



Harworth Estates

Proposed Development

Dearne Valley Parkway, Rockingham

Phase 1

Noise Assessment

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1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise assessment undertaken for employment use development on land at Dearne Valley Parkway, Rockingham.

This report considers the potential noise impact of the following potential noise sources:

- Building Services Plant
- Goods Deliveries
- Customer and Staff Car Parking
- Road Traffic Noise

A description of the existing noise environment in and around the site is provided. Noise surveys have been undertaken and the results used to verify predictions of the short-term and long-term effects of noise. The noise levels from the proposed development have been predicted at local representative receptors using CADNA noise modelling software which incorporates CRTN and ISO 9613 methodologies and calculations.

A list of acoustic terminology and abbreviations used in this report is provided in Appendix A and a set of location plans and noise contour plots relevant to the assessment are presented in Appendix B.

1.2 Legislative Context (England)

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in National Planning Policy Framework. With regard to noise and planning, NPPF contains the following 4 short statements (section 123):

- 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 conditions;
- 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.



The Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. With respect to noise, the NPPF Planning Practice Guidance (PPG) provides the following summary of the effects of noise exposure:

Table 1.1 Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No Specific Measures Required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent



2.0 Assessment Criteria

In order enable the assessment of the proposed development in terms of LOAEL and SOAEL, Table 2.1 presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from standards and design guidance:

BS 4142:1997, '*Rating Industrial Noise Affecting Mixed Residential and Industrial Areas*'

BS 8233:2014 '*Guidance on Sound insulation and noise reduction for buildings*'

World Health Organisation: '*Guidelines on Community Noise*'

For the purpose of this assessment, the target noise level criteria are noted in italics in the table below.

Table 2.1 Noise Level Criteria and Actions

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Adverse Effect	Building Services Plant	BS4142 Score of minus 10 or lower	No Action Required Complaints Relating To Plant Noise Unlikely
	Goods Deliveries/Car Parking / Combined Change in Noise	Noise levels less than: Living Rooms (daytime) – 30 dBL _{Aeq,16hours} External Amenity Space (daytime) – 50 dBL _{Aeq,16hours}	No Action Required Within BS8233 / WHO criteria
	Road Traffic	Increase in noise is Less than 1 dB	Magnitude of Change is Negligible (DMRB)
Lowest Observed Adverse Effect Level (LOAEL)	Building Services Plant	BS4142 Score of zero or higher	Mitigate to achieve: BS4142 Score of zero or lower
	Goods Deliveries/Car Parking / Combined Change in Noise	Noise levels less than: Bedrooms (night-time) – 30 dBL _{Aeq,8hours} Bedrooms (night-time) – 45 dBL _{Amax} Living Rooms (daytime) – 35 dBL _{Aeq,16hours} External Amenity Space (daytime) – 50 dBL _{Aeq,16hours}	No Action Required Within BS8233 / WHO criteria
	Road Traffic	Increase in noise is between 1 - 3 dB	Magnitude of Change is Minor (DMRB)
Significant Observed Adverse Effect Level (SOAEL)	Building Services Plant	BS4142 Score of plus 5 or higher	Mitigate to achieve: BS4142 Score of zero or lower



Effect Level	Assessment	Noise Level Criteria	Action / Justification
	Goods Deliveries/Car Parking / Combined Change in Noise	Noise levels exceed: Bedrooms (night-time) – 30 dBL _{Aeq,8hours} Bedrooms (night-time) – 45 dBL _{Amax} Living Rooms (daytime) – 40* dBL _{Aeq,16hours} External Amenity Space (daytime) – 55 dBL _{Aeq,16hours}	Mitigate to achieve: <i>Bedrooms – 30 dBL_{Aeq,8hours}</i> <i>Living Rooms – 40 dBL_{Aeq,16hours}</i> <i>External Amenity Space – 55 dBL_{Aeq,16hours}</i> Within BS8233 / WHO criteria * Values correspond with PPG24 Category B (15 dB open window reduction)
	Road Traffic	Increase in noise is between 3 - 5 dB	Magnitude of Change is Moderate (DMRB)
Unacceptable Observed Adverse Effect Level (UOAEI)	Building Services Plant	BS4142 Score of plus 10 or higher	Mitigate to achieve: BS4142 Score of zero or lower
	Goods Deliveries/Car Parking / Combined Change in Noise	Noise levels exceed: Living Rooms (daytime) – 57 dBL _{Aeq,16hours} Bedrooms (night-time) – 30 dBL _{Aeq,8hours}	Avoid Values correspond with PPG24 Category D (mixed sources), planning permission should normally be refused.
	Road Traffic	Increase in noise is greater than 5 dB	Magnitude of Change is Major (DMRB)

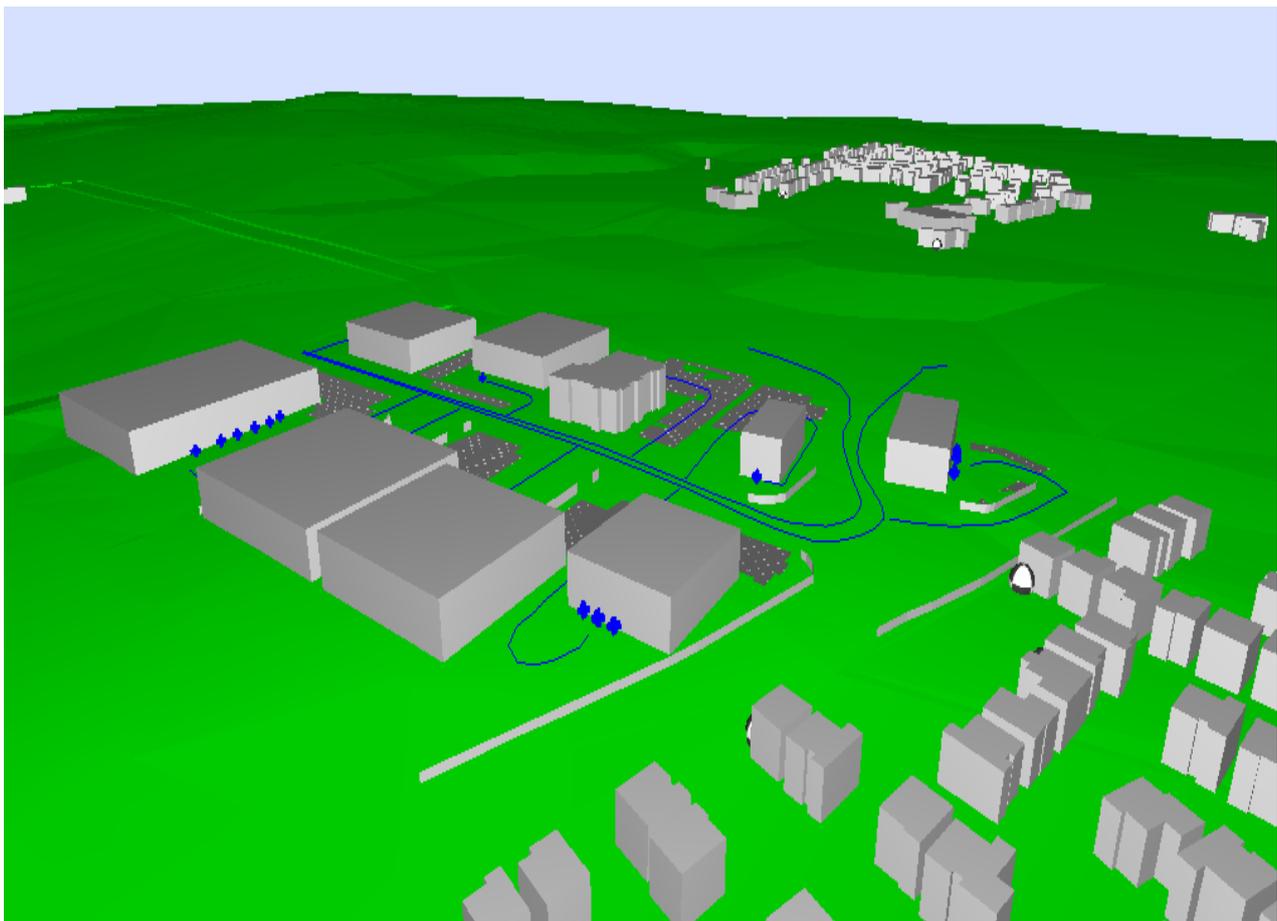


3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three dimensional noise modelling has been undertaken based on the monitoring data to predict source noise levels at a large number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on the Department of Transport Calculation of Road Traffic Noise (CRTN) and ISO 9613 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically.

Figure 3.1 CADNA Noise Model



The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data, assumptions and model settings as given in the table below have been used.



Table 3.1 Modelling Parameters Sources and Assumptions

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	The Harris Partnership Architects	Topographical Survey
Ground levels – other areas	Site Observations and Ordnance Survey	OS 1:25,000 contours and OS 50m spot heights.
Traffic data	Optima Highways	18hr AAWT flows with and without the development.
Building heights – around site	WYGE Observations	8 m height for two storey residential properties, and 4 m for Bungalows
Barrier heights	WYGE	1.8m as shown on Parameters Plan / 2.5m for service yard boundary treatments
Receptor positions	WYGE	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor properties.
Reflections	WYGE	First order reflections have been applied based on mirror image sources
Absorbent Ground	CADNA	Frequency dependant ground absorption has been applied based on values specified in VDI 2714/16 clause 6.3.
Façade Correction	CADNA	Façade corrections have been incorporated into the modelling
Proposed Plans	The Harris Partnership Architects	11462-111C Parameters Plan 11462-110F Proposed Site Plan 11462-111F Proposed Site Plan

It is acknowledged that a number of these assumptions will affect the overall noise levels presented in this report. However, it should be noted that certain assumptions made, as identified above, are worst case.



3.2 Model Input Data

3.2.1 HGV Delivery Event Noise Data

Noise of a delivery event has been known to vary from site to site by as much as 22 dB L_{Aeq} at 3 m distance even with the same vehicle type. Similarly, individual events using the same vehicle and at the same location have been recorded to vary by as much as 14 dB.

As such, the following worst-case calculations have been based on measurements of refrigerated, articulated HGVs delivering consumables. All measurements were undertaken in free-field conditions. In addition to noise from the unloading process, the levels used in the assessment include noise from the vehicle pulling up to the unloading bay, manoeuvring into position and then pulling away once unloading/loading is complete, together with other sources such as trolleys and reversing alarms.

The calculations are based on the number of events presented in Table 3.2. As the end users of the units are currently unknown, it is considered that the assessed scenarios for both daytime and night-time periods represent a worst case scenario with regard to the proposed uses. The assessment is based on an hourly breakdown of HGV movements from a regional distribution centre which was provided by Optima Highways. Noise modelling is based on the proposed site plan which provides an indication of how the development could be brought forward. The highest number of deliveries per hour during the night-time and the daytime periods has been assessed at Unit 5. For other uses, assumptions have been made in relation to the reduction in floorspace of the B1b,c / B8 units and other anticipated uses.

Table 3.2 Assumed worst case number of delivery events per hour

Unit (Reference on Parameters Plan)	Daytime (Each)	Night-time (Each)
1 (Fast Food Use: A3)	1	0
2 (Employment Use: B1b,c / B8)	3	0
3 (Employment Use: B1b,c / B8)	3	3
4 (Employment Use: B1b,c / B8)	8	5
5 (Employment Use: B1b,c / B8)	10	6
6 (Employment Use: B1b,c / B8)	3	3
7 (Employment Use: B1b,c / B8 or Hotel or Car Showroom or Sui Generis Use)	1	0
8 (Public House: A4 / A3)	1	0
9 (Employment Use: B1b,c or ancillary supporting use)	3	0



Delivery Vehicle Docking and Unloading

- *Daytime $L_{Aeq,1hr}$ Noise Level (1 event)*

5 minutes at L_p 75 dB at 3 m distance (vehicle arriving and manoeuvring)
 38 minutes at L_p 70 dB at 3 m distance (vehicle unloading)
 2 minutes at L_p 72 dB at 3 m distance (vehicle leaving)
 15 minutes of quiet (associated with documentation and waiting with engine off)

$$L_{Aeq, 1hr} = 10\log(1/60)(5\text{mins} \times 10^{0.1 \times 75\text{dB}} + 38\text{mins} \times 10^{0.1 \times 70\text{dB}} + 2\text{mins} \times 10^{0.1 \times 72\text{dB}})$$

$$= 69.8 \text{ dB at 3 m distance } [L_w = 89.5 \text{ dB}]$$

The number of point sources (69.8 dB at 3m each) reflect the assumptions made in Table 3.2.

- *L_{Amax} Noise levels*

L_{Amax} used is as 85.4dB at 3 m distance [$L_w = 102.9$ dB]

Delivery Vehicle Arriving/Exiting along service yard access road

The following calculations have been used to represent this as a line source in the model based on the number of deliveries outlined in Table 3.2.

- *Daytime $L_{Aeq,1hr}$ Noise Level (1 Delivery)*

1 x 10 seconds $L_p = 69.3$ dB at 3 m distance (vehicle arriving and leaving)

$$L_{Aeq(60 \text{ mins})} = 10\log(1/60)(10 \text{ sec} \times 10^{0.1 \times 69.3 \text{ dB}} + 10 \text{ sec} \times 10^{0.1 \times 69.3 \text{ dB}})$$

$$= 46.7 \text{ dB at 3 m distance}$$

- *L_{Amax} Noise levels*

L_{Amax} used is as 81.0 dB at 3 m distance [$L_w = 98.5$ dB]

3.2.2 Car Park Noise Data

Based on the proposed site plan, the car parking areas as presented on the Proposed Site Plan have been modelled as area sources. For the purposes of this assessment it is assumed that each car parking area is operating at full capacity across the whole site with all spaces in use during the daytime to ensure that the assessment is worst case. During the night-time period, the employment use within the Good Neighbour Zone (as outlined within the parameters plan) will be restricted to daytime operation. Additionally, the car parking areas during the night-time have been reduced within the fast food and public house zones to reflect the reduced usage during these periods. All other car parking zones have been modelled based on the daytime scenario to present a worst case.



3.2.3 Building Services Plant Noise Data

As the proposed layout and end users are not confirmed at this stage a detailed plant noise assessment cannot be undertaken. However, an assessment has been made with respect to the building layout as presented within the Proposed Site Plan which provides a realistic worst case scenario in relation to the location of units within proximity to the adjacent residential area.

Point sources have been defined in the model to represent potential roof mounted plant associated with the new store. The maximum sound pressure levels of the point sources at 3 and 10 metres were estimated in the model as a conditional maximum level that the noise levels at nearby receptors were predicted to meet the BS 4142 assessment criteria. Noise emission limits have been specified to ensure that plant noise rating levels (including a + 5 dB acoustic feature correction) are at or below existing daytime and night-time background noise levels.

3.2.4 Road Traffic Noise

Traffic flows and HGV percentages have been provided by Optima Highways & Transportation Consultants for the 'with' and 'without' development scenarios. Estimates of the vehicle speeds have been made based upon the speed restrictions currently in force in the area. The 18hr AAWT traffic data used within the model is presented in the table below.

Table 3.3 Traffic Data – 18 hr AAWT

Road	Without Development Scenario (2019)		With Development (2019)	
	Flow	HGV%	Flow	HGV%
A61 (South of Birdwell Roundabout)	38721	2	39292	2
Sheffield Road (west)	21190	3	21278	3
Sheffield Road (east)	13154	4	13232	4
A6195 (west of site)	22863	3	23661	3
Site Access	0	0	3260	2
A6195 (east of site)	23024	2	23605	2
A61 (South of Birdwell Roundabout)	38721	2	39292	2
Sheffield Road (west)	21190	3	21278	3



3.3 Sensitive Receptors

The table below summarises receptor locations that have been selected to represent worst-case residential receptors with respect to direct noise from the proposed delivery points to the industrial units. Ground and first floor facades (adjacent and facing the proposed development) of nearest properties have been represented. The locations of the receptors are shown on SK02 in Appendix B.

Table 3.4 Receptor Locations

Ref.	Description	Closest Source	Approximate Distance To Source (m)	Height (m)
R1	20 Lynham Avenue	Unit 2 Service Yard	65	1.5 / 4.0
R2	29 Alverley Way	Unit 2 Service Yard	50	1.5 / 4.0
R3	27 Alverley Way	Unit 2 Service Yard	48	1.5 / 4.0
R4	36 Alverley Way	Unit 2 Service Yard	44	1.5 / 4.0
R5	21 Locksley Gardens	Unit 9 Access	55	1.5 / 4.0
R6	47 Locksley Gardens	Unit 9 Access	26	1.5 / 4.0
R7	51 Locksley Gardens	Unit 9 Access	22	1.5 / 4.0
R8	3 Cross Keys Lane	Site access	230	1.5 / 4.0
R9	120 Tinker Lane	Site access	360	1.5 / 4.0
R10	34 Lynham Avenue	Unit 2 Service Yard	135	1.5/ 4.0

3.4 Tranquillity Rating

An assessment of the existing tranquillity level of the site has been based on the mapping data published by Campaign to Protect Rural England (CPRE). This uses a colour coded system and a 500m assessment grid for the whole of England, and a tranquillity rating of between 1 and 10 is assigned (1 being least tranquil and 10 being most). By reference to these maps the development is assessed as falling into Zones 4 - 5.



4.0 Noise Survey

4.1 Noise Survey Methodology

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on and around the site.

Equipment used during the survey included:

B&K 2260	Environmental Noise Analyser (WYG1)	s/n	2361273
B&K 2238	Environmental Noise Analyser (WYG9)	s/n	2684499
B&K 4231	Calibrator	s/n	2176211
Rion NL-32	Environmental Noise Analyser (WYG11)	s/n	123729
Rion NL-52	Environmental Noise Analyser (WYG14)	s/n	610212

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice and no drift was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

A baseline monitoring survey was undertaken at nine locations (as specified in the following table and shown in SK01 of Appendix B) from Friday 4th July 2014 to Tuesday 8th July 2014. Attended short term measurements were undertaken at six locations during the day, evening and night-time periods with three additional locations being measured unattended over an 89 hour period. The raw data collected from the long term monitoring is available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 *The Description and Measurement of Environmental Noise: Guide to quantities and procedures*. Weather conditions during the survey period were observed as being dry with scattered showers. Anemometer readings confirmed that wind speeds were less than 5 ms⁻¹ at all times during the survey with a predominant westerly wind direction.

Table 4.1 Noise Monitoring Locations

Ref	Description	Grid Reference	
		X	Y
LT1	Along western site boundary opposite 31 Alverley Way	434912	400918
LT2	Along western site boundary adjacent to properties off Locksley Gardens	434954	400768
LT3	On field boundary off Cross Keys Lane opposite 33 Regent Court	434910	400864
ST1	Outside 27 Alverley Way	434959	400721
ST2	At the end of Rockingham Row by field boundary, near to 53 Locksley Gardens	434894	401499
ST3	At junction of Hay Green Lane and Herons Way, opposite 'The Granary'	434870	400372



Ref	Description	Grid Reference	
		X	Y
ST4	By 33 Wood View on the A61	435588	400470
ST5	By 11 Church View	435577	400648
ST6	On path in field behind Rockingham Street	434912	400918

4.2 Noise Survey Results

Existing ambient noise levels around the site are dominated by vehicles using A6195 Dearne Valley Parkway and distant noise from the M1 and A61 to the west. To the north of the site, noise is also generated from vehicles using Hay Green Lane and Herons Way. To the east by Church View and in the neighbouring field noise levels were influenced by people using scooters and other small motorcycles.

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the L_{A10} index (i.e. the level exceeded for 10% of the measurement period).

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2×10^{-5} Pa).

Table 4.2 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekday Day 07:00 - 23:00	25 hours	04/07/2014 – 08/07/2014 18:33 – 10:58	LT1	51.7	88.7	38.0	51.0	46.9
Weekday Night 23:00 – 07:00	16 hours	04/07/2014 – 08/07/2014 23:03 – 06:58		49.3	66.6	28.7	48.7	43.4
Weekend Day 07:00 – 23:00	32 hours	05/07/2014 – 06/07/2014 07:03 – 22:58		49.3	73.4	36.8	49.5	46.0
Weekend Night 23:00 – 07:00	16 hours	05/07/2014 – 06/07/2014 23:03 – 23:58		45.8	77.4	28.7	46.7	41.0
Weekday Day 07:00 - 23:00	25 hours	04/07/2014 – 08/07/2014 18:16 – 10:46	LT2	52.2	79.8	35.3	52.4	47.4
Weekday Night 23:00 – 07:00	16 hours	04/07/2014 – 08/07/2014 23:01 – 06:56		48.7	70.1	26.9	48.6	41.6
Weekend Day 07:00 – 23:00	32 hours	05/07/2014 – 06/07/2014 07:01 – 22:56		48.7	76.3	35.5	49.3	44.9
Weekend Night 23:00 – 07:00	16 hours	05/07/2014 – 06/07/2014 23:01 – 23:56		47.3	69.8	27.3	48.3	40.7



Period	Duration (T)	Monitoring Date and Times	Location	L _{Aeq,T} (dB)	L _{Amax,T} (dB)	L _{Amin,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
Weekday Day 07:00 - 23:00	25 hours	04/07/2014 – 08/07/2014 19:00 – 10:30	LT3	56.4	93.9	40.5	55.6	51.8
Weekday Night 23:00 – 07:00	16 hours	04/07/2014 – 08/07/2014 23:00 – 06:55		52.7	79.1	36.7	52.2	47.3
Weekend Day 07:00 - 23:00	32 hours	05/07/2014 – 06/07/2014 07:00 – 23:00		57.0	89.3	41.4	57.2	53.2
Weekend Night 23:00 – 07:00	16 hours	05/07/2014 – 06/07/2014 00:00 – 23:55		50.3	77.5	35.3	51.0	45.6
Day 07:00 - 19:00	15 Mins	07/07/2014 14:57:19	ST1	43.3	60.1	37.7	45.2	39.6
	15 Mins	07/07/2014 15:45:54	ST2	52.2	73.3	44.8	53.4	48.2
	15 Mins	07/07/2014 15:24:15	ST3	50.5	70.9	37.1	51.8	39.1
	15 Mins	07/07/2014 16:07:37	ST4	74.7	84.5	54.8	78.0	66.9
	15 Mins	07/07/2014 16:52:23	ST5	66.6	93.3	37.4	53.2	40.6
	15 Mins	07/07/2014 16:33:01	ST6	60.5	92.1	43.4	51.5	46.8
Evening 19:00 - 23:00	15 Mins	07/07/2014 20:14:19	ST1	48.1	69.8	42.3	49.0	45.7
	15 Mins	07/07/2014 19:55:09	ST2	48.4	58.7	43.1	50.2	46.1
	15 Mins	07/07/2014 19:30:53	ST3	54.5	73.1	41.0	55.8	44.8
	15 Mins	07/07/2014 20:35:58	ST4	72.1	85.7	56.0	76.1	60.0
	15 Mins	07/07/2014 19:07:18	ST5	47.0	73.0	36.6	44.9	39.0
Night 23:00 - 07:00	15 Mins	07/07/2014 23:45:58	ST1	34.8	52.1	28.2	36.9	31.0
	15 Mins	07/07/2014 23:26:06	ST2	46.2	60.2	35.1	48.1	39.0
	15 Mins	07/07/2014 23:01:33	ST3	44.2	63.0	36.2	44.4	38.7
	15 Mins	08/07/2014 00:07:39	ST4	65.1	84.8	43.7	66.9	49.0
	15 Mins	08/07/2014 00:29:29	ST5	36.6	62.9	28.2	38.7	32.2

All values are sound pressure levels in dB re: 2x 10⁻⁵ Pa



5.0 Assessment of Key Effects

As part of the assessment process and consideration of options of how the site could be brought forward, protecting neighbouring residents in relation to noise generation from the site has been a key aspect. As a result, a 'Good Neighbour Zone' has been built into the proposals along with the inclusion of noise barriers in the form of close boarded fences.

In order to assess the noise impact, reasonable worst case assumptions as outlined in Section 3 have been applied to the Proposed Site Plan. Committed measures which form part of controlling noise from the site and which have been adopted within the following assessment in relation to operations within the 'Good Neighbour Zone' and the Food / Drink Zones are as follows:

- Hours of operation for employment use to be limited to 07:00 – 22:00
- Hours of operation for food / drink uses to be limited to 06:00 – 00:00
- Delivery hours to be limited to 07:00 – 19:00 within the 'Good Neighbour Zone' and 07:00 – 23:00 within the Daytime Delivery Zone.
- The potential for building services plant to operate outside these hours is covered within Section 5.1 below.

1.8m high close boarded fences will be constructed in locations outlined in Parameters Plan whilst 2.5m high barriers (walls or close boarded fences) will be provided to boundaries of service yards with line-of-sight to existing residential properties.

Two internal highway alignments have been considered which have been reflected on the Proposed Site Plans 11462-110F and 11462-111F. Whilst the alignment presented on 11462-110F is considered the most likely option, both options have been considered. For the purpose of this assessment, the alignment which includes a roundabout within the site (Ref: 11462-111F) is referred to as Option 2.

5.1 Building Services Plant Noise Assessment

This assessment has been undertaken in order to provide an indication of the maximum external plant noise levels based on building layouts shown in the Proposed Site Plan. The calculations include the potential location of the plant (shown on SK02 of Appendix B) which for the purpose of this assessment have been assumed to be roof mounted. The assessment compares the predicted worst case noise levels from proposed building service plant (BSP) with the existing measured average background noise L_{A90} at the surrounding existing residential receptors. As the proposed plant noise could contain a 'distinguishable hum', a 5dB correction (specified in 8.2 of BS 4142) has been added to create the Plant 'Rating Level at Receptor'.

A series of predictions were made by defining different sound power levels at the point source. When the sound pressure level is set as shown in Table 5.1 (which is considered to be achievable), the noise rating





levels at all the representative receptors are predicted to be at or below the background levels during the daytime and night-time as shown in Table 5.2. Higher source noise levels could be permissible should screening or increasing the distance from the receptors be introduced.

Table 5.1 Proposed Emission Limits for BSP as Modelled

BSP Location (Roof Mounted / No screening)	Noise Emission Limit - Sound Pressure Level	
	Daytime	Night-time
Units 2 and 9	52.0 dB(A) at 3 m OR 41.5 dB(A) at 10 m	51.6 dB(A) at 3 m OR 41.1 dB(A) at 10 m
Units 3 and 8	57.0 dB(A) at 3 m OR 46.5 dB(A) at 10 m	56.6 dB(A) at 3 m OR 46.1 dB(A) at 10 m
Other Units	62.0 dB(A) at 3 m OR 51.5 dB(A) at 10 m	61.6 dB(A) at 3 m OR 51.1 dB(A) at 10 m

Table 5.2 BS 4142 Assessment for Proposed Plant

Ref	Existing Measured Average Background L_{A90}		Noise rating level from plant (with +5 dB Correction)		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R1	35.0	35.0	35.0	35.0	0.0	0.0
R2	35.0	35.0	33.9	34.2	-1.1	-0.8
R3	35.0	35.0	33.9	34.3	-1.1	-0.7
R4	35.0	35.0	33.4	33.9	-1.6	-1.1
R5	35.0	35.0	35.0	35.0	0.0	0.0
R6	35.0	35.0	33.8	34.5	-1.2	-0.5
R7	44.9	35.0	32.3	31.8	-12.6	-3.2
R8	46.8	35.0	27.8	27.6	-19.0	-7.4
R9	40.6	35.0	22.8	22.7	-17.8	-12.3
R10	35.0	35.0	30.7	30.4	-4.3	-4.6

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

5.2 Car Park Noise Assessment

Internal daytime L_{Aeq} noise levels, at nearby sensitive receptors, from the proposed car parking areas have been assessed both with windows open, where a reduction from a partially open window of 15 dB has been used, and with windows closed where an assumption of a glazing with a sound reduction of 30 dB (e.g. single glazing) has been used.

Table 5.3 Daytime Noise Intrusion Levels $L_{Aeq,1hour}$ (Car Parking Only)

Location	External L_{Aeq} Noise Level at 1 metre from façade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria (Internal L_{Aeq} dB)
R1	34.8	19.8	0.0	35 - 40
R2	34.1	19.1	0.0	35 - 40
R3	34.9	19.9	0.0	35 - 40
R4	37.4	22.4	7.4	35 - 40



Location	External L _{Aeq} Noise Level at 1 metre from façade	Internal L _{Aeq} with windows open	Internal L _{Aeq} with windows closed	Criteria (Internal L _{Aeq} dB)
R5	42.6	27.6	12.6	35 - 40
R6	42.7	27.7	12.7	35 - 40
R7	41.9	26.9	11.9	35 - 40
R8	36.7	21.7	6.7	35 - 40
R9	31.2	16.2	0.0	35 - 40
R10	29.7	14.7	0.0	35 - 40

All values are sound pressure levels in dB re: 2x 10⁻⁵ Pa.

Table 5.4 Night-time Noise Intrusion Levels L_{Aeq,1hour} (Car Parking Only)

Location	External L _{Aeq} Noise Level at 1 metre from façade	Internal L _{Aeq} with windows open	Internal L _{Aeq} with windows closed	Criteria (Internal L _{Aeq} dB)
R1	32.5	17.5	0.0	30
R2	28.9	13.9	0.0	30
R3	26.6	11.6	0.0	30
R4	28.2	13.2	0.0	30
R5	39.0	24.0	9.0	30
R6	39.9	24.9	9.9	30
R7	35.9	20.9	5.9	30
R8	33.1	18.1	0.0	30
R9	28.5	13.5	0.0	30
R10	28.1	13.1	0.0	30

All values are sound pressure levels in dB re: 2x 10⁻⁵ Pa.

Table 5.5 Night-time Noise Intrusion Levels L_{Amax} (Car Parking Only)

Location	External L _{Amax} Noise Level at 1 metre from façade	Internal L _{Amax} with windows open	Internal L _{Amax} with windows closed	Criteria (Internal L _{Amax} dB)
R1	40.5	25.5	10.5	45
R2	37.1	22.1	7.1	45
R3	36.5	21.5	6.5	45
R4	38.3	23.3	8.3	45
R5	45.8	30.8	15.8	45
R6	46.9	31.9	16.9	45
R7	41.4	26.4	11.4	45
R8	42.5	27.5	12.5	45
R9	39.5	24.5	9.5	45
R10	39.5	24.5	9.5	45

All values are sound pressure levels in dB re: 2x 10⁻⁵ Pa.

The assessment shown in the table above demonstrates that internal L_{Aeq} noise levels, with windows open, from the proposed car park are predicted to be within the target criteria at all existing sensitive receptor locations and are therefore within the Lowest Observable Adverse Effect Level (LOAEL).



5.3 Delivery Noise Assessment

Internal L_{Aeq} noise levels, at nearby sensitive receptors from deliveries to the store (on the basis of worst case assumptions) have been assessed both with windows open, where a reduction from a partially open window of 15 dB has been used, and with windows closed where an assumption of single glazing with a sound reduction of 30 dB has been used.

Table 5.6 Daytime Noise Intrusion Levels $L_{Aeq,1hour}$ (Deliveries Only)

Location	External L_{Aeq} Noise Level at 1 metre from façade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria (Internal L_{Aeq} dB)
R1	42.9	27.9	12.9	35
R2	43.6	28.6	13.6	35
R3	45.1	30.1	15.1	35
R4	46.5	31.5	16.5	35
R5	44.3	29.3	14.3	35
R6	42.8	27.8	12.8	35
R7	45.3	30.3	15.3	35
R8	36.7	21.7	6.7	35
R9	34.1	19.1	4.1	35
R10	39.2	24.2	9.2	35

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

Table 5.7 Night-time Noise Intrusion Levels $L_{Aeq,1hour}$ (Deliveries Only)

Location	External L_{Aeq} Noise Level at 1 metre from façade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria (Internal L_{Aeq} dB)
R1	34.7	19.7	4.7	30
R2	34.4	19.4	4.4	30
R3	34.8	19.8	4.8	30
R4	38.2	23.2	8.2	30
R5	40.6	25.6	10.6	30
R6	42.9	27.9	12.9	30
R7	39.4	24.4	9.4	30
R8	39.0	24.0	9.0	30
R9	32.6	17.6	2.6	30
R10	39.5	24.5	9.5	30

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

Table 5.8 Night-time Noise Intrusion Levels L_{Amax} (Deliveries Only)

Location	External L_{Amax} Noise Level at 1 metre from façade	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	Criteria (Internal L_{Amax} dB)
R1	47.7	32.7	17.7	45
R2	47.6	32.6	17.6	45
R3	48.7	33.7	18.7	45
R4	51.1	36.1	21.1	45
R5	52.5	37.5	22.5	45
R6	54.9	39.9	24.9	45



Location	External L _{Amax} Noise Level at 1 metre from façade	Internal L _{Amax} with windows open	Internal L _{Amax} with windows closed	Criteria (Internal L _{Amax} dB)
R7	50.8	35.8	20.8	45
R8	48.0	33.0	18.0	45
R9	41.3	26.3	11.3	45
R10	41.8	26.8	11.8	45

All values are sound pressure levels in dB re: 2x 10⁻⁵ Pa.

The assessment presented in the table above shows that internal L_{Aeq} noise levels from deliveries are predicted to be at or within the target criteria at all existing receptors with windows open or closed and are therefore within the Lowest Observable Adverse Effect Level (LOAEL).





5.4 Combined Noise Assessment

Combined internal L_{Aeq} noise levels, at nearby sensitive receptors from deliveries and car parking associated with the proposed development have been assessed both with windows open, where a reduction from a partially open window of 15 dB has been used, and with windows closed where an assumption of single glazing with a sound reduction of 30 dB has been used. For visual purposes daytime and night-time noise contour plots are presented in SK03 and SK04 in Appendix B.

Table 5.9 Daytime Noise Intrusion Levels $L_{Aeq,1hour}$

Location	External L_{Aeq} Noise Level at 1 metre from façade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R1	43.5	28.5	13.5	35
R2	44.1	29.1	14.1	35
R3	45.5	30.5	15.5	35
R4	47.0	32.0	17.0	35
R5	46.6	31.6	16.6	35
R6	45.7	30.7	15.7	35
R7	47.0	32.0	17.0	35
R8	39.7	24.7	9.7	35
R9	35.9	20.9	5.9	35
R10	39.7	24.7	9.7	35

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

Table 5.10 Night-time Noise Intrusion Levels $L_{Aeq,1hour}$

Location	External L_{Aeq} Noise Level at 1 metre from façade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R1	36.8	21.8	6.8	30
R2	35.5	20.5	5.5	30
R3	35.5	20.5	5.5	30
R4	38.7	23.7	8.7	30
R5	43.1	28.1	13.1	30
R6	44.9	29.9	14.9	30
R7	41.0	26.0	11.0	30
R8	40.2	25.2	10.2	30
R9	34.2	19.2	4.2	30
R10	39.9	24.9	9.9	30

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

The assessment presented in the table above shows that internal L_{Aeq} noise levels from deliveries are predicted to be within the target criteria and within the Lowest Observable Adverse Effect Level (LOAEL) at all existing receptor locations with windows open or closed.



A further assessment has been undertaken based on the Option 2 layout with the daytime and night-time noise levels presented in the tables below. A daytime noise contour plot is presented in SK07 in Appendix B for visual purposes.

Table 5.11 Daytime Noise Intrusion Levels $L_{Aeq,1hour}$ (Option 2)

Location	External L_{Aeq} Noise Level at 1 metre from façade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R1	43.5	28.5	13.5	35
R2	44.1	29.1	14.1	35
R3	45.5	30.5	15.5	35
R4	47.0	32.0	17.0	35
R5	46.6	31.6	16.6	35
R6	45.7	30.7	15.7	35
R7	47.0	32.0	17.0	35
R8	39.7	24.7	9.7	35
R9	35.9	20.9	5.9	35
R10	39.7	24.7	9.7	35

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

Table 5.12 Night-time Noise Intrusion Levels $L_{Aeq,1hour}$ (Option 2)

Location	External L_{Aeq} Noise Level at 1 metre from façade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R1	36.8	21.8	6.8	30
R2	35.5	20.5	5.5	30
R3	35.5	20.5	5.5	30
R4	38.7	23.7	8.7	30
R5	43.1	28.1	13.1	30
R6	44.9	29.9	14.9	30
R7	41.0	26.0	11.0	30
R8	40.2	25.2	10.2	30
R9	34.2	19.2	4.2	30
R10	39.9	24.9	9.9	30

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

As can be seen, there is a negligible difference between the two options (0 – 0.4 dB) and the conclusions identified above remain unchanged.



5.5 Road Traffic Noise Assessment

The table below shows the results of the traffic noise assessment comparing the L_{A10} noise levels from the 'with' (DS) and 'without' (DM) proposed development traffic flows in 2019 at identified receptors. The 'with' and 'without' development noise contour plots are presented in SK06 and SK07 in Appendix B.

Table 5.13 Traffic Noise Assessment

Ref	2019 DM dB $L_{A10,18hr}$	2019 DS dB $L_{A10,18hr}$	Difference
R1	56.5	50.5	-6.0
R2	57.1	52.0	-5.1
R3	58.0	53.5	-4.5
R4	59.5	55.6	-3.9
R5	58.5	54.9	-3.6
R6	57.6	56.0	-1.6
R7	62.9	61.5	-1.4
R8	61.2	61.4	0.2
R9	53.8	54.0	0.2
R10	54.3	46.9	-7.4

When compared to the criteria in Table 2.1 of this report, the change in road traffic noise levels as a result of the proposed development is predicted to have a negligible to major beneficial impact at the nearest receptors. The Lowest Observable Adverse Effect Level (LOAEL) is not exceeded at any receptor and it is predicted that as a result of the introduction of on-site screening, noise levels will reduce at receptors to the west of the site.

5.6 Tranquillity Assessment

An assessment of the existing tranquillity level of the site has been based on the mapping data published by Campaign to Protect Rural England (CPRE). This uses a colour coded system and a 500m assessment grid for the whole of England, and a tranquillity rating of between 1 and 10 is assigned (1 being least tranquil and 10 being most). By reference to these maps the development is assessed as falling into Zones 4 – 5 and therefore, has some tranquillity value. However, given the re-routing of the footpath within the site, access to areas further away from the Dearne Valley Parkway which are of greater tranquillity due to will be maintained. Additionally, where the footpath continues to the south of the site towards receptor points R8 and R9 the tranquillity rating of the area falls into Zones 2 – 3 which are of low tranquillity. As such the proposed development is considered to have a negligible effect on local access to areas of tranquillity.



6.0 Conclusions of Noise Assessment

NPPF Section 123

Section 123 of the NPPF gives four test points relating to noise. Considering these the following conclusions can be drawn:

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development*

Noise intrusion assessments associated with the proposals including deliveries and car parking have shown that noise levels from the proposed store are predicted to be within BS 8233 criteria and below the Lowest Observed Adverse Exposure Level (LOAEL) at nearby sensitive receptor locations on the basis of reasonable worst case assumptions. Therefore, the proposed development will not have a 'significant adverse impact' on health or quality of life.

- *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 conditions*

Noise control measures have been committed within the scheme proposals which include the creation of a 'Good Neighbour Zone' where the hours of operations and deliveries are restricted. Additionally, noise barriers will be provided to boundaries of plots where noise sources (such as services yards) have a direct line of sight to neighbouring residential dwellings.

Baseline noise measurements have been undertaken to enable suitable noise limits to be set in relation to noise generation from proposed building services plant. An assessment has been undertaken based on a Proposed Site Plan to predict noise rating levels from the new building services plant in order to set indicative suitable plant noise limits (at or below existing background noise levels with an acoustic feature correction applied). If appropriate in the context of the future layout within the site, this will assist in ensuring that target noise levels are met at nearby noise sensitive receptors.

- *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*

Although new noise sources are created these have been mitigated wherever practical. As a result the proposed development will not have a 'significant adverse impact' on health or quality of life.





- *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*

The development site and surrounding area is situated in CPRE Zones 4 - 5 areas for tranquillity (1 being least tranquil and 10 being most). Whilst there is some tranquillity value within proximity to the site, the development will not restrict local access to areas of greater tranquillity away from the Dearne Valley Parkway. As such, the use of the site for employment use is not considered likely to affect this rating.

Appendices



An explanation of abbreviations used within this report is provided below.

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

WYGE – WYG Environment

NPPF – National Planning Policy Framework

NPPG – National Planning Policy Guidance

NOAEL – No Observed Adverse Effect Level

LOAEL – Lowest Observed Adverse Effect Level

SOAEL – Significant Observed Adverse Effect Level



Appendix B – Sketches

- SK01 Noise Monitoring Locations
- SK02 Sensitive Receptor Locations
- SK03 Combined Daytime $L_{Aeq,1 \text{ hour}}$ Noise Contour Plot
- SK04 Combined Night-time $L_{Aeq,1 \text{ hour}}$ Noise Contour Plot
- SK05 Combined Daytime $L_{Aeq,1 \text{ hour}}$ Noise Contour Plot (Option 2)
- SK06 Without Development Road Traffic Noise Contour Plot $L_{A10,18 \text{ hours}}$
- SK07 With Development Road Traffic Noise Contour Plot $L_{A10,18 \text{ hours}}$





Client:
Harworth Estates

Project:
Rockingham
Phase 1a

Project Number:
A088714

Site Address:
Dearne Valley Parkway
Hoyland

Drawing Title / Scenario:
Noise Monitoring
Location Plan

Drawing Number:
SK01

Key:
Noise Monitoring
Locations:

Site Boundary:

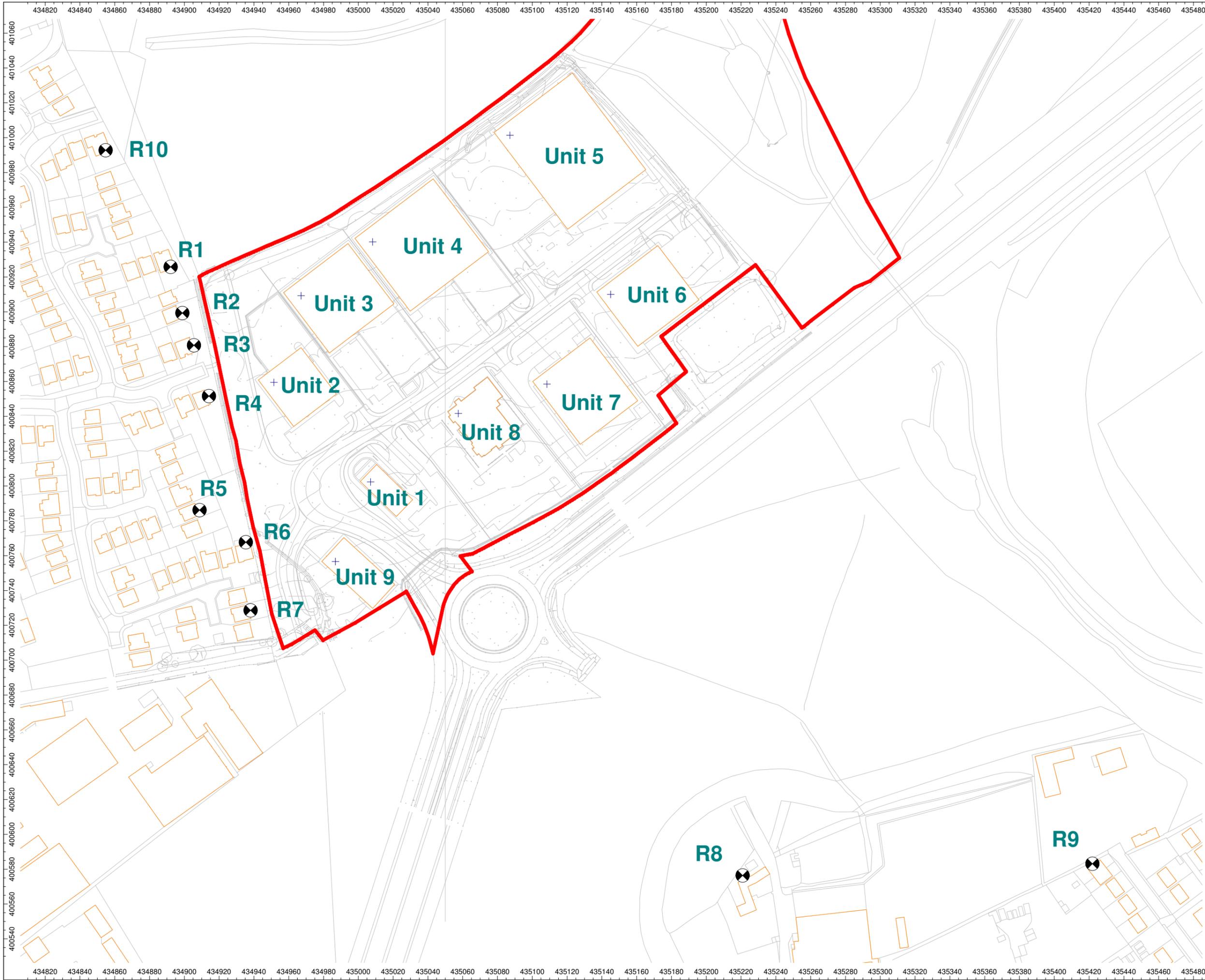
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Site Address:
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Drawing Title / Scenario:
Receptor
Location Plan

Drawing Number:
SK02

Key:

Receptor
Locations: 

Site Boundary: 

Assessed BSP locations: 

Note: Site layout and buildings
based on Proposed Site Plan
(Dwg number: 11462-110F)

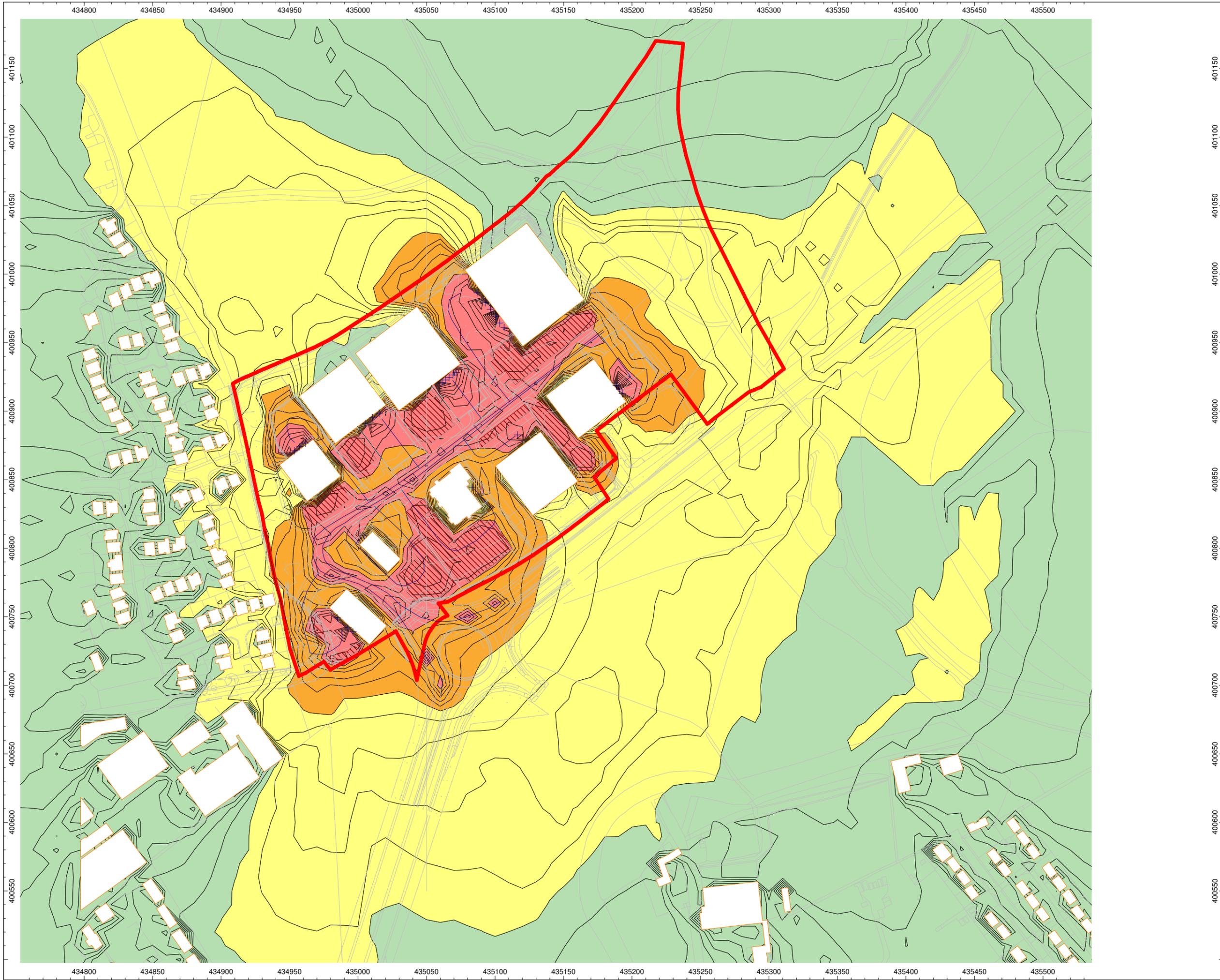
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Drawing Title / Scenario:
Combined Daytime
Noise Contour Plot
(LAeq,1hour)

Drawing Number:
SK03

Key:

Site Boundary: 

-  0.0 - 40.0 dB
-  40.0 - 50.0 dB
-  50.0 - 60.0 dB
-  >60.0 dB

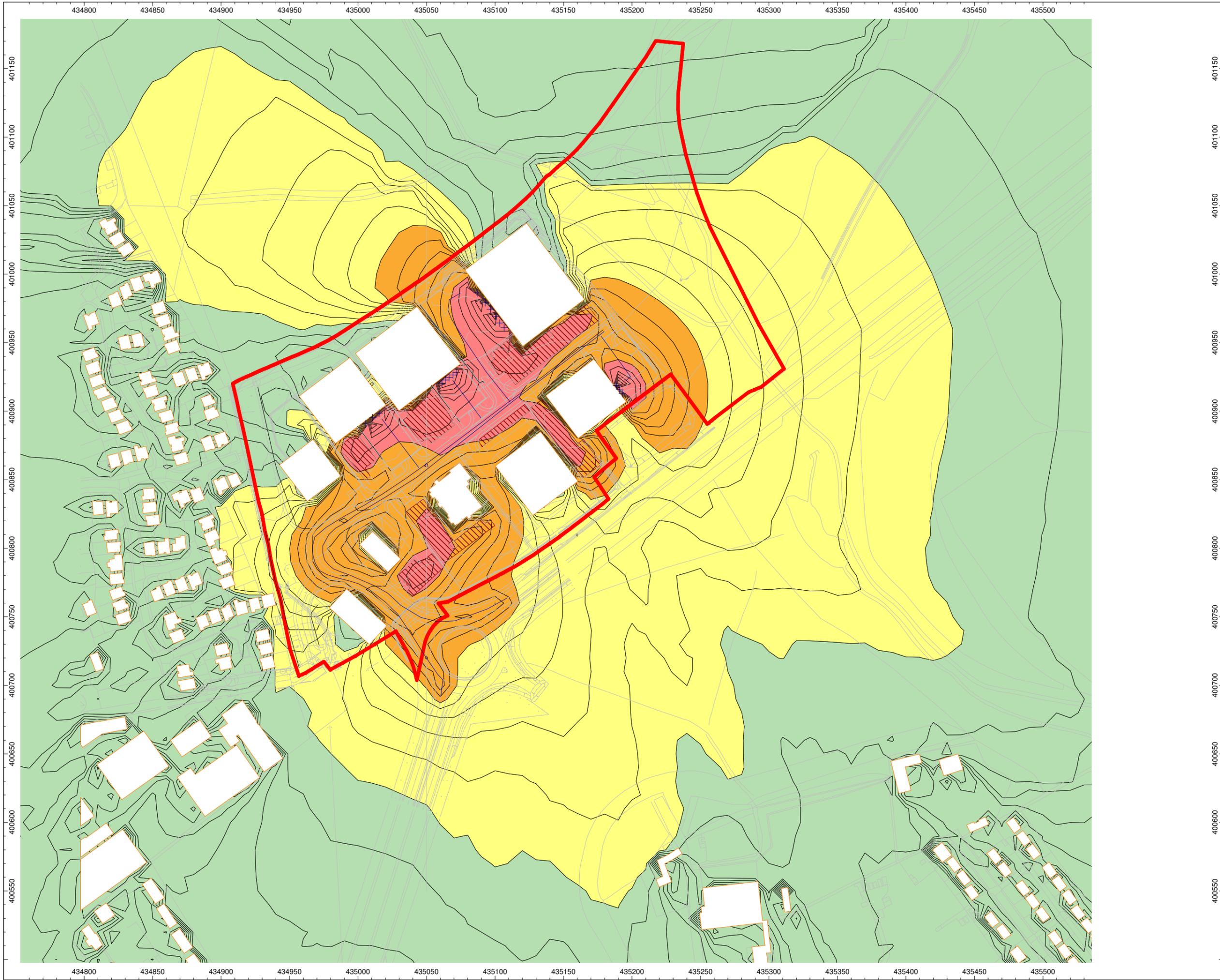
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Drawing Title / Scenario:
**Combined Night-time
 Noise Contour Plot
 (LAeq,1hour)**

Drawing Number:
SK04

- Key:
- Site Boundary: —
 - 0.0 - 40.0 dB
 - 40.0 - 50.0 dB
 - 50.0 - 60.0 dB
 - >60.0 dB

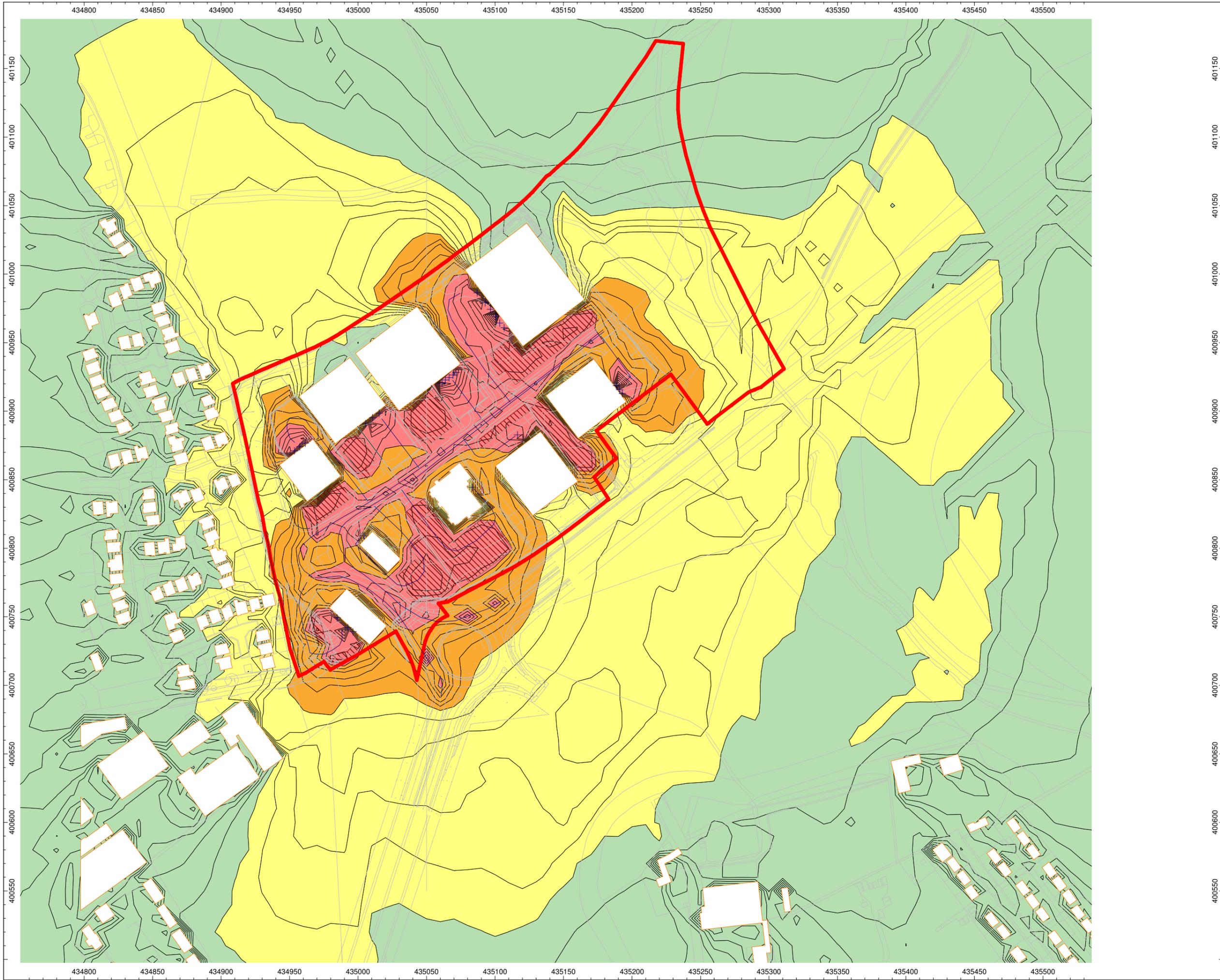
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Drawing Title / Scenario:
Combined Daytime
Noise Contour Plot
Option 2
(LAeq,1hour)

Drawing Number:
SK05

Key:

Site Boundary: 

-  0.0 - 40.0 dB
-  40.0 - 50.0 dB
-  50.0 - 60.0 dB
-  >60.0 dB

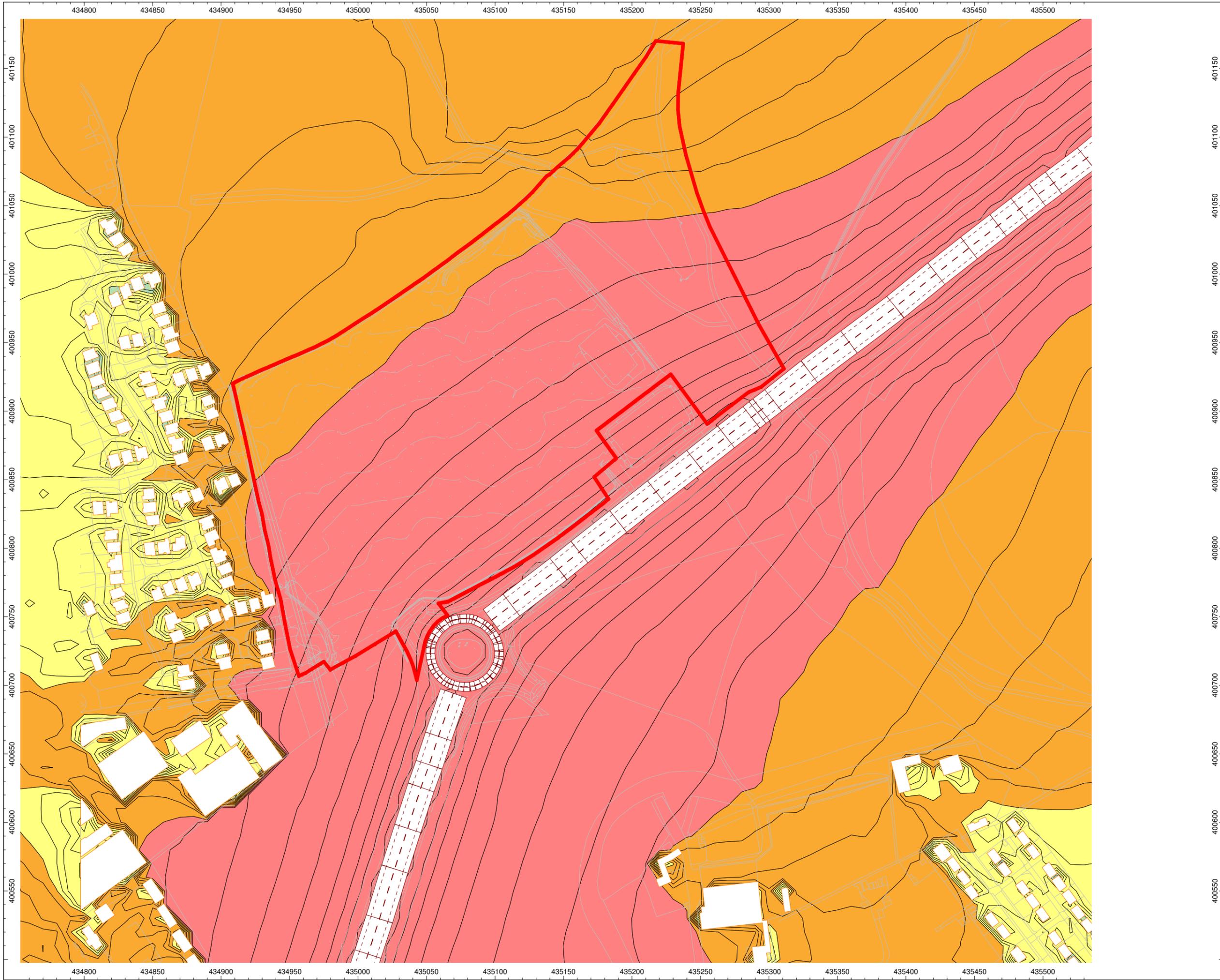
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Site Address:
Dearne Valley Parkway
Hoyland

Drawing Title / Scenario:
Without Development
Road Traffic
Noise Contour Plot
(LA10,18 hours)

Drawing Number:
SK06

Key:

Site Boundary: 

-  0.0 - 40.0 dB
-  40.0 - 50.0 dB
-  50.0 - 60.0 dB
-  >60.0 dB

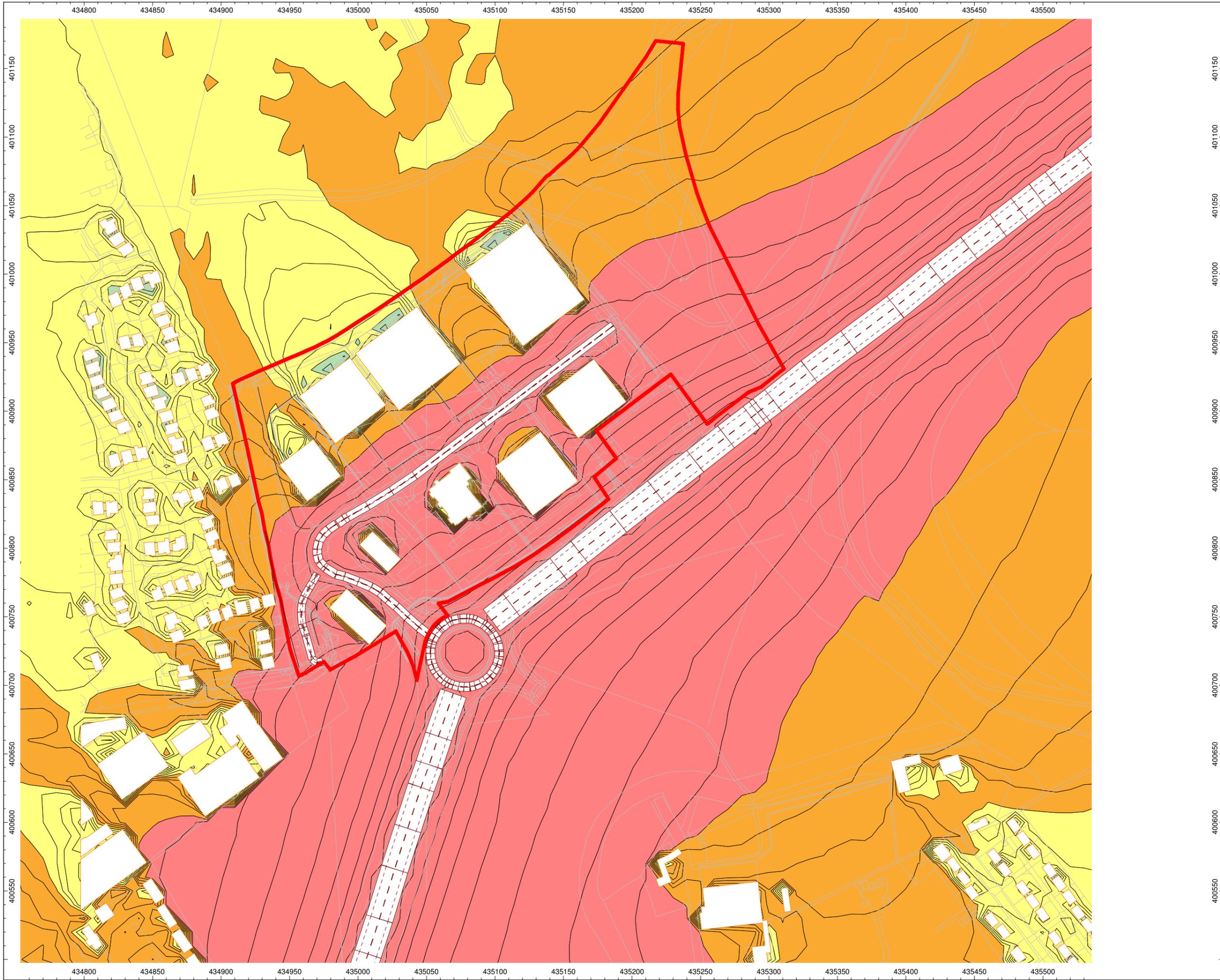
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Project Number:
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Site Address:
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Hoyland

Drawing Title / Scenario:
With Development
Road Traffic Noise
Contour Plot
(LA10,18 hours)

Drawing Number:
SK07

- Key:
- Site Boundary: —
 - 0.0 - 40.0 dB ■
 - 40.0 - 50.0 dB ■
 - 50.0 - 60.0 dB ■
 - >60.0 dB ■

Scale : Not to scale

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