

Hydraulic Services Feasibility Report

Glenhaven Gardens, Glenhaven Road, Glenhaven

Prepared upon the instructions of

Mr. Barry Flack of NBRS+PARTNERS

ABEL & BROWN PTY. LTD.

SPECIALIST BUILDING SERVICES CONSULTANTS

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EDITORS OF THE **AUSTRALIAN PLUMBING COST GUIDE**

A.C.N. 001 202 722
A.B.N. 49 001 202 722
23 Warung Street,
YAGOONA, N.S.W., 2199
T - (02) - 9709-5705
F - (02) - 8790-6401
E - mail@abelandbrown.com.au
W - www.abelandbrown.com.au
Mail PO Box 7430,
Mount Annan, NSW 2567
T - 02-4648-1010
M - 0403-390-810
F - 02-8790-6401
E - ross@abelandbrown.com.au

Wednesday, 16 July 2014

NBRS+PARTNERS

Level 3, 4 Glen Street

Milsons Point NSW 2061

Attn: Mr. Barry Flack

RE: Glenhaven Gardens, Glenhaven

This report outlines the preliminary issues for plumbing, gas and fire services as part of the proposed development of 14 self care units located adjacent to the existing Glenhaven Gardens site.

1 1 INSTRUCTIONS

Instructing Party: Mr. Barry Flack of NBRS+Partners.

Abel & Brown have been instructed by Mr. Barry Flack of NBRS+Partners, to review and provide advice as to the available hydraulic services infrastructure, and the anticipated requirements necessary to serve the proposed aged care development at Glenhaven Gardens, Glenhaven Road, Glenhaven..

This report is wholly based upon information able to be gained from the review of the materials provided to me as set out below, plans of previous stages of work, and of available council and authority infrastructure documentation.

Comment is addressed to the following hydraulic and fire services relevant to the proposed development as applicable.

- ✓ Potable Cold Water Service
- ✓ Potable Hot Water Service
- ✓ Non Potable Cold Water Service
- ✓ Warm Water Service
- ✓ Rain Water Storage
- ✓ Sewer Drainage
- ✓ Stormwater Drainage System
- ✓ Natural Gas System
- ✓ Fire Hydrant System

2 Purpose of Report

The proposed building development is currently, as we understand it to be proposed construction of fourteen (14) self care units and the amalgamation of the two additional parcels of land with the original Glenhaven Gardens site.

The report has been requested to assess to feasibility of the proposed development, whether existing site infrastructure and authority services are available to adequately service the site and any specific issues arising with respect to hydraulic relevant to the proposed construction

3 Building Code Of Australia

The report is based on assessment carried out for compliance of hydraulic services as described within to meet the *Deemed to Satisfy* provisions of National Construction Code 2013 Vol. 1 May 2014.

4 Documentation

AB has been provided with the following documentation relevant to this feasibility study.

1. Architectural Master Plan only

5 Annexures

The following documents are annexed to this report

- a) ***Sketch Plans of possible On Site Detention Locations***
- b) ***Sydney Water Service Reference Sheet***
- c) ***Plan showing designed connection points serving 144 Glenhaven Road.***
- d) ***Jemena Gas Networks Service Reference Diagram***

6 Information Not Presently In Hand That May Assist In Providing Further Information.

- Detailed internal layouts of the dwellings showing wet areas.

7 Site Data

Site Address	144-146 Glenhaven Road, Glenhaven
Local Government Area	Hills Shire Council
Rise In Storeys	1 floor
No of Proposed Units	14 Units 9x3 bedroom & 5 2 Bedroom
Floor Area / Roof Area	TBC by Architect
Site Area	Approximately 7000sqm

8 Anticipated Hydraulic Services Requirements

All loadings are subject to change and confirmation upon final selected building design, hot water and other plant types, PC Items and Tapware and usage. Please contact our office for updated information when further information becomes available.

Water Supply		
Cold Water Supply	2.1 litres / second	Serviced by existing 40mm connection located within 144 Glenhaven Road.
Drainage Services		
Sewer Drainage	1.8 litres / second (Gravity Discharge)	Existing 150mm
Stormwater Drainage	New Stormwater Drainage required	On Site Detention required – 235 cubic metres
Natural Gas Service		
	Each Unit – 270mj each	
Total Gas Requirement	3850 Mj/Hr	Existing 32mm gas connection provided, insufficient size to cater for the proposed gas usage.

9 Summary

1. The existing site is presently served by Sydney Water 100mm water main located in Mill Road. The incoming service is limited to 1 litre /sec. The incoming service fills 2x10kL storage tanks and is pumped around the existing site by dual pumps. The pumps and service have sufficient capacity to serve the existing potable domestic water needs of the site, and the proposed new works. The daily water usage for the developed site is approximately 30000 litres/day, and will require an additional 10000 litre tank to provide one days storage if the water supply to the site is interrupted.
2. A 150mm sewer connection is located within the boundaries of the development area and possesses sufficient capacity to meet the sewer drainage needs of the proposed development. The existing connection drains to a 25kL pumping station with dual pumps. The estimated sewer discharge of the entire site is 27000 litres per day and the existing pump station will require additional volume to provide one days storage if the power supply to the pumps are interrupted
3. The site is currently served by a 32mm natural gas service terminated in 144 Glenhaven Road, which has insufficient capacity to serve the proposed gas needs of the site. The gas service will be required to be upgraded or a new service could be requested from Jemena from a gas main located within Glenhaven Road.
4. The stormwater drainage system including on site detention will be required to serve the development. The existing connection and on site detention systems will be insufficient to service the new development and additional on site detention will be required as well as a new discharge point
5. The building plans will need to be taken to a Sydney Water quick check agent and stamped to ensure compatibility with Sydney Water requirements, and for advice on any specific requirements Sydney Water may have with respect to the existing site and proposed development.
6. A section 73 certificate must be obtained from Sydney Water. This can be obtained through any Sydney Water water servicing coordinator.

10 Hydraulic Services

1. General

New services would be required for the proposed development to comply with all Authorities, the Building Code of Australia, and relevant Australian Standard Codes and regulations.

2. Building and Australian Standards Code Requirements

The hydraulics, fire and waste systems are required to be designed and installed to comply with all relevant codes and standards, including:

1. The Building Code of Australia (current amendment)
2. The Plumbing Code of Australia (current amendment)
3. Local Council Stormwater Drainage Design Guidelines
4. AS 3500.1 Water Supply (2003)
5. AS 3500.2 Sanitary Plumbing & Drainage (2003)
6. AS 3500.3 Stormwater Drainage (2003)
7. AS 3500.4 Hot Water Supply (2003)
8. AS 5601.2004 Gas Installation Code

3. Potable Domestic Cold Water System

The existing site is presently served by an existing 100mm water main in Mill Road. The service is limited to 1 litre per second, and the incoming service fills 2 x 10kL potable water storage tanks. The water is reticulated around the existing site by dual 7 litre/sec pumps.

A 40mm water supply service was provided at part of the Glenhaven Gardens stage 2 works to supply the previous scheme at No 144 Glenhaven road consisting of eleven (11) single bedroom units and a common room area. A diagram showing the designed location of the connection point is shown below.

A minimum flow of approximately 2.1 litres/second in the incoming service is desirable as a minimum requirement for the domestic cold water service. The existing pumps would be suitable, however the use of low flow tapware would be recommended to reduce the required flow.

Due to the increase in population above what was originally envisaged, the storage tanks would be required to be upgraded with an additional tank of 30000 litres tank to provide one days storage if the water supply to the site is interrupted.

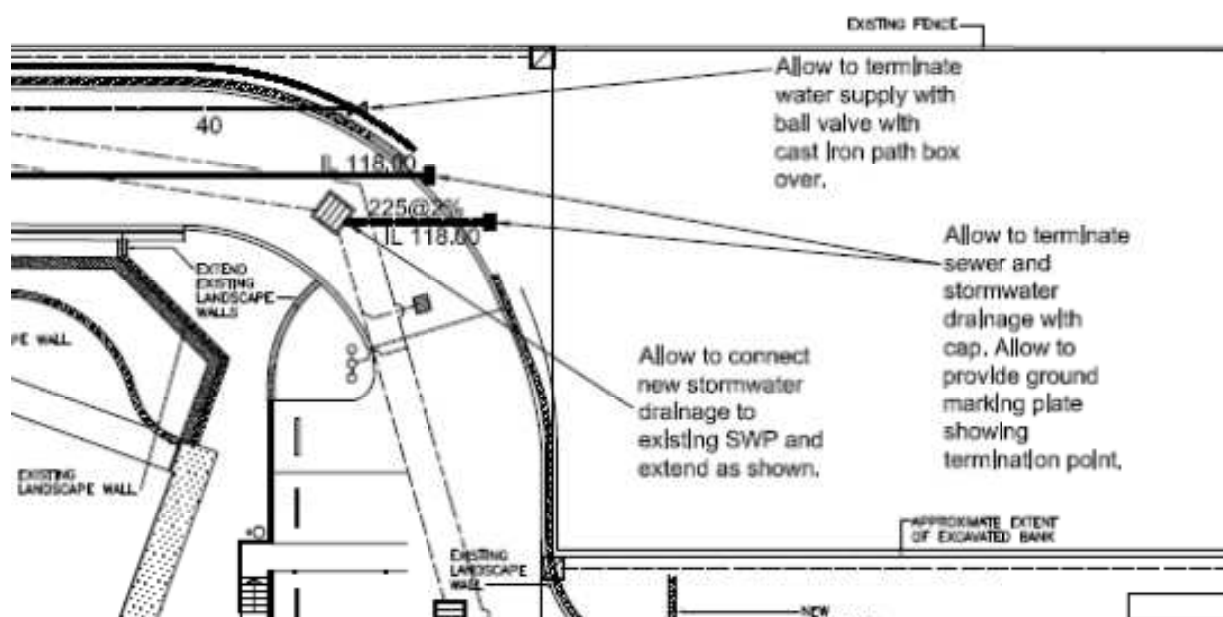


Figure 1 - Location of Designed Water Connection.

4. Non Potable Cold Water System

A non-potable water supply system from roof rainwater storage tanks should be considered for reuse within the site for laundry, cistern flushing and planter bed drip feed irrigation and general wash down purposes should budget allow. All proposed non-potable outlets would require indication of 'Warning Non Potable Water Do not Drink' to regulations and the distribution pipe work appropriately colour coded.

5. Potable Hot Water Service

The existing self care units properties are provided with hot water heating by Rinnai infinity, instantaneous hot water service units located recessed into external walls

We recommend that similar hot water plant be provided in accordance with the relevant requirements of AS5601.2004 and to provide more uniform delivery of hot water throughout the units.

As the existing hot water heating plant is solely gas fired, consideration of utilising a solar boosted gas hot water system with solar collectors mounted on the roof to decrease energy consumption should be given. This will result in significantly lower ongoing operating costs for the site, and provide a measure of 'green' compliance.

6. Warm Water Service

All hot water to be used for ablutions (i.e. all bathrooms, ensuites and the like within the building will need to be thermostatically controlled to below 50°C. for compliance with the Plumbing Code of Australia and AS3500.

Hot water for laundry and kitchen sinks need not necessarily be required to be thermostatically controlled, however depending upon the area, this may be considered with the presence older persons within the units.

Where hot water is available at fixtures where persons are subject to a scalding risk, such as kitchen sinks & laundry tubs, these fixtures should be signposted as such for compliance with NSW Code of Practice requirements.

7. Rainwater Water Storage

Roof water storage would likely best be served by the use of concrete storage tanks below ground depending on the final proposed building design. The tanks should be enclosed with first flush systems to provide primary treatment prior to reuse.

8. Sewer Drainage

An existing 150mm sewer connection has been provided just outside the boundary of 144 Glenhaven Road, and it drains to an existing 25kL sewer pumping station, which discharges to the Sydney Water Sewer system at a manhole in Temora Road.

The 150mm connection is of sufficient size to cater for the 14 proposed units however site levels of development area would be required to determine if all areas of the development can gravitate to the connection point.

The existing 25kL sewer pumping station is insufficiently sized to cater for the expected flow of 27kL per day, and would need to be upgraded as part of the works. A diagram of the designed sewer connection point is shown below.

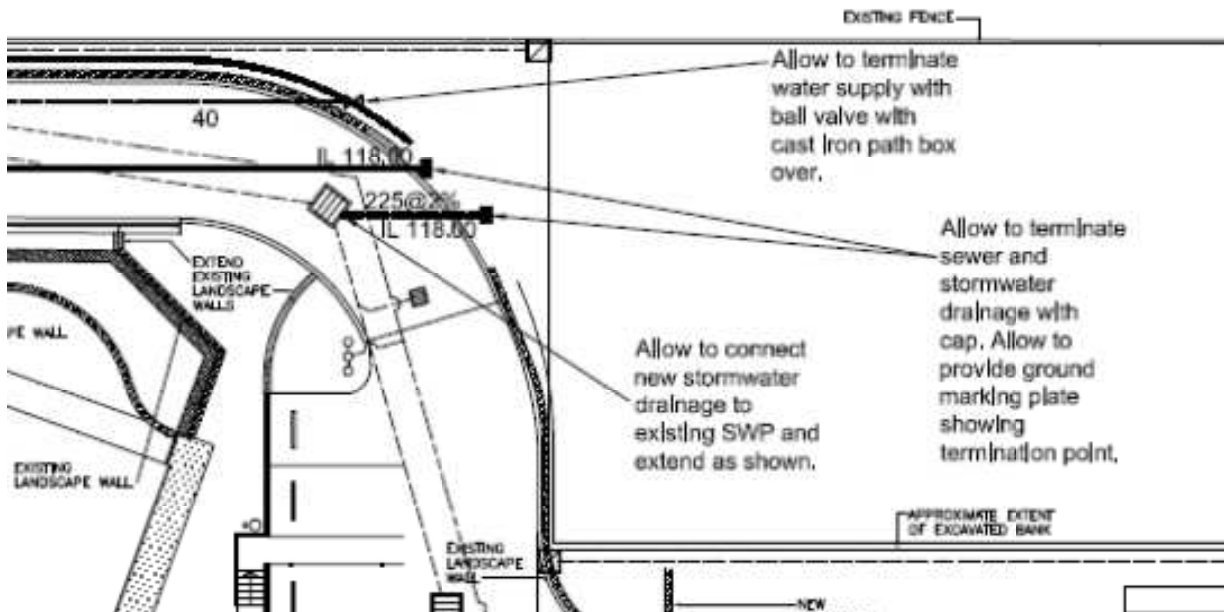


Figure 2 - Location of Designed Sewer Connection.

9. Natural Gas System

The development area is presently served by a 32mm 210kPa natural gas service terminated just within the boundary of 144 Glenhaven Road.

Based upon the 14 self care units, we anticipate the gas load would be as follows:

Hot Water

14 Rinnai Instantaneous Gas Hot Water System 2800 MJ/Hr

Kitchen

14 x Gas Cooktops 700 mJ/Hr

14 x Gas Ovens 350 mJ/Hr

Total Gas Load to the Site

3850 mJ/Hr

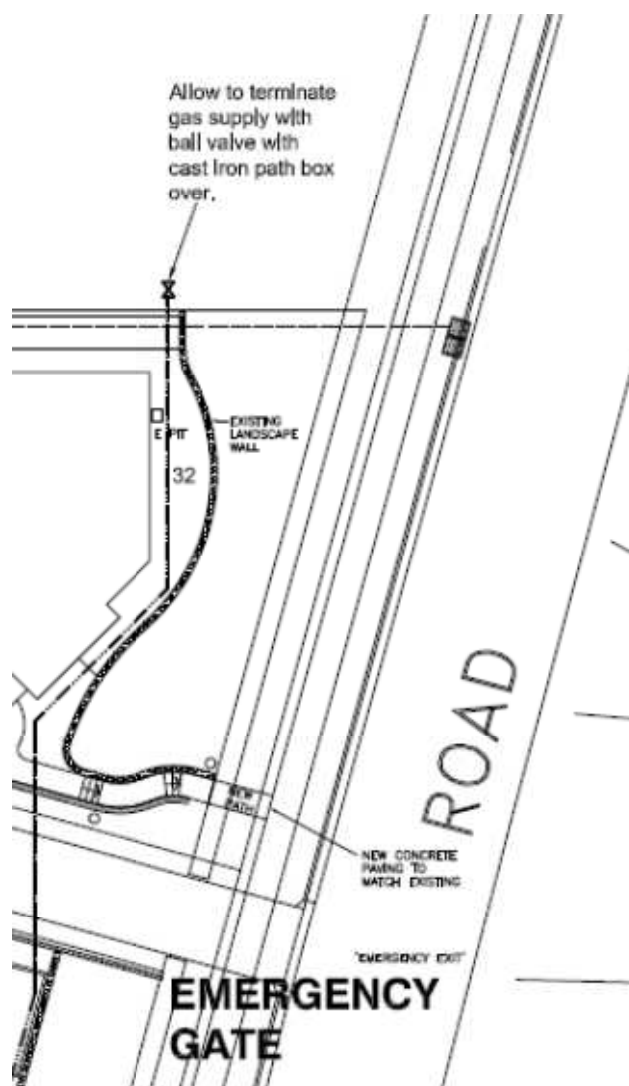


Figure 3 - Location of Gas Service Termination point

Based upon the flows above and the length of service, the 32mm has insufficient capacity to serve the existing and proposed needs of the site. To cater for the gas loads above, a 50mm line would be required to be provided to the proposed development area.

Gas fired heating / cooling, or reticulated underfloor heating may also be used, however, we do not have any indication that this will be used and we have not included this in our energy usage estimates at this time.

We recommend that Rinnai 32 Hot Water units be used for the three bedroom units, with smaller Rinnai 26 units to serve the 2 bedroom units.

The Jemena Gas networks service diagram sheet indicating the areas available infrastructure assets is annexed to this report.

10. Stormwater Drainage Service

The existing site stormwater system comprises of a network of pits and pipes collecting stormwater from around the site. The pipe network drains to the bushland area at the lower end of the site via two on site detention system, the large pond located at the loop road and a tank below the entry road.

A 225mm connection has been provided that drains to the on site detention basin downstream of the existing hostel. The previous scheme for 144 Glenhaven Road utilised this connection and proposed modifications to the discharge control pit in the basin. Due to the considerably larger area of this scheme, draining the entire development to the existing OSD basin would not be feasible.

The proposed development will require an onsite detention system to comply with the requirements of the Hills Shire Council. A total of 235 cubic metres of OSD storage would need to be provided, with approximately 1000sqm of the development area directed to the existing OSD basin, however the additional 6000sqm would need to be directed to a new OSD tank located as shown below.



Figure 4 - Possible OSD Location

This new OSD tank could drain to the council easement that runs parallel to the property boundary shown on the enclosed services plan.

11. Fire Hydrant Service

The existing site provides a fire hydrant system, which has sufficient pressure and flow to cater for the proposed building footprint, however the master plan currently in hand provides insufficient detail to determine if the existing fire hydrants provide sufficient coverage to the requirements of AS 2419.1.

12. Environmental Considerations

The following items are possible environmental considerations for client review and consideration depending upon the project budget.

1. Reuse of roof water and rainwater runoff.
2. Utilising solar energy for hot water preheat / augmentation
3. Utilising waste heat from mechanical services for hot water pre heat / augmentation
4. Using natural gas for heating
5. Possible reuse rainwater for spray irrigation with rain and moisture detector controls
6. Utilising drip feed irrigation for planter areas with moisture detectors
7. Possible consideration of the treatment and reuse of grey waste water

We trust this report meets your needs. Should you require further information with respect to this matter, please do not hesitate to contact myself directly.

Regards,



Stuart Brown
Abel & Brown Pty. Ltd.