point. This catchment will be detained with a basin and is intended to discharge through a temporary outlet within Shaw Road.

7. SERVICES

The below outlines existing services within the immediate area along with likely service requirements for the development.

7.1 SEWER

There are no existing Water Corporation assets within the vicinity of the site. Servicing the site via tradition Water Corporation methodologies is not possible. WML have prepared an investigation and report confirming the suitability of the site for onsite effluent disposal via individual ATU's on each proposed lot. The report prepared to accompany the structure plan submission will provide more comprehensive detail on onsite effluent disposal.

7.2 WATER

The development is not located within a Water Corporation supply area. Proposed lots will be required to have water tanks to be used for potable water. In terms of fire infrastructure, tanks maybe required to be located at strategic locations throughout the development to be used as a firefighting supply. This will be detailed further in a Bushfire Management Plan to support the structure plan submission.

7.3 POWER

(UPD) Underground Power Development have provided advice on power and communications supplies for the proposed development. This advice is summarised below.

Western Power's Network Capacity Mapping tool indicates that the area has sufficient power available to meet the developers needs from the Picton Zone Substation. The tool indicates that there is approximately 20 -25MVA available in the area.

7.3.1 HV Network

The HV network mapping tool indicates there is a HV aerial single phase feeder crossing Venn Road from the north east, and again from the north-west. See network map below. The nearest three phase network is on the Boyanup-Picton Road approximately 600m east of the new access road from Venn Road. Two existing properties excluded from the new subdivision will need alternative power arrangements since the power lines cross parts of the subdivision.

Should the pace of the development exceed the rate of which Western Power is required to carry out any network upgrades Western Power may request the Developer to fund the associated network upgrades.

In country areas there is generally capacity in the Zone Substations. However, some of the 22kV Distribution lines are of age and the line conductors may be at capacity, thus any additional load could trigger a line conductor upgrade. This can only be determined through a request to Western Power to model the existing Distribution network with the new development load on the network. The study could also model potential natural load growth on the network to determine if the network would need upgrading.

Figure 4: Present HV Network Dark blue is three phase. Light blue is single phase.

7.4 TELECOMMUNICATIONS

Based on the DBYD and NBN rollout map, the area of interest is being serviced by NBN fixed wireless. This will need to be investigated further with NBN.

The nearest NBN physical connection is approximately 10km to the west.

In view that the nearest physical network is approximately 10km away, NBN will require an application to be submitted to them for a detailed assessment, including confirmation of backhaul charges, which will take between 2 to 3 months for them to do the assessment. UPD is not able to comment on the cost of the backhaul charges from NBN.

Should NBN choose to accept this development and service the development with fibre, then the timing for the NBN back haul quote could take up to 3 months to obtain.

If NBN reject the development by providing a forma rejection letter. We can apply for the development to be exempt from install pit and pipe network through the Department of Infrastructure, Transport, Regional Development and Communications, under the Telecommunication Act.

Should it be not exempted then pit and pipe will need to be installed. The assets will be the responsibilities of the developer till they are taken over by a communication provider should the developer choose not to accept NBN's quote for this subdivision.

8. SUMMARY

The structure plan area identified in this report is capable of being serviced by the essential infrastructure required for residential development. Some minor headworks extensions will be required for power. No logistical reasons have been identified as to why the site cannot be serviced with the required services.