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30 November 2020

Mr Stephen Sawtell
Stephen Sawtell Consultants
78 Fairview Road
SAPPHIRE BEACH, NSW, 2450

Our ref: 20-205
Your ref:

Dear Stephen,

Investigation of Traffic Related Matters Associated with Proposed Subdivision of 148 Gaudrons Road

1 Background

A proposed plan of subdivision has been submitted to Coffs Harbour City Council to subdivide Lot 7 DP 555490 into 2 lots to separate the two existing dwellings on the property.

Coffs Harbour City Council has provided a list of road and access related issues to be addressed resulting from the TLC meeting notes of 17 June 2020. The matters include:

1. Upgrading of Gaudrons Road in accordance with the Coffs Harbour City Council Development Design Specification, particularly Section 3.6
2. Sight distances to be verified for access onto Gaudrons Road



Figure 1 - The site.

2 This Review

This review will address relevant matters relating to vehicular access to Lot 7 and the need to upgrade Gaudrons Road.

3 Site Inspection

An inspection of the site was carried out on 24 November 2020. The weather was fine.

4 Subdivision

It is proposed to subdivide the existing lot with an area of 2.05 ha into lots of 1.0 and 1.05 ha area. Both lots will have more than 50 m of frontage to Gaudrons Road.

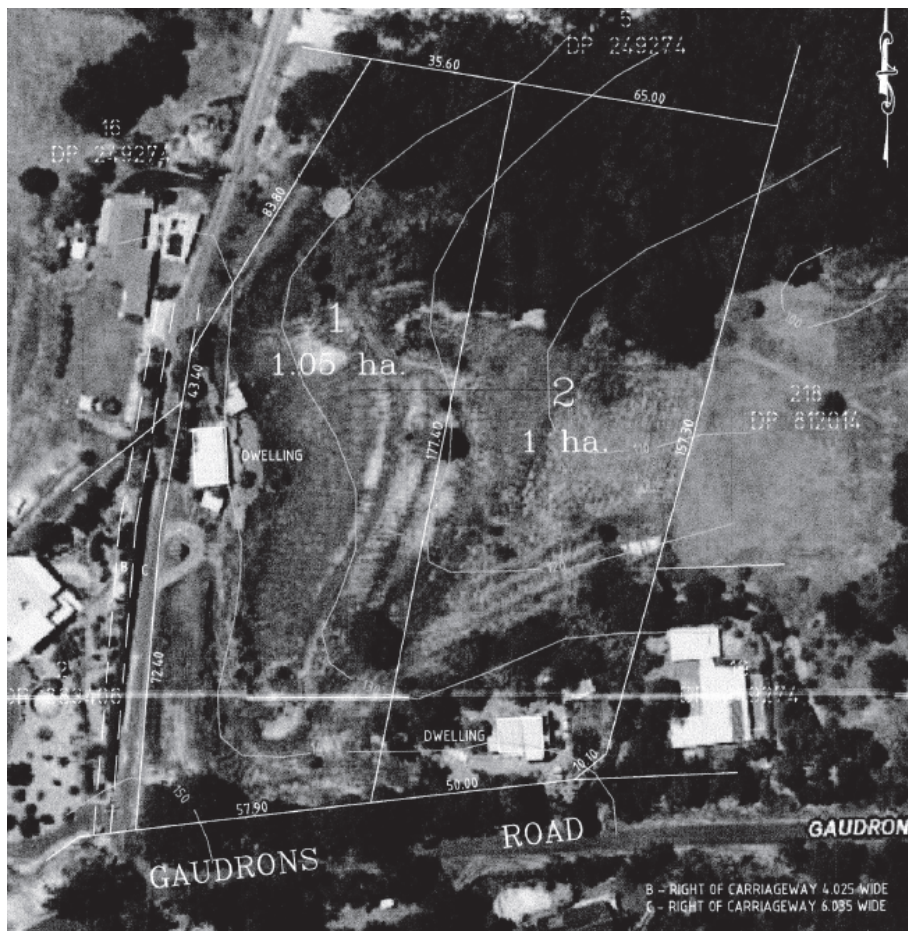


Figure 2 – Proposed subdivision layout.

5 Traffic Generation

From the RMS Technical Direction TDT 2013/04a, Guide to Traffic Generating Developments – Updated Traffic Surveys the traffic generation from Low Density Residential Dwellings in regional areas is:

- 7.4 trips per day per dwelling
- Weekday average evening peak hour vehicle trips 0.78

- Weekday average morning peak hour vehicle trips 0.71

The existing lot contains two dwellings. There will be a nil increase in daily vehicle trips created by the subdivision as there are already two dwellings on the lot.

The current contribution to traffic on Gaudrons Road is:

- 14.8 trips per day
- Weekday average evening peak hour vehicle trips 1.56
- Weekday average morning peak hour vehicle trips 1.42

6 Sight Distance Assessment

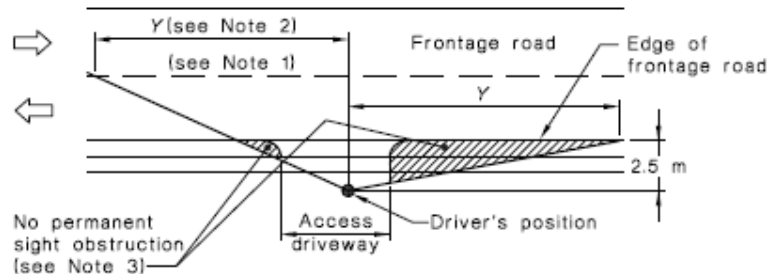
Proposed Lot 1 on the western side currently has vehicular access via the existing ROC along the western side boundary. The terms of the instrument for access via the ROC have not been disclosed to the writer. An alternative access direct to Gaudrons Road is located 30 m east of the ROC. An existing access to proposed lot 2 is located at the eastern corner of the lot.

6.1 Sight Distance Requirements

Sight distance requirements are documented in AS/NZS 2890.1 Parking Facilities Part 1: Off-street car parking.

AS/NZS 2890.1:2004

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Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2 nd and 3 rd columns
100	139	160	
110	153	190	

Figure 3 – AS 2890.1 Figure 3.2 Sight Distance Requirements at Access Driveways

The Minimum SSD in the figure above is Stopping Sight Distance as contained in Austroads Guide to Road Design – Part 3 Geometric Design, 2017. Stopping Sight Distance (SSD) is the

distance to enable a normally alert driver, travelling at the design speed on wet pavement, to perceive, react and brake to a stop before reaching a hazard on the road ahead. The reaction time is taken as 2.0 seconds and the values above have been rounded to the nearest 5 m.

The driver's sight line is taken to be from eye height at 1.1 m to an approaching vehicle also at 1.1 m. It is noted that more recent Austroads sightline criteria adopt a vehicle height of 1.25 m which will result in greater sight line lengths when sighting over a crest.

$$SSD = \frac{R_T V}{3.6} + \frac{V^2}{254(d + 0.01a)}$$

where

R_T	=	reaction time (sec)
V	=	operating speed (km/h)
d	=	coefficient of deceleration (longitudinal friction factor)
a	=	longitudinal grade (% , + for upgrades and – for downgrades)

6.2 Access to Lot 1 Via ROC

The existing ROC appears to provide access to at least 7 lots.

Available sight distances at the access are as follows:

- The available sight distance to eastbound traffic is 152 m
- The available sight distance to westbound traffic is 130 m
- The grade of Gaudrons Road at the ROC is 9% and 3% down 30 m west of the ROC.



Figure 4 - Intersection of ROC with Gaudrons Road



Figure 5 – Sight line from ROC to westbound traffic.



Figure 6 – Sight line from ROC to eastbound traffic.

For traffic travelling west uphill to the point of impact at the ROC a sight distance of 130 m equates to an approach speed of more than 100 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and uphill grade.

For traffic travelling east downhill to the point of impact at the ROC a sight distance of 152 m equates to an approach speed of 96 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and undulating grade for which a sight distance of 70 m would be required.

6.3 Access to Lot 1 Via Existing Access 30 m from ROC

Available sight distances at the access are as follows:

- The available sight distance to eastbound traffic is 75 m
- The available sight distance to westbound traffic is 126 m
- The grade of Gaudrons Road at the access is 13%.



Figure 7



Figure 8 – Sight line from Lot 1 access to westbound traffic.



Figure 9 – Sight line from Lot 1 to eastbound traffic.

For traffic travelling west uphill to the point of impact at the existing access a sight distance of 126 m equates to an approach speed of more than 100 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and uphill grade.

For traffic travelling east downhill to the point of impact at the existing access a sight distance of 75 m equates to an approach speed of 60 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and undulating grade. A horizontal curve located approximately 135 m west of the ROC was assessed to have a radius of approximately 65 m which equates to a travel speed of 47 km/h.

Therefore, the sight distance requirements of AS 2890.1 are considered to be satisfied for proposed Lot 1.

6.4 Access to Lot 2 Via Existing Access at the Eastern End of the Site

Available sight distances at the access are as follows:

- The available sight distance to eastbound traffic is 125 m
- The available sight distance to westbound traffic is 180 m
- The grade of Gaudrons Road at the access is 15%.



Figure 10 - Existing Access to Lot 2



Figure 11 – Sight line from Lot 2 access to westbound traffic.



Figure 12 – Sight line from Lot 2 to eastbound traffic,

For traffic travelling west uphill to the point of impact at the existing access a sight distance of 180 m equates to an approach speed of more than 100 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and uphill grade.

For traffic travelling east downhill to the point of impact at the existing access a sight distance of 125 m equates to an approach speed of 80 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and undulating grade.

Therefore, the sight distance requirements of AS 2890.1 are considered to be satisfied for proposed Lot 2.

7 Upgrading of Gaudrons Road

Previous advice of Coffs Harbour City Council has been that upgrading of Gaudrons Road in accordance with the Coffs Harbour City Council Development Design Specification 0041 Geometric Road Layout Section 3.6 would be required. Section 3.6 contains the following table.

3.6 CARRIAGEWAYS

Carriageway widths for rural roads should comply with Table 3.2.

Table 3.2 Carriageway widths

Road type	Max traffic volume (vpd)	Max speed ⁽¹⁾ (km/h)	Carriageway width (m) ⁽²⁾	Shoulder ^{(3) (4)}	Reserve width
Local Minor	<200	60	6.0 (sealed)	1.0	20
Local Major	>200	80	6.0 (sealed)	1.0	20
Collector	>2000	80 ⁽⁸⁾	7.0 (sealed)	1.0 (sealed)	20
Arterial Road	NA	100 ⁽¹¹⁾	7.0 (sealed)	1.0 (sealed)	30
Rural Residential	400	60	6 (sealed)	(kerb)	20

The table indicates that the requirements for rural local roads include a sealed pavement 6.0 m wide and 1.0 m shoulders. The provision of a table drain would be outside the 8 m wide formation. Normally a 1.5 m slope at 1 in 4 into the invert of the drain is the standard requirement.

The width of Gaudrons Road was measured at uniform intervals from the end of the concrete pavement at the Solitary Islands Way roundabout as shown in the table below.

It is apparent that the road is not constructed with a uniform minimum sealed width of 6.0 m, nor does it have clearly defined separate shoulders and table drains at many locations. It is obvious that the road has been shaped into the steep mountainous terrain and given the apparent age of the road, standard 1.5 m wide table drains with a 1 in 4 lead in grade can not be achieved due to the constraints on the overall width of the road formation due to the terrain.

Due to the mountainous terrain, it is apparent that a “run off road” type crash would have a high probability of resulting in fatalities. The road has a posted speed limit of 60 km/h and many curves with a safe travel speed less than the speed limit. There are no curve warning signs, delineation is sporadic, there are many trees in the clear zone and no safety barriers in high risk areas.

Widening of the shoulders in various locations would no doubt result in massive earthworks and potential environmental impacts. As there is no apparent damage to roadsides resulting from insufficient table drain capacity it must be assumed that stormwater drainage is currently adequately catered for.

Table 1 – Gaudrons Road widths.

Distance from Concrete pavement (km)	Left shoulder width (m)	Central seal width (m)	Right shoulder width (m)	Comment
0.2	1.5	6.0	3.0	In cutting
0.4	3.0	5.9	1.5	Cutting LHS
0.5	1.5	6.8	1.5	Cutting LHS
0.6	2.5	6.2	3.5	
0.81	1.3	5.6	1.2	Cutting RHS
1.0	1.5	6.0	1.1	Cutting RHS
1.1	2.0	5.5	2.5	Fill embankment
1.2	2.0	5.6	1.1	Cutting RHS
1.4	Driveway	6.5	Driveway	
1.6	1.0	6.1	3.0	
1.7	1.2	5.2	1.0	

From the table above it can be seen that the seal width varies from 5.5 to 6.8 m. The wider seal would include some widening of curves. The arithmetic mean of the seal width is 5.95 m.

Previous indications from Council have been that development along the length of Gaudrons Road would result in the need to widen the seal and shoulders in accordance with Council's Development Specification for greenfield sites. An obvious benefit of the road in its current form is that drivers generally travel at lower speeds and with attention to the road alignment which would probably result in lower reaction times, probably 1.5 seconds would be the norm.

Widening of the road may result in higher operational traffic speeds which without upgrading horizontal curves and reducing grades could result in more traffic accidents on the road. Instead, it may be more appropriate to take a road safety approach in accordance with the "safe system" to carry out safety works which would reduce potential crash severity, serious injuries and possible deaths.

No 148 Gaudrons Road is located between cross sections at 1.2 and 1.4 km in the table above.

It is apparent that a blanket application of Council's rural road standard to the road would not be an efficient expenditure as any incremental improvement would be at enormous cost. Also, it is understood that there are currently 67 dwellings which gain access via Gaudrons Road. If the subdivision resulted in one additional dwelling the impact of the traffic increase would be only 1.5% and it would be difficult to attribute the need for any upgrading works to the resulting increase in traffic from the subdivision. As there is no increase in dwellings resulting

from the subdivision there is definitely no nexus on which to require upgrading of Gaudrons Road.

It is noted that Council does not have a Section 7.11 Infrastructure Contributions plan for Gaudrons Road. Therefore, Council is not legally entitled to require the developer to contribute to works at other locations along the length of the road.

8 Conclusion

This investigation has proven that the existing points of access to Gaudrons Road for proposed Lots 1 and 2 are suitable for access from each lot to Gaudrons Road.

As there are already two dwellings, one on each proposed lot, there will be no increase in traffic generation from the subdivision and no decrease in the amenity of the existing access along Gaudrons Road.

As there is no current EPA Act Section 7.11 Infrastructure Contributions plan for Gaudrons Road Council can not require the applicant to contribute toward upgrading of Gaudrons Road.

Consideration of the mountainous nature of the existing road environment indicates that general upgrading of Gaudrons Road in accordance with Specification 0041 may not produce desirable outcomes and a more targeted approach to safety improvements, funded through Council's normal channels, may be more suited to the locality.

If any of these issues need clarification please contact me on 0432 016 490.

Yours sincerely



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