05 August 2010

GHD Limited
PO Box 76477
Manukau City 2241

Attention: Kent McNaughten

Dear Kent

**SH22/GLENBROOK RD INTERSECTION – EXISTING NOISE MEASUREMENT**

**INTRODUCTION**

Marshall Day Acoustics (MDA) has been engaged by GHD Limited to measure existing noise levels at the intersection of State Highway 22 and Glenbrook Rd near Paerata. It is proposed that this intersection be upgraded, which will involve remodelling of the intersection into a roundabout and minor realignment of the adjacent road sections away from the existing dwellings. This summary of measurement results is intended to accompany the application for these works.

**MEASUREMENT POSITION**

A six-day continuous measurement was carried out near the aforementioned intersection between the 30th July, 2010, and the 4th of August, 2010, in accordance with the relevant standards. The measurement was performed using an Acoustic Research Laboratories 315 Environmental Noise Logger. The logger was setup in the field of number 741 Karaka Rd. This location is shown in Figure 1 below.
This measurement position was chosen to give an uncontaminated measurement of traffic noise levels around the intersection. It was confirmed before measurement that no livestock would be grazing in either field beside the noise logger.

Subjective assessment during setup confirmed that traffic noise was incontestably the dominant noise source at the measurement point.

**EXISTING NOISE LEVEL**

The average $L_{Aeq(24hour)}$ noise level measured by the logger was 65 dB. Variation of the $L_{Aeq(24hour)}$ level between individual days is given below:

<table>
<thead>
<tr>
<th>Date</th>
<th>$L_{Aeq(24hour)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday 30th July</td>
<td>65</td>
</tr>
<tr>
<td>Saturday 31st July</td>
<td>66</td>
</tr>
</tbody>
</table>
Sunday 1st August 64

Monday 2nd August 63

Tuesday 3rd August 65

Wednesday 4th August 65

Appendix A gives a full summary of the logger results.

Weather data from NIWA was used to check the influence of weather upon the results. Weather effects can create additional noise when rainfall exceeds 6mm/h and wind speed exceeds 5m/s. When the hours in which these conditions were met/exceeded were removed from the data, a change of less than 1dB resulted.

**NOISE EFFECTS OF PROPOSED WORKS**

GHD has expressed to MDA that the proposed works to the intersection will not result in increased design-year Average Annual Daily Traffic (AADT) flow above the levels which would be expected at design-year if no change to the intersection occurred. GHD has also expressed that the proposed road surface near the proposed roundabout would be stone mastic asphalt – a surface which causes less traffic noise than the current chip seal. Road surfaces further from the roundabout on would remain as chip seal. The proposed alignment would move the majority of the traffic flow (on State Highway 22) 5-10 metres further from the dwellings at 5-7 Glenbrook Rd.

On the basis of this information, MDA advises that the proposed works would, in fact, result in a decrease in noise levels at the dwellings nearest the intersection (5 and 7 Glenbrook Road), and hence would not require assessment with respect to NZS 6806:2010 *Acoustics – Road traffic noise – New and altered roads*.

The Altered Road Test from the New Zealand Transport Agency’s website has been carried out (http://acoustics.nzta.govt.nz/node/add/calc-altered-road-screening). A summary of results from this test is given in Appendix B. These test results agree with MDA’s opinion that the proposed works will result in a noticeable decrease in noise level at the nearest dwellings, and are not subject to assessment by NZS 6806.

Yours faithfully

**MARSHALL DAY ACOUSTICS LTD**

Jack Mules

Consultant
Appendix A
Logger Measurements

Date: Friday, 6 August 2010
File name: J:\JOBS\2010\2010323A\Logger results\[processed, not weather corrected.xls]Logger_Summary

Job number: 2010323
Job name: SH22/Glenbrook Rd Intersection Improvements
Initials: JJM
Measurement Dates: Friday, 30 July 2010 to Thursday, 04 August 2010

Notes: 741 Karaka Rd

<table>
<thead>
<tr>
<th></th>
<th>Noise Level, dBA</th>
<th>L10</th>
<th>L95</th>
<th>Lmax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>Lowest 59</td>
<td>63</td>
<td>45</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Average 67</td>
<td>70</td>
<td>57</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Highest 71</td>
<td>73</td>
<td>65</td>
<td>95</td>
</tr>
<tr>
<td>Evening</td>
<td>Lowest 60</td>
<td>64</td>
<td>41</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Average 64</td>
<td>68</td>
<td>51</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Highest 68</td>
<td>71</td>
<td>62</td>
<td>88</td>
</tr>
<tr>
<td>Night</td>
<td>Lowest 50</td>
<td>47</td>
<td>29</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Average 60</td>
<td>62</td>
<td>40</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Highest 69</td>
<td>72</td>
<td>64</td>
<td>82</td>
</tr>
</tbody>
</table>

$L_{eq}$ 24-hr 65 dBA

Measured Noise Levels at 741 SH22 between 30 Jul 2010 & 04 August 2010
Appendix B

Altered Road Test

Preliminaries
What is the design year?:
2021

Is the traffic volume at design year greater than 2000 vehicles per day?:
Yes

Is the road in a rural or urban area?:
Rural

Distance to façade of most affected PPF:
Existing road:
10m
Proposed alteration:
15m

Will the horizontal or vertical road alignment be changed?:
Yes

Is the alteration a permitted or designated activity?:
No

Estimated noise levels
Is the geometry simple?:
Yes

Is there currently any screening or bunding?:
Existing road:
No
Proposed alteration:
No

Barrier height:
Existing road:
Proposed alteration:

Barrier distance:
Existing road:
Proposed alteration:

Are there reflecting surfaces opposite?:
Existing road:
No
Proposed alteration:
No

AADT:
Existing road:
14950 vpd
Proposed alteration:
14950 vpd

Average vehicle speed:
Existing road:
90km/hr
Proposed alteration:
60km/hr

Percentage heavy vehicles:
Existing road:
5%
Proposed alteration:
5%

Gradient:
Existing road:
0%
Proposed alteration:
0%

Is the surface chip seal?:
Existing road:
Yes
Proposed alteration:
No

From NZTA:
Results:
Levels used in assessment:
Existing road
74dB
Proposed alteration
66dB
Result:
Screen test indicates that NZS6806 does not apply. No further action is required.

Calculation details
Road:
SH22/Glenbrook Rd Intersection
Project:
SH22/Glenbrook Rd Intersection Upgrade
Section:
Intersection
Scenario:
Roundabout
Receiver address:
Comments:
Traffic counts based on 2009 data with 3% non-compounding increase. Design-year existing and proposed alignment predicted traffic counts are equal.

Map
Latitude:
-37.138572
Longitude:
174.882876

Friday 6th of August 2010 03:54:15 PM