

There is an existing 600mm diameter trunk main that runs down the eastern side of Fraser Drive. The development will not connect directly into the existing trunk main, but to smaller existing lines running from the 600mm diameter line listed below:

- 150mm diameter main in Merlot Ct at the southern boundary
- 200mm diameter main in Fraser Dr, to the north of the site
- 100mm diameter main in Ocean Ave, at the western boundary
- 100mm diameter main in Hillcrest Avenue, at the western boundary

By utilising these four connection points, it can be shown that the proposed water supply infrastructure achieves Tweed Shire Council's (TSC) adopted Standards of Service for the development.

8.0 ACID SULFATE SOILS

A detailed acid sulfate soils investigation was prepared for the site by Gilbert & Sutherland which reported that the chances of encountering Acid Sulfate Soils would be NIL to Slight. No recommendation for liming was required. However should Potential Acid Sulphate Soils be encountered during the excavation for earthworks or deep services, then treatment will be required in accordance with the approved site Acid Sulfate Soils Management Plan, Fraser Drive, South Tweed.

9.0 BUSHFIRE MANAGEMENT

A Bushfire Assessment Report of the development site has been prepared by Boskae Environmental Planning dated October 2006 (attached Appendix B). The report gives background information on the site and the surrounding area and provides recommendations to be undertaken on the site in an effort to minimise the threat of bushfire. The recommendations in the report are as follows:

- Asset Protection Zones are to be maintained on all aspects of the lots;
- All dwellings on lot facing the SEPP14 Coastal Wetland/Tall Open Ecotonal Forest shall be constructed to a Level 2 performance level (AS3959-1999);
- Fire hydrants located on the reticulated water supply should comply with Section 6.4.3 of *Planning for Bushfire Protection (2001)*;
- Underground electrical transmission lines are recommended on the development;
- The internal road system should be designed to comply with Section 4.3.1 of *Planning for Bushfire Protection (2001)*.

10.0 NOISE FROM FRASER DRIVE

As part of the development application, Cardno have provided an assessment of traffic noise from Fraser Drive and the required acoustic performance of building elements for the development as determined in accordance with Australian Standard AS3671-1989 "Acoustics – Road Traffic Noise Intrusion-Building Siting and Construction". See separate Acoustic Report.

11.0 FLOODING ASSESSMENT & EMERGENCY FLOOD EGRESS

The development site has had the bulk earthworks filling approved and constructed under an existing approval. (Tweed Shire reference DA 02/083 determined on 2nd October 2002) No filling of any significance is proposed as part of this application. Part A earthworks will only involve the existing fill being reshaped to suit the new road layout with minor cut/fill being carried out.

The filled area is no longer prone to flooding (i.e. it has been filled to above the Q100 flood event level), therefore no additional regional flood modelling has been carried out for this application. Drawing No. DA 4 shows the intended flood evacuation route for the Part A land up to Ocean Avenue should this be necessary if a regional flood closes off Fraser Drive.

The development proposal will not alter the existing land drainage patterns to the east of Fraser Drive (Sullivan's Land) as the new Stormwater System has been designed to collect stormwater flows from the existing cross drainage on Fraser Drive and re-divert it past the new treatment/ detention pond. Refer to figure DA 21 which show details of the system.

Please note the 3x1500dia stormwater lines cannot cross Fraser Drive in any case as they would clash with the 600 dia trunk watermain in the location, see DA 23 for information locations.

12.0 CONCLUSION

This report has been prepared on behalf of Villa World Ltd for the proposed development on Lot 9 DP1039569 and part of Lot 2 DP1000385, Fraser Drive in South Tweed being an area of 31 hectares.

The proposal for the development site is to construct 168 allotments and 66 dwellings in a medium density housing area. The overall equivalent tenements (ET) for design of water and sewer demands for the site have been calculated at 234 ET or an equivalent population (EP) of 749.

The site will be accessed from a number of points. The main access to Part A of the development will be from Fraser drive with access points for Part B from Hillcrest Avenue, Merlot Court and Ocean Avenue.

The Part A of the site requires further filling to ensure all allotments are above the flood level. The Part B will require minor re-profiling to remove gullies and ridges and to tie the roadways in with the existing surface. Due to the slopes on the site, retaining walls will be used in an effort to do away with excessive batters. Slope stabilisation works will also be carried out in the areas that require such.

A Stormwater Management Plan has been produced for the development. Refer to Cardno report "Proposed Development, Fraser Drive – South Tweed, Stormwater Management Plan" dated 8th December 2006.

The proposed development will increase sewerage discharge from the site. The site and the surrounding areas are serviced by an existing sewer network. For the proposed sewer reticulation system, the development had been split into two catchments. The northern catchment will gravitate to pump station PS3022 while the southern catchment will gravitate to pump station PS3021. Also, it is proposed to re-align the two existing gravity lines running through the centre and along the southern boundary of the site to accommodate the proposed lot layout.

The proposed development will increase water reticulation demands on the site. There is an existing 600mm diameter trunk main that runs down the eastern side of Fraser Drive. The development will not connect directly into the existing trunk main, but to smaller existing lines running from the 600mm diameter line. By utilising the four existing connection points, it can be shown that the proposed water supply infrastructure achieves Tweed Shire Council's (TSC) adopted Standards of Service for the development.

A detailed acid sulphate soils investigation was prepared for the site by Gilbert & Sutherland in March 2003 which reported that the chances of encountering Acid Sulfate Soils would be NIL to Slight. No recommendation for liming was required.

The development site has had the bulk earthworks filling approved and constructed under an existing approval. (Tweed Shire reference DA 02/083 determined on 2nd October 2002) No filling of any significance is proposed as part of this application.

The new residential land has been filled to above the regional Q100 flood level and is no longer prone to flooding. Therefore no additional regional flood modelling has been carried out for this application. Drawing No. DA 4 shows the intended flood evacuation route for the Part A land up to Ocean Avenue should this be necessary if a regional flood blocks off Fraser Drive.

This engineering report concludes that the proposed development as described in the attached documents - being 168 residential allotments and 66 medium density dwellings can be constructed with limited impact on infrastructure and the environment. Cardno can engineer acceptable solutions to meet the requirements and constraints of the various specialist reports pertaining to this land and proposal.

APPENDIX A

Geotechnical Report by Shaw Urquhart