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22 August 2016

Christchurch City Council
C/o Beca
410 Colombo St
Sydenham
Christchurch 8023

Attention: Paul Whyte

Dear Paul

REZONING AT CRANFORD BASIN - NOISE ASPECTS

Summary

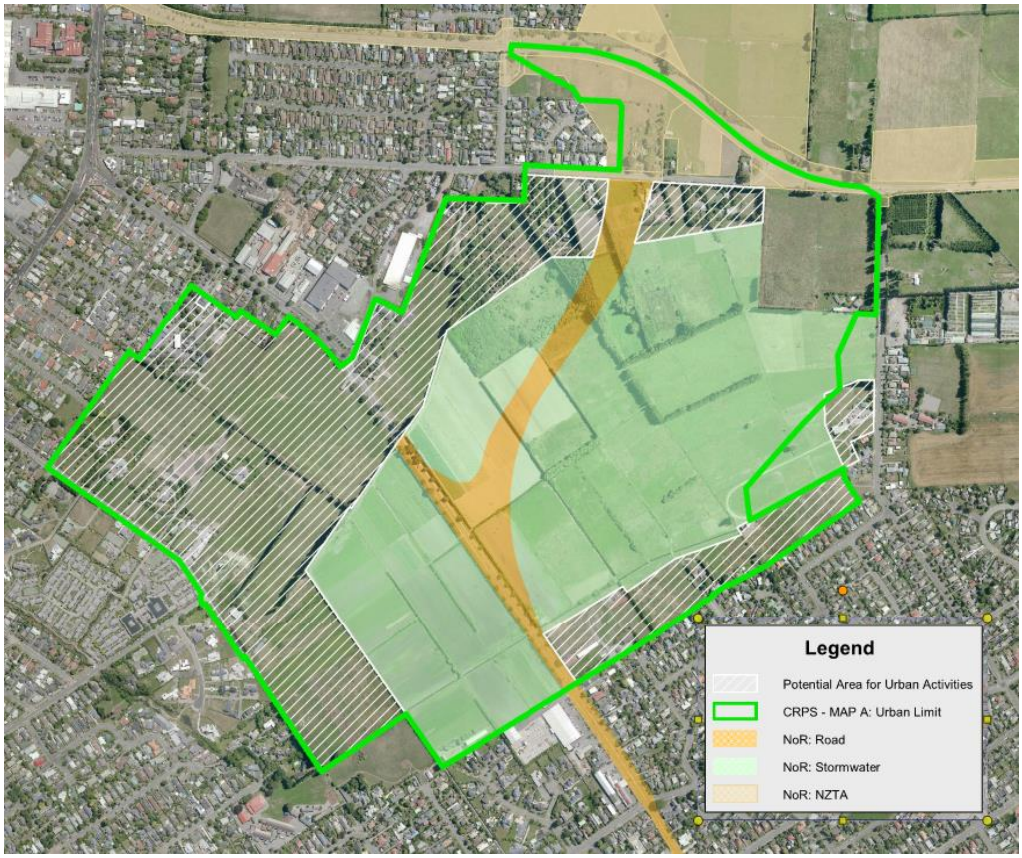
On the basis of the assessment outlined below, we have reviewed the potential noise effects associated with the proposed zoning change to the area identified in Figure 1, on both noise sensitive activities within the zone, and commercial/industrial activities adjacent to the zone. Overall our assessment finds:

1. There will be **negligible change in noise amenity for existing or proposed residences** within the proposed *Residential New Neighbourhood* zone when compared with both the existing provisions within the operative District Plan and the notified *Rural Urban Fringe* zoning in the proposed Replacement District Plan (RDP);
2. Activities within the adjacent **commercial and industrial zones will be subject to the same noise limits** under the proposed *Residential New Neighbourhood* zone change as they experience under the operative District Plan. However, **noise limits will be 5 dB more stringent** compared with the *Rural Urban Fringe* zone that has been notified as part of the RDP process; and
3. New residential or other noise sensitive activities establishing next to road infrastructure will be subject to the same façade sound insulation requirements irrespective of their zoning under the RDP.

Introduction

Marshall Day Acoustics has been engaged to review the environmental noise aspects associated with the proposed rezoning of land at Cranford Basin. We understand that the proposal is to rezone the land from *Rural Urban Fringe* to *Residential New Neighbourhood*. The proposed rezoned area is identified in Figure 1 (hatched area).

Figure 1: Cranford Basin – proposed Residential New Neighbourhood zone (hatched)



This report considers the proposed rezoning in the context of both the operative and proposed replacement District Plans[1]. Specifically we have provided comment on what the proposed change will means for:

1. Existing residences;
2. Business adjoining the zone; and
3. Reverse sensitivity effects from transport infrastructure.

We discuss each of these aspects in turn below:

[1] At the time of writing, the Replacement District Plan Noise chapter is being considered the Independent Hearings Panel. Our comments are based on the proposed rules as notified.

Existing Residential

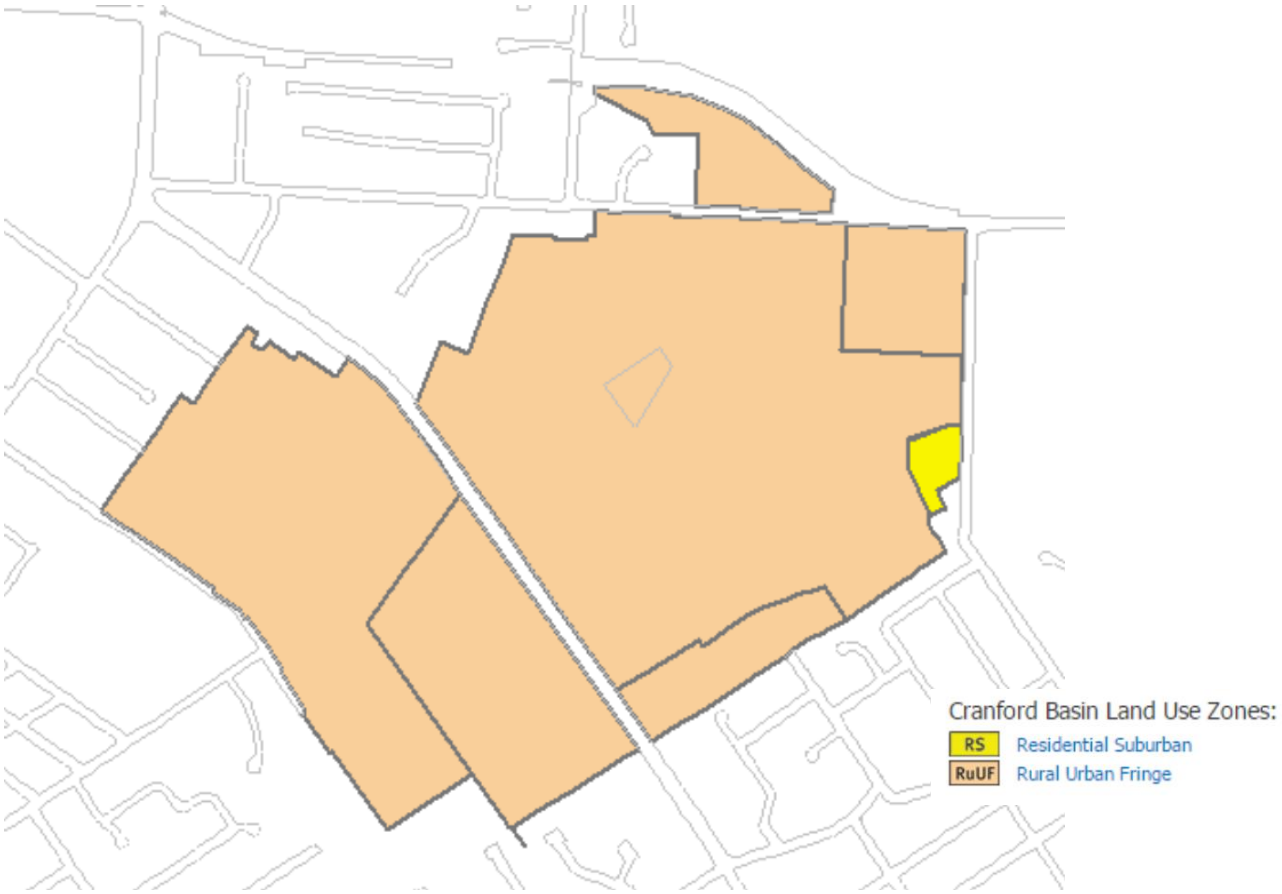
There are a number of existing residential properties zoned *Rural* within the area and these are subject to the most stringent 'Group 1' noise standards in the operative District Plan which apply at the site boundary.

Under the Replacement District Plan (RDP), the properties are zoned *Rural Urban Fringe* which means that noise limits apply at the 'notional boundary'[2] of the dwelling in addition to less stringent limits at the site boundary. Under the proposed *Residential New Neighbourhood* zoning, the noise assessment location would change to the site boundary only – this is the same situation as under the operative District Plan.

In theory, this change of noise assessment point from notional to site boundary could mean that some dwellings on relatively large sections (e.g. Grasmere Road) could experience lower levels of noise which can broadly be considered a positive outcome. However, in practice, any difference is unlikely to be realised and, if it did, would probably be negligible. Under the proposed *Residential New Neighbourhood* zoning, these residences will be provided with a similar level of noise amenity as they currently experience under the operative plan.

The table in Appendix A provides a summary of the operative and proposed replacement plan rules.

Figure 2: Replacement District Plan (Stage Three) Zoning



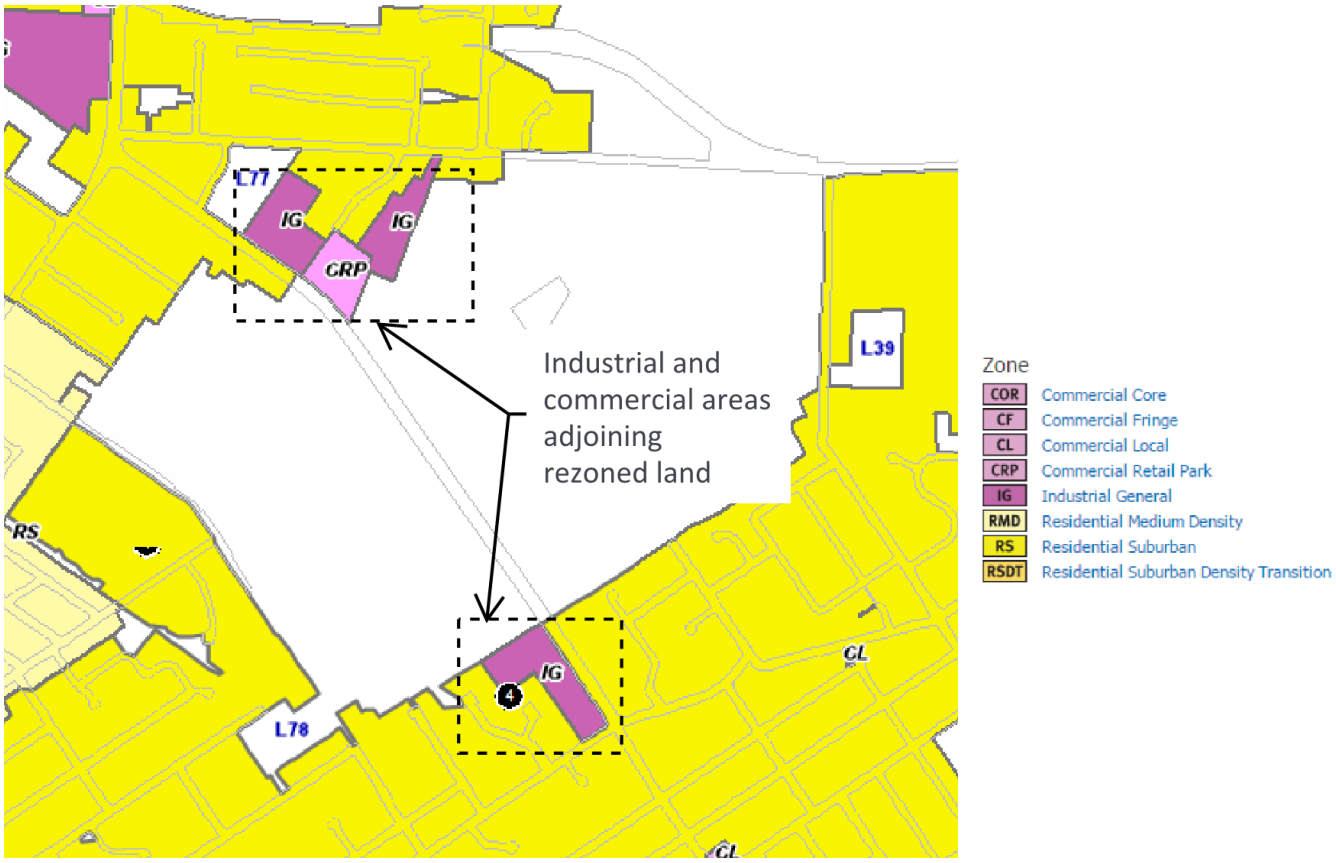
[2] A line 20 metres from any façade of a dwelling or the legal boundary (whichever is closer)

Business Adjoining the Zone

Noise generated by the commercial and industrial areas immediately to the north and south (refer Figure 2) to the proposed zone, are required to meet the noise limits of the zone where their noise is received, if these are more stringent.

The *Rural Urban Fringe* zoning within the RDP would mean that commercial and industrial noise would be assessed at both the notional boundary of the nearest dwelling and at the site boundary. The proposed *Residential New Neighbourhood* zoning will reduce the applicable noise limit by 5 dB at the commercial and industrial zones site boundary.

Figure 3: Replacement District Plan (Stage One) Zoning



In theory, the proposed rezoning would impose more stringent noise limits on the commercial and industrial zones compared with what has been notified in the RDP. Whilst the industrial zone noise limits are relatively lenient (i.e. higher noise levels), activities within this zone will be limited by the requirement to comply with *Residential New Neighbourhood* noise limits at their boundary. From a noise perspective, this signals a potential incompatibility of adjacent land use. However, we note that any commercial or industrial activities on these sites will already be constrained by residential noise limits at their other boundaries (refer Figure 3).

Therefore, in practice, there will be minimal additional constraints for these businesses compared to what currently exists in the operative plan, or what has been notified in the RDP.

Noise from Transport Infrastructure

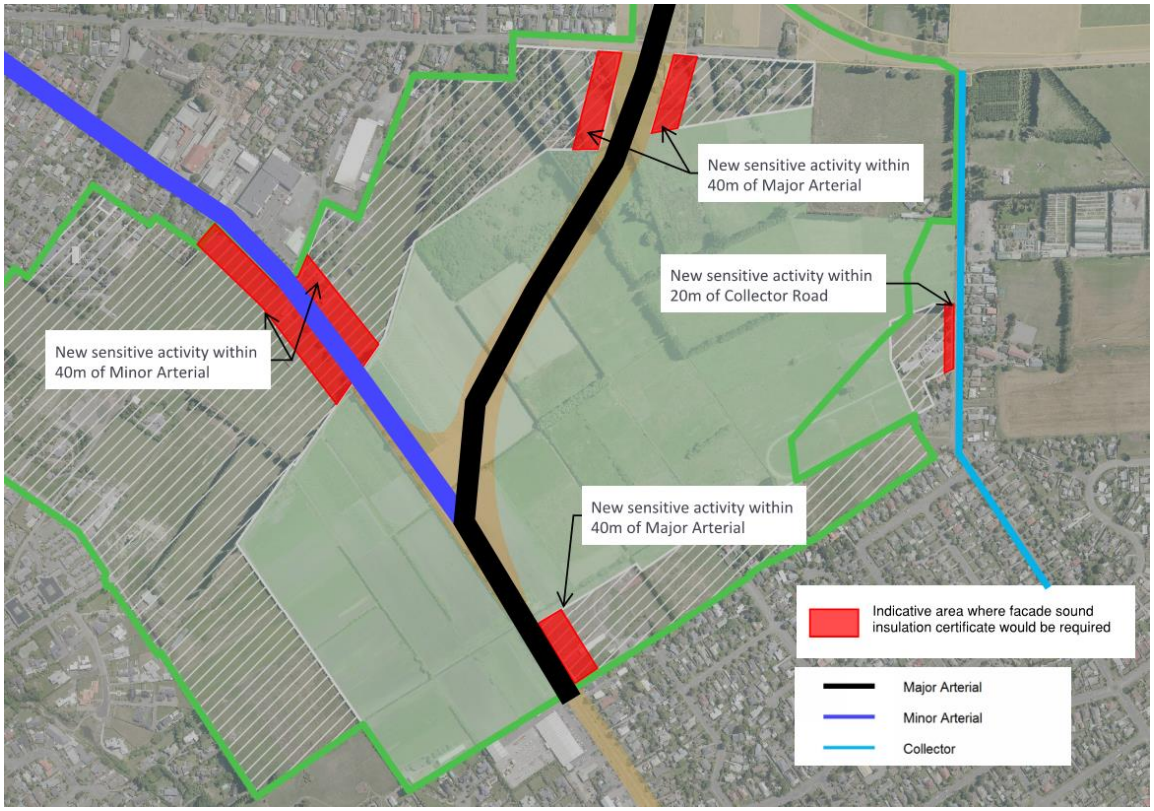
Under both the proposed RDP and the operative District Plan, reverse sensitivity noise effects are mitigated through façade sound insulation requirements for noise sensitive activities. These are triggered by the distance that the proposed sensitivity activity is located from nominated roads (collector, major and minor arterial).

The text of proposed RDP Rule 6.1.5.2 is provided In Appendix B. This rule is similar to the current provisions in the operative District Plan in that the general requirement is for new sensitive activity within the following distances to be provided with appropriate façade sound insulation:

- 40 metres from edge of the nearest marked traffic lane of a Minor or Major Arterial; or
- 20 metres edge of the nearest marked traffic lane of a Collector Road.

In the context of the proposed *Residential New Neighbourhood* zoning, only new noise sensitive activities within the buffer distances would be affected. These areas are identified in Figure 4. However, it should be noted that the Rule applies to a new sensitive activity and is not specifically tied to the underlying zoning (provided that the sensitivity activity is permitted). On this basis, Rule 6.1.5.2 applies to any noise sensitive activity (e.g. residential) that is permitted within the currently notified *Rural Urban Fringe* zone or proposed *Residential New Neighbourhood*. Therefore there will be negligible change with the proposed plan change.

Figure 4: Areas where façade sound insulation requirements will apply



Please contact us should you have any queries.

Yours faithfully

MARSHALL DAY ACOUSTICS LTD

Jon Farren
Principal

APPENDIX A PROPOSED RDP NOISE LIMITS RULE 6.1.4

Table 1: Proposed Replacement District Plan noise standards

Zone	Time(hrs)	Permitted	
		dB L_{Aeq}	dB L_{Amax}
All **Residential** Zones	0700-2200	50	75
Rural Zone, except Rural Quarry Zone, measured at any **notional** boundary	2200-0700	40	65
All **Commercial** Zones	0700-2200	55	80
Rural Zone, except Rural Quarry Zone, measured at the **zone** boundary	2200-0700	45	70
Industrial General Zone	0700-2200	60	80
	2200-0700	50	70

APPENDIX B PROPOSED DISTRICT PLAN RULE 6.1.5.2

6.1.5.2 Sensitive activities near roads and railways

a. Any new sensitive activity, or any addition to a building for an existing sensitive activity beyond 10% of the existing gross floor area, within 80m of the boundary of any state highway or railway designation, or within 20m of the edge of the nearest marked traffic lane of a collector road, or within 40m of the edge of the nearest marked traffic lane of a minor arterial road or major arterial road, shall either:

I. achieve a minimum external to internal noise reduction of 30 dB $D_{tr,2m,nT,w} + C_{tr}$ in accordance with the acceptable solutions listed in Appendix 6.11.4 Noise Attenuation Construction Requirements; or

II. be designed and constructed to comply with the following indoor design sound levels:

A. Rail noise inside bedrooms – 35 dB $L_{Aeq(1h)}$

B. Rail noise inside habitable spaces excluding bedrooms – 40 dB $L_{Aeq(1h)}$

C. Road traffic noise inside all habitable spaces – 40 dB $L_{Aeq(24h)}$

D. Rail and road traffic noise within any other sensitive activity – maximum value recommended in AS/NZS2107:2000

Except where either:

E. the sound incident on the most exposed part of the outside of the building is less than 55 dB $L_{Aeq(1h)}$ for rail noise or 57 dB$L_{Aeq(24h)}$ for road traffic noise; or

F. the nearest façade of the building is at least 50m from all state highways and railways and there is a solid building, fence, wall or landform that blocks the line-of-sight from all parts of all windows and doors to all parts of any state highway road surface or railway track.

For the purposes of Rule 6.1.5.2:

1. Rail noise shall be deemed to be 70 $L_{Aeq(1h)}$ at a distance of 12m from the edge of the track, and shall be deemed to reduce at a rate of 3 dB per doubling of distance up to 40m and 6 dB per doubling of distance beyond 40m;
2. Compliance with (a)(ii) and E above shall be confirmed by providing the Council's Resource Consents Unit Manager with a design report prepared by a qualified acoustic engineer demonstrating compliance, prior to any sensitive activity or alteration occurring. The design shall take into account future permitted use of the collector and arterial roads, and railway and state highway designations outside the Central City, either by the addition of 2 dB to predicted sound levels or based on forecast traffic in 20 years' time.
3. The indoor design sound levels in (a) above shall be achieved at the same time as the ventilation requirements of the New Zealand Building Code. If windows are required to be closed to achieve the indoor design sound levels then either:
    a. Air conditioning, in compliance with Rule 6.1.4.2.6, shall be provided to all habitable spaces, or
    b. A ventilation system, in compliance with Rule 6.1.4.2.6, shall be installed that provides at least 15 air changes per hour in the largest habitable space (excluding bedrooms) and at least 5 air changes per hour in all other habitable spaces.