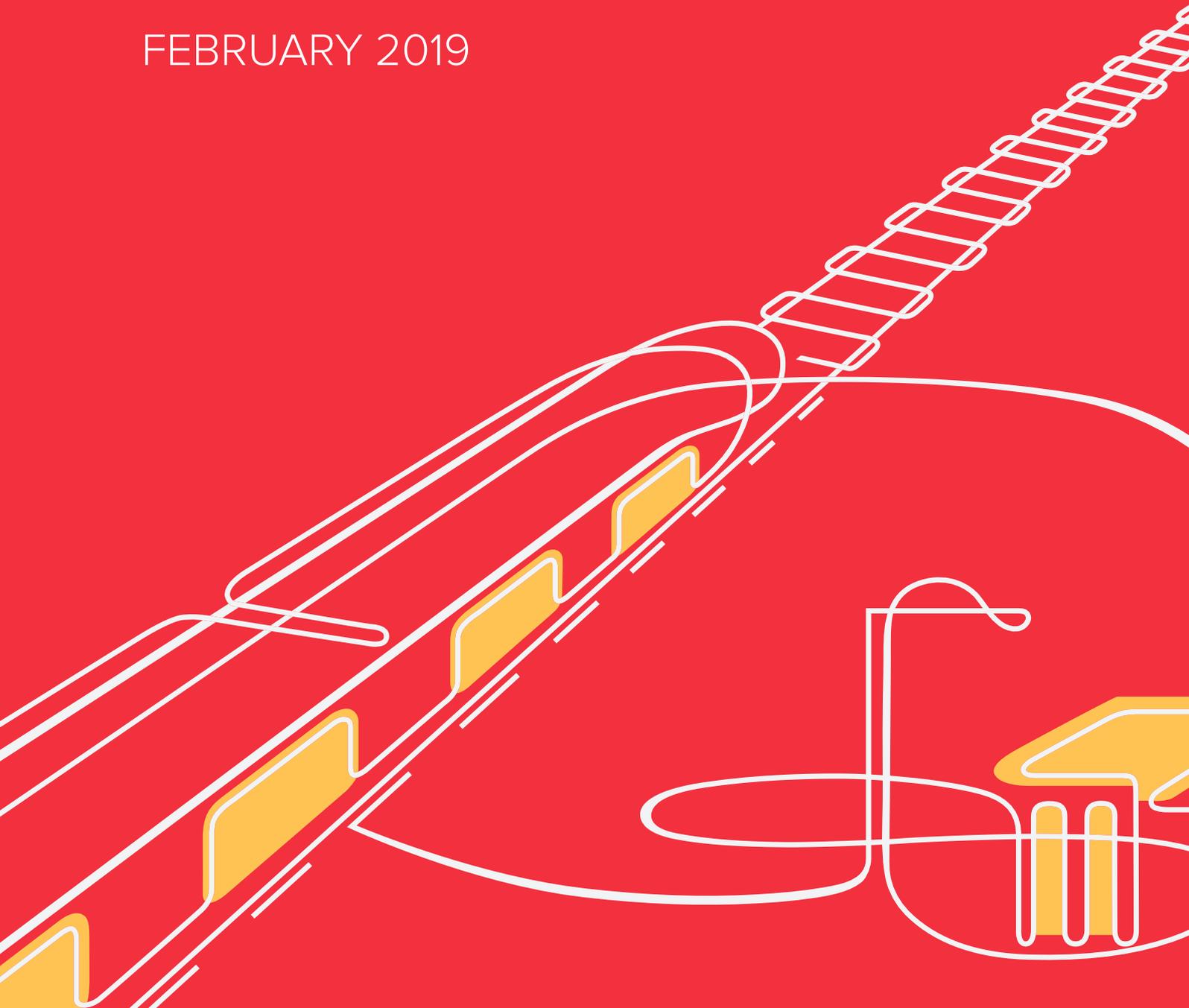




# A4119 ELY VALLEY ROAD IMPROVEMENT SCHEME, COEDEL

## NOISE ASSESSMENT REPORT

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A4119 Ely Valley Road Improvement Scheme, Coedely  
 Noise Assessment Report

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## Contents

1. Introduction	1
2. Planning and Legislation	2
3. Traffic Flows	7
4. Methodology	8
5. Measured Noise Levels	9
6. Calculated Noise Levels	10
7. Construction Noise	12
8. Vibration	13
9. Summary	16

## Appendices

Appendix A - Glossary of Acoustic Terminology
Appendix B - Survey Method and Equipment
Appendix C - Traffic Flow Diagrams
Appendix D - Noise Schedule – Calculated Noise Levels
Appendix E - Noise Contour Plans

## Drawings

EVRI-RED-00-XX-DR-C-0100	Location Plan
EVRI-RED-00-XX-DR-C-0101	Traffic Noise Measurement Locations/ Properties Assessed
EVRI-RED-00-XX-DR-C-0001	Do Minimum
EVRI-RED-00-XX-DR-C-0002	Do Something

# 1. Introduction

## Relevant Dates

Start of Construction	2020
Opening date	2022
Design year	2037

## Scope of Work

- 1.1 Capita Property and Infrastructure acting on behalf of Rhondda Cynon Taf County Borough Council has been commissioned to produce a Noise Assessment Report for the A4119 Ely Valley Road improvement scheme which is located south-east of Coedely. The work is based on background noise surveys and development of a noise model.

## General Background/Description of Scheme

- 1.2 The A4119 Ely Valley Road is located within the county of Rhondda Cynon Taf, between Llantrisant and Coedely, approximately 16.8km north-west centre of Cardiff. (See location plan - EVRI-RED-00-XX-DR-C-0100).
- 1.3 The proposed improvement scheme will see the dualling of the existing single carriageway A4119 from Coedely to Ynysmaerdy, known locally as 'Stink Pot Hill' (which is due to the sewerage works that is located on the side of the road).
- 1.4 The proposal is to expand the single carriageway to two 3.65m lanes in both directions with central reserve and active travel provision. This will cover 1.3km in length from near Llantrisant Business Park to the Coedely roundabout, which connects the Rhondda Valleys to the M4 corridor.
- 1.5 The scheme will help to resolve traffic congestion and daily queues around Tonyrefail, where the A4119 connects to a busy highway network, which also serves the Royal Glamorgan Hospital, the Royal Mint and South Wales Fire & Rescue nearby.
- 1.6 The proposed route alignment at Coedely has several transportation and regeneration benefits – including reduced traffic congestion and improved connectivity between key settlements and sites. It will also improve access to existing businesses and also encourage future businesses via a more reliable journey time.

## Purpose

- 1.7 This report assesses the change in noise due to the proposed A4119 Ely Valley Road improvement scheme and contains the results of a detailed assessment of traffic noise in accordance with the requirements of the Noise Insulation (Amendment) Regulations 1988, in order to determine properties eligible for insulation against future traffic noise.
- 1.8 A glossary of acoustic terminology used in the report is contained in Appendix A.

## 2. Planning and Legislation

### The Noise Insulation (Amendment) Regulations 1988

- 2.1 Regulation 3 of the Noise Insulation (Amendment) Regulations 1988 states that a Highway Authority is required to make offers of noise insulation to occupiers of residential properties where certain criteria are met. The three conditions which must all be satisfied to qualify are as follows:
- (i) The predicted L10 (18 hour) noise level at the facade of a building, within 15 years of a road opening to traffic, must be at least 68 dB(A).
  - (ii) The relevant L10 (18 hour) noise level must be greater by at least 1 dB(A) than the noise level prevailing before the new road scheme.
  - (iii) Noise from the new or altered carriageway must make an effective contribution to the total noise level of at least 1 dB(A).
- 2.2 In addition, Regulation 4(4) provides a discretionary power enabling offers of insulation to be made for some non-qualifying dwellings where they form part of a contiguous facade.
- 2.3 The level of future traffic noise is assessed in accordance with the recommended method of prediction contained in the Department of Transport/Welsh Office Technical Memorandum "Calculation of Road Traffic Noise" (CRTN). Calculations have been undertaken utilising the Noisemap calculation software.
- 2.4 Calculated noise levels are the L10 (18 hour) levels as required by the Regulations. L10 is defined as the noise level in dB(A) which is exceeded for 10% of a given period of time. In the Regulations, L10 (18 hour) is the arithmetic average of all hourly L10 values during the period 06.00 - 24.00 hours on a normal working day.
- 2.5 In order to determine eligibility, noise figures are calculated to 0.1 dB(A), and these values used to determine whether the requirements under paragraphs 2.1 (ii) and 2.1 (iii) are met.
- 2.6 Those properties adjacent to the proposed highway improvements were assessed, being located at the points where the change in noise is greatest.
- 2.7 Eligible buildings are dwellings and other buildings used for residential purposes within 300m of the new or altered road. Eligible rooms are living rooms, bedrooms or kitchen diners with no gas appliances, which have a qualifying window or door.

### National Planning Policy Framework (NPPF)

- 2.8 Published in March 2012, NPPF has replaced a number of national policy documents with a brief document which is written simply and clearly and is intended to be more accessible to people and communities.
- 2.9 The document explains how the planning system should contribute to and enhance the natural and local environment. One of these is by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

2.10 Paragraph 123 is specifically related to noise, according to which, planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of condition;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

### British Standard BS 6472-1:2008

2.11 The response of the human body to vibration is addressed in BS6472-1:2008. The threshold of human vibration is expressed in terms of a weighted (Wb) peak acceleration between 0.01 and 0.02 ms<sup>-2</sup>. Perception thresholds are slightly higher for vibration duration of less than 1 second.

2.12 This standard provides guidance on the acceptable levels of Vibration Dose (VDV) for residential properties for both the daytime (07:00 to 23:00) and the night-time (23:00 to 07:00) periods. These are given in Table 2.1:

Table 2.1: Acceptable Vibration Dose Values (VDV, m/s<sup>1.75</sup>) in Residential Properties

Time	Low probability of adverse comment	Adverse comment possible	Adverse comment probable
07:00 to 23:00	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
23:00 to 07:00	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

Source: BS6472-1:2008

### British Standard BS 5228

2.13 British Standard BS 5228: Parts 1 and 2: 2009 Noise and Vibration Control on Construction and Open Sites provides basic guidance on the control of noise and vibration from construction activity.

2.14 There are no regulations that provide limits for construction noise and vibration. The Control of Pollution Act 1974 leaves it to local authorities to recommend criteria appropriate to their area of jurisdiction.

### BS5228-1:2009 Noise and Vibration Control on Construction and Open Sites – Noise

2.15 BS5228-1 provides generic source noise data for various items of plant used on open sites along with methods for calculating the effects of these activities and their respective noise levels at nearby noise sensitive properties.

- 2.16 BS5228: 2009 ‘Code of Practice for Noise and Vibration Control on Construction and Open Sites’ gives recommendations for basic methods of noise and vibration control relating to construction and open sites where work activities/operations generate significant noise and/or vibration levels. BS5228:2009 provides generic source noise data for various items of plant used on open sites along with methods for calculating the effects of these activities and their respective noise levels at nearby noise sensitive properties.
  
- 2.17 Annex E to the standard provides guidance on the significance of noise effects and examples of noise limits for construction noise. These are based on the noise limits from the DoE Advisory Leaflet 72 1976 ‘Noise Control on Building Sites’ which have traditionally been adopted as best practice. Leaflet 72 advised that noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut. Noise levels, between 07:00 and 19:00 hours, outside the nearest window of the occupied room closest to the site boundary, should not exceed:
  
- 2.18 “... 70 decibels (dBA) in rural, suburban and urban areas away from main road traffic and industrial noise; or 75 decibels (dBA) in urban areas near main roads in heavy industrial areas.”
  
- 2.19 BS 5228 identifies two methodologies for assessing the significance of construction noise based on the noise change in relation to the pre-existing noise climate (i.e. the pre-construction baseline). The approach taken in this assessment is based on the ABC method as shown in Table 2.2 below.

Table 2.2: BS5228 Recommended Construction Noise Limits

Assessment category and threshold value period	Threshold value, in decibels (L <sub>Aeq T</sub> ) (dB)		
	Category A (A)	Category B (B)	Category C (C)
Night-time (23.00–07.00)	45	50	55
Evenings and weekends D)	55	60	65
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	65	70	75

NOTE 1 A significant effect has been deemed to occur if the total L<sub>Aeq</sub> noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L<sub>Aeq</sub> noise level for the period increases by more than 3dB due to construction activity.

NOTE 3 Applied to residential receptors only.

(A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

(B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

(C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.

(D) 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

Source: BS 5228:2009

## BS5228-2:2009 Noise and Vibration Control on Construction and Open Sites - Vibration

2.20 BS5228-2 provides guidance on the significance of vibration and provides guidance on vibration minimisation on construction sites. BS5228-2 states:

*“Vibrations, even of very low magnitude, can be perceptible to people and can interfere with the satisfactory conduct of certain activities, e.g. delicate procedures in hospital operating theatres, use of very sensitive laboratory weighing equipment. Vibration nuisance is frequently associated with the assumption that, if vibrations can be felt, then damage is inevitable; however, considerably greater levels of vibration are required to cause damage to buildings and structures (see, for example, BS 7385-2) or to cause computers and similar electronic equipment to malfunction. Vibrations transmitted from site activities to the neighbourhood can, therefore, cause anxiety as well as annoyance, and can disturb sleep, work or leisure activities. In any neighbourhood, some individuals will be more sensitive to vibration than others. The significance of vibration effects should be assessed in accordance with Annex B.”*

2.21 An extract of BS 7385-2: 1993 is shown in Table 2.3 below:

Table 2.3: Transient Vibration Guide Values Relating to Cosmetic Damage to Buildings from Construction Operations

Type of Building	Peak component Particle Velocity in Frequency Range of Predominant Pulse <sup>1</sup>	
	4Hz to 15Hz	15Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50mm/s at 4Hz and above.	Reinforced or framed structures. Industrial and heavy commercial buildings.
Un-reinforced or light framed structures. Residential or light commercial buildings.	15mm/s at 4Hz increasing to 20mm/s at 15Hz.	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above.
Note 1: Values referred to are at the base of the building. Note for line 2: At frequencies below 4Hz, a maximum displacement of 0.6mm (zero to peak) is not to be exceeded.		

Source: BS7385-2:1993

## 3. Traffic Flows

3.1 Traffic flows used for the traffic noise assessment are:

- 2018 eighteen hour weekday traffic flows (including HGV percentages) prior to commencement of construction, and
- 2022 and 2037 eighteen hour weekday traffic flows, post scheme.

3.2 The traffic flows have been generated from the A4119 Coed Ely Traffic Model. Flows from the peak hour model have been factored by a November 2018 automatic traffic count located on the A4119, to create eighteen hour flow figures. Growth within the model has been based on the National Transport Model, utilizing the National Trip End Model for local factors. This microsimulation model simulates daily variation in traffic behavior, resulting in slight discrepancies in growth values (The associated traffic flows diagrams are contained within Appendix C).

## 4. Methodology

- 4.1 All road traffic noise calculations have been undertaken in accordance with Calculation of Road Traffic Noise 1988 (CRTN). This methodology has been deployed via the use of the Noisemap Five computer package. Input data includes topographical information in the form of a digital plan provided by the Rhondda Cynon Taf County Borough Council and the traffic flows as described in Chapter 3.0.
- 4.2 In addition to the calculations detailed in Appendix D, four 18 hour CRTN surveys were undertaken within the locality. These are summarised in Chapter 5.0 and included as Appendix B.
- 4.3 The purpose of these surveys is to assist in validating the noise model and to provide a set of actual pre-scheme conditions.

## 5. Measured Noise Levels

- 5.1 Capita Property and Infrastructure carried out four 18 hour CRTN noise surveys in October 2018 within the proposed A4119 Ely Valley Road improvement scheme area (as shown on Drawing No. EVRI-RED-00-XX-DR-C-0101).
- 5.2 The measurements were taken using a Rion NL 52 Noise meter environment analyser, positioned at the facades of the nearby properties. A description of the survey method, equipment, calibration details and noise measurement results is contained in Appendix B.
- 5.3 The measured noise levels recorded and converted were:

Table 5.1 Noise Site Surveys (CRTN)

Location No.	Reference	Measured Level – 2018 dB(A) (L <sub>AF10</sub> )	Calculated Level – 2018 dB(A) (L <sub>AF10</sub> )	Level Difference dB(A) (L <sub>AF10</sub> )
A	21 Ynysmaerdy	50.9	51.6	+ 0.7
B	Signalmans Cottage	61.0	60.8	- 0.2
C	Pantglas Farm	61.3	60.7	- 0.6
D	26 Elwyn Street	62.4	63.1	+ 0.7

- 5.4 From the table, the above measurements were shown to compare favourably with the calculated levels.
- 5.5 It should be noted that the above measured results have been analysed to remove any anomalies that the site surveys might have recorded e.g. humans shouting / HGV's unloading / dogs barking etc.

## 6. Calculated Noise Levels

### The Noise Insulation (Amendment) Regulations 1988

6.1 Regulation 3 of the Noise Insulation (Amendment) Regulations 1988 states that a Highway Authority is required to make offers of noise insulation to occupiers of residential properties where certain criteria are met. The three conditions which must all be satisfied to qualify are as follows:

- (i) The predicted L10 (18 hour) noise level at the facade of a building, within 15 years of a road opening to traffic, must be at least 68 dB(A).
- (ii) The relevant L10 (18 hour) noise level must be greater by at least 1 dB(A) than the noise level prevailing before the new road scheme.
- (iii) Noise from the new or altered carriageway must make an effective contribution to the total noise level of at least 1 dB(A).

6.2 A total of 74 properties were assessed in the Noise Assessment Report. The results show that **no properties** qualify for physical noise insulation measures in accordance with the Noise Insulation (Amendment) Regulations 1988 (as shown in the criteria above). The results (including the predicted future noise levels) can be found in the Noise Schedule in Appendix D and on the noise contour plans in Appendix E.

### Land Compensation Act 1973

6.3 A total of 74 properties were assessed in the noise model the results of which (including predicted future noise levels) can be found in the schedule in Appendix D.

6.4 The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 7 HA 213/11) presents an impact significant matrix for assessing the magnitude of changes in noise level, which is reproduced in Tables 6.1 and 6.2 below:

Table 6.1: Classification of Magnitude of Noise Impacts in the Short Term

Change in Noise Level, dB(A)	Magnitude of Impact
0.0	No Change – No Impact
0.1 – 0.9	Negligible
1.0 – 2.9	Minor
3.0 – 4.9	Moderate
>5.0	Major

Table 6.2: Classification of Magnitude of Noise Impacts in the Long Term

Change in Noise Level, dB(A)	Magnitude of Impact
0.0	No Change – No Impact
0.1 – 2.9	Negligible
3.0 – 4.9	Minor
5.0 – 9.9	Moderate
>10.0	Major

6.5 A comparison of with scheme and without scheme data has been undertaken. All the residential properties within proximity to the new scheme have been assessed, the findings of which are summarised below in Table's 6.3 and 6.4:

Table 6.3: Noise Bandings – Short Term

Noise Level Increase dB(A)	No. of Properties
<0.0	3
0.1 – 0.9	62
1.0 – 2.9	9
3.0 – 4.9	0
>5.0	0

Table 6.4: Noise Bandings – Long Term

Noise Level Increase (Bandings)	No. of Properties
<0 dB	38
0.1-2.9 dB	36
3.0-4.9 dB	0
5.0-9.9 dB	0
>10 dB	0

6.6 Based on a total of 74 properties assessed, in accordance with the road traffic noise criteria there is a minor increase in noise levels (1.0-2.9dB) at 9 properties in the short term and there is a negligible increase in noise levels (0.1dB – 2.9dB) at 36 properties in the long term.

## 7. Construction Noise

- 7.1 The assessment criteria have been determined with reference to the ambient noise levels in the study area. In accordance with the significance criteria highlighted in Table 2.2, the total noise levels (construction noise and ambient noise) should not exceed the following threshold values:
- 65dB L<sub>Aeq</sub> (Category A) during the day (07:00 – 19:00) and on Saturdays (07:00 – 13:00)
  - 55dB L<sub>Aeq</sub> (Category A) in the evenings (19:00 – 23:00 weekdays) and over weekends (13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays)
  - 45 dB L<sub>Aeq</sub> (Category A) at night time (23:00 – 07:00)
- 7.2 If the total noise level exceeds the appropriate category value, then a significant effect is deemed to occur. However BS 5228 does not provide guidance to determine the degree of significance for various 'exceedence' levels. Therefore, the impacts from construction activities including the haul roads within the site are classified as either 'significant' or 'not significant', depending on whether they exceed the limit values or not, respectively.
- 7.3 Noise levels will be measured and monitored during the construction process and results compared to the threshold values. If the threshold values are exceeded, mitigation measures will be utilised in agreement with the local authority.

## 8. Vibration

- 8.1 The impact of the proposed scheme in terms of vibration has been assessed in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 7: HA213/11 Traffic Noise and Vibration (Highways Agency et al, 2011) and the guidance provided in BS 5228-2: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites (British Standard Institution, 2009).
- 8.2 Traffic generated vibration is either transmitted through the ground or through the air; the former is produced by the interaction between the travelling vehicle and the road surface and the latter by the engines or exhausts of vehicles with dominant frequencies in the 50Hz to 100Hz range.
- 8.3 Design Manual for Roads and Bridges Volume 11, Section 3, Part 7: HA213/11 Traffic Noise and Vibration (Highways Agency et al, 2011) indicates that the ground-borne vibration is much less likely to be a cause of disturbance than airborne vibration. The greatest risk of complaint regarding ground-borne vibration occurs when a building on soft soil is close to a heavily trafficked older road where the road surface is uneven or constructed from concrete slabs. A method to predict the peak vibration level based on the texture depth, speed of traffic, type of sub-grade and distance to the property is available.
- 8.4 For airborne vibration, the A-weighted  $LA_{10,18hr}$  noise index has been found to be closely associated with the average vibration disturbance ratings. The relationship between the percentage of people in the community who are bothered very much or quite a lot by vibration is similar to that for noise, except that it is 10% lower in all cases.
- 8.5 However, the relationship between the percentage of people bothered very much or quite a lot by airborne vibration and for noise have only been determined for unshielded properties located within 40 metres of the carriageway. DMRB also states that, on average, traffic induced vibration is expected to affect a very small percentage of people at exposure levels below 58dB  $LA_{10,18hr}$  and, therefore, zero percent people bothered should be assumed in these cases.
- 8.6 The most relevant guidance for addressing vibration impacts from construction activities is BS 5228-2: 2009 Code of practice for noise and vibration control on construction and open sites (British Standard Institution, 2009). It contains methodology for predicting vibration emanating from various construction techniques, as well as guidance on mitigation and best practice. Further guidance on vibration impacts can be found in BS 6472-1:2008 and BS 7385-2:1993.
- 8.7 Part 1 of BS 6472-1:2008 Guide to Evaluation of Human Exposure to Vibration in Buildings (British Standard Institution, 2008) contains a methodology for assessing the human exposure to vibration in terms of either the Vibration Dose Value, acceleration or the peak velocity of the vibration (also referred to as Peak Particle Velocity). The Vibration Dose Value is a single figure descriptor that represents the cumulative dose of transient vibrations, taking into account the frequency spectrum and duration of each event. Values are reproduced in Table 8.1:

Table 8.1: Vibration Dose Values (ms<sup>-1.75</sup>) in Residential Buildings

Time Period	Low Probability of Adverse Comment	Adverse Comment Possible	Adverse Comment Probable
Day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

8.8 Part 2 of BS 7385-2:1993 Evaluation and Measurement for Vibration in Buildings (British Standard Institution, 1993) highlights that vibration in buildings is frequently associated with the assumption that, if vibrations can be felt, then damage is inevitable. However, considerably greater levels of vibration are typically required to cause damage to buildings and structures. Limits for transient vibration, above which cosmetic damage could occur are presented, which are reproduced as Table 8.2:

Table 8.2: Transient Vibration Guide Values for Cosmetic Damage

Type of Building	Peak component Particle Velocity (PPV)		
	4Hz – 15Hz	15Hz – 40Hz	> 40Hz
Reinforced or framed structures (Industrial and heavy commercial buildings)	50 mm/s		
Un-reinforced or light framed structures (Residential or light commercial buildings)	15 mm/s	20 mm/s	50 mm/s

## Construction Vibration

- 8.9 Vibration may be impulsive, such as that due to hammer-driven piling; transient, such as that due to vehicle movements along a railway; or continuous, such as that due to vibratory driven piling. The primary cause of community concern generally relates to building damage from both construction and operational sources of vibration, although, the human body can perceive vibration at levels which are substantially lower than those required to cause building damage.
- 8.10 Damage to buildings associated solely with ground-borne vibration is not common and although vibration may be noticeable, there is little evidence to suggest that they produce cosmetic damage such as a crack in plaster unless the magnitude of the vibration is excessively high. The most likely impact, where elevated levels of vibration do occur during the demolition and construction phases, is associated with perceptibility.
- 8.11 BS 5228 indicates that the threshold of human perception to vibration is around 0.15mms<sup>-1</sup>, although it is generally accepted that for the majority of people vibration levels in excess of between 0.15 and 0.3 mms<sup>-1</sup> peak particle velocity (ppv) are just perceptible.
- 8.12 There are currently no British Standards that provide a methodology to predict levels of vibration from construction activities, other than that contained within BS 5228 which relates to percussive or vibratory piling only. Therefore, it is not possible to accurately predict levels of vibration during the site preparation and construction phases of the development. As such, to control the impact of vibration during the site preparation and construction of the proposed development, limits relating to the perceptibility of vibration have been set.
- 8.13 Accordingly 1 mms<sup>-1</sup> ppv has been selected as the target criteria to control the impact of construction vibration, with the criteria for assessing the magnitude of vibration impacts according to the margin by which this target criterion is achieved or exceeded presented in Table 8.3 below. This target criterion is based on the guidance contained within BS 5228, experience from previous

sites and accepted vibration policy criteria across a range of enforcing authorities elsewhere in the UK. The limits are presented in terms of peak particle velocity (PPV) as it is the simplest indicator for both perceptibility and building damage.

Table 8.3: Criteria for Assessing the Magnitude of Construction Vibration Impacts

Vibration Level, $\text{mms}^{-1}$ ppv	Significance of Impact
>1.0	Major Adverse
0.30 - 1.0	Moderate Adverse
0.15 - 0.30	Minor Adverse
<0.15	Negligible

- 8.14 It is worth noting that the purpose of the target construction vibration criteria is to control the impact of construction vibration insofar as is reasonably practicable and is entirely based on the likelihood of the vibration being perceptible, rather than causing damage to property. Hence, although vibration levels in excess of  $1 \text{ mms}^{-1}$  ppv would be considered a major adverse impact in respect of the likelihood of perceptibility, they would not be considered significant in terms of the potential for building damage, which would require levels of at least  $15 \text{ mms}^{-1}$  ppv to result in minor cosmetic damage in light / unreinforced buildings.
- 8.15 Vibration will be monitored during the construction period and increases assessed in accordance with the stated British Standards. Mitigation works will be implemented if required.

## 9. Summary

- 9.1 This report identifies the potential noise impacts from the A4119 Ely Valley Road improvement scheme. The assessments have been undertaken in accordance with the appropriate methodology and with reference to measured and calculated noise levels in the study area.

### The Noise Insulation (Amendment) Regulations 1988

- 9.2 A total of 74 properties were assessed in the Noise Assessment Report. The results show that **no properties** qualify for physical noise insulation measures in accordance with the Noise Insulation (Amendment) Regulations 1988. The results (including the predicted future noise levels) can be found in the Noise Schedule in Appendix D.

### Land Compensation Act 1973

- 9.3 A total of 74 properties were assessed in the Noise model the results of which (including predicted future noise levels) can be found in the Noise Schedule in Appendix D.
- 9.4 A comparison of with scheme and without scheme data has been undertaken. All the residential properties within proximity to the new scheme have been assessed, the findings of which are summarised below in Table 9.1 and 9.2:

Table 9.1: Noise Bandings – Short Term

Noise Level Increase dB(A)	No. of Properties
<0.0	3
0.1 – 0.9	62
1.0 – 2.9	9
3.0 – 4.9	0
>5.0	0

Table 9.2: Noise Bandings – Long Term

Noise Level Increase (Bandings)	No. of Properties
<0 dB	38
0.1-2.9 dB	36
3.0-4.9 dB	0
5.0-9.9 dB	0
>10 dB	0

- 9.5 Based on a total of 74 properties assessed, In accordance with the road traffic noise criteria there is a minor increase in noise levels (1.0dB – 2.9dB) at 9 properties in the short term and there is a negligible increase in noise levels (0.1dB – 2.9dB) at 36 properties in the long term.

# Appendix A

## Glossary of Acoustic Terminology

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Table A1: Glossary of Acoustic Terminology

CRTN	Calculation of Road Traffic Noise
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 <sup>-6</sup> Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log <sub>10</sub> (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
L <sub>eq,T</sub>	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
L <sub>max,T</sub>	A noise level index defined as the maximum noise level during the period T. L <sub>max</sub> is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L <sub>eq</sub> noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L <sub>90,T</sub>	A noise level index. The noise level exceeded for 90% of the time over the period T. L <sub>90</sub> can be considered to be the "average minimum" noise level and is often used to describe the background noise.
L <sub>10,T</sub>	A noise level index. The noise level exceeded for 10% of the time over the period T. L <sub>10</sub> can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A2: Typical Sound Levels Found In the Environment

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the  $L_{A10}$ , the noise level exceeded for 10% of the measurement period.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

# Appendix B

## Survey Method and Equipment

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## Equipment

Noise levels were measured using a Rion NL 52 environmental noise analyser (serial number: 00943362) calibrated in the field with a Rion NC74–field calibrator (serial number: 34546649). The equipment, complying with the type-1 rating in BS5969 was calibrated to comply with the manufacturer's performance specification on the 12<sup>th</sup> May 2017.

## Method

Measurements were taken in accordance with CRTN with the microphone mounted on a tripod/pole at a height of 1.2 metres above ground level, positioned at free field sites. An outdoor microphone system was used which includes an anti-bird spikes, a windscreen and a rain cover. The time weighting of the meter was set to fast, and on-site calibration was carried out before each measurement and the calibration was checked immediately after. In all cases the analyser stayed within the correct range  $94.0 \text{ dB(A)} \pm 0.2 \text{ dB(A)}$ , as specified by the manufacturer. For weather conditions, see survey comments.

## Noise Measurement Results

Capita Property and Infrastructure carried out four 18 hour noise surveys in October 2018 within the proposed A4119 Ely Valley Road improvement scheme (as shown on Drawing No. EVRI-RED-00-XX-DR-C-0101).

The results are summarised in the tables shown overleaf.

Location: Survey A – 21 Ynysmaerdy Terrace – LAF10 18 hour (CRTN)

Hour	Minutes	LAF10, 15min	LAF10, Hourly Mean	Hour	Minutes	LAF10, 15min	LAF10, Hourly Mean						
06:00	:00	50.7	52.1	16:00	:00	51.8	50.6						
	:15	51.9			:15	50.3							
	:30	52.6			:30	49.8							
	:45	53.1			:45	50.5							
07:00	:00	53.0	53.1	17:00	:00	49.8	50.5						
	:15	53.1			:15	49.7							
	:30	53.3			:30	51.1							
	:45	53.1			:45	51.5							
08:00	:00	54.2	54.6	18:00	:00	50.2	51.5						
	:15	54.4			:15	52.9							
	:30	55.4			:30	51.8							
	:45	54.3			:45	51.1							
09:00	:00	51.9	52.7	19:00	:00	49.8	50.6						
	:15	53.5			:15	50.8							
	:30	53.2			:30	50.7							
	:45	52.1			:45	51.0							
10:00	:00	51.9	51.2	20:00	:00	50.4	50.5						
	:15	50.5			:15	52.3							
	:30	51.3			:30	50.7							
	:45	51.1			:45	48.5							
11:00	:00	49.8	51.4	21:00	:00	48.2	48.1						
	:15	53.1			:15	48.2							
	:30	50.1			:30	48.7							
	:45	52.4			:45	47.2							
12:00	:00	52.7	52.3	22:00	:00	48.6	47.3						
	:15	53.3			:15	47.7							
	:30	53.4			:30	47.1							
	:45	49.8			:45	45.8							
13:00	:00	50.6	50.7	23:00	:00	46.5	44.9						
	:15	51.0			:15	44.6							
	:30	50.6			:30	43.9							
	:45	50.7			:45	44.5							
14:00	:00	50.8	51.9	<table border="1"> <tr> <td colspan="2"><b>08/10/2018</b></td> </tr> <tr> <td colspan="2">LAF10, 18-hour (dB)</td> </tr> <tr> <td colspan="2"><b>50.9</b></td> </tr> </table>				<b>08/10/2018</b>		LAF10, 18-hour (dB)		<b>50.9</b>	
	<b>08/10/2018</b>												
	LAF10, 18-hour (dB)												
	<b>50.9</b>												
:15	51.1												
:30	51.0												
:45	54.6												
15:00	:00	50.6	51.4										
	:15	51.6											
	:30	50.8											
	:45	52.7											

Weather – A dry but cloudy start in the morning with patchy drizzle. Some brighter spells in the afternoon, which remained overcast. Some early evening sunny spells, leading into a dry and partly cloudy night, with light to moderate winds. Maximum temperature 9 °C to 15 °C.

Location: Survey B – Signalsman Cottage – L<sub>AF10</sub> 18 hour (CRTN)

Hour	Minutes	LAF10, 15min	LAF10, Hourly Mean	Hour	Minutes	LAF10, 15min	LAF10, Hourly Mean						
06:00	:00	61.5	61.0	16:00	:00	62.3	60.8						
	:15	60.8			:15	60.6							
	:30	60.6			:30	60.3							
	:45	61.1			:45	59.9							
07:00	:00	61.7	61.9	17:00	:00	59.9	60.5						
	:15	61.6			:15	60.5							
	:30	62.2			:30	60.2							
	:45	61.9			:45	61.5							
08:00	:00	62.3	62.1	18:00	:00	62.5	61.9						
	:15	62.1			:15	62.0							
	:30	61.9			:30	61.5							
	:45	62.1			:45	61.3							
09:00	:00	62.8	62.4	19:00	:00	61.6	61.6						
	:15	62.1			:15	62.5							
	:30	62.8			:30	61.4							
	:45	61.7			:45	61.2							
10:00	:00	61.9	61.6	20:00	:00	60.7	60.5						
	:15	61.4			:15	60.6							
	:30	61.6			:30	60.1							
	:45	61.4			:45	60.6							
11:00	:00	61.8	61.4	21:00	:00	60.2	59.9						
	:15	61.3			:15	60.2							
	:30	61.2			:30	60.1							
	:45	61.3			:45	59.1							
12:00	:00	61.2	61.2	22:00	:00	60.3	59.7						
	:15	61.2			:15	60.2							
	:30	61.2			:30	59.1							
	:45	61.3			:45	58.9							
13:00	:00	61.7	61.8	23:00	:00	58.2	57.0						
	:15	61.5			:15	56.6							
	:30	61.6			:30	56.7							
	:45	62.3			:45	56.5							
14:00	:00	61.7	61.7	<table border="1"> <tr> <td colspan="2" style="text-align: center;"><b>09/10/2018</b></td> </tr> <tr> <td colspan="2" style="text-align: center;">LAF10, 18-hour (dB)</td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>61.0</b></td> </tr> </table>				<b>09/10/2018</b>		LAF10, 18-hour (dB)		<b>61.0</b>	
	<b>09/10/2018</b>												
	LAF10, 18-hour (dB)												
	<b>61.0</b>												
:15	61.7												
:30	61.5												
:45	61.7												
15:00	:00	61.7	61.9										
	:15	62.1											
	:30	62.0											
	:45	62.0											

Weather – An early morning mist/fog start of the day, then become clear to leave a mostly a dry day, with some bright sunny spells, especially late afternoon. Light winds and warm. Maximum temperature 9 °C to 15 °C.

Location: Survey C – Pantglas Farm – L<sub>AF10</sub> 18 hour (CRTN)

Hour	Minutes	LAF10, 15min	LAF10, Hourly Mean	Hour	Minutes	LAF10, 15min	LAF10, Hourly Mean			
06:00	:00	62.1	61.5	16:00	:00	61.6	61.5			
	:15	62.2			:15	61.1				
	:30	61.1			:30	62.6				
	:45	60.6			:45	60.9				
07:00	:00	61.5	62.4	17:00	:00	61.4	61.4			
	:15	62.6			:15	60.7				
	:30	62.5			:30	61.8				
	:45	63.0			:45	61.8				
08:00	:00	63.0	62.8	18:00	:00	62.3	61.8			
	:15	63.0			:15	62.1				
	:30	62.5			:30	61.4				
	:45	62.7			:45	61.5				
09:00	:00	63.1	62.6	19:00	:00	61.4	61.2			
	:15	62.3			:15	60.8				
	:30	62.5			:30	61.2				
	:45	62.6			:45	61.2				
10:00	:00	62.0	62.0	20:00	:00	60.7	60.8			
	:15	62.0			:15	61.0				
	:30	61.9			:30	61.0				
	:45	62.2			:45	60.4				
11:00	:00	62.4	62.1	21:00	:00	60.0	59.9			
	:15	62.2			:15	60.1				
	:30	61.9			:30	60.0				
	:45	62.1			:45	59.6				
12:00	:00	62.1	62.9	22:00	:00	60.7	59.8			
	:15	62.3			:15	60.5				
	:30	62.7			:30	59.9				
	:45	64.6			:45	58.0				
13:00	:00	63.9	62.4	23:00	:00	55.7	53.9			
	:15	62.2			:15	55.1				
	:30	61.8			:30	52.1				
	:45	61.7			:45	52.6				
14:00	:00	62.5	62.1	<table border="1"> <tr> <td><b>10/10/2018</b></td> </tr> <tr> <td>LAF10, 18-hour (dB)</td> </tr> <tr> <td><b>61.3</b></td> </tr> </table>				<b>10/10/2018</b>	LAF10, 18-hour (dB)	<b>61.3</b>
	<b>10/10/2018</b>									
	LAF10, 18-hour (dB)									
	<b>61.3</b>									
:15	61.9									
:30	61.8									
:45	62.2									
15:00	:00	61.7	61.8							
	:15	62.0								
	:30	62.0								
	:45	61.5								

Weather – An early morning mist/fog clearing to give a dry, bright and warm day. Turning breezier in the evening, with increasing amounts of cloud. Some showery outbreaks of rain during the night Maximum temperature 9 °C to 15 °C.

Location: Survey D – 26 Elwyn Street – LAF10 18 hour (CRTN)

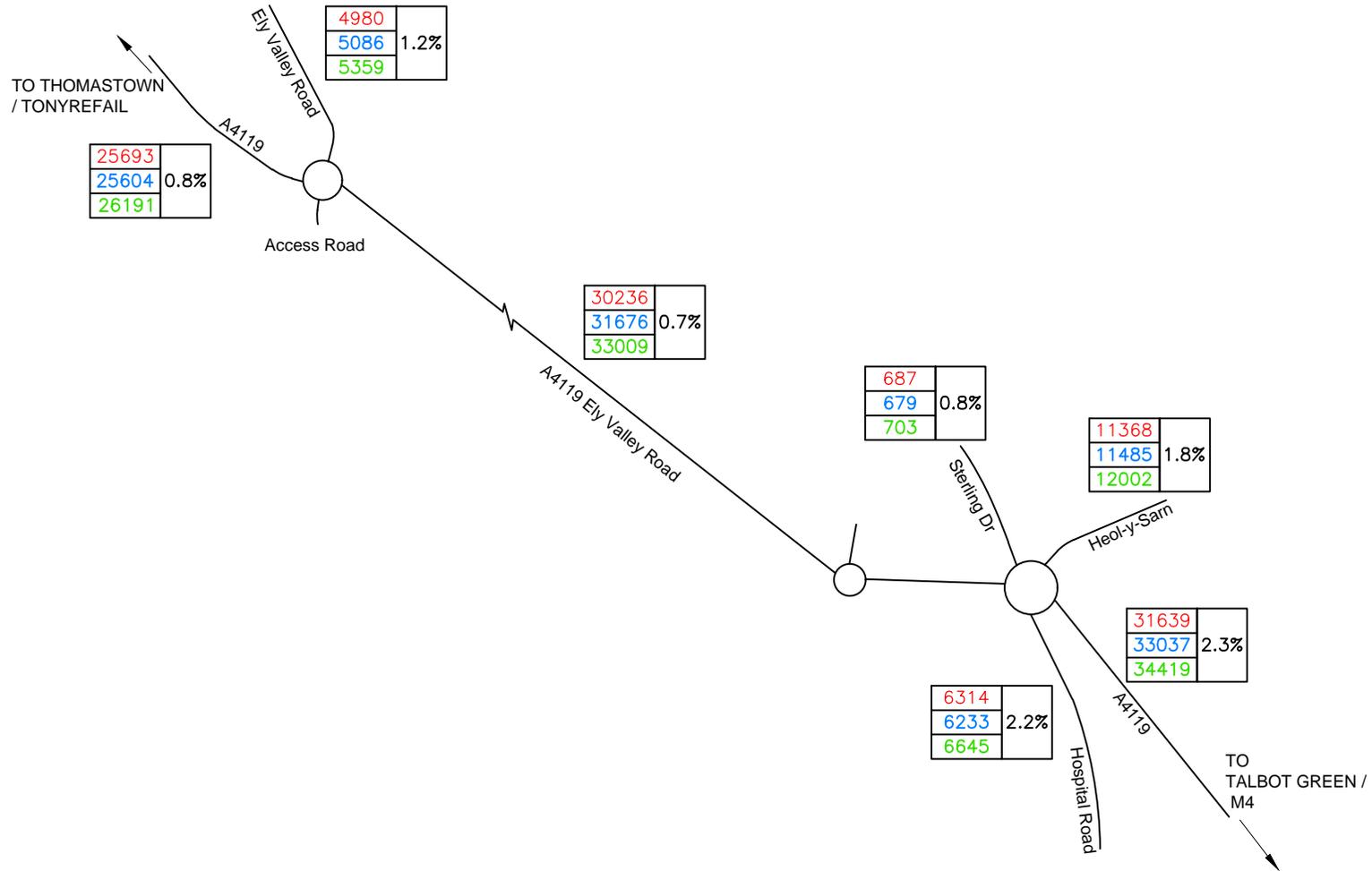
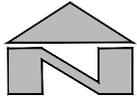
Hour	Minutes	LAF10, 15min	LAF10, Hourly Mean	Hour	Minutes	LAF10, 15min	LAF10, Hourly Mean						
06:00	:00	61.3	63.5	16:00	:00	64.9	65.7						
	:15	62.1			:15	65.5							
	:30	65.4			:30	66.5							
	:45	65.2			:45	65.8							
07:00	:00	65.3	65.3	17:00	:00	65.8	65.4						
	:15	65.4			:15	65.2							
	:30	65.0			:30	65.6							
	:45	65.5			:45	65.0							
08:00	:00	66.4	65.4	18:00	:00	64.3	63.6						
	:15	66.2			:15	64.2							
	:30	65.1			:30	63.1							
	:45	63.9			:45	63.0							
09:00	:00	65.4	63.4	19:00	:00	62.7	62.2						
	:15	62.7			:15	62.4							
	:30	62.3			:30	62.4							
	:45	63.3			:45	61.3							
10:00	:00	62.7	62.6	20:00	:00	60.8	60.2						
	:15	62.7			:15	60.5							
	:30	61.7			:30	60.8							
	:45	63.1			:45	58.8							
11:00	:00	62.0	62.3	21:00	:00	59.4	59.2						
	:15	62.8			:15	60.2							
	:30	62.6			:30	59.0							
	:45	61.7			:45	58.2							
12:00	:00	62.3	62.6	22:00	:00	58.4	57.9						
	:15	62.3			:15	59.1							
	:30	62.8			:30	56.4							
	:45	62.8			:45	57.9							
13:00	:00	61.8	62.3	23:00	:00	56.4	54.2						
	:15	62.4			:15	54.3							
	:30	62.6			:30	54.3							
	:45	62.1			:45	52.1							
14:00	:00	62.6	63.3	<table border="1"> <tr> <td colspan="2" style="text-align: center;"><b>17/10/2018</b></td> </tr> <tr> <td colspan="2" style="text-align: center;">LAF10, 18-hour (dB)</td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>62.4</b></td> </tr> </table>				<b>17/10/2018</b>		LAF10, 18-hour (dB)		<b>62.4</b>	
	<b>17/10/2018</b>												
	LAF10, 18-hour (dB)												
	<b>62.4</b>												
:15	63.5												
:30	62.3												
:45	64.9												
15:00	:00	64.1	64.9										
	:15	64.7											
	:30	65.3											
	:45	65.4											

Weather – Early morning patches of mist, then a dry and fine day with spells of sunshine. The evening and night time is mainly dry with clear skies, with some mist/fog forming. Maximum temperature 8 °C to 14 °C.

# Appendix C

## Traffic Flow Diagrams

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**KEY:**

Annual Average Weekday Traffic

2683	YEAR 2018 AAWT
16864	YEAR 2022 AAWT
20632	YEAR 2037 AAWT

2683 = TOTAL VEHICLES  
1.0% = HGV PERCENTAGE

Rev	Drawn	Chk'd	App'd	Description	Date
P01				Initial issue	17/12/2018

Purpose of Issue  
**S2 - Suitable for information**

Classification  
**Commercial in Confidence**



Project  
**A4119 Ely Valley Road Improvement Scheme  
Coedely  
Noise Assessment Report**

Drawing  
**Traffic Flow Diagram  
Existing 2018, 2022 and 2037 Do Minimum**

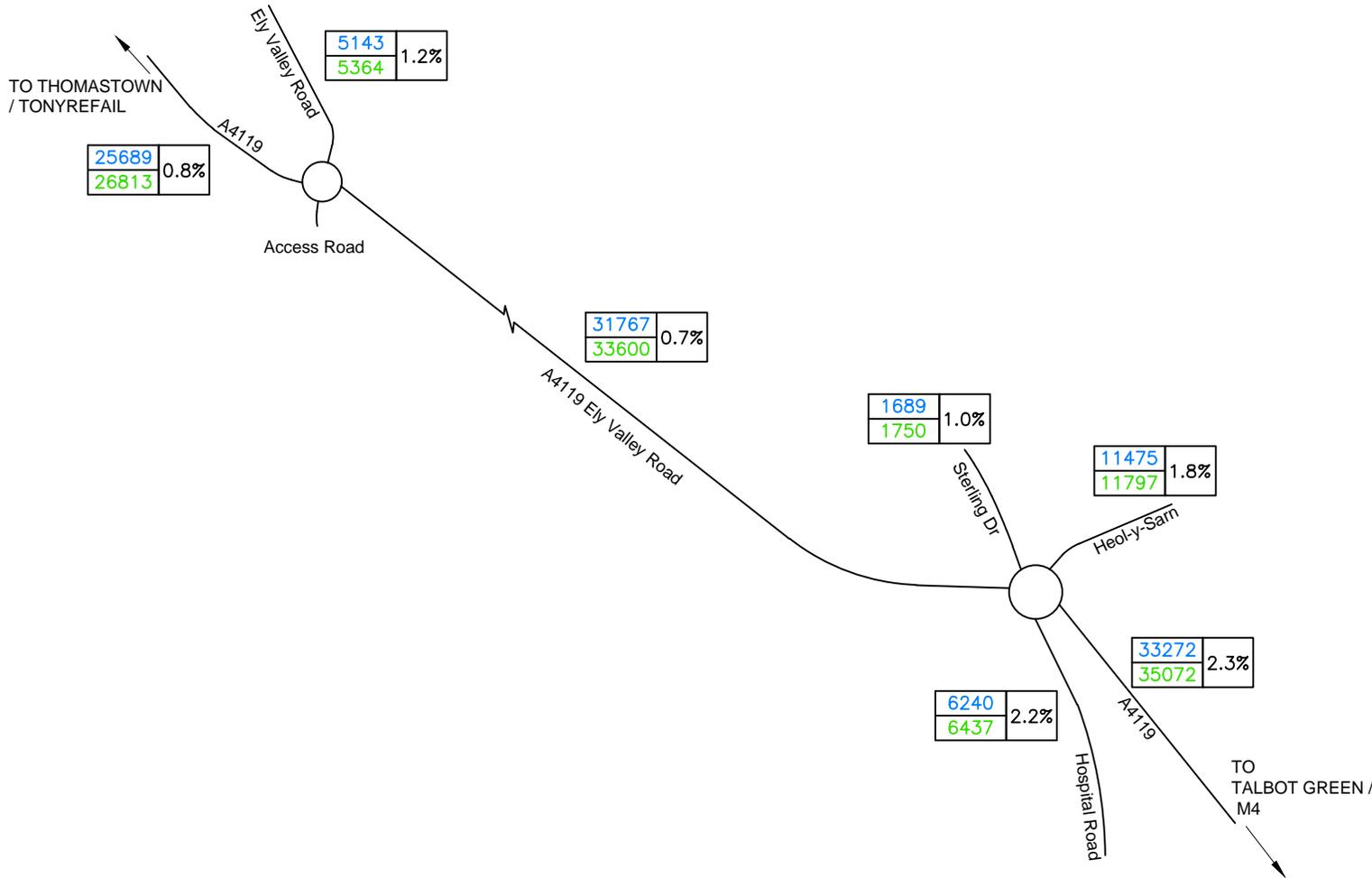
Scale @ A4	Drawn	Checked	Approved
NTS	YKW	GBW	GBW

Project No.	Date
CS/095111	17/12/2018

Drawing Identifier	BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number	rev
EVRI-RED-00-XX-DR-A-TF01	P01



St David's House, Pascal Close, St Mellons, Cardiff, CF3 0LW  
www.redstartwales.com



**KEY:**

Annual Average Weekday Traffic

16864	YEAR 2022 AAWT
20632	YEAR 2037 AAWT

2683 = TOTAL VEHICLES  
1.0% = HGV PERCENTAGE

Rev	Drawn	Chk'd	App'd	Description	Date
P01				Initial issue	17/12/2018

Purpose of Issue  
**S2 - Suitable for information**

Classification  
**Commercial in Confidence**



Project  
**A4119 Ely Valley Road Improvement Scheme  
Coedely  
Noise Assessment Report**

Drawing  
**Traffic Flow Diagram  
2022 and 2037 Do Something**

Scale @ A4	Drawn	Checked	Approved
NTS	YKW	GBW	GBW

Project No.	Date
CS/095111	17/12/2018

Drawing Identifier	BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number	rev
EVRI-RED-00-XX-DR-A-TF02	P01



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## Appendix D

# Noise Schedule – Calculated Noise Levels

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**NOISE SCHEDULE 1**  
**A4119 ELY VALLEY ROAD IMPROVEMENT SCHEME**  
**NOISE INSULATION (AMENDMENT) REGULATIONS 1988**  
**CALCULATED NOISE LEVELS**

**KEY:**

	< 0dB
	0 - 1 dB
	1 - 3 dB
	3 - 5 dB
	5 - 10 dB
	> 10 dB

	Levels between 68dB to 72dB
	Levels between 72dB to 75dB
	Levels in excess of 75dB

**NOTE:**

1dB	- No Noticeable Change
3dB	- Noticeable Difference
5dB	- Clearly Noticeable Difference
10dB	- Up to a Doubling of Perceived Loudness
>10dB	- Over a Doubling of Perceived Loudness

(Above information taken from Institute of Acoustics documentation)

**SCHEDULE 1  
NOISE INSULATION (AMENDMENT) REGULATIONS 1988  
CALCULATED NOISE LEVELS**

NO	PROPERTY	FAÇADE	FLOOR	CALCULATED L10 NOISE LEVELS					2022 DS	2032 DS	2037 DM	2037 DS
				2018 BASE YEAR	2022 DO MINIMUM	2022 DO SOMETHING	2037 DO MINIMUM	2037 DO SOMETHING	minus 2022 DM	minus 2022 DM	minus 2022 DM	minus 2037 DM
1	Ynysmaerdy Terrace	W	Gound	56.8	56.9	56.8	57.0	56.9	-0.1	0.0	0.1	-0.1
1	Ynysmaerdy Terrace	W	First	60.5	60.6	60.7	60.8	60.9	0.1	0.3	0.2	0.1
2	Ynysmaerdy Terrace	W	Gound	55.9	55.9	55.8	56.0	55.9	-0.1	0.0	0.1	-0.1
2	Ynysmaerdy Terrace	W	First	58.6	58.7	58.6	58.9	58.8	-0.1	0.1	0.2	-0.1
3	Ynysmaerdy Terrace	W	Gound	55.3	55.4	55.2	55.5	55.3	-0.2	-0.1	0.1	-0.2
3	Ynysmaerdy Terrace	W	First	57.2	57.3	57.3	57.4	57.4	0.0	0.1	0.1	0.0
4	Ynysmaerdy Terrace	W	Gound	54.8	54.8	54.7	54.9	54.8	-0.1	0.0	0.1	-0.1
4	Ynysmaerdy Terrace	W	First	56.3	56.4	56.3	56.6	56.5	-0.1	0.1	0.2	-0.1
5	Ynysmaerdy Terrace	W	Gound	53.4	53.5	53.5	53.6	53.6	0.0	0.1	0.1	0.0
5	Ynysmaerdy Terrace	W	First	54.7	54.8	54.8	54.9	54.9	0.0	0.1	0.1	0.0
6	Ynysmaerdy Terrace	W	Gound	52.9	53.0	53.0	53.1	53.1	0.0	0.1	0.1	0.0
6	Ynysmaerdy Terrace	W	First	54.0	54.1	54.1	54.2	54.2	0.0	0.1	0.1	0.0
7	Ynysmaerdy Terrace	W	Gound	52.0	52.0	52.0	52.1	52.1	0.0	0.1	0.1	0.0
7	Ynysmaerdy Terrace	W	First	53.0	53.1	53.0	53.2	53.1	-0.1	0.0	0.1	-0.1
8	Ynysmaerdy Terrace	W	Gound	51.9	51.9	51.8	52.0	51.9	-0.1	0.0	0.1	-0.1
8	Ynysmaerdy Terrace	W	First	52.9	52.9	52.9	53.1	53.0	0.0	0.1	0.2	-0.1
9	Ynysmaerdy Terrace	W	Gound	51.4	51.4	51.3	51.5	51.4	-0.1	0.0	0.1	-0.1
9	Ynysmaerdy Terrace	W	First	52.2	52.2	52.2	52.3	52.3	0.0	0.1	0.1	0.0
10	Ynysmaerdy Terrace	W	Gound	51.2	51.2	51.2	51.3	51.3	0.0	0.1	0.1	0.0
10	Ynysmaerdy Terrace	W	First	51.9	52.0	52.0	52.1	52.1	0.0	0.1	0.1	0.0
11	Ynysmaerdy Terrace	N	Gound	56.3	56.4	56.2	56.6	56.4	-0.2	0.0	0.2	-0.2
11	Ynysmaerdy Terrace	N	First	59.4	59.5	59.4	59.7	59.7	-0.1	0.2	0.2	0.0
12	Ynysmaerdy Terrace	N	Gound	55.5	55.6	55.4	55.8	55.6	-0.2	0.0	0.2	-0.2
12	Ynysmaerdy Terrace	N	First	58.8	58.9	58.8	59.1	59.0	-0.1	0.1	0.2	-0.1
13	Ynysmaerdy Terrace	N	Gound	55.1	55.3	55.1	55.5	55.4	-0.2	0.1	0.2	-0.1
13	Ynysmaerdy Terrace	N	First	58.6	58.7	58.8	59.0	59.1	0.1	0.4	0.3	0.1
14	Ynysmaerdy Terrace	N	Gound	54.9	55.0	54.9	55.3	55.2	-0.1	0.2	0.3	-0.1
14	Ynysmaerdy Terrace	N	First	58.2	58.4	58.4	58.6	58.7	0.0	0.3	0.2	0.1
15	Ynysmaerdy Terrace	N	Gound	54.3	54.5	54.4	54.7	54.7	-0.1	0.2	0.2	0.0
15	Ynysmaerdy Terrace	N	First	57.5	57.7	57.8	57.9	58.1	0.1	0.4	0.2	0.2
16	Ynysmaerdy Terrace	N	Gound	54.1	54.3	54.3	54.5	54.5	0.0	0.2	0.2	0.0
16	Ynysmaerdy Terrace	N	First	57.1	57.3	57.6	57.5	57.8	0.3	0.5	0.2	0.3
17	Ynysmaerdy Terrace	N	Gound	53.8	54.0	54.2	54.2	54.4	0.2	0.4	0.2	0.2
17	Ynysmaerdy Terrace	N	First	56.7	56.8	57.3	57.1	57.6	0.5	0.8	0.3	0.5
18	Ynysmaerdy Terrace	N	Gound	53.6	53.7	53.9	54.0	54.1	0.2	0.4	0.3	0.1
18	Ynysmaerdy Terrace	N	First	56.2	56.3	56.6	56.6	56.9	0.3	0.6	0.3	0.3
19	Ynysmaerdy Terrace	N	Gound	54.0	54.1	54.4	54.4	54.6	0.3	0.5	0.3	0.2
19	Ynysmaerdy Terrace	N	First	56.9	57.1	57.6	57.3	57.8	0.5	0.7	0.2	0.5
20	Ynysmaerdy Terrace	N	Gound	53.4	53.5	53.7	53.8	54.0	0.2	0.5	0.3	0.2
20	Ynysmaerdy Terrace	N	First	56.1	56.3	56.6	56.5	56.9	0.3	0.6	0.2	0.4
21	Ynysmaerdy Terrace	NW	Gound	51.6	51.8	51.8	52.0	52.1	0.0	0.3	0.2	0.1
21	Ynysmaerdy Terrace	NW	First	54.7	54.9	54.9	55.2	55.2	0.0	0.3	0.3	0.0
22	Ynysmaerdy Terrace	NW	Gound	50.8	51.0	51.0	51.3	51.3	0.0	0.3	0.3	0.0
22	Ynysmaerdy Terrace	NW	First	53.6	53.8	53.9	54.1	54.1	0.1	0.3	0.3	0.0
23	Ynysmaerdy Terrace	W	Gound	49.2	49.3	49.5	49.6	49.8	0.2	0.5	0.3	0.2
23	Ynysmaerdy Terrace	W	First	51.1	51.3	51.5	51.6	51.7	0.2	0.4	0.3	0.1
24	Ynysmaerdy Terrace	W	Gound	47.4	47.6	47.7	47.9	47.9	0.1	0.3	0.3	0.0
24	Ynysmaerdy Terrace	W	First	49.5	49.6	49.8	49.9	50.0	0.2	0.4	0.3	0.1
25	Ynysmaerdy Terrace	W	Gound	46.1	46.3	46.6	46.6	46.9	0.3	0.6	0.3	0.3
25	Ynysmaerdy Terrace	W	First	48.0	48.2	48.7	48.5	48.9	0.5	0.7	0.3	0.4
26	Ynysmaerdy Terrace	W	Gound	44.9	45.1	45.5	45.5	45.7	0.4	0.6	0.4	0.2
26	Ynysmaerdy Terrace	W	First	47.1	47.3	47.8	47.6	48.1	0.5	0.8	0.3	0.5
27	Ynysmaerdy Terrace	W	Gound	43.5	43.7	44.4	44.0	44.6	0.7	0.9	0.3	0.6
27	Ynysmaerdy Terrace	W	First	45.7	45.9	46.7	46.3	47.0	0.8	1.1	0.4	0.7
28	Ynysmaerdy Terrace	W	Gound	43.5	43.7	44.4	44.0	44.6	0.7	0.9	0.3	0.6
28	Ynysmaerdy Terrace	W	First	45.7	45.9	46.7	46.2	46.9	0.8	1.0	0.3	0.7
1	Pembroke Crescent	NW	Gound	52.4	52.5	52.4	52.6	52.5	-0.1	0.0	0.1	-0.1
1	Pembroke Crescent	NW	First	53.6	53.7	53.6	53.8	53.7	-0.1	0.0	0.1	-0.1
2	Pembroke Crescent	NW	Gound	51.3	51.3	51.4	51.4	51.5	0.1	0.2	0.1	0.1
2	Pembroke Crescent	NW	First	52.6	52.6	52.7	52.7	52.8	0.1	0.2	0.1	0.1
3	Pembroke Crescent	W	Gound	49.1	49.2	49.4	49.3	49.4	0.2	0.2	0.1	0.1
3	Pembroke Crescent	W	First	50.2	50.3	50.5	50.4	50.6	0.2	0.3	0.1	0.2
4	Pembroke Crescent	W	Gound	48.8	48.8	48.9	49.0	49.0	0.1	0.2	0.2	0.0
4	Pembroke Crescent	W	First	49.9	50.0	50.1	50.1	50.2	0.1	0.2	0.1	0.1
5	Pembroke Crescent	W	Gound	48.3	48.3	48.4	48.5	48.6	0.1	0.3	0.2	0.1
5	Pembroke Crescent	W	First	49.4	49.5	49.7	49.7	49.8	0.2	0.3	0.2	0.1
6	Pembroke Crescent	W	Gound	47.8	47.9	48.1	48.0	48.2	0.2	0.3	0.1	0.2
6	Pembroke Crescent	W	First	49.0	49.1	49.3	49.3	49.5	0.2	0.4	0.2	0.2
7	Pembroke Crescent	N	Gound	50.1	50.2	50.3	50.4	50.5	0.1	0.3	0.2	0.1
7	Pembroke Crescent	N	First	51.8	52.0	52.1	52.2	52.3	0.1	0.3	0.2	0.1
8	Pembroke Crescent	N	Gound	50.7	50.8	50.9	51.0	51.1	0.1	0.3	0.2	0.1
8	Pembroke Crescent	N	First	52.3	52.5	52.6	52.7	52.8	0.1	0.3	0.2	0.1
9	Pembroke Crescent	N	Gound	51.9	52.0	52.1	52.2	52.3	0.1	0.3	0.2	0.1
9	Pembroke Crescent	N	First	53.5	53.6	53.7	53.8	53.9	0.1	0.3	0.2	0.1
10	Pembroke Crescent	N	Gound	50.8	51.0	51.1	51.1	51.3	0.1	0.3	0.1	0.2
10	Pembroke Crescent	N	First	52.4	52.6	52.7	52.8	52.9	0.1	0.3	0.2	0.1
11	Pembroke Crescent	NE	Gound	51.5	51.6	51.7	51.8	51.9	0.1	0.3	0.2	0.1
11	Pembroke Crescent	NE	First	52.9	53.0	53.1	53.2	53.3	0.1	0.3	0.2	0.1
12	Pembroke Crescent	NE	Gound	51.8	52.0	52.0	52.1	52.2	0.0	0.2	0.1	0.1
12	Pembroke Crescent	NE	First	53.1	53.3	53.4	53.5	53.6	0.1	0.3	0.2	0.1

**KEY:**  
 Denotes the locations that had actual site measurements

**SCHEDULE 1**  
**NOISE INSULATION (AMENDMENT) REGULATIONS 1988**  
**CALCULATED NOISE LEVELS**

NO	PROPERTY	FAÇADE	FLOOR	CALCULATED L10 NOISE LEVELS					2022 DS minus 2022 DM	2032 DS minus 2022 DM	2037 DM minus 2022 DM	2037 DS minus 2037 DM
				2018 BASE YEAR	2022 DO MINIMUM	2022 DO SOMETHING	2037 DO MINIMUM	2037 DO SOMETHING				
13A	Pembroke Crescent	W	Gound	42.7	42.8	43.8	43.2	44.0	1.0	1.2	0.4	0.8
13A	Pembroke Crescent	W	First	45.0	45.2	46.1	45.5	46.4	0.9	1.2	0.3	0.9
13B	Pembroke Crescent	W	Gound	42.5	42.7	43.6	43.0	43.9	0.9	1.2	0.3	0.9
13B	Pembroke Crescent	W	First	45.1	45.3	46.2	45.6	46.4	0.9	1.1	0.3	0.8
1	Glan-yr-Ely	SE	Gound	49.8	49.8	49.8	49.9	49.9	0.0	0.1	0.1	0.0
1	Glan-yr-Ely	SE	First	51.0	51.1	51.0	51.2	51.2	-0.1	0.1	0.1	0.0
2	Glan-yr-Ely	SE	Gound	55.5	55.6	55.6	55.9	55.8	0.0	0.2	0.3	-0.1
2	Glan-yr-Ely	SE	First	57.1	57.3	57.3	57.5	57.5	0.0	0.2	0.2	0.0
10	Glan-yr-Ely	N	Gound	53.4	53.5	53.5	53.8	53.8	0.0	0.3	0.3	0.0
10	Glan-yr-Ely	N	First	55.8	55.9	55.9	56.2	56.1	0.0	0.2	0.3	-0.1
11	Glan-yr-Ely	W	Gound	46.0	46.1	46.1	46.3	46.3	0.0	0.2	0.2	0.0
11	Glan-yr-Ely	W	First	47.7	47.8	47.8	48.0	48.0	0.0	0.2	0.2	0.0
12	Glan-yr-Ely	W	Gound	47.4	47.5	47.5	47.8	47.7	0.0	0.2	0.3	-0.1
12	Glan-yr-Ely	W	First	48.9	49.0	49.0	49.2	49.2	0.0	0.2	0.2	0.0
13	Glan-yr-Ely	W	Gound	46.0	46.1	46.0	46.3	46.2	-0.1	0.1	0.2	-0.1
13	Glan-yr-Ely	W	First	47.6	47.8	47.7	48.0	47.9	-0.1	0.1	0.2	-0.1
14	Glan-yr-Ely	W	Gound	47.1	47.2	47.1	47.4	47.3	-0.1	0.1	0.2	-0.1
14	Glan-yr-Ely	W	First	48.6	48.7	48.6	48.9	48.8	-0.1	0.1	0.2	-0.1
15	Glan-yr-Ely	N	Gound	52.8	52.9	52.8	53.0	53.0	-0.1	0.1	0.1	0.0
15	Glan-yr-Ely	N	First	54.5	54.6	54.6	54.8	54.8	0.0	0.2	0.2	0.0
16	Glan-yr-Ely	N	Gound	53.4	53.5	53.4	53.6	53.6	-0.1	0.1	0.1	0.0
16	Glan-yr-Ely	N	First	55.1	55.2	55.1	55.4	55.3	-0.1	0.1	0.2	-0.1
23	Elwyn Street	S	Gound	67.7	67.8	67.8	67.9	68.0	0.0	0.2	0.1	0.1
23	Elwyn Street	S	First	67.7	67.8	67.8	67.9	68.0	0.0	0.2	0.1	0.1
25	Elwyn Street	S	Gound	65.6	65.7	65.7	65.9	65.9	0.0	0.2	0.2	0.0
25	Elwyn Street	S	First	66.2	66.3	66.3	66.5	66.5	0.0	0.2	0.2	0.0
26	Elwyn Street	S	Gound	64.4	64.4	64.5	64.6	64.7	0.1	0.3	0.2	0.1
26	Elwyn Street	S	First	65.6	65.6	65.7	65.8	65.9	0.1	0.3	0.2	0.1
-	Site survey at 26 Elwyn Steert	-	Ground	63.1	63.2	63.3	63.3	63.4	0.1	0.2	0.1	0.1
-	Pantglas Farm, Cae Pantglas	N	Gound	60.7	60.9	61.5	61.1	61.7	0.6	0.8	0.2	0.6
-	Pantglas Farm, Cae Pantglas	N	First	63.9	64.1	65.3	64.3	65.5	1.2	1.4	0.2	1.2
-	Cerrid Llwyd, Cae Pantglas	N	Gound	61.7	61.9	62.1	62.1	62.3	0.2	0.4	0.2	0.2
-	Cerrid Llwyd, Cae Pantglas	N	First	65.7	66.0	67.2	66.1	67.5	1.2	1.5	0.1	1.4
-	Awelfryn, Cae Pantglas (Front View)	E	Gound	61.8	62.0	61.0	62.2	61.3	-1.0	-0.7	0.2	-0.9
-	Awelfryn, Cae Pantglas (Front View)	E	First	63.9	64.2	63.4	64.3	63.6	-0.8	-0.6	0.1	-0.7
-	Awelfryn, Cae Pantglas (Side View)	N	Gound	61.5	61.8	60.9	61.9	61.2	-0.9	-0.6	0.1	-0.7
-	Awelfryn, Cae Pantglas (Side View)	N	First	64.1	64.3	64.2	64.5	64.4	-0.1	0.1	0.2	-0.1
3	Glan-yr-Ely	E	Gound	50.2	50.2	50.1	50.4	50.2	-0.1	0.0	0.2	-0.2
3	Glan-yr-Ely	E	First	52.4	52.5	52.3	52.7	52.5	-0.2	0.0	0.2	-0.2
4	Glan-yr-Ely	E	Gound	50.3	50.5	50.4	50.6	50.5	-0.1	0.0	0.1	-0.1
4	Glan-yr-Ely	E	First	52.6	52.8	52.7	53.0	52.9	-0.1	0.1	0.2	-0.1
5	Glan-yr-Ely	E	Gound	50.6	50.7	50.6	50.9	50.8	-0.1	0.1	0.2	-0.1
5	Glan-yr-Ely	E	First	53.0	53.1	53.0	53.3	53.2	-0.1	0.1	0.2	-0.1
6	Glan-yr-Ely	E	Gound	47.7	47.8	47.7	48.0	47.9	-0.1	0.1	0.2	-0.1
6	Glan-yr-Ely	E	First	49.6	49.7	49.6	49.9	49.7	-0.1	0.0	0.2	-0.2
7	Glan-yr-Ely	N	Gound	55.6	55.8	55.8	56.0	56.0	0.0	0.2	0.2	0.0
7	Glan-yr-Ely	N	First	59.1	59.3	59.3	59.5	59.5	0.0	0.2	0.2	0.0
8	Glan-yr-Ely	N	Gound	54.8	54.9	54.9	55.2	55.2	0.0	0.3	0.3	0.0
8	Glan-yr-Ely	N	First	58.0	58.2	58.1	58.4	58.4	-0.1	0.2	0.2	0.0
9	Glan-yr-Ely	N	Gound	53.8	54.0	54.0	54.3	54.2	0.0	0.2	0.3	-0.1
9	Glan-yr-Ely	N	First	56.6	56.8	56.8	57.0	57.0	0.0	0.2	0.2	0.0
-	Dyffryn-isaf	S	Gound	60.6	60.8	61.8	61.0	62.1	1.0	1.3	0.2	1.1
-	Dyffryn-isaf	S	First	65.2	65.5	67.4	65.7	67.7	1.9	2.2	0.2	2.0
-	Signalmans Cottage	N	Gound	60.8	61.0	63.0	61.2	63.2	2.0	2.2	0.2	2.0
-	Signalmans Cottage	N	First	62.7	62.9	65.1	63.1	65.4	2.2	2.5	0.2	2.3
-	Pantglas Farm Annex	N	Gound	61.0	61.2	61.6	61.4	61.8	0.4	0.6	0.2	0.4
-	Pantglas Farm Annex	N	First	63.0	63.3	64.2	63.4	64.4	0.9	1.1	0.1	1.0
91	Ansari Court	W	Gound	47.8	47.9	47.9	48.2	48.1	0.0	0.2	0.3	-0.1
91	Ansari Court	W	First	50.1	50.2	50.2	50.4	50.4	0.0	0.2	0.2	0.0
92	Ansari Court	N	Gound	50.2	50.4	50.3	50.6	50.6	-0.1	0.2	0.2	0.0
92	Ansari Court	N	First	52.9	53.0	53.0	53.3	53.2	0.0	0.2	0.3	-0.1
93	Ansari Court	N	Gound	61.2	61.4	61.4	61.7	61.7	0.0	0.3	0.3	0.0
93	Ansari Court	N	First	63.0	63.1	63.1	63.4	63.4	0.0	0.3	0.3	0.0
94	Ansari Court	N	Gound	61.8	62.0	62.0	62.2	62.2	0.0	0.2	0.2	0.0
94	Ansari Court	N	First	63.3	63.4	63.4	63.7	63.7	0.0	0.3	0.3	0.0
95	Ansari Court	N	Gound	61.8	62.0	62.0	62.2	62.2	0.0	0.2	0.2	0.0
95	Ansari Court	N	First	63.7	63.8	63.8	64.1	64.1	0.0	0.3	0.3	0.0
96	Ansari Court	N	Gound	61.2	61.3	61.3	61.6	61.6	0.0	0.3	0.3	0.0
96	Ansari Court	N	First	63.8	64.0	64.0	64.2	64.2	0.0	0.2	0.2	0.0

**KEY:**  
 Denotes the locations that had actual site measurements

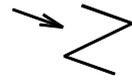
# Appendix E

## Noise Contour Plans

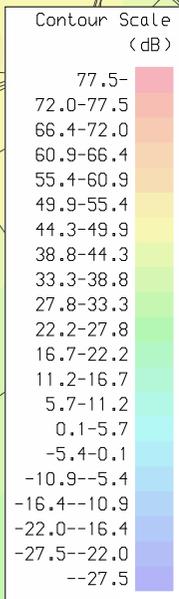
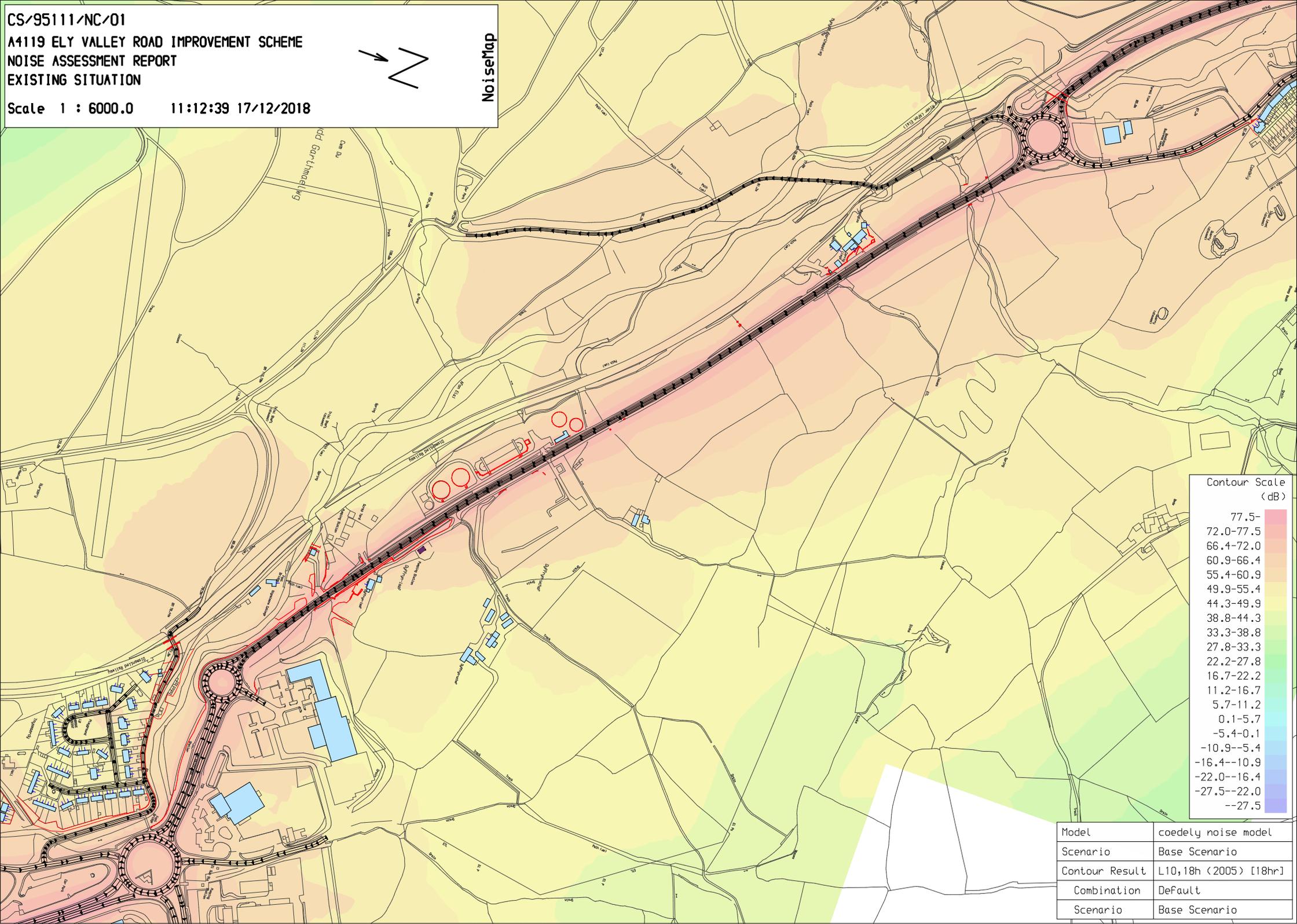
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CS/95111/NC/01  
 A4119 ELY VALLEY ROAD IMPROVEMENT SCHEME  
 NOISE ASSESSMENT REPORT  
 EXISTING SITUATION

Scale 1 : 6000.0 11:12:39 17/12/2018



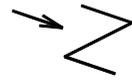
NoiseMap



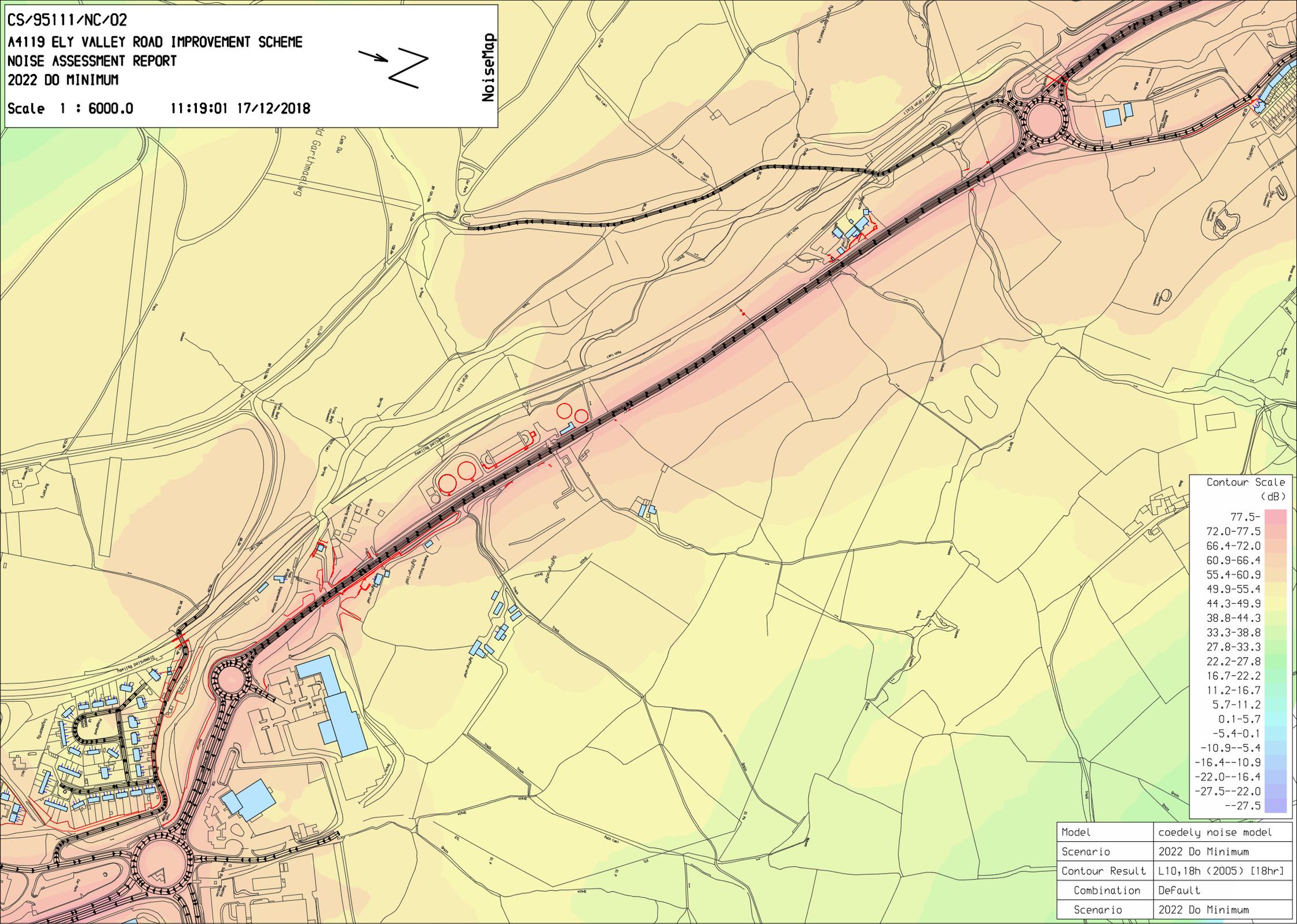
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Scenario	Base Scenario
Contour Result	L10,18h (2005) [18hr]
Combination	Default
Scenario	Base Scenario

CS/95111/NC/02  
 A4119 ELY VALLEY ROAD IMPROVEMENT SCHEME  
 NOISE ASSESSMENT REPORT  
 2022 DO MINIMUM

Scale 1 : 6000.0 11:19:01 17/12/2018



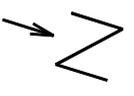
NoiseMap



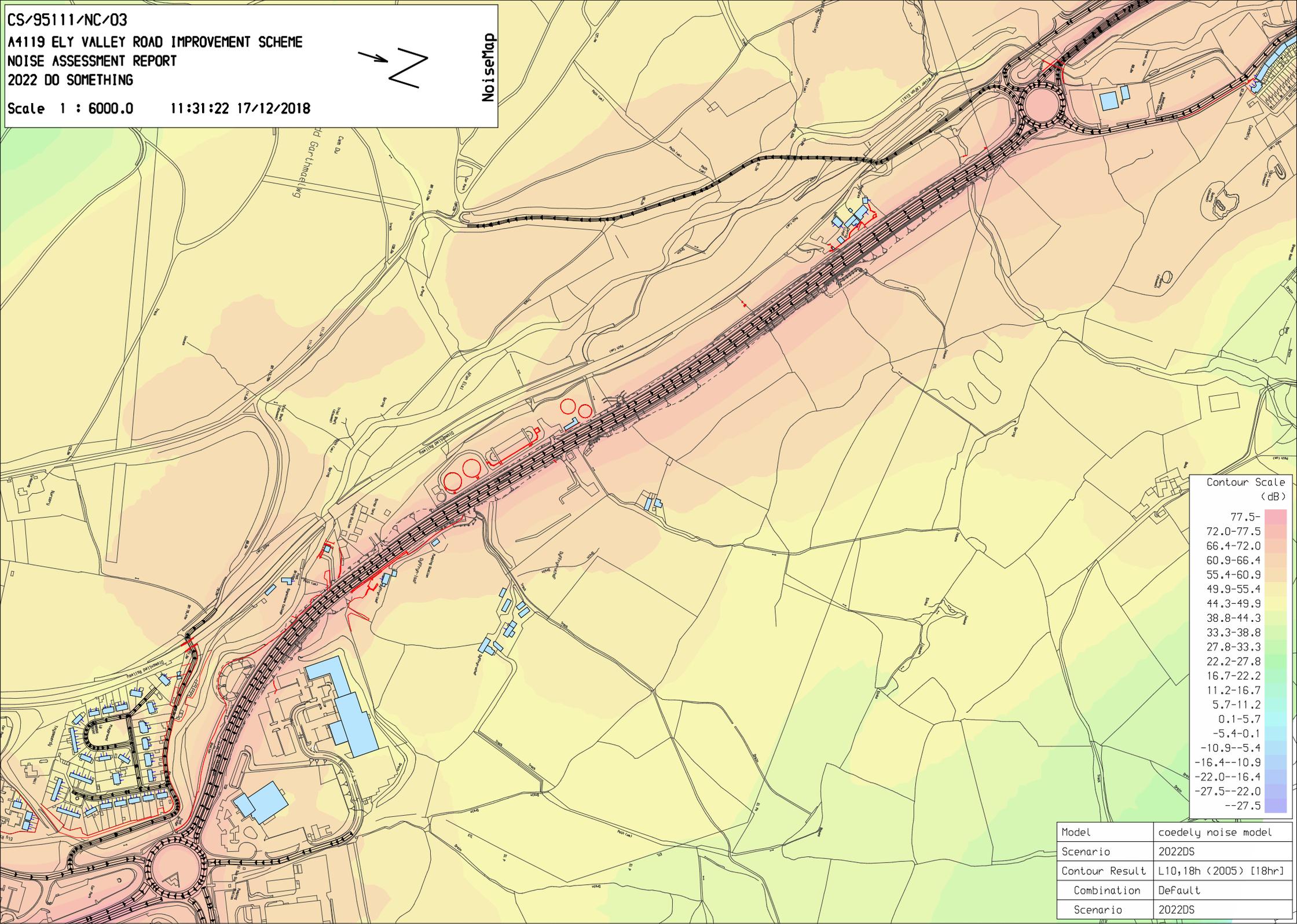
Contour Scale (dB)

77.5-
72.0-77.5
66.4-72.0
60.9-66.4
55.4-60.9
49.9-55.4
44.3-49.9
38.8-44.3
33.3-38.8
27.8-33.3
22.2-27.8
16.7-22.2
11.2-16.7
5.7-11.2
0.1-5.7
-5.4-0.1
-10.9--5.4
-16.4--10.9
-22.0--16.4
-27.5--22.0
--27.5

Model	coedely noise model
Scenario	2022 Do Minimum
Contour Result	L10,18h <2005> [18hr]
Combination	Default
Scenario	2022 Do Minimum



NoiseMap



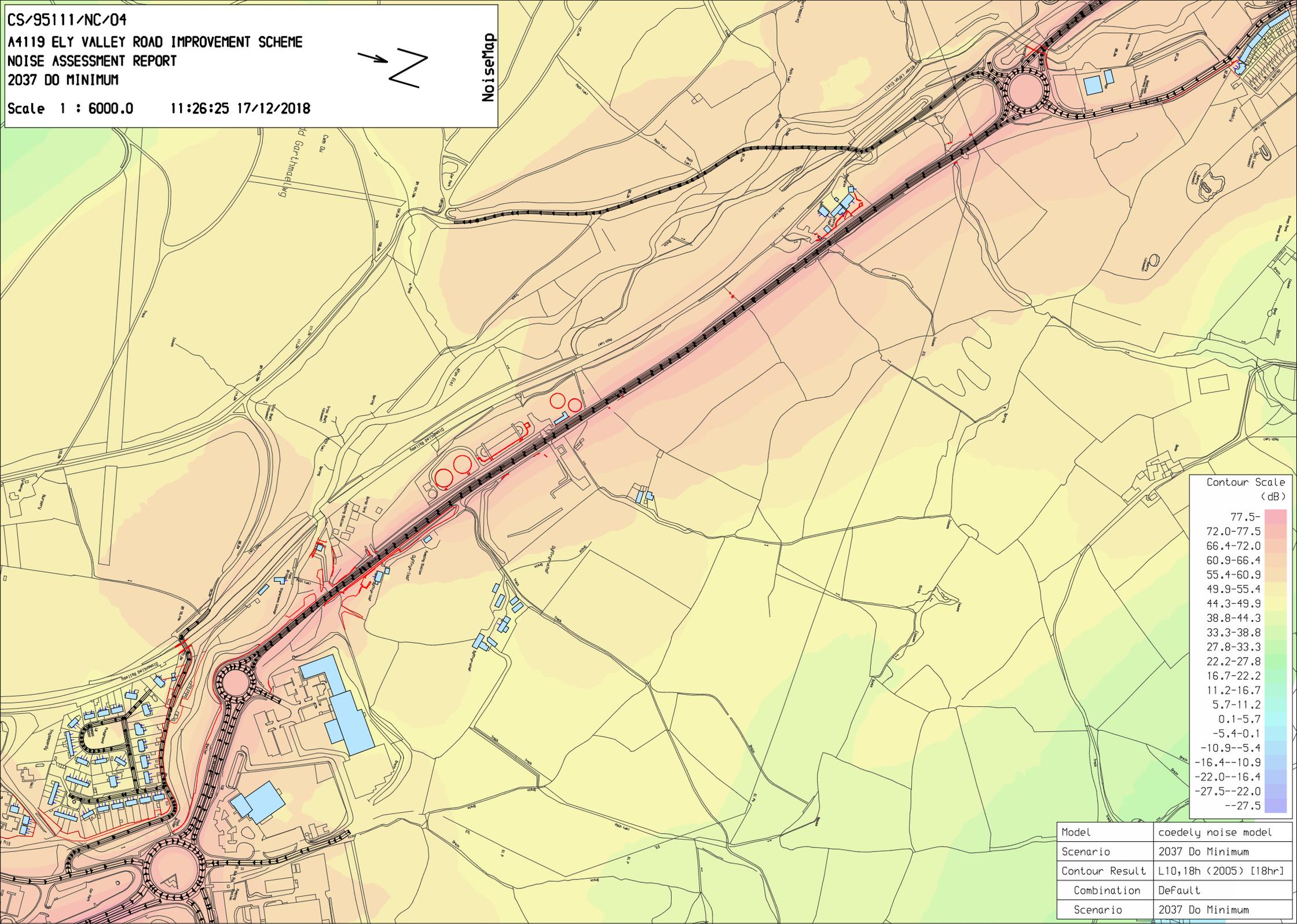
Contour Scale (dB)

77.5-
72.0-77.5
66.4-72.0
60.9-66.4
55.4-60.9
49.9-55.4
44.3-49.9
38.8-44.3
33.3-38.8
27.8-33.3
22.2-27.8
16.7-22.2
11.2-16.7
5.7-11.2
0.1-5.7
-5.4-0.1
-10.9--5.4
-16.4--10.9
-22.0--16.4
-27.5--22.0
--27.5

Model	coedely noise model
Scenario	2022DS
Contour Result	L10,18h <2005> [18hr]
Combination	Default
Scenario	2022DS



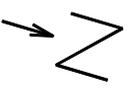
NoiseMap



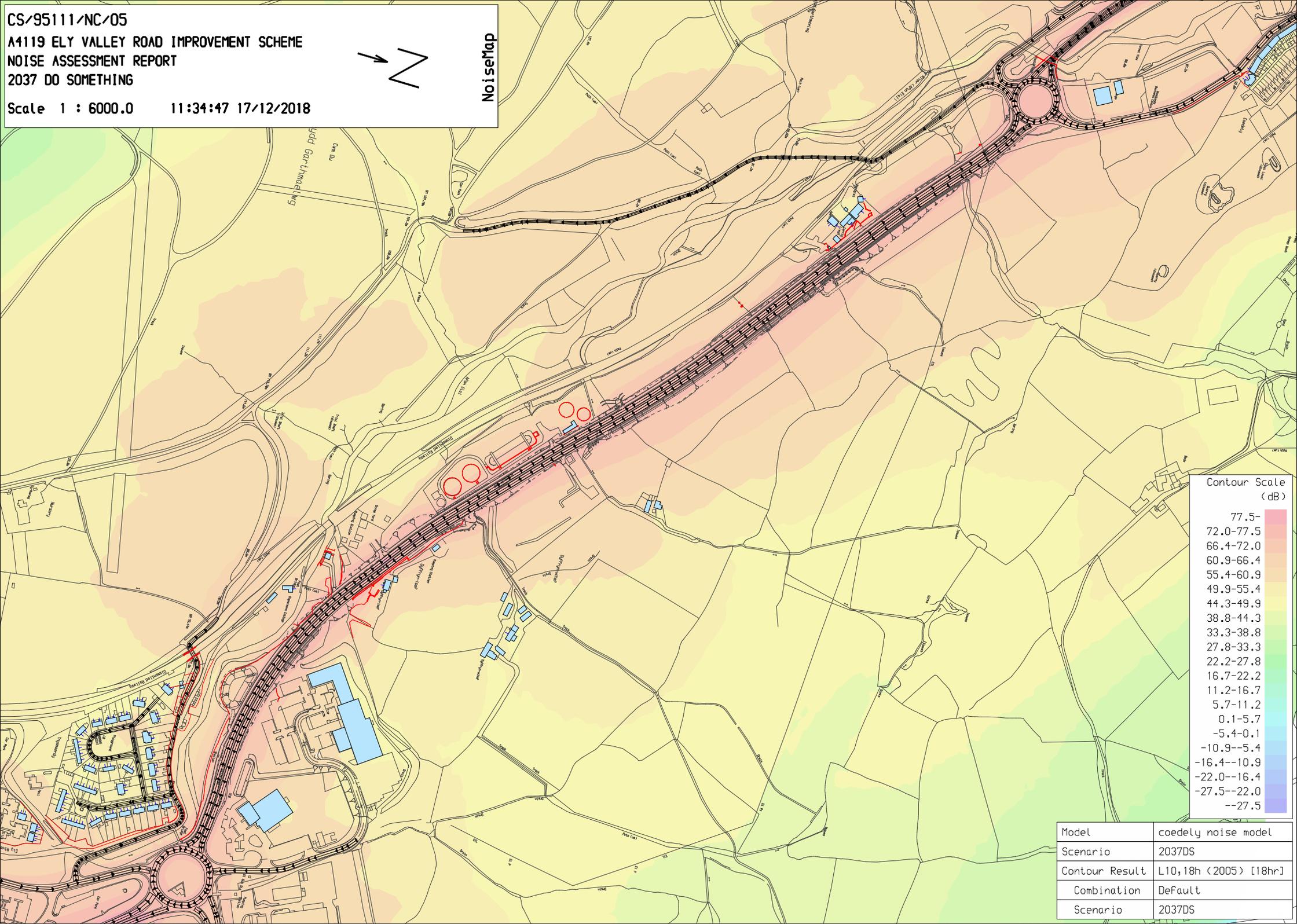
Contour Scale (dB)

77.5-
72.0-77.5
66.4-72.0
60.9-66.4
55.4-60.9
49.9-55.4
44.3-49.9
38.8-44.3
33.3-38.8
27.8-33.3
22.2-27.8
16.7-22.2
11.2-16.7
5.7-11.2
0.1-5.7
-5.4-0.1
-10.9--5.4
-16.4--10.9
-22.0--16.4
-27.5--22.0
--27.5

Model	coedely noise model
Scenario	2037 Do Minimum
Contour Result	L10,18h <2005> [18hr]
Combination	Default
Scenario	2037 Do Minimum



NoiseMap



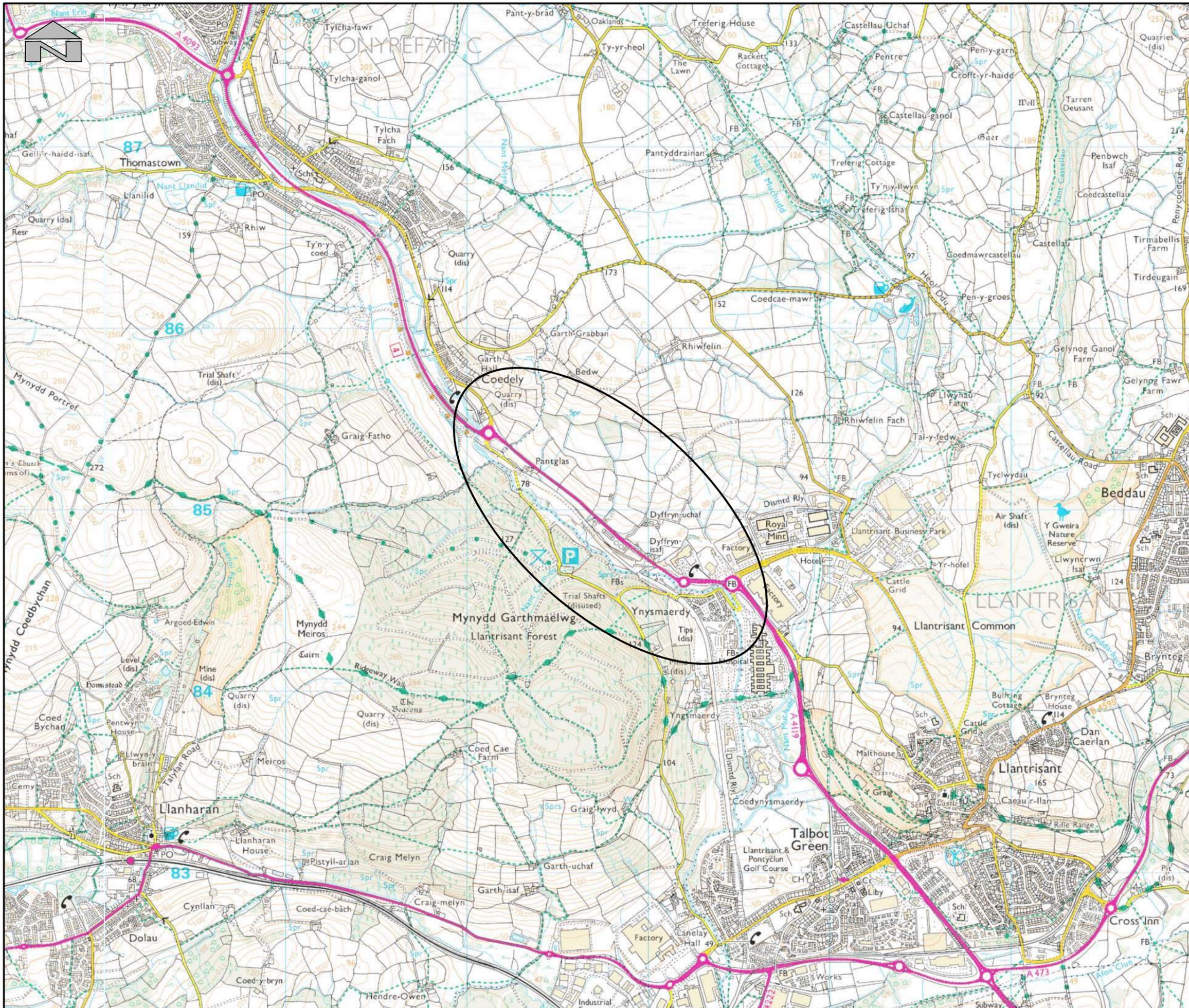
Contour Scale (dB)

77.5-
72.0-77.5
66.4-72.0
60.9-66.4
55.4-60.9
49.9-55.4
44.3-49.9
38.8-44.3
33.3-38.8
27.8-33.3
22.2-27.8
16.7-22.2
11.2-16.7
5.7-11.2
0.1-5.7
-5.4-0.1
-10.9--5.4
-16.4--10.9
-22.0--16.4
-27.5--22.0
--27.5

Model	coedely noise model
Scenario	2037DS
Contour Result	L10,18h <2005> [18hr]
Combination	Default
Scenario	2037DS

# Drawings

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Key:



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Rev	NP	Drawn	Chkd	App'd	Description	Date

Purpose of Issue  
**S2 - Suitable for information**

Classification  
**Commercial in Confidence**

Client



Project  
**A4119 Ely Valley Road Improvement Scheme  
 Coedely  
 Noise Assessment Report**

Drawing  
**Location Plan**

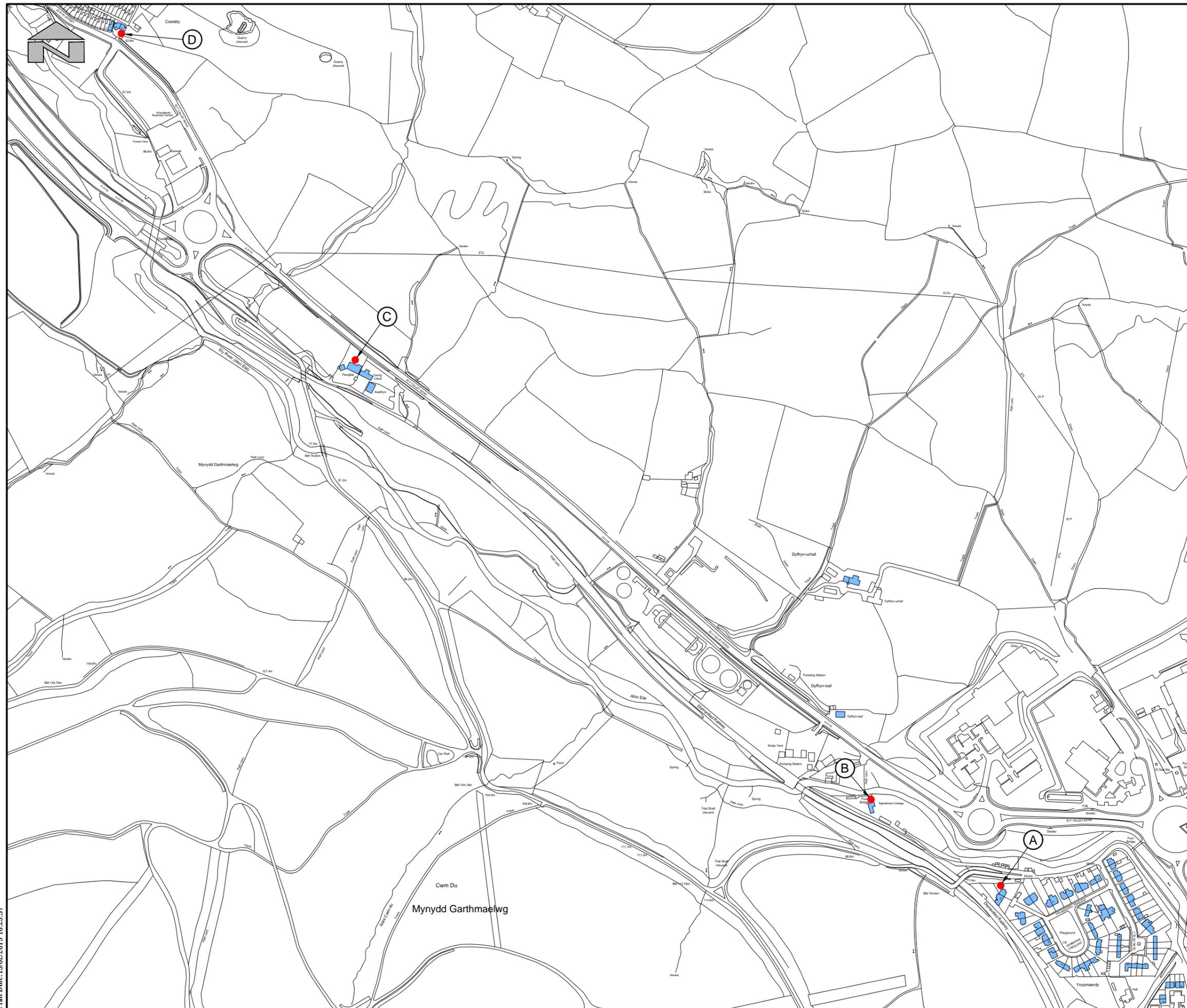
Scale @ A3	Drawn	Checked	Approved
NTS	NP	YKW	GBW

Project No.	Date
CS/95111	23/08/2018

Drawing Identifier	BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number	rev
EVRI-RED-76-XX-DR-C-0100	P01



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- Key**
- Properties Assessed
  - 18 hour Noise survey location

**Notes:**

- Survey information:**
- \* Microphone positioned at 1.2m high
  - \* Wind speed of less than or equal to 10 m/s
  - \* Survey period - 4 x 18 hour duration

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Rev	Drawn	Chkd	Appd	Description	Date
P01	NP				

Purpose of Issue  
**S2 - Suitable for information**

Classification  
**Commercial in Confidence**



Project  
**A4119 Ely Valley Road Improvement Scheme  
Coedely  
Noise Assessment Report**

Drawing  
**Noise Measurement Locations  
and Properties Assessed**

Scale @ A3	Drawn	Checked	Approved
1:5000	NP	YKW	GBW

Project No.	Date
CS/95111	23/08/2018

Drawing Identifier	BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number	rev
EVRI-RED-76-XX-DR-C-0101	P01



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Rev	Drawn	Chkd	App'd	Description	Date
P01	NP				

Purpose of Issue  
**S2 - Suitable for information**

Classification  
**Commercial in Confidence**



Project  
**A4119 Ely Valley Road Improvement Scheme  
 Coedely  
 Noise Assessment Report**

Drawing  
**Year 2018, 2022 & 2037  
 Do Minimum**

Scale @ A3	Drawn	Checked	Approved
1:5000	YKW	GBW	GBW

Project No.	Date
CS/95111	12/12/2018

Drawing Identifier	BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number	rev
<b>EVRI-RED-76-XX-DR-C-0001</b>	<b>P01</b>



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Rev	Drawn	Chkd	App'd	Description	Date
P01	NP				

Purpose of Issue  
**S2 - Suitable for information**

Classification  
**Commercial in Confidence**



Project  
**A4119 Ely Valley Road Improvement Scheme  
 Coedely  
 Noise Assessment Report**

Drawing  
**Year 2022 & 2037  
 Do Something**

Scale @ A3	Drawn	Checked	Approved
1:5000	YKW	GBW	GBW

Project No.	Date
CS/95111	12/12/2018

Drawing Identifier	BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number	rev
<b>EVRI-RED-76-XX-DR-C-0002</b>	<b>P01</b>



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