

BEFORE THE PORIRUA CITY COUNCIL AND GREATER WELLINGTON REGIONAL COUNCIL

Under	the Resource Management Act 1991 ('RMA')
Applicant	Jagger NZ Ltd
In the matter of	land use and subdivision consent (RC RC6922- SL0046/15) to: <ul style="list-style-type: none">• undertake a 149 lot subdivision consisting of residential lots, road and reserves to vest and balance lots, which includes contravening permitted activity standards in respect to earthworks, financial contributions, outdoor living area, private ways and driveways, site coverage, vehicle movements and front yard; and• vary or cancel a consent notice; and• vary or surrender existing easements; and• waive esplanade reserve requirements discharge permits, diversion and land use consents (WGN160028) to: <ul style="list-style-type: none">• divert Duck Creek; and• discharge sediment and chemical flocculant in treated stormwater runoff; and• discharge into water; and• discharge to land; and• undertake various works in respect to the bed of any river; and• place a stormwater pipe and a sewage pipe; and• construct temporary bridges, three permanent bridges, place stormwater inlet and outlet structures, and construct an outlet pipe to Duck Creek, a forebay in a pond system and an outlet channel from the pond to land where it will enter Duck Creek; and• undertake bank stabilisation works; and• reclaim the bed of Duck Creek

Primary Statement of Expert Evidence of Caron Elizabeth Greenough for the New Zealand Transport Agency

Dated 29 March 2016

Introduction

1. I am the New Zealand Transport Agency's (**'Transport Agency'**) Principal Safety Engineer for the Central region of New Zealand inclusive of the Wellington area. I have held this position for nearly four years. Prior to this I have held senior roles as a traffic engineer and transport planner with various engineering consultancies in New Zealand and in the United Kingdom.
2. I hold a Master of Science in Transportation Planning and Engineering and a Bachelor of Engineering in Civil and Environmental Engineering. I am an associate member of the Institution of Professional Engineers New Zealand.
3. I am responsible for managing the safety of the State Highway road network for the lower North Island and the upper South Island with a team of three Senior Safety Engineers.
4. I confirm that I have authority to give evidence on behalf of the Transport Agency.

Code of Conduct

5. I have read the Environment Court's Code of Conduct for Expert Witnesses, and I agree to comply with it. I confirm that the issues addressed in this brief of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed. I understand that the Code of Conduct requires me to assist the Commissioners impartially on matters within my expertise, and not to advocate for the Transport Agency.

Scope of Evidence

6. My evidence addresses the safe operation of State Highway 58 (**'SH58'**)/ James Cook Drive intersection and the proposed construction site access as a result of the Duck Creek North / Brookside development. My evidence does not consider impact on the local road network.

7. In order to assess safety of the accesses we specifically consider the Safe Intersection Sight Distance as defined in the Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.

Safer Journeys Strategy

8. As the Transport Agency, we work towards the Safer Journeys Strategy. This is the government's strategy to guide improvements in road safety over the period 2010 to 2020. The strategy's vision is a safe road system increasingly free of death and serious injury and introduces the Safe System approach to New Zealand.
9. The Safe System approach recognises that people make mistakes and are vulnerable in a crash. It reduces the price paid for a mistake so crashes don't result in loss of life or limb. Mistakes are inevitable - deaths and serious injuries from road crashes are not.

State Highway 58 / James Cook Drive

10. The location of the permanent access to the Applicant's site is located on James Cook Drive approximately 150m south of the intersection with SH58.
11. The Applicant, via the Transportation Impact Assessment ('TIA') submitted to the Transport Agency, has indicated that 100% of the traffic exiting the development in the AM peak shall use the SH58/James Cook Drive intersection, with approximately 60% turning left and 40% turning right out of James Cook Drive.
12. The intersection is a t-type intersection with a short right turn pocket that is used for traffic turning right into James Cook Drive. The length of the right turn pocket is somewhat constrained by a culvert underneath the state highway and the inlet itself.
13. The assessment of crashes supplied in the Applicant's TIA aligns with the Transport Agency's review of crashes in the area. The Transport Agency's review of the crash analysis system ('CAS') indicates there have been no recorded fatal and serious crashes within the last 5 years and three recorded minor injury crashes all from 2012. It is

worth noting that there is approximately a three month delay between the crashes occurring and being recorded in the CAS.

14. The section of SH58 in the locality of the intersection is classified by the Transport Agency as a High Risk Rural Road under the KiwiRap risk rating. This means there is a high collective safety risk on this road. However, the intersection with James Cook Drive and SH58 is only classified as a medium risk and this is reflected in its crash record.
15. The posted speed limit for this section of SH58 is 80km/h, however, recent tube counts east of James Cook Drive indicate that the 85th percentile operating speed for traffic travelling westbound is approximately 74km/h. Eastbound, while not recorded because of issues with geometry, would be significantly less and has an advisory curve speed warning sign of 45km/h. In reality, based on my own experience the operating speed is likely to be slightly higher and I would suggest 60km/h. The operating speeds are used to determine the appropriate safe sight distances for the intersection as described below.
16. From the TIA the Applicant has stated that the sight distance along SH58 from James Cook Drive is approximately 180m to the west (left) and 200m to the east (right) which I concur with.
17. In accordance with Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections the Safe Intersection Stopping Sight ('**SISD**') distance. This distance provides sufficient sight distance for a driver of a vehicle on the major road i.e. SH58 to observe a vehicle on a minor road approach moving into a collision situation e.g. worst case, stalling across the traffic lanes and to decelerate to a stop before reaching the collision point.
18. This is based on a reaction time of 2.0s.
19. For SH58 with an operating speed of 80km/h, the SISD is 180m to the east and 123m to the west for an operating speed of 60km/h. The available sight distances are therefore within acceptable safety margins.

20. SISD was also used to make a determination as to the visibility of the right turn pocket and to a potential queue in the right turn pocket.
21. Referring back to the sight distance to the right turn pocket as mentioned in paragraph 17; the maximum queue within the right turn pocket is theoretically, in the evening peak, approximately 8m based on the modelling supplied by the Applicant. This would require an SISD of 123m plus 8m = 132m. Again, as the sight distance is approximately 180m from the west, this is still within acceptable safety margins.
22. The other relevant assessment of safety used in Austroads Guide Part 4A is the Minimum Gap Sight Distance ('**MGSD**'). The MGSD is required for a driver of an entering vehicle i.e. turning right out of James Cook Drive onto SH58 to see a vehicle in the conflicting stream of traffic in order to safely commence the desired manoeuvre and is dependent on the critical acceptance gap. Turning right into and out of James Cook Drive would require a critical gap acceptance time of 5 seconds and a minimum sight distance of 111m to the east and 83m to the west. As both MGSD and SISD are within acceptable safety margins it is my opinion that the intersection will still operate safely.
23. As with all things, we will continue to monitor the network. We have agreed a condition with the applicant; to review the safe function of James Cook Drive / SH58 at 50% and 75% occupancy of the development. We will work with the applicant to review the safety of the aforementioned intersection. Agreed conditions are included in Appendix One.

Construction Access

24. During the initial stages of earth-moving the Applicant has requested approval to use an existing access approximately 120m west of the James Cook Drive intersection for a 12 week period. The available sight distance from the west is constrained to 50m. As indicated above, for an operating speed of 60km/h, the Austroads Guide requires an SISD of 123m. To mitigate the safety effects we have agreed the following conditions with the Applicant:

- a. A left-in/left-out arrangement, with the use of safe hit posts to control this; and
- b. a reduction of posted speed limit, to be controlled using an approved traffic management plan ('**TMP**') to 50km/h.

It is my opinion that this will mitigate the risk associated with turning traffic and the reduction is sight distance.

25. An independent safety review of the construction access was carried out by MWH in January 2016 (Appendix Two). The review agreed with the proposal for a left-in/left-out arrangement and commented on the details of the TMP, all of which are manageable as part of the TMP.
26. The details of the TMP, some of which have been detailed in the agreed conditions between the Applicant and the Transport Agency, will require approval by the Transport Agency through a separate process.

CONCLUSION

27. It is my opinion that the impact of the traffic generated by the Duck Creek North / Brookside development will be no more than minor on the safe operation of the intersection with SH58 and James Cook Drive and that the conditions will mitigate any safety concerns associated with the proposed short term construction access.

Caron Elizabeth Greenough
29 March 2016

Appendix One

Conditions

As agreed by the Applicant (Jagger NZ Ltd) and the NZ Transport Agency on the 17 March 2016; in relation to the Brookside Development (Duck Creek North), Whitby.

1. Construction Traffic Management Plan

The consent holder shall submit a Construction Traffic Management Plan (CTMP) to the Manager for certification, at least 15 working days prior to the commencement of construction on site. The purpose of the CTMP is to outline the proposed procedures, requirements and standards necessary for safely managing the traffic effects of construction. The CTMP shall be consistent with the version of the NZ Transport Agency Code of Practice for Temporary Traffic Management which applies at the time the CTMP is prepared, and include:

- i. Temporary traffic management measures required to manage the impacts on road users during the proposed working hours, including details confirming that the stop/go controls required to establish and remove the temporary access will only operate at night between Sunday and Thursday during the hours of 19.00 - 05.30;
- ii. Confirmation that access into the site off State Highway 58 will be no longer than 12 weeks in duration and only within off peak hours as defined by Capital Journeys for heavy vehicles;
- iii. Measures to maintain safe cyclist access along State Highway 58, including the widening of State Highway 58, and appropriate signage identifying the hazard at each end of the effect section of State Highway 58;
- iv. Any proposed temporary changes in speed limit, the length of which shall comply with the Setting of Speed Limits 2003 Section 5;
- v. Provision for safe and efficient access of construction vehicles to and from the construction site, exclusively the allowance for a left in and left out route only from State Highway 58 using safe hit posts as shown on Plan *Traffic Management SH 58 – Temporary Access February 2016* including widening to accommodate the safe hit posts;
- vi. Measures that will be undertaken to communicate traffic management measures to affected road users and stakeholders;
- vii. Measures for any road reinstatement to its original form prior to construction works commencing in the event that there is damage during construction works; and
- viii. Measures for the management of road drainage during construction works; this shall include photographing the drain once the road widening has been constructed and;
- ix. Any extension to the 12 week timeframe in (ii) above will need to seek approval from the Manager, including details of consultation with the NZ Transport Agency.

2. Postgate Drive Roundabout and Pauatahanui Roundabout

- a. The consent holder shall submit a survey, jointly prepared with the NZ Transport Agency, of the precondition of Postgate Drive Roundabout and Pauatahanui Roundabout to the Manager stating the precondition of both roundabouts. The survey shall:

- i. Be undertaken prior to any construction work being carried out on the temporary access off State Highway 58;
 - ii. Include photos of the condition of both Postgate Drive Roundabout and Pauatahanui Roundabout;
 - iii. Include the location of signs in the immediate vicinity of both Postgate Drive Roundabout and Pauatahanui Roundabout; and
 - iv. Include details of the pavement condition of both Postgate Drive Roundabout and Pauatahanui Roundabout.
- b. Immediately following the 12 week period permitted for access to the site from State Highway 58, the consent holder shall submit a final survey, jointly with the NZ Transport Agency, to the Manager of both Postgate Drive Roundabout and Pauatahanui Roundabout. The survey shall include the same data required in the precondition survey.
- c. Should there be a detrimental change to the condition of the roundabouts attributable to the vehicles operating under the CTMP mentioned in condition 1 above between the precondition survey required by Condition 2(a) and the final joint survey required by Condition 2(b), then the consent holder shall reinstate the road and Roundabouts, at their own costs, to its original form within six weeks of report being submitted.
- d. In the event of any divergence of views between the NZ Transport Agency and the consent holder, Porirua City Council shall have the final say.

3. Traffic Model Calibration

The consent holder shall submit to the Manager, in consultation with the NZ Transport Agency, an update to the SIDRA model for information purposes prior to construction commencing. The purpose of the update is to calibrate the model with actual on-site traffic counts provided by the consent holder.

4. Review Condition

- a. Pursuant to section 128 of the Resource Management Act 1991 the consent holder shall submit to the Manager, in consultation with the NZ Transport Agency, two reviews of the operational safety of the State Highway 58/James Cook Drive intersection. These reviews shall be submitted within three months of 50% of the development being occupied and 75% of the development being occupied. The reviews shall address the following matters:
 - i. Crash history, anecdotal and recorded. In calculating crash rates/history a moving 10 year period shall be analysed and used in the review;
 - ii. Capacity of the intersection, and its performance compared to the SIDRA model calibration required by Condition 3 above. In determining performance of the intersection, other growth in the traffic catchment shall be accounted for and considered in relation to the Brookside development through a record of turning movements associated with Proposed Road 1 at its intersection with James Cook Drive; and
 - iii. The potential for impacts on the safety of the intersection.

- b. In the event that the Manager, in consultation with the NZ Transport Agency, determines that the intersection is no longer operating safely, the following shall occur:
 - i. No further dwellings of the Brookside development shall be occupied until the Transmission Gully Expressway is operating; or
 - ii. Works to the existing road network to provide for enhanced safety of the SH58/JCD intersection.

Advice note: The consent holder is also required to seek approval from the NZ Transport Agency pursuant to the Government Roading Powers Act 1989 for any works on the State Highway

5. Culvert Management

- a. Prior to any construction commencing the consent holder shall inspect the culvert beneath State Highway 58 (culvert 119 - Duck Creek Culvert) and provide a Culvert Silting Report within 48 hours of the inspection being undertaken to the Manager for certification, in consultation with the NZ Transport Agency, containing the following information:
 - i. Date of inspection;
 - ii. Photographs of the culvert and any silt build-up;
 - iii. Existing silt levels taken as a current cross section measurement of the culvert capacity which are to be maintained by a comparable measurement, in the same locations for every inspection;
- b. The inspections shall be carried out by a suitably qualified person during the following times:
 - i. Prior to the commencement of construction to set baseline silt levels;
 - ii. Within 24 hours of every significant rainfall event during the construction period (A significant rainfall event Means any rainfall event that is predicted to meet or exceed 20mm in one 24 hour period); and
 - iii. A final inspection within 1 month following the construction works being completed.
- c. If the depth of silt within culvert 119 increases over and above the levels established as a result of the pre-construction baseline inspection, and is attributable to the activities authorised by this Consent, then the Consent Holder shall be responsible for removing the build-up of silt from within the culvert to provide the same baseline performance as reported in condition 5 (b)(i) within 48 hours of the report being submitted to the Manager.