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Version Control

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1 Background & Scope

1.1 Background

Jagger NZ Ltd is applying for the necessary consents to undertake residential development on the former Duck Creek Golf Course area in Whitby. For the purposes of this assessment, this is referred to as Duck Creek North.

The principle and general layout of development in this area was the subject of a Comprehensive Development Plan (CDP), approved by Porirua City Council (PCC) in 2010. The land is within the Suburban Zone as defined by the Porirua City District Plan (PCDP).

Jagger NZ wishes to avoid the creation of a 'standardised' roading environment with wide and undefined carriageways, which can be visually uninteresting and may encourage higher vehicle speeds. Instead, it is seeking to promote an alternative environment in this area with a standard of roading provision which creates a 'sense of place' and fosters a community 'feel'. Consistent with this, the roading design should control vehicle speeds without recourse to specific traffic management measures and should also allow excessive and unsightly earthworks to be kept to a minimum. This approach has been previously accepted by PCC and adopted successfully in the nearby ‘Banks’ residential development.

To achieve these objectives, some departures are sought from the 'default' roading standards applied by PCC. It is considered that the objectives of the developer and those of the PCC engineering standards can both be met with a package of road design measures that will not compromise the essential functionality of the roads or their safety of operation.

1.2 Scope

The purpose of this document is to assess the development proposals in terms of the functionality and standard of internal roads which are proposed. This includes consideration of provision for pedestrian and cycle movement.

Also addressed are the potential effects of the development as a whole upon the operation of the external road network, especially the intersection with James Cook Drive and the nearby State Highway 58 (SH58) intersection.

Liaison has taken place with PCC officers during the process of developing these proposals and feedback to date has been supportive of the design principles being adopted.
2  Existing Situation

This section summarises existing conditions in this area for vehicular and pedestrian movements.

2.1  Location

The location of the application site is shown by Figure 2.1 (site boundaries are approximate).

![Figure 2.1: Location Plan (Source: Porirua CC)](image)

2.2  Road Environment

James Cook Drive has the status of a ‘Principal Street’ in the hierarchy defined by the PCDP. With a total legal width of 19-21m, the section adjacent to the northern end of the application site provides one traffic lane in each direction with sealed shoulders and a footpath on the western side only. The applicable speed limit is 50 km/hr and street lighting is provided. At the point at which a new road would intersect with James Cook Drive, the available sight distances are approximately 140m to the north (left) and 109m to the south (right), the latter distance being limited by the curvature of the road.

SH58 (Paremata Road) is classified as a ‘Major Urban Arterial’ in the hierarchy. This also
provides a single traffic lane in each direction, with this section having a number of tight curves with advisory speeds as it follows the southern edge of the Pauatahanui Inlet. The applicable speed limit is 80 km/hr.

The SH58 / James Cook Drive intersection is priority controlled, with vehicle movements from James Cook Drive required to give-way. A short (12m) auxiliary lane is provided for vehicles wishing to turn right from SH58 into James Cook Drive. The available sight distances for vehicles turning from James Cook Drive are 180m to the west (left) and 200m to the east (right).

Photos of the existing environment in this area are shown at Annexure A.

### 2.3 Existing Traffic Volumes & Conditions

Recent traffic volumes for the three sections of road bordering the site have been supplied by PCC and the New Zealand Transport Agency (NZTA) and are summarised in Table 2.1.

<table>
<thead>
<tr>
<th>Location &amp; Date</th>
<th>Direction</th>
<th>5-Day (vehs/day)</th>
<th>Sat (vehs/day)</th>
<th>Sun (vehs/day)</th>
<th>Peak (time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>James Cook Drive</td>
<td>Northbound</td>
<td>4,310</td>
<td>4,620</td>
<td>3,840</td>
<td>500 (Tue 5-6pm)</td>
</tr>
<tr>
<td>(S of SH58) Jul 2012</td>
<td>Southbound</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>2-Way</td>
<td>4,310</td>
<td>4,620</td>
<td>3,840</td>
<td>500 (Tue 5-6pm)</td>
</tr>
<tr>
<td>SH58 (E of JCD)</td>
<td>Westbound</td>
<td>5,250</td>
<td>4,460</td>
<td>3,760</td>
<td>720 (Tue 7-8am)</td>
</tr>
<tr>
<td>May 2015</td>
<td>Eastbound</td>
<td>5,270</td>
<td>4,520</td>
<td>3,810</td>
<td>650 (Tue 5-6pm)</td>
</tr>
<tr>
<td></td>
<td>2-Way</td>
<td>10,520</td>
<td>8,980</td>
<td>7,560</td>
<td>1,280 (Wed 7-8am)</td>
</tr>
</tbody>
</table>

**TABLE 2.1: Existing Traffic Volumes (Source: PCC & NZTA)**

More detailed profiles of hourly traffic volumes are provided at Annexure B.

James Cook Drive exhibits broadly equal morning and evening weekday peaks in traffic activity consistent with commuter usage, with low levels of activity between 9am and 3pm. Weekend traffic volumes exhibit a single broader peak in activity, with peak flows on Saturday morning as high as the weekday peak volumes.

SH58 patterns are similar, but with volumes in the weekday morning peak higher than those in the evening, and peak weekend volumes at a considerably lower level.

The road network in this area generally operates without any congestion, aside from some delays experienced by turning movements at the James Cook Drive / SH58 intersection at peak periods.

### 2.4 Crash History

The crash history for this area for the period since January 2010 is summarised by Figure C1, Annexure C.

One incident has been recorded on James Cook Drive in the vicinity of the proposed access. This occurred in October 2013 and involved a northbound speeding motorcyclist who lost control on the bend and collided with a pole, resulting in a serious injury.
Three incidents have occurred at the intersection of SH58 with James Cook Drive;

- in March 2011 (Tuesday, 9am), a westbound car on SH58 collided with the rear of one which had slowed to allow a turning vehicle to proceed (no injuries);
- in April 2012 (Wednesday, 2pm) a right-turning vehicle failed to give way to a cyclist (one minor injury); and
- in December 2012 (Sunday, 4am), a westbound car on SH58 collided with a guard rail due to driver fatigue (one minor injury).

In addition, this general part of SH58 is characterised by a number of 'loss of control' incidents resulting from excessive speed at the tight corners.

The incidents recorded on James Cook Drive at and its intersection with SH58 are not uncommon and there is no evidence of any systemic safety problems in this area.

By law, only those crashes involving personal injuries are required to be reported. Accordingly, it is possible that a number of other non-injury crashes may have occurred which have not been included in these records.

2.5 Pedestrian, Cycle and Public Transport Facilities

As described above, James Cook Drive provides a continuous footpath along its western side. No footpath is provided along this section of SH58. A footpath from the eastern side of James Cook Drive at the SH58 intersection provide a connection (via steps) to Molyneux Close.

Although private land, the application site is itself used as a pedestrian route for recreational use and by school children. In this respect, the site provides connectivity to Discovery Drive, Observatory Close, Sailmaker Close, Picketboat Lane as well as James Cook Drive.

There are no specific on-road cycle lanes in the immediate area and cycles are required to share the roadspace with general traffic.

The 236 Whitby-Porirua bus service operates hourly along James Cook Drive to the south of the application site and along Discovery Drive.

2.6 Existing / Former Use of the Site

The site is currently vacant but was used previously by the Duck Creek golf course.

2.7 Planned Changes to Road Environment

While there are no programmed works which affect the immediate road environment, traffic volumes will be affected by the Transmission Gully motorway project. This has commenced construction, with completion currently anticipated by 2020.

This project is expected to reduce traffic volumes on SH58 to the west of Pauatahanui by
approximately 25% and on this section of James Cook Drive by over 40%.¹ This is because the proposed local link road to Transmission Gully will provide a more convenient route for many vehicle movements between this part of Whitby and destinations to the south.

¹ Transmission Gully Project: Assessment of Traffic and Transportation Effects. Sinclair Knight Merz, for NZTA (June 2011).
3 The Proposal

The proposal is shown in detail by the plan set submitted as part of the consent application material. This section summarises the key aspects of relevance to vehicular, pedestrian and cycle activity.

3.1 Development

The development will provide 149 residential lots. Based upon current market conditions, it is anticipated that full development of the area will take around 7 years (at approximately 20 dwellings a year).

It is expected that the development of each lot will provide off-street parking for at least two vehicles (one garage space plus space to the front of the garage).

3.2 Roads

An internal hierarchy of roads will service the development area. Provision for traffic movement, kerbside parking, walking and cycling is summarised by Table 3.1.

Road 1 is the ‘spine’ road running through the development area for a distance of 850m from an intersection with James Cook Drive (described below) in the north. This has two crossings of Duck Creek at Bridge 1 (close to the James Cook Drive intersection) and Bridge 2 (to the south of the Road 2 intersection). The northern section of the road has minimal residential frontages and elsewhere residential frontage alternate with areas of reserve.

Road 2 is a short (100m) link off the western side of Road 1 having residential frontages and connecting to Road 3. This will service around 50 lots.

Road 3 is 120m in length forming two cul-de-sacs connecting to RoWs at each end.

Road 4 is a short cul-de-sac running from the eastern side of Road 1.

Road 5 runs from the south end of Road 1 on its western side with a crossing of Duck Creek at Bridge 3 and will service 28 lots. While a cul-de-sac, connectivity to Samuel Marsden Collegiate and Discovery Drive will be provided by means of a footpath/cycle route (utilising RoW 9).

Road 6 runs from the western side of Road 1 and will provide access to 11 lots.

Below this, 12 rights-of-way will provide access to small clusters of lots and will accommodate pedestrian/cycle routes.

Carriageways & Kerbside Parking

Road 1 will provide a 7m carriageway (2 lanes @ 3.5m) along its length between the James Cook Drive intersection and RoW 3 at its southern end (from where the carriageway reduces to a width of 5.5m).

 Provision for kerbside parking is linked to the extent of adjacent residential development. Recessed parking bays will be provided on the short northern section which adjoins
residential development. Further south, one or two parking bays will be provided adjacent to development.

Roads 2 & 3 will provide a 7m wide carriageway to include allowance for kerbside parking which will be permitted on one side of these roads.

Roads 4 & 6 will provide a single 5.5m carriageway with 2.2m wide parking bays on one side only.

Road 5 will provide a 6m carriageway. Parking will be prohibited across Bridge 3 but elsewhere provided for with 2.5m wide bays to one side of the road.

None of the RoWs will provide for kerbside parking (as all lots will provide sufficient off-street parking). Carriageway widths will vary between 2.7m and 5.0m with some accommodating a single 1.5m footpath.

**Footpaths / Cycleways**

A 2.6m wide shared footpath/cycleway will run through the development area, connecting James Cook Drive in the north with Samuel Marsden Collegiate school and Discovery Drive to the south.

From the southern side of Bridge 1, the shared path will follow the edge of Duck Creek away from the road, returning to the road mid-way between Bridge 1 and the Road 2 intersection. The shared path will cross the road just west of Bridge 2 to follow the west side of Duck Creek, crossing Road 5 on the western side of Bridge 3. From this point it adjoins Road 5 and is then accommodated by RoW 9 through to Samuel Marsden school and Discovery Drive.

While all roads will accommodate on-road cycle activity, movement through the development area will be provided for by the shared path.

**Berms / Services**

All roads will provide for berms sufficient to accommodate services and to provide separation between the carriageway and footpaths or the shared path.

**Turning Areas**

The nature of the development area is that it involves a number of cul-de-sacs with a requirement for vehicles to turn around.

Turning facilities will be provided in the form of circular turning heads or alternate ‘L’ or ‘Y’ configurations (to meet the NSZ4404:2004 standard).

**Public Transport**

It has been agreed with PCC officers that there is no realistic prospect of this subdivision being serviced by public transport vehicles for the foreseeable future and hence there is no requirement to make specific provision for bus stops or turning facilities.
3.3 **Bridges**

The three bridges within the development will be constructed to provide:

- Bridge 1: a 7m carriageway with adjoining 2.6m wide shared pedestrian/cycle path;
- Bridge 2: a 7m carriageway with adjoining 1.5m wide footpath to one side; and
- Bridge 3: a 6m carriageway with adjoining 1.6m footpath to one side.

3.4 **Intersections**

The James Cook Drive intersection will be priority controlled, with all vehicle movements from the development area subject to ‘give-way’ controls. The traffic volumes expected mean that the provision of an auxiliary lane for right-turning movements into the development from the north is not warranted (refer **Section 4**).

All intersections within the development area will be uncontrolled.
<table>
<thead>
<tr>
<th>Road #</th>
<th>Section / Location</th>
<th>Traffic &amp; Parking</th>
<th>Walking &amp; Cycling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bridge 1</td>
<td>7.0m c/way, no parking</td>
<td>2.6m shared path + cycle in road</td>
</tr>
<tr>
<td>1</td>
<td>Bridge 1 – Road 2</td>
<td>7.0m c/way, no parking (except in recessed bays adjacent to lots)</td>
<td>2.6m shared path + cycle in road</td>
</tr>
<tr>
<td>1</td>
<td>Bridge 2</td>
<td>7.0m c/way, no parking</td>
<td>1 * 1.5m footpath</td>
</tr>
<tr>
<td>1</td>
<td>Road 2 – Road 4</td>
<td>7.0m c/way + 2.4m parking bay one side</td>
<td>1.5m footpath + cycle in road (+ off-road shared path)</td>
</tr>
<tr>
<td>1</td>
<td>S of Road 5</td>
<td>7.0m c/way + 2.4m parking bays two sides</td>
<td>2 * 1.5m footpaths + cycle in road (+ off-road shared path)</td>
</tr>
<tr>
<td>2</td>
<td>Road 1 – Road 3</td>
<td>7.0m c/way, parking one side within c/way</td>
<td>1 * 1.5m footpath + cycle in road</td>
</tr>
<tr>
<td>3</td>
<td>N/S of Road 2</td>
<td>7.0m c/way, parking one side within c/way</td>
<td>1 * 1.5m footpath + cycle in road</td>
</tr>
<tr>
<td>4</td>
<td>SE of Road 1</td>
<td>5.5m c/way + 2.2m parking bay one side</td>
<td>1 * 1.5m footpath + cycle in road</td>
</tr>
<tr>
<td>5</td>
<td>Bridge 3</td>
<td>6.0m c/way, no parking</td>
<td>1 * 1.6m footpath + cycle in road</td>
</tr>
<tr>
<td>5</td>
<td>SW of Bridge 3</td>
<td>6.0m c/way + 2.5m parking bay one side</td>
<td>1 * 1.5m footpath + 2.6m shared path + cycle in road</td>
</tr>
<tr>
<td>6</td>
<td>W of Bridge 3</td>
<td>5.5m c/way + 2.2m parking bay one side</td>
<td>1 * 1.5m footpath + cycle in road</td>
</tr>
<tr>
<td>RoW 1</td>
<td>W of Road 3</td>
<td>5.0m c/way, no parking</td>
<td>1 * 1.5m footpath + cycle in road</td>
</tr>
<tr>
<td>RoW 1 (extn)</td>
<td>W of RoW 1</td>
<td>2.7m c/way, no parking</td>
<td>walking &amp; cycling share roadspace</td>
</tr>
<tr>
<td>RoW 2</td>
<td>E of Road 3</td>
<td>2.9m c/way, no parking</td>
<td>1 * 1.5m footpath + cycle in road</td>
</tr>
<tr>
<td>RoW 3</td>
<td>S of Road 1</td>
<td>2.7m c/way, no parking</td>
<td>walking &amp; cycling share roadspace</td>
</tr>
<tr>
<td>RoW 4</td>
<td>off Road 2</td>
<td>2.7m c/way, no parking</td>
<td>walking &amp; cycling share roadspace</td>
</tr>
<tr>
<td>RoW 5</td>
<td>off Road 3</td>
<td>2.7m c/way, no parking</td>
<td>walking &amp; cycling share roadspace</td>
</tr>
<tr>
<td>RoW 6&amp;7</td>
<td>off Road 5</td>
<td>2.8-3.2m c/way, no parking</td>
<td>walking &amp; cycling share roadspace</td>
</tr>
<tr>
<td>RoW 8</td>
<td>off Road 5</td>
<td>2.7m c/way, no parking</td>
<td>walking &amp; cycling share roadspace</td>
</tr>
<tr>
<td>RoW 9</td>
<td>S end Road 5</td>
<td>2.7m c/way with 2.3 passing bays, no parking</td>
<td>2.6m shared path + cycle in road</td>
</tr>
<tr>
<td>RoW 10</td>
<td>off Road 6</td>
<td>2.8-3.2m c/way, no parking</td>
<td>walking &amp; cycling share roadspace</td>
</tr>
<tr>
<td>RoW 11</td>
<td>off Road 1</td>
<td>2.7m c/way, no parking</td>
<td>1 * 1.5m footpath + cycle in road</td>
</tr>
<tr>
<td>Row 12</td>
<td>off Road 3</td>
<td>2.7m c/way, no parking</td>
<td>walking &amp; cycling share roadspace</td>
</tr>
</tbody>
</table>

**TABLE 3.1: Proposed Road Standards & Provision for Walking, Cycling**
4 Assessment of Effects

This section describes an assessment of the likely effects of the operation of the proposed subdivision in terms of transportation issues.

4.1 Vehicle Movement – Safety

Internal Movement

The standard of the proposed internal roading will ensure the safety of vehicle movements with good sight-lines, minimal areas of conflict and low traffic volumes constrained by the absence of any through traffic.

External Movement

As noted above, the sight-lines available to vehicle movements exiting to James Cook Drive will be 140m to the left (north) and 109m to the right (south).

Austroads guidance\(^2\) is that a Safe Intersection Sight Distance (SISD) should be provided on the major road at any intersection. SISD ‘provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle on the minor road approach moving into a collision situation (e.g. in the worst case, stalling across the traffic lanes) and to decelerate to a stop before reaching the collision point’. For a 60 km/hr design speed (appropriate for a posted 50 km/hr speed limit), the SISD is 114m, assuming an ‘urban’ reaction time of 1.5 seconds.

Based upon similar principles, guidance prepared by the (former) Land Transport Safety Authority (LTSA)\(^3\) recommends that the minimum sight-distance from a ‘high volume’ driveway (having more than 200 vehicle movements/day) onto a ‘Collector’ road having a 60 km/hr design speed should be 115m. In this case, the ‘Collector’ road categorisation used by the guidance is considered to most closely reflect the ‘Principal Street’ status of James Cook Drive in the PCC road hierarchy, in terms of both volumes and functionality within the network. The PCC Code of Land Development and Subdivision Engineering requires compliance with the LTSA guidance.

This means that the available sight-distance to the south lies marginally below recommended values. While this difference is unlikely to have any material effect upon the safety of operation of the intersection (particularly with the forecast future reduction in traffic volumes on James Cook Drive) it could, if necessary, be mitigated by a ‘stop’ rather than ‘give-way’ control upon vehicle movements exiting the development.

For these reasons, it is considered that the new intersection will operate safely.

As described in Section 2, there do not appear to be any systemic safety problems on adjoining road sections or at the SH58 intersection which would be aggravated by the additional traffic activity arising from the development.

4.2 Vehicle Movement - Efficiency

The standard of the proposed internal roading will enable all vehicle movements to take place with negligible delays.

*James Cook Drive / Access Intersection*

SIDRA6 has been used to simulate conditions at this intersection during weekday morning and evening peak periods when levels of background traffic are at a maximum. With the PCC count for James Cook Drive not available by direction, it has been assumed that the traffic splits 70% northbound / 30% southbound in the morning peak period with the reverse pattern in the evening peak period.

The results, summarised at *Annexure D*, indicate that all movements would operate at Level of Service (LOS) A, with minimal levels of delay.

This assessment may be regarded as a ‘worst-case’ because no allowance has been made for the future reduction in traffic volumes forecast to result from the Transmission Gully motorway project.

*SH58 / James Cook Drive Intersection*

Similarly, SIDRA6 has been used to simulate conditions at the SH58 / James Cook Drive intersection. Again, assumptions have been necessary regarding the directional split of traffic on James Cook Drive and between turning movements at the intersection.

The results, summarised at *Annexure E*, indicate that during the morning peak period the right turn from James Cook Drive experiences significant levels of delay with LOS E, deteriorating to LOS F with the addition of development traffic.

During the evening peak period, this movement remains at LOS D but with the delay increasing from 26 to 31 seconds. The queue length for the right-turn movement from SH58 increases from 6 to 8m, still within the available length of the right-turn bay.

These results are likely to overstate delays for the right-turn movement from James Cook Drive, as an alternative route is available for these movements to access SH58 by means of Joseph Banks Drive. Also, with Transmission Gully having the effect of reducing traffic volumes on SH58 by 25% and James Cook Drive by 40%, this intersection would operate with much lower levels of delay.

As noted in Section 3, with construction expected to take place at the rate of approximately 20 dwellings per year, the development would be at most only two-thirds complete by the time the Transmission Gully project opens and provides the traffic relief described above.

4.3 Pedestrian and Cycle Safety & Convenience

The proposed shared foot / cycle path will provide a high standard facility through the development area. Together with footpaths alongside road sections, this will provide for a high standard of pedestrian and cycle connectivity.
At the points where the shared foot / cycle path crosses roads, just to the west of Bridges 2 & 3, good sight-lines will be available of approaching vehicle movements.

Walkway reserves will provide for pedestrian connectivity with adjoining residential areas, providing convenient and more direct routes.

4.4 Kerbside Parking Adequacy

All dwellings will provide garaging and off-road standing space for vehicles, with the degree of provision being linked to the size of dwelling.

The number of kerbside spaces to be provided equates to a minimum of one space for every 2.5 dwellings.

In 2011, surveys were undertaken of existing kerbside parking usage on a number of recently constructed residential roads in Woodridge, Churton Park, Aotea and Whitby, where the type of residential properties and off-street parking provision was similar to that for the proposal being assessed in Woodridge.

Observations were made on a typical Friday and Saturday in May 2011, at 12pm, 3pm, 6pm and 9pm. As a result, the surveys provided representative figures for a range of areas and time periods. The results of the surveys indicated that:

- for all of the areas and time periods combined, the average use of kerbside parking was 0.22 spaces per dwellings (or 1 space for every 4.6 dwellings);
- within this average, there was significant variation by day of week, time of day and location, with kerbside parking use varying between 0.04 and 0.62 spaces per dwelling, with an 85th percentile value of 0.37 spaces per dwelling (or 1 space per 2.7 dwellings); and
- the use of kerbside parking is generally greater on a Saturday (1 space per 3.7 dwellings) when compared to a Friday (1 space per 6.3 dwellings).

It was observed during these surveys that vehicles were parked at the kerbside even when a vacant off-street space was available.

The residential development in Woodridge subsequently took place and there has been no indication of any problems associated with a shortage of available kerbside parking.

On this basis, the provision of a minimum of one space per 2.5 dwellings is considered to be appropriate and will not result in a shortage of available kerbside parking.

4.5 Servicing

The provision of turning heads as described in Section 3 will ensure that all medium service vehicles (up to 8m in length) will be able to turn without any necessity to reverse to or from road frontages.
5  District Plan Provisions & Compliance

This section assesses the ability of the proposal to comply with the relevant rules and standards of the operative District Plan.

5.1  Operative District Plan

The relevant plan is the Porirua City District Plan (PCDP).

The site is located within the Suburban Zones as defined by the PCDP.

5.2  Applicable Standards in Porirua

In theory, three sets of standards are potentially applicable to roads in the Porirua area. The status of each and their principal requirements are discussed below.

District Plan (Part H)

The Porirua City District Plan⁴ (PCDP) became operative in November 1999. Table 4 at Part H of the PCDP defines the key technical standards for the secondary road network within the district.

These standards form part of the rules of PCDP. It is understood that PCC intends to revise these standards to ensure compatibility with its more recent engineering code (described below), but that because this forms part of the more general PCDP update process, this has been delayed. As a result, where differences exist, these older standards take precedence over other standards.

Porirua Code of Practice

In February 2010, PCC published its Code of Land Development and Subdivision Engineering⁵, which identifies local variances to the older national standard NZS4404:2004⁶.

These local and national standards are intended to integrate with one another and in combination are referred to as the Porirua Code of Practice (PCoP). In general, the standards defined by NZS4404 are the ‘default’. Where PCC has determined that a local requirement is necessary to address an issue specific to Porirua, this is identified as a ‘Special Provision’ that overrides the NZS4404 requirements.

The code is intended to be ‘performance-based’ rather than ‘prescriptive’, allowing for some flexibility in the use of other means to achieve the same overall objectives. In these cases, the developer is required to demonstrate that its solution;

a)  is consistent with the Level 1 Performance Goal (as defined by the PCoP);

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⁴ Porirua City District Plan. Porirua City Council, 1999.
b) meets the ‘Level 2 Performance Criteria’ (as defined by the PCoP and defines the PCC performance requirements); and

c) is equivalent to the ‘Level 3 Acceptable Solution’ (as defined by the PCoP together with NZS4404:2004).

The PCoP notes that:

There may be instances where an objective can be best achieved by a means not anticipated by this Code. In this situation, departure from the Code is justifiable provided it can be demonstrated that the proposed design solution is in accordance with the ‘Goals’ and ‘Performance Criteria’ and delivers an outcome equivalent to recognised ‘Acceptable Solutions’.

New Zealand Standard NZS4404:2010

Subsequent to the publication of the local standards in the PCoP (described above), the national standard to which they are linked has been superseded.

Although in theory the revised national standard NZS4404:2010 has no direct status with regard to roading provision in Porirua, it nonetheless provides a relevant context within which proposals should also be considered, as it represents the most up to date national ‘best practice’ for road engineering design and standards.

One of the key changes from NZS4404:2004 is a recognition that road design needs to allow ‘context’ or ‘place’ to be given significant emphasis, together with a requirement for roads to achieve safe (slower) operating speeds. Part of the reason for the new standard was that well-designed solutions that were not directly in accordance with the requirements of NZS4404:2004 often had difficulty gaining consent under the Resource Compliance with Standards

Road 1

Road 1 will service at most 149 dwellings with 1,340 vehicle movements/day at its northern end, declining with distance southwards. Based upon volumes alone, the categorisation of Road 1 by the PCoP would progressively reduce from a ‘Collector’ route, to a ‘Local Distributor’ and finally a ‘Minor Access’.

In practice, Road 1 should more logically be considered as a ‘Local Distributor’ road. Assessed against this standard, the proposal would not be compliant in terms of:

- the legal road width (17.1m – 19.4m) is below the 21m required;
- not all sections provide two footpaths;
- not all sections provide kerbside parking to both sides; and
- with no specific in-road cycle lanes, the traffic lanes have not been increased to 4m wide.

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Roads 2 & 3

Roads 2 & 3 will service at most 50 dwellings with 450 vehicle movements/day. Based upon volumes alone, the categorisation of these roads by the PCoP would be as a ‘Minor Access’ road.

Assessed against this standard, the proposal would not be compliant in terms of:

- the legal road width (12m) is below the 20m required;
- footpath provided on one side only;
- parking provided on one-side only;
- berm 1.2m wide below minimum value of 1.5m; and
- with no specific in-road cycle lanes, the traffic lanes have not been increased to 4m wide.

Access Lots

These will service at most 15 dwellings with 135 vehicle movements/day. Based upon the number of dwellings served, the categorisation of these roads by the PCoP would be as ‘Suburban Cul-de-Sac’.

Assessed against this standard, the proposal would not be compliant in terms of:

- the legal road width (10m) is below the 12m required;
- no kerbside parking provided (although the provision of a single carriageway at 5m against a minimum requirement of 3.5m would allow vehicles to park); and
- berms in some places below the 4.5m minimum value.

5.3 Assessment

To achieve full compliance with the PCoP roading standards, wider road cross-sections would be required which would be detrimental to the overall environment within the subdivision and encourage higher vehicle speeds.

In this respect, it is more relevant to consider the extent to which the proposals are compliant with performance criteria defined by the PCoP.

Passage

The proposed road standards will comply with the passage requirements, because:

- all anticipated requirements will be easily accommodated, including light vehicles, buses and truck movements;
- a shared foot/cycle path will be provided through the development area, providing an alternative to on-road facilities;
- pedestrian movement will be catered for, with roadside footpaths, off-road routes and linkages to adjacent residential areas and roads;
- sufficient kerbside parking is provided for to meet the demands generated by residential development;
Delays experienced at intersections will be minimal.

**Safety**
The proposed road standards will comply with the safety requirements, because:

- a lower speed environment will be encouraged by the use of cross-sections which are narrower than the PCoP requirements, together with alternating parking bays and street trees, reducing the perceived width of the road;
- specific provision is made for cyclists;
- intersections will provide for good sight-lines; and
- where possible, off-road footpaths are provided for pedestrians (a 2.6m wide shared pedestrian / cycle pathway), elsewhere appropriate provision is made for pedestrians both to walk alongside the road and to cross it at safe locations.

**Access**
The proposed road standards will comply with the access requirements, because:

- vehicular access would be provided for all residential properties;
- emergency services access would not be impeded; and
- connectivity will be provided for cycle and pedestrian movements.

**Parking**
The proposed road standards will comply with the parking requirements, because:

- adequate on and off road parking will be available to meet the reasonable needs of adjacent residences.

**Function**
The proposed road standards will comply with the function requirements, because:

- the roads will easily perform their intended functions, being able to accommodate the expected volumes and mix of traffic; and
- the road cross-sections, together with priority provision at intersections will provide an unambiguous signal to drivers of the intended status of the road.

**Landscape Development**
The proposed road standards will comply with the landscape development requirements, because:

- the visual narrowing of the road together with street trees will be aesthetically pleasing (particularly when compared to some existing road sections in Whitby which have wide expanses of carriageway); and
- by following the stream alignment, the road pattern will emphasise rather than hide the stream environment.
Duck Creek North, Whitby: Transportation Impact Assessment

Drainage

The proposed road standards will comply with the drainage requirements, because all footpaths and carriageways will be fully drained with a safe operating surface.

The reduced area of carriageway results in reduced volumes of storm-water run-off, which can be treated by roadside swales to remove contaminants before being discharged into Duck Creek.

Utility Servicing

The proposed road standards will comply with the utility requirements, because adequate berms will be provided to ensure that utilities infrastructure can be accommodated where required.

Economic Life-Cycle

The proposed road standards will comply with the economic life-cycle requirements, because the road will be easily capable of accommodating expected traffic demands over a 25-year minimum period (there is no prospect of further areas of development being accessed).

Environmental Quality

The proposed road standards will comply with the environmental quality requirements, because:

- visually intrusive earthworks will be minimised; and
- the use of street trees alternating with parking bays will soften the visual impact of the road.
6 Construction

This section addresses the potential effects of vehicular activity during the construction phase of the development.

6.1 Access Arrangements

Initial stages of earth-moving will take place prior to the construction of an access from James Cook Drive and an associated bridge over Duck Creek. This is provisionally expected to be for a period of around 2 months.

This will necessitate the use of an existing legal access with SH58 located approximately 120m to the west of the James Cook Drive intersection (shown by Photos 7 – 9 at Annexure A). The available sight-line to the west from this access is constrained to 50m by the horizontal curvature of SH58 at this point. For this reason, it is proposed that the use of this access would be constrained to left-in / left-out movements only, reinforced with high-visibility flexi-poles mounted along the centre-line and advanced warning signage.

To facilitate the left-turn entry movement a temporary adjustment of the existing Armco barrier will be required.

After this period, remaining construction traffic activity will utilise the new access intersection with James Cook Drive. At this time, the SH58 access will be returned to its existing condition.

The number of truck movements through this period and their origin / destination has yet to be defined.

6.2 Construction Traffic Management Plan

The detailed logistics of construction activity cannot be finalised until a contractor is engaged. For this reason, it is proposed that consent be conditional upon the preparation and agreement of a Construction Traffic Management Plan (CTMP) with both PCC and the NZTA. This document will address issues such as:

- the duration and timing of construction traffic activity;
- the use of a temporary access to/from SH58 and the management of safety in this area;
- the prevention of the migration of dust and mud into the public road environment; and
- a protocol for communication, problem reporting and resolution between the contractor and PCC/NZTA officers.
7 Conclusions

Jagger NZ Ltd is applying for the necessary consents to undertake residential development on the former Duck Creek Golf Course area in Whitby.

An internal road design package has been developed which seeks to avoid the creation of a ‘standardised’ roading environment with wide and undefined carriageways, which can be visually uninteresting and may encourage higher vehicle speeds.

This assessment concludes that:

- the internal roading proposed, although not compliant with some aspects of the relevant PCC standards, will nonetheless be compliant with the functional requirements, ensuring, safety, convenience and efficiency of use;
- the proposals provide for a high degree of permeability by pedestrian and cycle movements, with a shared path running through the development, footpaths and connections to adjoining areas;
- a new intersection to be formed with James Cook Drive will operate safely and without any significant delays for vehicle movements;
- additional traffic movements associated with the development may result in some deterioration in conditions experienced at the SH58 intersection, but this will not affect the efficiency of through movements and the existing right-turn bay will remain adequate in length; and
- with full development unlikely to occur prior to the opening of the Transmission Gully project, the effects above are unlikely to materialise, as the effect of Transmission Gully will be to significantly reduce traffic volumes on both SH58 and James Cook Drive.

The successful implementation of a similar package of road design proposals in The Banks development (Duck Creek South / Resolution Drive) provides confidence that this area will become a pleasant and safe environment for its residents and visitors.

For these reasons there is not considered to be any justification for declining consent for the development, based upon the issues addressed by this assessment.
ANNEXURE A: PHOTOGRAPHS OF ROAD CONDITIONS IN AREA

Photo 1
View to north along James Cook Drive (from location of proposed access road)
(May 2015)

Photo 2
View to south along James Cook Drive (from location of proposed access road)
(May 2015)

Photo 3
View to north along James Cook Drive showing approach to SH58 intersection
(May 2015)
Photo 4
View to east along SH58 showing James Cook Drive intersection in distance
(May 2015)

Photo 5
View to west along SH58 from James Cook Drive intersection
(May 2015)

Photo 6
View to east along SH58 from James Cook Drive intersection
(May 2015)
Photo 7
View of proposed construction access, SH58
(May 2015)

Photo 8
Sight-line to left (west) from proposed construction access, SH58
(May 2015)

Photo 9
Sight-line to right (east) from proposed construction access, SH58
(May 2015)
ANNEXURE B: EXISTING TRAFFIC VOLUMES

James Cook Drive @ SH58 (2way, Jul12)

SH58 E of James Cook Dr (2way, May15)
Figure C1: Crash Plot for Area Road Network (January 2010 on)

*Star symbol indicates approximate position of application site.*

(Source: NZTA Crash Analysis System)
### Annexure D: James Cook Drive Intersection Performance

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Tim Kelly Transportation Planning Ltd

July 2015
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## ANNEXURE E: SH58 INTERSECTION PERFORMANCE

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<td>40%</td>
<td>0.0</td>
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<td>PM Peak with Development</td>
<td>SH58 W</td>
<td>Through</td>
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<td>4.1</td>
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<td>10.5</td>
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<td></td>
<td></td>
<td>Left</td>
<td>107</td>
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<td>9%</td>
<td>2.6</td>
<td>LOS A</td>
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<td></td>
<td>Through</td>
<td>72</td>
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<td>10.5</td>
<td>LOS D</td>
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