# TECHNICAL APPENDIX 9.2: CONSTRUCTION NOISE ASSESSMENT

## 9.2.1 Introduction

9.2.1.1 This note presents a noise impact assessment for construction works associated with the proposed M9 Winchburgh Junction.

9.2.1.2 This work was undertaken by Lukasz Jakielaszek (MIOA).

9.2.1.3 The proposed works will include a construction of four slip roads either side of M9 to create an on and off motorway connection in all directions, a construction of two roundabouts either side of M9, and a slight diversion of the B8020 to the north of M9. The diversion of the B8020 is up to 30 m to the east of the existing alignment; approximately 250 m of the road will be realigned.

9.2.1.4 There were three Noise Sensitive Receptors (NSRs) identified (refer to Chapter 9: Noise in Volume 2). The nearest distances of each of the NSR to the proposed construction works are identified in Table TA9.1.1. The NSRs and alignment of the proposed scheme are shown graphically in Figure A1 within this document.

**Table TA9.1.1: Distance of NSRs to construction works**

| ID | Receptor | Minimum Distance |
|---|---|---|
| R1 | Duntarvie Castle | 100 m |
| R2 | The Myre Farm | 270 m |
| R3 | Niddry Mains House | 480 m |

9.2.1.5 It is expected that the construction works will include:

- Earthworks either side of the existing M9 carriageways to create the slip roads;
- Breaking existing road surfaces;
- Spreading chipping and fill;
- Rolling and compaction; and
- Paving.

9.2.1.6 It is assumed that piling will not be required.

9.2.1.7 No construction traffic data is available currently.

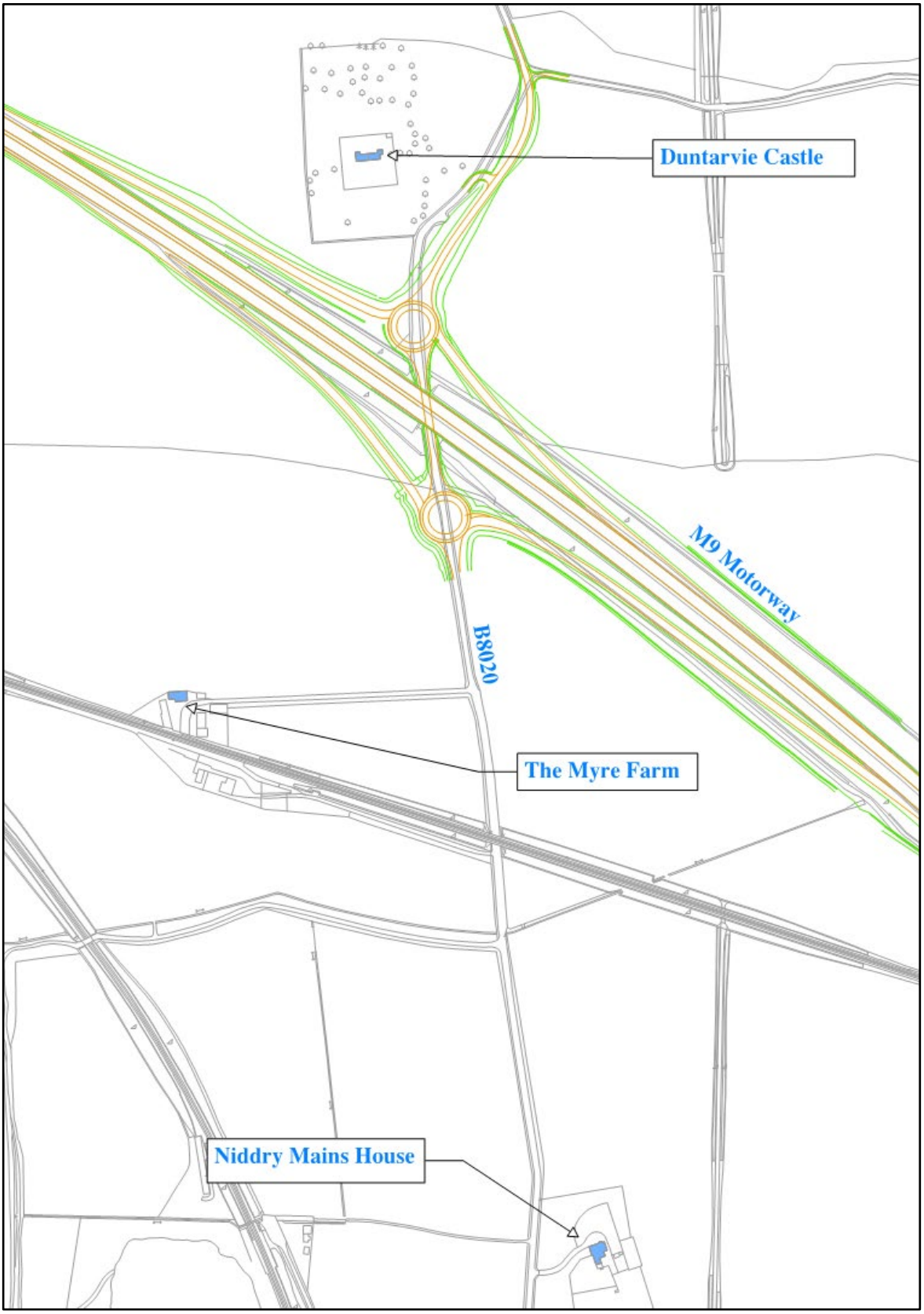


**Figure A1: Location of Noise Sensitive Receptors**

### 9.2.2 Assessment Method

9.2.2.1 Construction noise impacts are typically assessed in accordance with a method described in British Standard 5228-1:2008+A1:2014[1]. The method defines a single value noise level criterion for construction noise that should not be exceeded for a 12 hours daytime (07:00 - 19:00) period. Criteria for other periods are also specified. The criteria are established relative to the prevailing ambient noise level at any NSR. The essence of setting out the threshold values is that the total noise level, construction noise plus the pre-construction ambient level does not exceed the pre-construction ambient level by more than 5dB, with a lower threshold of 65dB(A) for daytime period.

9.2.2.2 Pre-construction noise levels were measured in proximity of the NSRs, usually 10 m from the B8020, and they were predicted at 1 m from the building façades for the purpose of operational noise assessment presented in Chapter 9: Noise in Volume 2. Road traffic noise levels predicted at NSRs are considered representative of the pre-construction ambient noise levels, as they consider the attenuation with distance between the road and receptor location. The predated noise levels presented in the ES are expressed in terms of LA10, 18hour. To convert between road traffic noise expressed in LA10, 18hour and ambient noise level expressed in LAeq, 12hour, a subtraction of 2dB is commonly applied. With such a conversion, it is evident that pre-exiting ambient noise levels at NSRs are no greater than 60dBLAeq, 12hour, therefore lower threshold of 65dB will applied for the construction noise assessment at all assessment locations.

9.2.2.3 Noise emission levels were determined based on values presented in BS5228. A detailed list of derived activity noise levels is shown in Table TA9.1.2. Contractor's schedule of equipment was not available at the stage of this assessment, therefore selection of equipment for the purpose of noise level calculations was made based on professional judgement. When more than one item of equipment was listed in Annex C of BS5228-1, it was not always the item with the highest noise emission that was selected.

9.2.2.4 For each construction stage identified in 9.2.1.5, overall activity level was calculated considering item noise emissions, its on-time and number of items. Predictions of noise at receptor locations were made using propagation formula F.2 of BS5228-1:

$$\text{Distance attenuation} = (25 * \log10(R/10) - 2 \text{ [dB]}$$

*where R is distance in metres.*

### 9.2.3 Assessment of Predicted Noise Levels

9.2.3.1 Predicted noise levels are presented in Table TA9.1.2. These represent the highest 12-hour daily levels because calculations of noise propagation assumed the minimum separation distance between receptors and construction work areas.

[1] British Standards Institute, 2008 (amended 2014). BS 5228-1[1]:2008+A1:2014 Code of practice for noise and vibration control on construction and open sites.

| Table TA9.1.2: Prediction Construction Noise Levels at NSRs | | | | |
|---|---|---|---|---|
| Activity | Activity level at 10m, dBLAeq,12-hour | Construction noise level, $dBL_{Aeq,12\text{-}hour}$ | | |
| | | R1 | R2 | R3 |
| Earthworks | 85 | 62 | 52 | 45 |
| Breaking of existing surface | 81 | 58 | 47 | 41 |
| Spreading chipping | 80 | 57 | 46 | 40 |
| Rolling and compaction | 81 | 58 | 47 | 41 |
| Paving | 81 | 58 | 47 | 41 |

9.2.3.2 Results show that receptor R1, Duntarvie Castle, is predicted to experience the highest construction noise level due to its proximity to construction work areas. The predicted noise level is however below the adopted significance threshold of 65dBLAeq, 12-hour, therefore the construction noise is assessed to have **no significant impacts**.

9.2.3.3 The results of this assessment are not an indication that construction works are not a material consideration during planning process. Care must be taken during construction management phase to ensure the noise emissions of the selected equipment are adequate.

### 9.2.4 Conclusions

9.2.4.1 Assessment of construction noise resulted in no significant impacts.