



# FORTH REPLACEMENT CROSSING – FIFE ITS

**FRC/FITS/JG/NVMP/BMR/0001 – Rev 4**

## BASELINE MONITORING REPORT

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# **Fife Intelligent Transport Scheme**

## **Baseline Noise Report**

February 2012

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# Fife Intelligent Transport Scheme




## Baseline Noise Report

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### Quality Assurance – Approval Status

This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2008 and BS EN ISO 14001: 2004)

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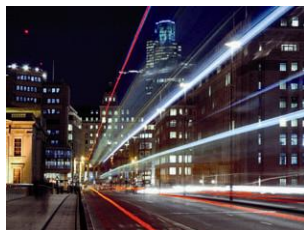
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## 1. Introduction

### 1.1 The Brief

Waterman Energy, Environment & Design Limited („Waterman“) has been commissioned to provide noise and vibration advice during the installation of the Fife Intelligent Transport Scheme which forms part of the Fourth Replacement Crossing package of works.

With regards to noise and vibration all works on the site must be completed in line with the Forth Replacement Crossing Code of Construction Practice (the CoCP) and Appendix 1/9 of the Employers Requirements (hereafter „the Employers Requirements“).

A Noise and Vibration Management Plan (NVMP) has been prepared for the works setting out noise and vibration control measures that would be adopted during the works and providing details with regards to any noise and vibration monitoring which would take place during the works.

This report identifies the closest sensitive receptors to the works, describes the baseline noise climate experienced at each of these locations and defines appropriate threshold levels at each identified sensitive receptor in line with the procedures set out in the CoCP and the Employers Requirements.

### 1.2 Noise Sensitive Receptors

The closest noise sensitive receptors to the proposed works were identified following a review of aerial photography and a site walkover completed on the 24<sup>th</sup> June 2011. The closest sensitive receptors to the site boundary are identified on Figure 1 and summarised in Table 1. For assessment purposes a sensitive receptor has been identified as a residential receptor or noise sensitive space such as a school or playground located within 500m of a works site.

Table 1 Noise Sensitive Receptors

Noise Sensitive Receptor	Name	Description	Approximate Grid Reference	Distance from Works
NSR A	Craig Street	Two story residential dwellings	312355,683622	60m
NSR B	Park Lea	Two story residential dwellings	312410,683958	60m
NSR C	Wemyss Street	Two story residential dwellings	311322,684453	230m
NSR D	Covenanters Rise	Two story residential dwellings	311341,684855	115m
NSR E	The Bungalow	Bungalow for residential dwellings	312747,674680	80m
NSR F	Properties off Masterson Road	Two story residential dwellings	313011,684754	50m
NSR G	Duloch House	Two story residential dwelling	313296,685133	180m
NSR H	Old Duloch	Two story residential dwelling	313426,685470	220m
NSR I	Duloch	Two story residential dwelling	313870,685534	170m
NSR J	Perth Lodge	Two story residential dwelling	314024,685858	310m

Noise Sensitive Receptor	Name	Description	Approximate Grid Reference	Distance from Works
NSR K	Beaully Crescent	Two story residential dwellings	313378,685836	310m
NSR L	North Dhuloch House	Two story residential dwelling	314248,686903	475m
NSR M	Main Street	Two story residential dwellings	312998,688494	240m
NSR N	Alice Grove	Two story residential dwellings	314050,688988	50m
NSR O	West Back	Two story residential dwelling	312726,689156	170m

## 2. Noise Assessment Criteria

Section A2 of Appendix 1/9 of the Employers Requirements and The Forth Replacement Crossing Code of Construction Practice (CoCP) require that noise levels generated during the construction of any phase of works should not exceed the residual effects set out in the Forth Replacement Crossing Environmental Statement (“the ES”). This document sets out the ABC Threshold Level assessment methodology presented in Appendix E of BS5228-1:2009 as being the appropriate assessment methodology for the works.

This method defines category threshold values which are determined by the time of day and existing monitored ambient noise levels. The noise level generated by construction activities is then compared with the „threshold value“. If the total noise level exceeds the „threshold value“, a significant effect is deemed to occur. The construction noise impact criteria are set out in Table 2.

Table 2 Construction Noise Impact Criteria

Period	Assessment Category					
	A		B		C	
	$L_{Aeq,T}$	$L_{Amax}$	$L_{Aeq,T}$	$L_{Amax}$	$L_{Aeq,T}$	$L_{Amax}$
Night	45	60	50	65	55	65
Evening	55	70	60	75	65	80
Day	65	80	70	85	75	90
Saturday	65	80	70	85	75	90

Note:

- Category A: are threshold values to use when ambient levels (rounded to the nearest 5dB) are less than these values;
- Category B: are values to use when ambient noise levels (rounded to the nearest 5dB) are the same as the Category A values; and
- Category C: are values to use when ambient noise levels (rounded to the nearest 5dB) are greater than Category A values.

Consideration is also required to  $L_{Amax,fast}$  noise levels in line with Section 5.4 of the CoCP. The Employers Requirements require the execution of the works to be limited to maximum noise levels that are 5dB lower than those defined in the CoCP and summarised in Table C.1.

### 3. Noise Monitoring Methodology

In order to determine the baseline noise climate on and in the vicinity of the Site, short term attended noise monitoring has been undertaken at locations on and around the site. These locations were chosen to represent both the building façades proposed in the development and noise sensitive receptors in the vicinity of the development.

All measurements were undertaken under free field conditions (i.e. there were no nearby reflecting surfaces, other than the ground). The weather was dry and maximum wind speeds were less than 5 m/s. A windshield was fitted to the monitoring equipment throughout the survey periods. All monitoring was undertaken during a period prior to the commencement of works and are considered to be representative of noise levels experienced during typical hours of operation.

The monitoring locations are identified in Figure 2 and described in Table 3 below.

Table 3: Noise Monitoring Locations

Location	Description	Notes	Representative Sensitive Receptor
ML1	<b>Craig Street</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto the M90.	Noise climate dominated by road traffic on the M90. Some noise associated with local traffic was also noted.	NSR A
ML2	<b>Park Lea</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto the M90.	Noise climate dominated by road traffic on the M90. Some noise associated with local traffic was also noted.	NSR B
ML3	<b>Wemyss Street</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto the railway line.	Noise climate dominated by rail traffic and distant road traffic associated with the M90 and the A823(M). Some noise associated with local traffic was also noted.	NSR C
ML4	<b>Covenanters Rise</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto Castle Drive.	Noise climate dominated by distant road traffic on the M90 and A823(M). Some noise associated with local traffic was also noted.	NSR D
ML5	<b>Properties off Masterson Road</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	Noise climate dominated by distant road traffic on the M90. Some noise associated with local traffic on Masterson Road was also noted.	NSR E and NSR F
ML6	<b>Old Duloch</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	Noise climate dominated by distant road traffic on the M90. Some noise associated with construction of nearby housing estate was also noted.	NSR G and NSR H
ML7	<b>Duloch</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	Noise climate dominated by distant road traffic on the M90. Some noise associated with local traffic on Aberdour Road was also noted.	NSR I and NSR J



Location	Description	Notes	Representative Sensitive Receptor
ML8	<b>Beaulieu Crescent</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	Noise climate dominated by distant road traffic on the M90. Some noise associated with local traffic on Aberdour Road was also noted.	NSR K
ML9	<b>North Dhuloch House</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	Noise climate dominated by road traffic on the M90. Some noise associated with local traffic was also noted.	NSR L
ML10	<b>Main Street</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	Noise climate dominated by road traffic on the M90. Some noise associated with local traffic and nearby industrial and commercial premises was also noted	NSR M
ML11	<b>Alice Grove</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	Noise climate dominated by road traffic on the A92 and more distant M90. Some noise associated with local traffic was also noted.	NSR N
ML12	<b>West Back</b> - Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	Noise climate dominated by road traffic on the M90. Some noise associated with local traffic and was also noted	NSR O

Noise levels were monitored at five minute intervals throughout the survey period. The parameters logged throughout the survey period were  $L_{Aeq}$ ,  $L_{Amax}$ ,  $L_{Amin}$ ,  $L_{A90}$  and  $L_{A10}$ . The  $L_{Aeq}$  level is the equivalent continuous sound pressure level over the measurement period;  $L_{Amax}$  is an indicator of the highest sound level during the measurement period; the  $L_{Amin}$  is the lowest level during the measurement period;  $L_{A90}$  is used as a descriptor of background noise levels and  $L_{A10}$  is the noise level which is achieved for 10% of the monitoring period and is often used to describe road traffic noise.

The monitoring equipment used during the survey period is described in Table 4. The sound level meter was calibrated both before and after each monitoring period; no significant drift from the reference level of 94 dB was recorded.

Table 4: Noise Monitoring Equipment

<b>Sound Level Meter</b>	1
Meter Mode	Rion NA-28
Serial Number	01170649
<b>Calibrator</b>	
Calibrator Model	NC-74
Serial Number	35173533
Calibration Level at 1000 Hz	94 dB
Date of last calibration	06/08/2011

All measurements were undertaken under free-field conditions unless otherwise stated and a wind shield was fitted to the monitoring equipment at all times.

## 4. Noise Monitoring Results

### Monitoring Location 1 – Craig Street

Figure 1: Craig Street Noise Monitoring Location



<b>Description</b>	Monitoring location adjacent to 1 Craig Street. Sound level meter installed at 1.5m above ground level	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	17/08/2011 (10:03–10:58)	Dry and sunny, light south easterly breeze, 16°C
	06/08/2011 (21:00–22:00)	Dry, light south easterly breeze, 15°C
	23/08/2011 (23:50-00:20)	Dry, light north easterly breeze, 14°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by road traffic noise from the M90 some noise associated with local traffic and children playing was also noted during the daytime period. During the night-time survey distant rail and industrial noise was audible although road traffic noise remained dominant.	

Table 5 Summary of Monitored Noise Levels – Craig Street

Period	Monitored Baseline		Assessment Category	Threshold level
	$L_{Aeq, 1\text{ hour}}$	$L_{Amax,F}$	$L_{Aeq}$	$L_{Amax}$
Daytime	65	70	70	85
Evening	65	91	65	80
Night-time	62	70	55	65

## Monitoring Location 2 – Park Lea

Figure 2: Park Lea Noise Monitoring Location



<b>Description</b>	Monitoring location adjacent to residential dwellings on Park Lea Sound level meter installed at 1.5m above ground level	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	17/08/2011 (11:07-12:07)	Dry and sunny, light south easterly breeze, 16°C
	23/08/2011 (21:40-22:40)	Dry, 10% cloud cover, light south easterly breeze, 16°C
	23/08/2011 (23:16–23:41)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by road traffic noise from the M90 some noise associated with local traffic and children playing was also noted during the daytime period. During the night-time survey distant rail and industrial noise was audible although road traffic noise remained dominant.	

Table 6 Summary of Monitored Noise Levels – Park Lea

Period	Monitored Baseline		Assessment Category	Threshold Level
	L <sub>Aeq, 1 hour</sub>	L <sub>Amax,F</sub>	L <sub>Aeq</sub>	L <sub>Amax</sub>
Daytime	67	72	70	85
Evening	62	72	65	80
Night-time	65	72	55	65

### Monitoring Location 3 – Weyness Street

Figure 3: Wemyss Street Noise Monitoring Location



<b>Description</b>	Monitoring location adjacent to residential dwellings on Weyness Street Sound level meter installed at 1.5m above ground level		
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>	
	17/08/2011 (07:46-08:46)	Dry and sunny, light south easterly breeze, 16°C	
	1708/2011 (20:00:20:25)	Dry, 10% cloud cover, light south easterly breeze, 16°C	
	24/08/2011 (00:26–00:56)	Dry, 10% cloud cover, light south easterly breeze, 12°C	
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)		
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)		
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)		
<b>Survey Notes</b>	Noise climate dominated by distant road traffic noise from the M90 some noise associated with local traffic and rail noise was also noted during the daytime period. During the night-time survey distant rail and industrial noise was audible although road traffic noise remained dominant. Although daytime monitoring undertaken over the peak period in terms of traffic flows, given the distance of the monitoring location from the road noise levels experienced are considered to be representative of the daytime period.		

Table 7 Summary of Monitored Noise Levels – Wemyss Street

Period	Monitored Baseline		Assessment Category	Threshold Level
	L <sub>Aeq, 1 hour</sub>	L <sub>Amax,F</sub>		
Daytime	56	82	65	80
Evening	55	79	60	75
Night-time	44	60	50	65



## Monitoring Location 4 –Covenanters Drive

Figure 4: Covenanters Drive Noise Monitoring Location



<b>Description</b>	Monitoring location adjacent to residential dwellings on Covenanters Drive Sound level meter installed at 1.5m above ground level	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	17/08/2011 (09:00-10:00)	Dry and sunny, light south easterly breeze, 16°C
	18/01/2012 (19:59-20:49)	Dry overcast, light south westerly breeze, 5°C
	24/08/2011 (01:02–01:32)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by distant road traffic on the M90 and A823(M). Some noise associated with local traffic was also noted.	

Table 8 Summary of Monitored Noise Levels – Covenanters Drive

Period	Monitored Baseline		Assessment Category	Threshold Level
	$L_{Aeq, 1 \text{ hour}}$	$L_{Amax,F}$	$L_{Aeq}$	$L_{Amax}$
Daytime	66	84	70	85
Evening	63	84	65	80
Night-time	46	51	50	65

## Monitoring Location 5 – Properties off Masterson Road

Figure 5: Masterson Road Noise Monitoring Location



<b>Description</b>	Monitoring location adjacent to residential dwellings off Masterson Drive Sound level meter installed at 1.5m above ground level	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	17/08/2011 (12:37-13:37)	Dry and sunny, light south easterly breeze, 16°C
	03/09/2011 (19:15:20:15)	Dry, 70% cloud cover, light south easterly breeze, 12°C
	24/08/2011 (01:40–02:05)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by distant road traffic on the M90. Some noise associated with local traffic on Masterson Road was also noted.	

Table 9 Summary of Monitored Noise Levels – Masterson Road

Period	Monitored Baseline		Assessment Category	Threshold Level
	L <sub>Aeq, 1 hour</sub>	L <sub>Amax,F</sub>	L <sub>Aeq</sub>	L <sub>Amax</sub>
Daytime	66	70	70	85
Evening	63	76	65	80
Night-time	66	65	55	65

## Monitoring Location 6 –Old Duloch

Figure 6: Old Duloch Noise Monitoring Location



<b>Description</b>	Short term free field monitoring location at height of 1.5m above ground level facing onto M90	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	17/08/2011 (13:46-14:26)	Dry and sunny, light south easterly breeze, 16°C
	26/07/2011 (19:00:20:00)	Dry, 10% cloud cover, light south easterly breeze, 16°C
	22/08/2011 (23:41–00:11)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by distant road traffic on the M90. Some noise associated with local traffic on Aberdour Road was also noted.	

Table 10 Summary of Monitored Noise Levels – Old Duloch

Period	Monitored Baseline		Assessment Category	Threshold Level
	$L_{Aeq, 1\text{ hour}}$	$L_{Amax,F}$	$L_{Aeq}$	$L_{Amax}$
Daytime	65	82	70	85
Evening	58	76	65	80
Night-time	55	75	55	65

## Monitoring Location 7 – Duloch

Figure 7: Duloch Noise Monitoring Location



<b>Description</b>	Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	19/08/2011 (09:00-10:00)	Dry and sunny, light south easterly breeze, 16°C
	27/07/2011 (21:00-22:00)	Dry, 10% cloud cover, light south easterly breeze, 16°C
	22/08/2011 (23:04-23:34)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by distant road traffic on the M90. Some noise associated with local traffic on Aberdour Road was also noted	

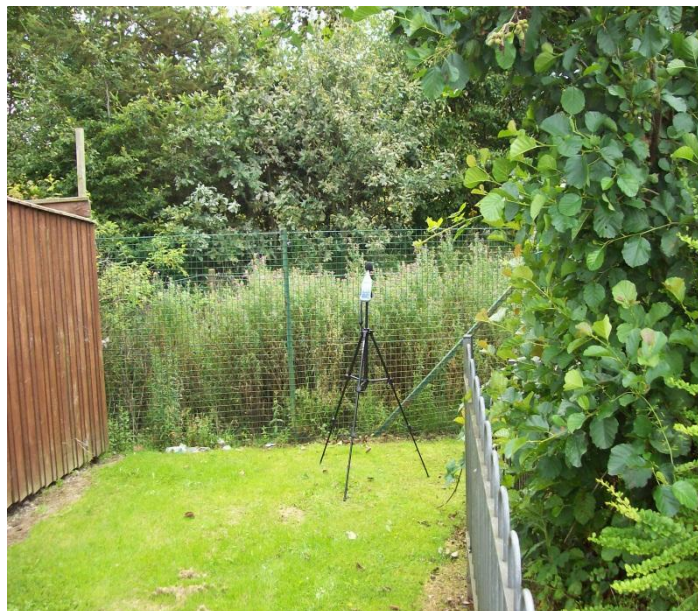
Table 11 Summary of Monitored Noise Levels – Duloch House

Period	Monitored Baseline		Assessment Category	Threshold Level
	$L_{Aeq, 1 \text{ hour}}$	$L_{Amax,F}$	$L_{Aeq}$	$L_{Amax}$
Daytime	67	78	70	85
Evening	58	79	65	80
Night-time	58	77	55	65



## Monitoring Location 8 – Bealey Crescent

Figure 8: Bealey Crescent Monitoring Location



<b>Description</b>	Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	19/08/2011 (10:21-11:21)	Dry and sunny, light south easterly breeze, 16°C
	27/07/2011 (20:35-21:25)	Dry, 10% cloud cover, light south easterly breeze, 16°C
	23/08/2011 (00:21-00:51)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by distant road traffic on the M90. Some noise associated with local traffic on Aberdour Road was also noted.	

Table 12 Summary of Monitored Noise Levels – Bealey Crescent

Period	Monitored Baseline		Assessment Category	Threshold Level
	$L_{Aeq, 1 \text{ hour}}$	$L_{Amax,F}$	$L_{Aeq}$	$L_{Amax}$
Daytime	47	60	65	80
Evening	45	80	55	70
Night-time	42	48	45	60

## Monitoring Location 9 – North Dhuloch House

Figure 9: North Dhuloch House Monitoring Location



<b>Description</b>	Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	17/08/2011 (17:00-18:00)	Dry and sunny, light south easterly breeze, 16°C
	18/01/2012 (20:00-21:00)	Dry overcast, light south westerly breeze, 5°C
	22/08/2011 (03:00-03:40)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by road traffic on the M90. Some noise associated with local traffic was also noted.	

Table 13 Summary of Monitored Noise Levels – North Dhuloch House

Period	Monitored Baseline		Assessment Category	Threshold Level
	$L_{Aeq, 1 \text{ hour}}$	$L_{Amax,F}$	$L_{Aeq}$	$L_{Amax}$
Daytime	64	80	70	85
Evening	60	75	65	80
Night-time	54	75	55	65

## Monitoring Location 10– Main Street

Figure 10: Main Street Monitoring Location



<b>Description</b>	Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	19/08/2011 (12:22-13:22)	Dry and sunny, light south easterly breeze, 16°C
	18/01/2012 (20:57-21:42)	Dry, light south easterly breeze, 14°C
	23/08/2011 (01:02-01:32)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by road traffic on the M90. Some noise associated with local traffic was also noted.	

Table 14 Summary of Monitored Noise Levels – Main Street

Period	Monitored Baseline		Assessment Category	Threshold Level
	L <sub>Aeq, 1 hour</sub>	L <sub>Amax,F</sub>	L <sub>Aeq</sub>	L <sub>Amax</sub>
Daytime	71	84	75	90
Evening	65	82	65	80
Night-time	56	53	55	65



## Monitoring Location 11– Alice Grove

Figure 11: Alice Grove Monitoring Location



<b>Description</b>	Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	19/08/2011 (13:30-14:30)	Dry and sunny, light south easterly breeze, 16°C
	23/08/2011 (19:05-19:35)	Dry, 10% cloud cover, light south easterly breeze, 16°C
	23/08/2011 (01:38-02:08)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by road traffic on the A92 and more distant M90. Some noise associated with local traffic was also noted.	

Table 15 Summary of Monitored Noise Levels – Alice Grove

Period	Monitored Baseline		Assessment Category	Threshold Level
	L <sub>Aeq, 1 hour</sub>	L <sub>Amax,F</sub>	L <sub>Aeq</sub>	L <sub>Amax</sub>
Daytime	61	71	65	80
Evening	55	65	60	75
Night-time	48	60	55	65

## Monitoring Location 12– West Back

Figure 12: West Back Monitoring Location



<b>Description</b>	Short term free field monitoring location at height of 1.5m above ground level facing onto M90.	
<b>Survey Date and Meteorological Conditions</b>	<b>Date</b>	<b>Meteorological Conditions</b>
	20/08/2011 (17:00-18:00)	Dry and sunny, light south easterly breeze, 16°C
	20/08/2011 (19:00-20:00)	Dry, 10% cloud cover, light south easterly breeze, 16°C
	20/08/2011 (22:00-22:32)	Dry, 10% cloud cover, light south easterly breeze, 12°C
<b>Sound Level Meter</b>	Rion NA-28 (Serial Number 01170649)	
<b>Calibrator</b>	Rion NC-74 (Serial Number 35173533)	
<b>Calibrated to</b>	94dB (final calibration level 93.9dB)	
<b>Survey Notes</b>	Noise climate dominated by road traffic on the M90. Some noise associated with local traffic and was also noted	

Table 16 Summary of Monitored Noise Levels – West Back

Period	Monitored Baseline		Assessment Category	Threshold Level
	L <sub>Aeq, 1 hour</sub>	L <sub>Amax,F</sub>	L <sub>Aeq</sub>	L <sub>Amax</sub>
Daytime	64	79	70	85
Evening	62	75	65	80
Night-time	62	75	55	65

## 5. Conclusions

A baseline noise survey was undertaken on and in the vicinity of the works between June and August 2011. The baseline noise data has been used to determine noise threshold levels for each of the closest sensitive receptors to the works. A summary of the noise threshold levels for each sensitive location are summarised in Table 17 below.

Table 17 Summary of Noise Threshold Levels

Monitoring Location	Period	$L_{Aeq}$ Category Level	Assessment $L_{Amax}$ Threshold level
ML1	Daytime	70	85
	Evening	65	80
	Night-time	55	65
ML 2	Daytime	70	85
	Evening	65	80
	Night-time	55	65
ML 3	Daytime	65	80
	Evening	60	75
	Night-time	50	65
ML 4	Daytime	70	85
	Evening	65	80
	Night-time	50	65
ML 5	Daytime	70	85
	Evening	65	80
	Night-time	55	65
ML 6	Daytime	70	85
	Evening	65	80
	Night-time	55	65
ML 7	Daytime	70	85
	Evening	65	80
	Night-time	55	65
ML 8	Daytime	65	80
	Evening	55	70
	Night-time	45	60

Monitoring Location	Period	$L_{Aeq}$ Category Level	Assessment $L_{Amax}$ Threshold level
ML 9	Daytime	70	85
	Evening	65	80
	Night-time	55	65
ML 10	Daytime	75	90
	Evening	65	80
	Night-time	55	65
ML 11	Daytime	65	80
	Evening	60	75
	Night-time	55	65
MI 12	Daytime	70	85
	Evening	65	80
	Night-time	55	65



## FIGURES





Noise Sensitive Receptor

**Project Details**

E12317-100: Fife Intelligent Transport Scheme

**Figure Title**

Figure 1: Noise Sensitive Receptors

**Figure Ref**

E12317-100\_GR\_NM\_1A

**Date**

November 2011

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Noise Monitoring Locations

Project Details

E12317-100: Fife Intelligent Transport Scheme

Figure Title

Figure 2: Noise Monitoring Locations

Figure Ref

E12317-100\_GR\_NM\_2A

Date

November 2011

File Location

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## **APPENDICES**



**Appendix A.      Baseline Noise Survey Results**

### Location A1 – Craig Street

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>A10</sub>	L <sub>A90</sub>
1	17/08/2011 10:03	0:05:00	66.4	72.7	68.7	63.2
2	17/08/2011 10:08	0:05:00	66.6	73.2	69.2	62.7
3	17/08/2011 10:13	0:05:00	67	73.1	69.2	63.6
4	17/08/2011 10:18	0:05:00	67	71.3	69	64.1
5	17/08/2011 10:23	0:05:00	66.7	72.9	68.8	62.8
6	17/08/2011 10:28	0:05:00	66.9	73	69.1	62.8
7	17/08/2011 10:33	0:05:00	66.5	70.6	68.7	63.2
8	17/08/2011 10:38	0:05:00	67.4	72.5	69.2	64.8
9	17/08/2011 10:43	0:05:00	66.9	75.1	68.8	63.9
10	17/08/2011 10:48	0:05:00	67.2	73.4	69.2	64.3
11	17/08/2011 10:53	0:05:00	66.5	72.7	68.7	63.2
12	17/08/2011 10:58	0:00:06	63	64.4	63.9	62.5

Evening						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>A10</sub>	L <sub>A90</sub>
1	06/08/2011 21:00	00:05:00	63.3	81.2	60.2	69.1
2	06/08/2011 21:05	00:05:00	64.7	87.0	59.2	69.9
3	06/08/2011 21:10	00:05:00	65.0	92.0	59.7	68.1
4	06/08/2011 21:15	00:05:00	64.9	82.0	60.2	71.6
5	06/08/2011 21:20	00:05:00	64.0	82.4	59.5	67.0
6	06/08/2011 21:25	00:05:00	63.0	105.8	60.2	66.3
7	06/08/2011 21:30	00:05:00	64.7	81.2	59.0	69.2
8	06/08/2011 21:35	00:05:00	63.9	83.0	58.5	67.7
9	06/08/2011 21:40	00:05:00	65.1	84.0	60.3	68.1
10	06/08/2011 21:45	00:05:00	64.1	82.0	59.1	67.5
11	06/08/2011 21:50	00:05:00	64.6	81.3	59.6	66.8
12	06/08/2011 21:55	00:05:00	65.0	81.5	59.9	69.1

Night-time						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	23/08/2011 23:50	0:05:00	60.9	64.9	52.7	69.1
2	23/08/2011 23:55	0:05:00	62.7	66	55.8	71.5
3	24/08/2011 00:00	0:05:00	61.5	65.9	50.8	70.7
4	24/08/2011 00:05	0:05:00	62.2	66.5	49.6	70.7
5	24/08/2011 00:10	0:05:00	61.7	66.1	49.4	71.2
6	24/08/2011 00:15	0:05:00	60.8	65.6	48.5	69.6

**Location A2 – Park Lea**

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	17/08/2011 11:07	0:05:00	67.1	69.3	64.2	71.2
2	17/08/2011 11:12	0:05:00	67.8	69.7	65	72.8
3	17/08/2011 11:17	0:05:00	68	69.8	65.2	71.6
4	17/08/2011 11:22	0:05:00	67.5	69.1	65.2	71.6
5	17/08/2011 11:27	0:05:00	67.2	69.3	64.3	71.6
6	17/08/2011 11:32	0:05:00	67.5	69.5	64.8	74.4
7	17/08/2011 11:37	0:05:00	67.1	69	64.6	71.2
8	17/08/2011 11:42	0:05:00	66.9	68.8	64.1	71.4
9	17/08/2011 11:47	0:05:00	66.2	68.1	63.6	69.8
10	17/08/2011 11:52	0:05:00	67.1	69.1	64.2	71.7
11	17/08/2011 11:57	0:05:00	66.9	68.9	63.2	80.8
12	17/08/2011 12:02	0:05:00	66.8	68.7	63.6	74.4
13	17/08/2011 12:07	0:03:12	66.9	69	64.5	71.4

Evening						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	23/08/2011 21:40	00:05:00	62.9	69.1	59.8	88.9
2	23/08/2011 21:45	00:05:00	62.7	65.6	60.1	92.7
3	23/08/2011 21:50	00:05:00	65.0	69.2	58.5	92.0
4	23/08/2011 21:55	00:05:00	61.2	64.1	59.1	86.0
5	23/08/2011 22:00	00:05:00	62.9	65.0	58.6	93.0
6	23/08/2011 22:05	00:05:00	61.1	62.9	57.2	87.3
7	23/08/2011 22:10	00:05:00	65.4	69.1	57.9	89.2
8	23/08/2011 22:15	00:05:00	62.1	65.3	58.5	95.0
9	23/08/2011 22:20	00:05:00	66.0	67.1	59.2	84.0
10	23/08/2011 22:25	00:05:00	65.1	67.5	57.2	92.5
11	23/08/2011 22:30	00:05:00	63.9	66.9	53.1	91.6
12	23/08/2011 22:35	00:05:00	62.0	64.1	56.3	94.0

Night						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub> X
1	23/08/2011 23:16	0:05:00	63.6	67.2	54.9	71.7
2	23/08/2011 23:21	0:05:00	65	68.4	58.3	71.1
3	23/08/2011 23:26	0:05:00	64.6	68.1	57	71.9
4	23/08/2011 23:31	0:05:00	66	68.6	60.9	71.6
5	23/08/2011 23:36	0:05:00	65.6	68.6	60.3	71.6
6	23/08/2011 23:41	0:05:00	65.2	68.3	58.3	71.4

**Location A3 – Weyness Street**

Daytime							
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>	
1	17/08/2011 07:46	0:05:00	52.3	53.3	51.2	55.2	
2	17/08/2011 07:51	0:05:00	52.5	53.8	50.7	60.1	
3	17/08/2011 07:56	0:05:00	52.1	53.5	50.6	56.7	
4	17/08/2011 08:01	0:05:00	53.5	56	51.2	58.9	
5	17/08/2011 08:06	0:05:00	64.3	61.1	51.8	81.5	
6	17/08/2011 08:11	0:05:00	57.5	56.1	51.5	73.2	
7	17/08/2011 08:16	0:05:00	52.6	53.7	51.1	64.1	
8	17/08/2011 08:21	0:05:00	52.3	53.8	50.5	60.5	
9	17/08/2011 08:26	0:05:00	52.3	53.8	50.4	60.6	
10	17/08/2011 08:31	0:05:00	51.1	52.5	49.7	56.5	
11	17/08/2011 08:36	0:05:00	55.5	53	49.1	72	
12	17/08/2011 08:41	0:05:00	49.5	50.6	48.3	55.8	
13	17/08/2011 08:46	0:00:01	49.8	50.1	49.4	50.3	

Evening							
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>	
1	17/08/2011 20:00	0:05:00	55.4	59.7	42.1	64.4	
2	17/08/2011 20:05	0:05:00	55.2	59.6	40.7	65.3	
3	17/08/2011 20:10	0:05:00	58	62.1	39.6	67.6	
4	17/08/2011 20:15	0:05:00	55.9	60.7	37.4	65.8	
5	17/08/2011 20:20	0:05:00	54	58.4	39.4	63.9	
6	17/08/2011 20:25	0:05:00	54.9	60.1	39	64.1	

Night							
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>	
1	24/08/2011 00:26	0:05:00	44	47.4	38.1	54.7	
2	24/08/2011 00:31	0:05:00	43.6	46.4	39.2	52.5	
3	24/08/2011 00:36	0:05:00	43	46	38.1	50.1	
4	24/08/2011 00:41	0:05:00	46.8	50.7	36.5	60.2	
5	24/08/2011 00:46	0:05:00	40.6	43.9	35.2	50.5	
6	24/08/2011 00:51	0:05:00	41	44.6	33.9	50.8	
7	24/08/2011 00:56	0:00:18	42.3	44.5	39	54.7	

**Location A4 – Covenanters Drive**

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub> K
1.00	17/08/2011 09:00	0:05:00	68.30	72.70	57.00	77.90
2.00	17/08/2011 09:05	0:05:00	67.60	72.10	54.70	80.60
3.00	17/08/2011 09:10	0:05:00	67.30	72.10	55.40	77.30
4.00	17/08/2011 09:15	0:05:00	67.90	72.50	54.90	83.60
5.00	17/08/2011 09:20	0:05:00	64.20	68.80	52.70	79.30
6.00	17/08/2011 09:25	0:05:00	64.80	70.10	52.90	77.00
7.00	17/08/2011 09:30	0:05:00	64.00	68.70	52.50	77.90
8.00	17/08/2011 09:35	0:05:00	65.30	69.40	52.50	79.90
9.00	17/08/2011 09:40	0:05:00	65.50	70.30	54.10	80.80
10.00	17/08/2011 09:45	0:05:00	62.60	66.60	52.90	76.90
11.00	17/08/2011 09:50	0:05:00	65.20	70.00	53.60	79.10
12.00	17/08/2011 09:55	0:05:00	64.50	68.80	52.30	79.30
13.00	17/08/2011 10:00	0:00:36	66.60	71.20	52.70	79.10

Evening						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	18/01/2012 19:59	00:05:00	63.0	66.7	52.8	77.5
2	18/01/2012 20:04	00:05:00	65.9	70.3	53.4	81.1
3	18/01/2012 20:09	00:05:00	62.1	65.8	52.7	77
4	18/01/2012 20:14	00:05:00	62.3	65.4	52.1	76.5
5	18/01/2012 20:19	00:05:00	64.4	68.4	52.3	79.6
6	18/01/2012 20:24	00:05:00	61.6	64.5	49.1	76.6
7	18/01/2012 20:29	00:05:00	62.4	66.3	51	84.1
8	18/01/2012 20:34	00:05:00	60.8	62	50.4	76.7
9	18/01/2012 20:39	00:05:00	61.3	62.8	49.8	77.2
10	18/01/2012 20:44	00:05:00	62.9	66	50.5	76.8

Night						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	24/08/2011 01:02	00:05:00	52	51.4	42.2	70.5
2	24/08/2011 01:07	0:05:00	42.4	44.3	40.3	48.1
3	24/08/2011 01:12	0:05:00	42.6	44.4	41.1	50.6
4	24/08/2011 01:17	0:05:00	42.2	43.5	41	46.3
5	24/08/2011 01:22	0:05:00	43.3	45.4	41.1	49.7
6	24/08/2011 01:27	0:05:00	42.8	44.5	41.2	52
7	24/08/2011 01:32	0:00:04	43.4	45.3	41.4	51.1



**Location A5 – Properties off Masterson Road**

Daytime						
Address	Time	Measurement Time	$L_{Aeq}$	$L_{A10}$	$L_{A90}$	$L_{Amax}$
1	17/08/2011 12:37	0:05:00	66	67.8	63.5	
2	17/08/2011 12:42	0:05:00	65.8	67.3	63.7	69.3
3	17/08/2011 12:47	0:05:00	65.5	67.1	63	70.1
4	17/08/2011 12:52	0:05:00	65.1	66.9	62.1	68.6
5	17/08/2011 12:57	0:05:00	66.2	68.1	63.7	71.2
6	17/08/2011 13:02	0:05:00	65.1	66.8	62.6	69
7	17/08/2011 13:07	0:05:00	66	67.5	63.6	74.5
8	17/08/2011 13:12	0:05:00	66.2	67.9	64	71.1
9	17/08/2011 13:17	0:05:00	65.3	66.6	63.5	69.9
10	17/08/2011 13:22	0:05:00	65.8	67.6	63.4	69.6
11	17/08/2011 13:27	0:05:00	66.2	67.7	64.5	69.7
12	17/08/2011 13:32	0:05:00	67.2	68.8	64.8	70.6
13	17/08/2011 13:37	0:00:02	68.7	69.1	68.4	69.3

Evening						
Address	Date	Time	$L_{Aeq}$	$L_{A10}$	$L_{A90}$	$L_{Amax}$
1	03/09/2011 19:15	0:15:00	64.1	77.8	67.6	58.6
2	03/09/2011 19:30	0:15:00	63.6	76.9	66.9	58.5
3	03/09/2011 19:45	0:15:00	63.4	79.7	66.5	57.8
4	03/09/2011 20:00	0:15:00	61.7	73.4	65.6	55.7

Night						
Address	Time	Measurement Time	$L_{Aeq}$	$L_{A10}$	$L_{A90}$	$L_{Amax}$
1	24/08/2011 01:40	0:05:00	55.4	59.7	42.1	64.4
2	24/08/2011 01:45	0:05:00	55.2	59.6	40.7	65.3
3	24/08/2011 01:50	0:05:00	58	62.1	39.6	67.6
4	24/08/2011 01:55	0:05:00	55.9	60.7	37.4	65.8
5	24/08/2011 02:00	0:05:00	54	58.4	39.4	63.9
6	24/08/2011 02:05	0:05:00	54.9	60.1	39	64.1

**Location A6 – Old Duloch**

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	17/08/2011 13:46	0:05:00	61.2	59.2	47.7	76.8
2	17/08/2011 13:51	0:05:00	65.8	68.6	49.3	81
3	17/08/2011 13:56	0:05:00	65.9	69.7	50.1	83.7
4	17/08/2011 14:01	0:05:00	63.2	63.3	49.6	78.8
5	17/08/2011 14:06	0:05:00	66.1	68.6	49	84.3
6	17/08/2011 14:11	0:05:00	64.7	67.8	48.9	80.7
7	17/08/2011 14:16	0:05:00	63.8	64.8	47	81.8
8	17/08/2011 14:21	0:05:00	64.4	63.3	47.6	81.3

Evening						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	26/07/2011 19:00	0:05:00	57.4	63.6	52.0	78.3
2	26/07/2011 19:05	0:05:00	56.2	63.7	52.1	82.0
3	26/07/2011 19:10	0:05:00	59.8	64.6	52.8	79.3
4	26/07/2011 19:15	0:05:00	61.0	63.1	52.1	79.2
5	26/07/2011 19:20	0:05:00	57.3	63.9	54.3	78.1
6	26/07/2011 19:25	0:05:00	55.6	64.8	54.1	79.0
7	26/07/2011 19:30	0:05:00	60.1	63.4	52.8	78.7
8	26/07/2011 19:35	0:05:00	58.2	60.3	52.1	72.3
9	26/07/2011 19:40	0:05:00	57.9	63.9	52.9	81.0
10	26/07/2011 19:45	0:05:00	59.8	66.3	52.3	81.8
11	26/07/2011 19:50	0:05:00	57.3	64.2	53.7	81.9
12	26/07/2011 19:55	0:05:00	56.1	62.6	53.3	81.0

Night-time						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	22/08/2011 23:41	0:05:00	52.3	39.6	33.2	75.3
2	22/08/2011 23:46	0:05:00	55.9	40.9	31	77.5
3	22/08/2011 23:51	0:05:00	59	50.9	33.3	79.4
4	22/08/2011 23:56	0:05:00	34.7	36.6	31.8	47.8
5	23/08/2011 00:01	0:05:00	37	38.5	34.1	47
6	23/08/2011 00:06	0:05:00	58.7	54.8	32.2	77.8
7	23/08/2011 00:11	0:00:02	33	33.5	32.8	33.8

**Location A7 –Duloch**

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	19/08/2011 09:00	0:05:00	67.2	70.5	60.3	80.5
2	19/08/2011 09:05	0:05:00	68.2	72.1	60.3	81.4
3	19/08/2011 09:10	0:05:00	67.1	70.9	60.7	81.6
4	19/08/2011 09:15	0:05:00	68.4	72.6	61.5	79
5	19/08/2011 09:20	0:05:00	66.2	70.6	60.1	77.3
6	19/08/2011 09:25	0:05:00	65.8	70.4	58.7	77.2
7	19/08/2011 09:30	0:05:00	67.2	71.1	59.6	80.3
8	19/08/2011 09:35	0:05:00	65.5	69.7	58.3	79.2
9	19/08/2011 09:40	0:05:00	66	70.2	58.7	78.3
10	19/08/2011 09:45	0:05:00	65.1	67.5	59.9	77
11	19/08/2011 09:50	0:05:00	66.4	69.6	60.3	78.7
12	19/08/2011 09:55	0:05:00	67.8	72	59.8	81.5
13	19/08/2011 10:00	0:00:01	61.3	61.8	61.1	62.1

Evening						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	27/07/2011 21:00	0:05:00	57.4	63.6	52.0	78.3
2	27/07/2011 21:05	0:05:00	56.2	63.7	52.1	82.0
3	27/07/2011 21:10	0:05:00	59.8	64.6	52.8	79.3
4	27/07/2011 21:15	0:05:00	61.0	63.1	52.1	79.2
5	27/07/2011 21:20	0:05:00	57.3	63.9	54.3	78.1
6	27/07/2011 21:25	0:05:00	55.6	64.8	54.1	79.0
7	27/07/2011 21:30	0:05:00	60.1	63.4	52.8	78.7
8	27/07/2011 21:35	0:05:00	58.2	60.3	52.1	72.3
9	27/07/2011 21:40	0:05:00	57.9	63.9	52.9	81.0
10	27/07/2011 21:45	0:05:00	59.8	66.3	52.3	81.8
11	27/07/2011 21:50	0:05:00	57.3	64.2	53.7	81.9
12	27/07/2011 21:55	0:05:00	56.1	62.6	53.3	81.0

Night-time						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	22/08/2011 23:04	0:05:00	60.2	55	46.2	82.4
2	22/08/2011 23:09	0:05:00	62.2	64	47.4	81.2
3	22/08/2011 23:14	0:05:00	50	50.8	44.5	67.2
4	22/08/2011 23:19	0:05:00	59.2	56.5	42	82
5	22/08/2011 23:24	0:05:00	56.7	57.1	44.3	74.9
6	22/08/2011 23:29	0:05:00	54.4	51.4	41.6	71.5

**Location A8 –Beauley Crescent**

Day-time						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	19/08/2011 10:21	0:05:00	46.8	48.1	44.7	65.4
2	19/08/2011 10:26	0:05:00	46.1	47.7	44.1	59.3
3	19/08/2011 10:31	0:05:00	46.5	48	44.1	57.7
4	19/08/2011 10:36	0:05:00	49.5	51.6	46.5	60.7
5	19/08/2011 10:41	0:05:00	48.1	49.8	45.6	59.3
6	19/08/2011 10:46	0:05:00	46.2	47.4	44.5	56.9
7	19/08/2011 10:51	0:05:00	48	49.6	45.4	66.1
8	19/08/2011 10:56	0:05:00	46.9	48.3	43.2	65.1
9	19/08/2011 11:01	0:05:00	46.3	47.5	43.5	62.5
10	19/08/2011 11:06	0:05:00	44.6	45.6	43.2	57.7
11	19/08/2011 11:11	0:05:00	49	53.3	43	61.4
12	19/08/2011 11:16	0:05:00	44.5	45.9	43.1	49.8
13	19/08/2011 11:21	0:01:03	45.2	46.5	43.4	52.3

Evening							
Address	Date	Time	Measurement time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
2	27/07/2011	20:35:08	0:05:00	43.7	45.9	40.8	54.6
3	27/07/2011	20:50:08	0:05:00	45.8	45.9	40.7	65.7
4	27/07/2011	21:05:08	0:05:00	43.9	44.1	40	69.6
5	27/07/2011	21:20:08	0:05:00	42.5	44.1	40.2	65.6

Night-time						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	23/08/2011 00:21	0:05:00	45.4	48.2	39.8	53.7
2	23/08/2011 00:26	0:05:00	43.2	46.7	35.3	53.1
3	23/08/2011 00:31	0:05:00	44.8	48.6	36.6	54.5
4	23/08/2011 00:36	0:05:00	40.3	43.6	28.7	49.8
5	23/08/2011 00:41	0:05:00	37.5	41.2	26.9	46.1
6	23/08/2011 00:46	0:05:00	38.4	42.3	32.4	46.3
7	23/08/2011 00:51	0:00:01	33.3	33.8	33.1	34

**Location A9 – North Dhuloch House**

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	17/08/2011 17:00	00:05:00	62.9	69.1	59.8	88.9
2	17/08/2011 17:05	00:05:00	62.7	65.6	60.1	92.7
3	17/08/2011 17:10	00:05:00	65.0	69.2	58.5	92.0
4	17/08/2011 17:15	00:05:00	61.2	64.1	59.1	86.0
5	17/08/2011 17:20	00:05:00	62.9	65.0	58.6	93.0
6	17/08/2011 17:25	00:05:00	61.1	62.9	57.2	87.3
7	17/08/2011 17:30	00:05:00	65.4	69.1	57.9	89.2
8	17/08/2011 17:35	00:05:00	62.1	65.3	58.5	95.0
9	17/08/2011 17:40	00:05:00	66.0	67.1	59.2	84.0
10	17/08/2011 17:45	00:05:00	65.1	67.5	57.2	92.5
11	17/08/2011 17:50	00:05:00	63.9	66.9	53.1	91.6
12	17/08/2011 17:55	00:05:00	62.0	64.1	56.3	94.0

Evening						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	18/01/2012 20:00	00:05:00	60.0	63.2	55.8	66.7
2	18/01/2012 20:05	00:05:00	60.5	63.0	56.6	73.8
3	18/01/2012 20:10	00:05:00	61.7	63.5	57.1	70.5
4	18/01/2012 20:15	00:05:00	61.1	64.1	57.7	71.7
5	18/01/2012 20:20	00:05:00	59.6	62.5	56.6	67.6
6	18/01/2012 20:25	00:05:00	60.3	64.2	56.2	71.2
7	18/01/2012 20:30	00:05:00	60.2	64.0	54.6	73.5
8	18/01/2012 20:35	00:05:00	59.0	64.0	57.3	72.6
9	18/01/2012 20:40	00:05:00	60.1	63.0	56.4	69.4
10	18/01/2012 20:45	00:05:00	59.7	64.3	54.2	65.7
11	18/01/2012 20:50	00:05:00	60.0	64.0	57.9	74.0
12	18/01/2012 20:55	00:05:00	59.8	62.8	56.4	66.5

Night-time						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	22/08/2011 03:00	0:05:00	52.3	39.6	33.2	75.3
2	22/08/2011 03:05	0:05:00	55.9	40.9	31	77.5
3	22/08/2011 03:10	0:05:00	59	50.9	33.3	79.4
4	22/08/2011 03:15	0:05:00	34.7	36.6	31.8	47.8
5	23/08/2011 03:20	0:05:00	37	38.5	34.1	47
6	23/08/2011 03:25	0:05:00	58.7	54.8	32.2	77.8
7	23/08/2011 03:30	0:00:02	33	33.5	32.8	33.8

**Location A10 – Main Street**

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	19/08/2011 12:22	0:05:00	73.4	75	58.3	92.3
2	19/08/2011 12:27	0:05:00	70	74.2	58.2	83
3	19/08/2011 12:32	0:05:00	69.9	74.1	59.3	78.2
4	19/08/2011 12:37	0:05:00	70.2	74.7	60.1	80.7
5	19/08/2011 12:42	0:05:00	70.3	74.7	58.7	84.3
6	19/08/2011 12:47	0:05:00	71.1	75	59.1	82.7
7	19/08/2011 12:52	0:05:00	70.6	74.3	58.1	81.5
8	19/08/2011 12:57	0:05:00	70.4	74.3	59.8	82.2
9	19/08/2011 13:02	0:05:00	70.4	74.1	60.6	83.5
10	19/08/2011 13:07	0:05:00	70.7	74.3	59.4	81.8
11	19/08/2011 13:12	0:05:00	70	74.3	58.1	81.8
12	19/08/2011 13:17	0:05:00	69.7	74.4	57.7	78.9

Evening						
Address	Date	Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	23/08/2011 18:00	0:05:00	65.5	68.3	46.8	89.0
2	23/07/2011 18:05	0:05:00	67.0	65.9	47.9	79.8
3	23/07/2011 18:10	0:05:00	60.6	63.8	46.8	79.6
4	23/07/2011 18:15	0:05:00	60.0	61.1	45.9	81.5
5	23/07/2011 18:20	0:05:00	60.7	63.0	44.7	83.0
6	23/07/2011 18:25	0:05:00	62.8	66.0	46.3	81.0
7	23/07/2011 18:30	0:05:00	62.0	65.5	46.0	86.6
8	23/07/2011 18:35	0:05:00	65.5	56.9	44.7	79.2
9	23/07/2011 18:40	0:05:00	62.9	56.4	43.9	80.1
10	23/07/2011 18:45	0:05:00	60.6	50.6	43.7	79.5
11	23/07/2011 18:50	0:05:00	58.0	53.4	43.8	79.0
12	23/07/2011 18:55	0:05:00	64.0	63.2	44.9	80.0

Night-time						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	23/08/2011 01:02	0:05:00	59.8	59.4	36.6	76.5
2	23/08/2011 01:07	0:05:00	55.4	57.4	31.3	74
3	23/08/2011 01:12	0:05:00	54.5	57.5	33.5	72.3
4	23/08/2011 01:17	0:05:00	49.1	52	32	63.1
5	23/08/2011 01:22	0:05:00	59.2	59.7	39.2	74.8
6	23/08/2011 01:27	0:05:00	50.2	54.3	36.6	67.4

**Location A11 – Alice Grove**

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	19/08/2011 13:30	0:05:00	61	64.2	56.8	67.7
2	19/08/2011 13:35	0:05:00	61.6	64	57.6	73.8
3	19/08/2011 13:40	0:05:00	61.7	64.5	57.1	71.5
4	19/08/2011 13:45	0:05:00	62.4	65.1	57.7	71.7
5	19/08/2011 13:50	0:05:00	60.6	63.5	56.6	67.6
6	19/08/2011 13:55	0:05:00	61.5	64.2	56.2	72.2
7	19/08/2011 14:00	0:05:00	61.2	64	55.6	73.5
8	19/08/2011 14:05	0:05:00	62.2	65	57.3	72.6
9	19/08/2011 14:10	0:05:00	61.1	64	56.4	69.4
10	19/08/2011 14:15	0:05:00	60.7	64.3	55.2	66.7
11	19/08/2011 14:20	0:05:00	62.8	65	58.9	75
12	19/08/2011 14:25	0:05:00	60.8	63.8	56.4	66.5
13	19/08/2011 14:30	0:00:05	56.1	56.5	55.8	56.7

Evening						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	23/08/2011 19:05	0:05:00	55.4	59.7	42.1	64.4
2	23/08/2011 19:10	0:05:00	55.2	59.6	40.7	65.3
3	23/08/2011 19:15	0:05:00	58	62.1	39.6	67.6
4	23/08/2011 19:20	0:05:00	55.9	60.7	37.4	65.8
5	23/08/2011 19:25	0:05:00	54	58.4	39.4	63.9
6	23/08/2011 19:30	0:05:00	54.9	60.1	39	64.1

Night						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	23/08/2011 01:38	0:05:00	47.2	51.3	30	55.8
2	23/08/2011 01:43	0:05:00	43.3	47.6	26.5	55.4
3	23/08/2011 01:48	0:05:00	51.9	55	37.8	63.4
4	23/08/2011 01:53	0:05:00	48.9	52	33.5	61.9
5	23/08/2011 01:58	0:05:00	43.5	45.5	26.7	60.3
6	23/08/2011 02:03	0:05:00	48.1	52.8	27	61.4
7	23/08/2011 02:08	0:00:14	36.4	39.7	31.3	47.8

**Location A12 –West Bank**

Daytime						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	20/08/2011 17:00	0:05:00	62.9	69.1	59.8	88.9
2	20/08/2011 17:05	0:05:00	62.7	65.6	60.1	92.7
3	20/08/2011 17:10	0:05:00	65.0	69.2	58.5	92.0
4	20/08/2011 17:15	0:05:00	61.2	64.1	59.1	86.0
5	20/08/2011 17:20	0:05:00	62.9	65.0	58.6	93.0
6	20/08/2011 17:25	0:05:00	61.1	62.9	57.2	87.3
7	20/08/2011 17:30	0:05:00	65.4	69.1	57.9	89.2
8	20/08/2011 17:35	0:05:00	62.1	65.3	58.5	95.0
9	20/08/2011 17:40	0:05:00	66.0	67.1	59.2	84.0
10	20/08/2011 17:45	0:05:00	65.1	67.5	57.2	92.5
11	20/08/2011 17:50	0:05:00	63.9	66.9	53.1	91.6
12	20/08/2011 17:55	0:05:00	62.0	64.1	56.3	94.0

Evening						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	20/08/2011 19:00	0:05:00	65.5	68.3	46.8	89.0
2	20/08/2011 19:05	0:05:00	67.0	65.9	47.9	79.8
3	20/08/2011 19:10	0:05:00	60.6	63.8	46.8	79.6
4	20/08/2011 19:15	0:05:00	60.0	61.1	45.9	81.5
5	20/08/2011 19:20	0:05:00	60.7	63.0	44.7	83.0
6	20/08/2011 19:25	0:05:00	62.8	66.0	46.3	81.0
7	20/08/2011 19:30	0:05:00	62.0	65.5	46.0	86.6
8	20/08/2011 19:35	0:05:00	65.5	56.9	44.7	79.2
9	20/08/2011 19:40	0:05:00	62.9	56.4	43.9	80.1
10	20/08/2011 19:45	0:05:00	60.6	50.6	43.7	79.5
11	20/08/2011 19:50	0:05:00	58.0	53.4	43.8	79.0
12	20/08/2011 19:55	0:05:00	64.0	63.2	44.9	80.0

Night-time						
Address	Time	Measurement Time	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Amax</sub>
1	20/08/2011 22:00	0:05:00	60.2	55	46.2	82.4
2	20/08/2011 22:05	0:05:00	62.2	64	47.4	81.2
3	20/08/2011 22:10	0:05:00	50	50.8	44.5	67.2
4	20/08/2011 22:15	0:05:00	59.2	56.5	42	82
5	20/08/2011 22:20	0:05:00	56.7	57.1	44.3	74.9
6	20/08/2011 22:25	0:05:00	54.4	51.4	41.6	71.5