



Ref: 09095

8 November 2010

The General Manager
Coffs Harbour City Council
Locked bag 155
COFFS HARBOUR NSW 2450

**de Groot &
Benson Pty Ltd**

**Consulting
Engineers &
Planners**

Dear Sir

Engineering Issues Report,
Proposed Re-Development of Petina Park
Lot 211 DP 1044292, Moonee Beach,
Major Project 08-0003.

REVISION TO THE PROPOSAL

It has been proposed to redevelop the above property to provide a 32 lot community title subdivision. Following various concerns from Council and other authorities, the original proposal has been partially revised and is now resubmitted for consideration.

This letter reports on the engineering aspects of the proposal and accompanies de Groot & Benson drawings 09095-01 to 04, rev DA1, which describe the revised proposal. The revised proposal is still for a 32 lot community title subdivision in much the same configuration as previously. There are major revisions to the proposed public roads and some revisions to the internal layout of the community title estate.

Public Roads

It is now anticipated that the collector road through the northern neighbouring lot (Lot 210 DP 1044292) will be constructed by others ahead of or during the construction of the proposal. The collector road to the property's northern boundary plus the access driveway to the western neighbouring lots is to be constructed by the RTA as part of the current highway upgrade works.

As such, access can be provided by the collector road for all stages of the development. The previously proposed local road that was to link Woodhouse Road to the collector road and provide early stage access is no longer proposed. A short public road constructed to Access Place standard is still proposed off Woodhouse Road. This will terminate at a cul-de-sac head within the property and will only provide access for the residents of the proposal, circulating garbage trucks and a fire trail, but will not provide through public access.



The removal of the through public road should alleviate concerns over the previous potential for the development to provide a short cut or “rat run” into the Moonee Beach at the detriment of residents in Woodhouse and surrounding roads.

Collector Road Alignment

It is now proposed to construct only approximately 140 m of the collector road. This is to run through the property from the northern boundary to just south of proposed lot 25 and be terminated in a cul-de-sac head. It is not proposed to construct the collector road right through the property to the southern boundary. The road will stop short of the 7A zoned land.

Preliminary detailed design of the collector road has been undertaken as shown on drawing 09095-02. The geometric alignment has been prepared in accordance with Council’s development specification for a 50 km/h collector road. It is proposed to construct the collector road so that it can be continued to the south in the future by others. The southern extension will require fill embankments and a crossing of the un-named creek.

From the northern boundary heading south, the alignment rises and passed over a crest before dropping steeply to the un-named creek that passes through the southern part of the property. To construct the road on an alignment capable of future southern extension, it is necessary to compromise between deep cuts through the crest and high fill embankments over the creek.

The approximate location of the un-named creek, as shown on the drawings, was determined by GPS and rudimentary triangulation. While not precise, the creek has been located accurately enough to conclude that it and its immediate riparian vegetation will not be directly impacted by the proposal. However, any future southern extension of the collector road will need to cross the creek.

Given this impact and the cost of construction across the creek, it must be question whether the collector road will ever be extended in the future. Regardless, it is considered prudent to ensure that the alignment of the collector road constructed under this development be suitable for future extension.

The proposed compromise between deep cut through the crest and high embankments over the creek calls for the road crest to be up to 3 m below the natural surface. The proposed construction will terminate to the south just before the fill embankment is required. This will ensure that earthworks and road construction does not encroach into the 7A zone and impact on the creek.

The collector road is to lie within a 20 m road reserve that runs along the boundary with the western neighbouring properties. The preliminary design has been prepared to show how a 3 m cut can be undertaken without batters impacting on the neighbouring properties. This is achieved by limiting the road width to 9.0m, the minimum allowable under Council’s design specifications, and offsetting the centre line to the east. This maximises the width available for a steep cut batter of 1:2. Even so, a low retaining wall of up to 1.2 m high will still be required over about 50 m, refer to the drawings and cross sections.

It is noted that access from the collector road to the western neighbouring properties is not required and so the steep cut batter will not be an impediment. As there will be no access there is not likely to be much demand for roadside parking on that side of the road and a 9 m road width is considered sufficient.



All services and the footpath will lie on the eastern side of the road. The cut batter here will be laid back at 1:4 and will spill into the community title lots. A 1 in 4 batter will allow steep, but acceptable driveway gradients.

Earthworks

The need to cut the collector road through the crest of the ridge, so that it is suitable for any future extension, will generate fill material. The construction of the internal roads and dwelling pads will be generally "on grade" with balanced and shallow cut to fill. As discussed below in the Key Issues Response, some shallow fill may be required in and around the bio-retention basin area.

However, overall, the proposed development is likely to generate an excess of fill material, principally from the collector road construction. This material will be clean residual soil and extremely weathered rock. The material will be quite suitable as general filling and will be exported off site to be used in whatever local and approved developments are available to receive fill at the time.

Internal Roads

The internal road system will be constructed in concrete and generally dished to the centre. The main thoroughfare will be 6 m wide. The minor side roads will be 4.5 m wide. The horizontal alignment of the roads has been revised. Lots 1 to 6 have shifted west to allow the connection to Woodhouse Road to be shifted east. This then allows a garbage truck to circulate through most of the development without having to turn around or reverse.

The approximate levels and maximum grades of the internal roads have been estimated as shown on drawing 09095-01. Grades are unlikely to exceed a manageable 16%.

Garbage Collection

Drawing 09095-03 shows the swept path of the largest garbage truck used by the local contractors. The drawing shows that the truck can easily negotiate through the estate without having to turn around or reverse.

Lots 25 to 28, which front the collector road will have individual kerbside collection. Within the estate 1100 L bulk bins in three collection areas are proposed. The roadway gradients and cross fall in these locations will be suitable for manoeuvring the bulk bins to the rear of the truck. The collection points are fairly evenly spaced through the estate with the furthest distance from a dwelling being from lot 9 at about 145 m.

Car Parking

Roadside parking along the collector road servicing lots 25 to 28 will be available within the 9 m pavement width. However, roadside parking within the estate, while technically possible within a 6 m pavement width, is not proposed.

The proposed 30 three bedroom dwellings each have a double garage, which meets the requirements of Council's Off Street Parking DCP. The remaining 2 two bedroom dwellings have only a single garage, and as these will have gross floor areas in excess of 100 sq.m, will require an additional parking space each. In addition, Council's DCP calls for 1 visitor/overflow parking



space per 5 dwellings or part thereof. In total 9 car spaces are required. The proposal offers 13 spaces.

Stormwater Management

The Stormwater Assessment and Management Plan prepared by Gilbert+Sutherland P/L in June 2007 still remains mostly valid. The exceptions being that the collector road is no longer proposed to pass through the southern half of the property. As such, treatment of their catchment 8 is no longer required. In addition, their catchments 3 and 6 are no longer burdened with a local road. These differences reduce the pollutant loading over the original proposal.

The remaining development will be treated generally in accordance with Gilbert+Sutherland P/L recommendations, specifically:

- Rainwater tanks of minimum 3000 L per dwelling. The harvested water being used for toilet flushing, garden watering etc.
- Two bio-retention basins, placed to capture and treat essentially all runoff from the development.

The majority of the development drains to the south and will be collected in a pipe and pit system before passing through a bio-retention basin of approximately 300 sq.m, from where it will discharge to the creek with adequate scour protection. The remainder of the development drains north-east and will be treated by a basin of nominal 80 sq.m, as shown on drawing 09095-04. These areas are those in the Gilbert+Sutherland plan and shall be re-assessed at detail design stage. It is noted that there is significant scope to increase the size of the basins in their current locations should further treatment be required.

Flooding

The un-named creek that passes through the southern half of the property has a sizable up-stream catchment of nearly 230 Ha. Sufficient to produce considerable flow rates in times of flood, although these may be somewhat attenuated by the Pacific Highway culverts and the wide, densely vegetated floodplain.

In time of flood, these flows will be well in excess of the narrow creek channel that follows a rather meandering course. This channel is in many places relatively small at only a few metres wide and a couple deep. Flood flows will spill out across the fairly wide floodplain.

A detailed flood assessment has not been undertaken and nor is it warranted. A simple site inspection and assessment of the contour information shows that the vast majority of the development, including all buildings and public roads are well above possible flood levels. The anticipated 100-year ARI flood level is between 4 and 5 metres AHD, probably closer to 4 than 5. This is sufficient to inundate the southern bio-retention basin, some of the gravel fire trail and possibly just enter the low rear yards of lots 3 to 6. The dwelling floor levels of these lots are likely to be a minimum of 9.5 mAHD, well above possible flood effects.

The bio-retention basin and the gravel fire trail will not be significantly affected by inundation and as such it can be concluded that flood behaviour will not significantly impact on the proposal.



Likewise, the proposal will not significantly impact on flood behaviour. Construction within the floodplain will be limited to a bio-retention basin, a gravel fire trail and perhaps some filling to lots 3 to 6. These pose an insignificant impediment to the floodplain in these locations.

Services

Drawing 09095-04 provides a preliminary design of stormwater, water supply and sewerage services. The proposed sewerage and water supply is similar to the original proposal and demonstrates that the proposed development can be adequately serviced.

Power and telecommunication services, which are not shown for clarity, are also similar to the original proposal. These will be underground and run through the estate typically on the other side of the internal road to the water supply. Along the collector road they will run underground on the east side, being the same as the water supply.

The proposed development can be adequately serviced by all utilities.

KEY ISSUES RESPONSE

In response to the schedule of Key Issues/Additional Information Required (Attachment 1 of Council's letter of 24 November 2009) we can advise in respect to each dot point as follows:

Flora and Fauna

Addressed by others.

Stormwater

- A stormwater management plan is provide by drawing 09095-04 plus the Gilbert + Sutherland P/L report.
- All conventional sediment and erosion control measures will be incorporated during the construction phase of the development and will be maintained until sufficient control is achieved through revegetating of the disturbed areas. These will include:
 - Sediment fencing;
 - Diversion drainage;
 - Straw bale sediment traps;
 - Scour protection / energy dissipaters at all temporary stormwater outlets.

It is noted that the soils are not highly erodible. Emerson Class testing in the Gilbert + Sutherland P/L report found the soils to be typically class 4/7 with some class 3. The provision of adequate sediment and erosion control measures is not anticipated to be a substantial constraint on the development. These will be detailed and submitted as part of the construction approval process.



Post construction sediment control will be achieved through the bio-retention basins. Scour and erosion control will be installed as part of the works at the two stormwater discharge points. That required at the main southern discharge point into the creek will be the subject of detailed design and consultation with the NSW Office of Water as these works will require Controlled Activity Approval, being within 40 m of the water course.

- The Gilbert+Sutherland P/L report included soil permeability testing on 2 of 4 boreholes from which fairly low (conservative) infiltration rates were adopted. This is considered sufficient testing for the subsequent analysis and preparation of the stormwater management plan.

Bushfire

Addressed by others.

The Community Management Statement

Addressed by others.

Building Design

Addressed by others.

Urban Design

- The previously proposed public local road linking Woodhouse Road and the collector road is no longer proposed and as such the privacy and fencing issue raised is no longer relevant.
- Please refer to the Garbage Collection section above which describes how the development will be serviced.
- The streetscape elevation is to be addressed by others.

Traffic

- Pedestrian walkways are proposed as part of the internal road system, as shown on drawing 09095-01.
- The collector road is now to be constructed during or prior to the development's first stage. Any revisions to the traffic impact statement is to be addressed by others.
- Please refer to the Car Parking section above which describes such provision.
- The note regarding the possible early construction of the collector road has proven to be correct and has allowed the revisions to be made to the proposal.



Flooding and Acid Sulphate Soils

- Please refer to the Flooding section above.
- Due to the topography and elevation, acid sulphate soils, if present, will only occur along the low area in the creek's floodplain (below RL 5.0 mAHD). This is where they were tested for. It is considered pointless to test for these soils in the more elevated lands across the site where residual soils are present.
- The works now proposed in class 5 land is relatively minor, being the construction of the bio-retention basin, a gravel fire trail and installation of stormwater pipes. These minor works will not impact on the areas hydrology and a preliminary hydrology study is not considered warranted.
- The geotechnical investigation found no evidence of a water table over much of the developments footprint, being the elevated land. This is not unusual for the ridge topography and residual soils present. As such, the vast majority of the development will not impact on, or be impacted by, the water table.

A water table is present across the creek's floodplain and at the toe of the hill. The geotechnical investigation suggests that this will be less than 1 metre deep. As such the construction of the bio-retention basin and stormwater trenching has some potential to impact on, or be impacted by, the water table. This issue has also been raised by the NSW Office of Water in their correspondence of 12 November 2009.

Further investigation will need to be undertaken during detailed design to minimise groundwater impact. This may involve some shallow filling in the area of the basin, approaching stormwater lines and the rear yards of lots 3 to 6. The filling would allow the basin and approaching stormwater lines to be constructed above the water table. The basin may also need to be lined. Note, shallow filling would also reduce the already minimal impact of flooding on the proposal.

- The revised proposal is unlikely to disturb more than 1000 tonnes of soil within the class 5 land. As discussed above the limited works within the class 5 land will be undertaken as shallow as possible to avoid the ground water table. Some filling is possible to achieve this. As a result, less than 1000 tonnes (550 cu.m) of soil below the existing surface will be disturbed.

Noise

Addressed by others.

Geotechnical Assessment

- The geotechnical assessment found few limitations that could form significant constraints to the development. The principle limitation of poor road subgrade for the local road is no longer relevant as the road has been removed. The remaining limitations of slope stability and erosion control can be successfully managed through appropriate design and construction techniques.



- The construction of the local road, which was recommended to be filled rather than cut, is no longer proposed.

Other Comments

- How the proposed meets the principles of ESD is addressed by others.
- The approximate location of the creek's channel has now been included on the drawings. The revised proposal now has minimal impact on the creek other than at the stormwater discharge point, where scour protection is proposed.
- All dwellings are to be fitted min 3,000 L rainwater tanks.
- Refer to the Garbage Collection section above.
- Further contamination investigation is addressed by others.
- Management of the 7A zone is addressed by others.
- The development is not specifically proposed for senior's living, as suggested in the original stormwater report.

We trust that this report and drawings adequately describes the revised proposal and address many of previous concerns raised.

Please contact Graham Knight should you require any further information.

Yours faithfully

Graham Knight

att: