WOOD & GRIEVE ENGINEERS

Treeby (Banjup) District Structure Plan Engineering Infrastructure Report

Perron Developments Pty Ltd
30 June 2016
Revision No. 1

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Revision

REVISION	DATE	COMMENT	APPROVED BY
1	30 June 2016	Original Issue	J. Fabling

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1. Background

Wood & Grieve Engineers have been engaged by Perron Developments Pty Ltd to undertake an assessment of civil infrastructure requirements for the development of land within the Treeby District Structure Plan (DSP).

The purpose of this report is to outline the servicing strategy for the purposes of the preparation of the Treeby District Structure Plan.

It is noted that the Stockland Calleya development (Lot 9004 Armadale Road and Lot 9002 & 132 Jandakot Road) is included within the District Structure Plan however as the development and servicing of this land parcel is significantly progressed we have not focussed on this area within our report.

In summary the DSP area can be serviced by the construction, upgrade and/or extension of regional service infrastructure to the site.

2. Earthworks

The final earthworks levels for the site are a complex combination of geotechnical, hydrological, planning, environmental, engineering design and marketing factors.

The existing topography of the site varies in elevation from RL25 at the center of the site to RL46 near Warton Road, with undulation varying between these levels over the site. The gradient available provides the subject land with the flexibility to orientate the home sites to suit passive solar orientation and to obtain some cut material, together with imported fill material to achieve required lot levels to suit clearance to groundwater and storm event flood routing.

The DSP design has considered the need to match into existing ground levels to suit the preservation Bush Forever vegetation.

Detailed hydrological and geotechnical investigations have been undertaken over Lot 4 which have revealed a typical subsurface profile of a relatively thick 4.5m layer of Bassendean Sands overlaying cemented “coffee rock” at depth. It is anticipated that this surface profile would be indicative of the greater structure plan area. These results indicate that a site classification of Class A in accordance with AS2870-2011 would be anticipated.

Market forces presently dictate the provision of flat building sites with retaining walls to accommodate level differences. It is anticipated that lots will be designed with a maximum of 500mm front elevation from the verge level, with retaining walls installed for greater elevations.

Final earthwork levels will be designed to accommodate market requirements together to ensure adequate clearance to the 100 year flood level for the local and district drainage network, as well as providing adequate clearance to groundwater and ensuring roadway geometrical design incorporates flood routing constraints. Sufficient site levels will be required to be provided for the operation of gravity sewer connections.

3. Storm Water Drainage

The Better Urban Water Management requirements for Western Australia prescribes that storm water drainage design ensures that the post development flows are maintained to the predevelopment levels specified, as well as incorporating best practice water sensitive urban design.

It is proposed that minor drainage events (typically less than 5year ARI) discharge via a piped drainage network to drainage treatment train systems with water quality structural controls.

Major storm events (those in excess of the 5 year event and up to the 100 year event) are to be conveyed via roadways to online detention storage systems within multiple use corridors. Discharge from these detention areas is to be controlled to retain existing outflow discharge rates and is to be conveyed offsite using swales and spillways.
Seasonal fluctuations in the water table result in groundwater levels being close to the existing surface levels at the some portions of the site though the year. These areas will be filled to remove the expressions of groundwater at the

surface. Individual lot levels will need to have sufficient clearance to the average annual maximum groundwater level to achieve the desired site classification.

It is anticipated that the Local Structure Plans developed for the individual developments would incorporate storm water detention requirements of the individual Local Water Management Stragegy, with POS locations selected to logically and sympathetically cater for proposed catchments.

4. Roadworks

The DSP is bounded by Jandakot Road (to the north), Warton Road (to the east), Armadale Road (to the south) and Solomon Road (to the west). It is proposed that Liddelow Road is extended north through the structure plan area and this together with Fraser Road south will provide two north south links from Armadale Road to Jandakot Road.

Roadways within the DSP area would be constructed in accordance with the configurations established as part of the traffic engineering requirements of this proposal and the City of Cockburn standard requirements. Road pavement configuration would be designed in accordance with specific geotechnical advice.

It is recommended that the upgrading of Armadale Road by Main Roads WA (MRWA) considers the intersection connections with the DSP area. These intersections will be required to be constructed to the standards of MRWA.

5. Wastewater

The DSP area is currently outside of the Water Corporations current formal sewer planning scheme, which will require review to accommodate the proposal. The Water Corporation have advised that an approved MRS Amendment would be the catalyst for the review of their wastewater planning scheme to establish the detailed requirements for servicing of the site. However, the Water Corporation have commenced conceptual wastewater supply planning about the subject site which is included as Appendix 1.

Disposal of wastewater within the subject land will be achieved via a network of gravity reticulation sewers gravitating to two wastewater pumping stations. One of the wastewater pump stations servicing the DSP area has already been constructed at the intersection of Clementine Boulevard and Ginger Loop within the Calleya development which discharges, via a pressure to existing infrastructure west of the DSP area. The balance of the DSP area discharges to a proposed Type 40 wastewater pumping station within Lot 4, which will discharge via a section of 100 diameter pressure main and 225 diameter gravity sewer to the existing pump station within the Calleya development. The structure plan would ultimately provide for suitable site to house the required Water Corporation infrastructure. It is anticipated a site in the order of 1000 m^2 would be required near the center of Lot 4.

Local structure plans for individual developments will be designed to have a layout sympathetic to the landform, while providing very direct links though the development to the wastewater pumping station to ensure minimisation of sewer extent and depth.

6. Water Supply

The Water Corporation have commenced conceptual water supply planning about the DSP area, as an extension of the Thomson Lake Gravity Supply Scheme, which is included as Appendix 2. This indicates that provision of a DN375 water main extension from the existing DN760 water distribution main crossing Liddelow Road south of Armadale Road and the provision of DN500 water main extension from the existing DN760 water distribution main to Armadale Road, becoming a DN375 within the DSP area.

This water supply arrangement to the site is conceptual and the approval of the MRS Amendment would provide the catalyst for review of the water supply scheme to suit the proposal.

Provision of a potable water supply to individual lots would be achieved the construction of a network of DN100 to DN250 throughout the internal road network of the landholding.

7. Underground Power

Power supply to the DSP area can be achieved via expansion and/or upgrading of Western Power's network in the vicinity of the site. There are currently 22kV high voltage overhead power lines installed in Armadale Road and in the western portion of Jandakot Road adjacent to the DSP area. There is existing underground high voltage infrastructure that has been constructed as part of the Calleya development within the DSP area.

An underground network will be progressively constructed through the proposed subdivision with interconnected switchgear and transformers located about the site being reticulated as a low voltage underground network connecting to each lot.

It is anticipated that the existing overhead power lines located in Armadale Road and Jandakot Road would be removed and be replaced by underground power cables as part of the development works.

330kv transmission lines traverse the DSP area in a north west to south east alignment. The DSP has allowed for a easement about these transmission lines and landuse within this easement will be required to conform with Western Power's requirements.

8. Telecommunications

The current communications legislation details developments of greater than 100 premises National Broadband Network (NBN) are the Wholesale Provider of last resort, recent amendments to the Communications act has encouraged competition within the wholesale sector; as such the developer has the option to sign up with an alternative provider for a Broadband solution.

NBN has already been installed within the Calleya development and noting the relatively large landholdings within the DSP area, it is expected that the NBN network would be extended through the DSP area. An underground network of NBN cabling (in a common trench with underground power) would be progressively constructed through the proposed land parcel with fibre distribution hubs located about the site as required.

If a particular development was to be less than 100 lots then it is anticipated that telecommunication services would be provided by Telstra.

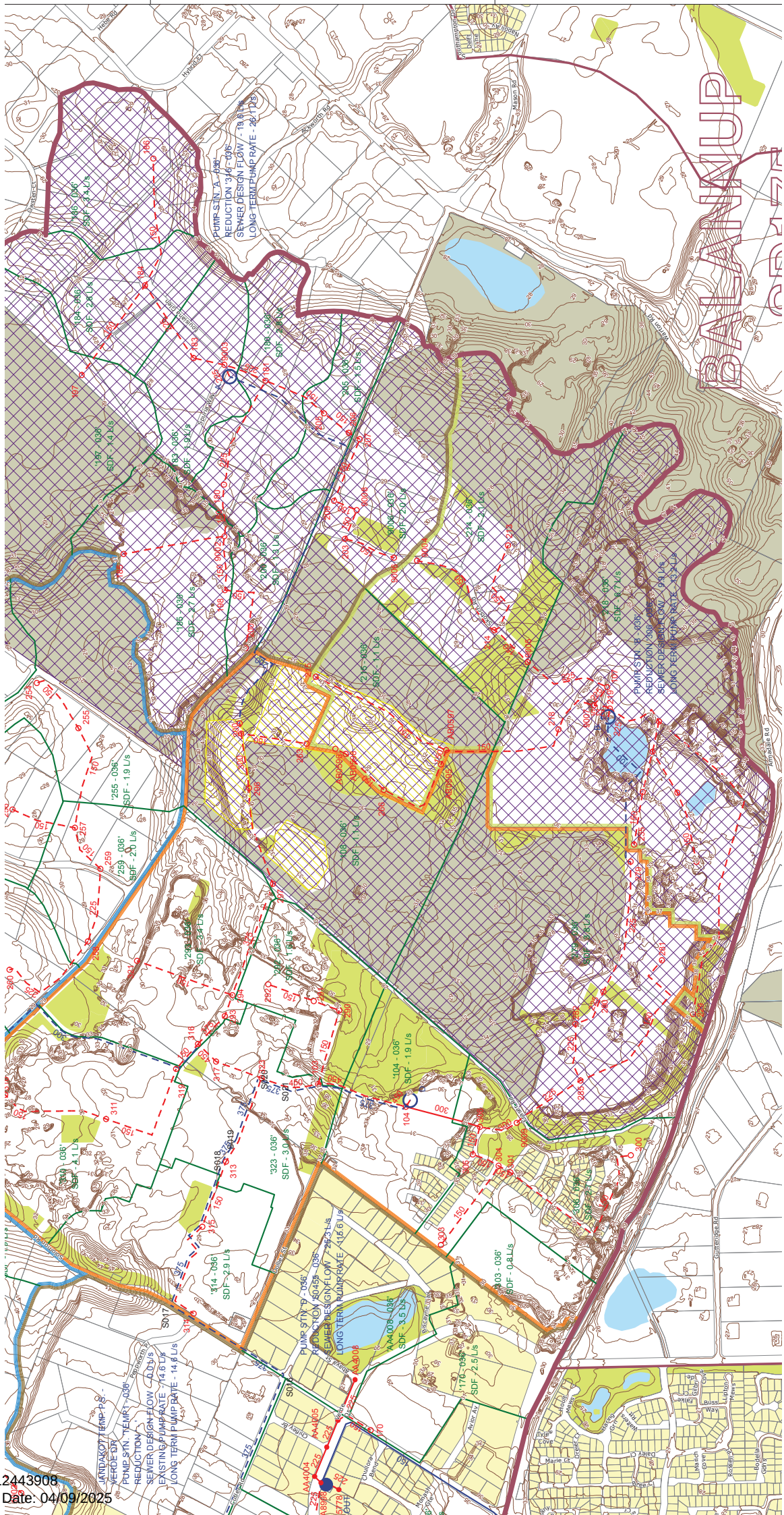
9. Gas

The DSP area is currently serviced by an existing connection to Atco Gas's DN300 high-pressure steel gas main located in Armadale Road.

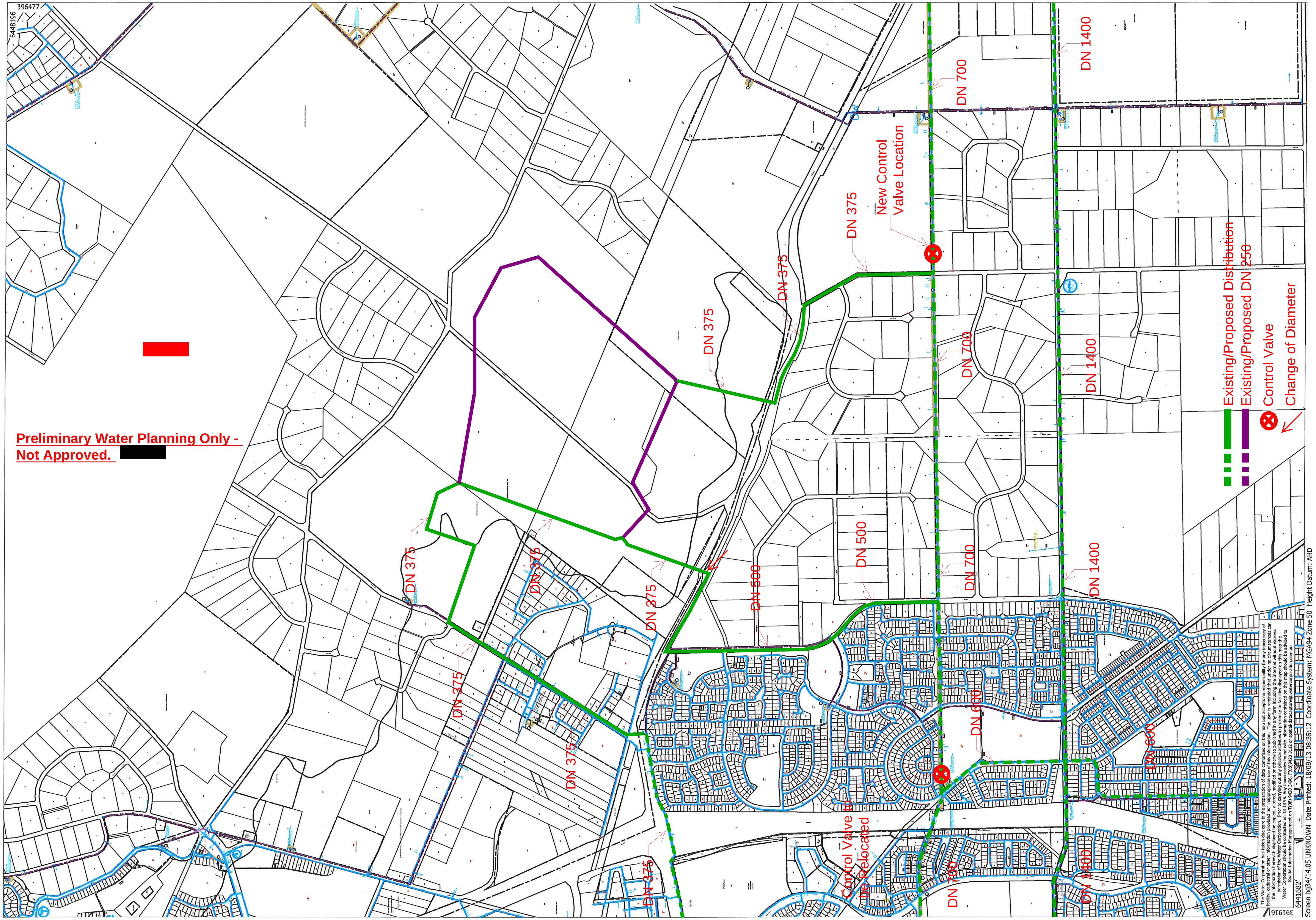
It is anticipated that ATCO Gas will service this development by the internal reticulation of natural gas about the subdivision, utilising a common trench with water reticulation being provided by the developer, connecting to the existing gas mains adjacent to the site.

It is anticipated that a pressure reducing valve will be required to reduce operating pressures at the site to that suitable for residential reticulation.

Appendix 1 – Wastewater Supply Planning



Appendix 2 – Water Supply Planning



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Preliminary Water Planning Only - Not Approved. [redacted]

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