



Architectural & Environmental Acousticians

Noise & Vibration Engineers

Noise Impact Assessment

East Cambridge District Council Crematorium

Noise Impact Assessment

Project: EAST CAMBRIDGE DISTRICT COUNCIL CREMATORIUM

Report reference: RP01-20702-R0

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1. INTRODUCTION


- 1.1 Cass Allen has been instructed by The CDS Group to assess the noise impact of a proposed new crematorium at the site of the former Mepal Outdoor Centre in East Cambridgeshire.
- 1.2 The assessment has been carried out in accordance with relevant local and national planning guidance.
- 1.3 The aims of the assessment were:
- To assess the potential impact of noise emissions from the crematorium at the positions of existing sensitive receptors in the area; and,
 - To establish the suitability of existing noise levels at the site for the crematorium.
- 1.4 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

2. PROJECT DESCRIPTION

- 2.1 The site currently contains the former Mepal Outdoor Centre and is located on Ireton's Way which runs along the eastern boundary. The site is positioned between two reservoirs, to the east and west, with farmland to the south.
- 2.2 The closest noise sensitive receptors to the site are residential properties approximately 230m to the north on Block Fen Drove and residential properties approximately 530m to the south east. Pretoria Energy is located approximately 360m to the north west.
- 2.3 An annotated aerial photo of the site is shown in Figure 1 below.

Figure 1 Annotated Aerial Photo



- 2.4  The proposal is for the construction of a crematorium and associated service and administration building, function building, memorial garden, natural burial areas, pet cemetery, car parking, new vehicular access from the A142 to the north of the site and landscaping, for East Cambridge District Council. A current drawing of the proposed crematorium layout is shown in Appendix 1.

- 2.5 Cremation services (including woodland burials) will be held during traffic off-peak hours of 1000-1600hrs. Direct cremations (cremation where there are no attendees) will occur between 0900-1000hrs and 1600-1700hrs.

3. PLANNING POLICY

National Policy

- 3.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF). Section 170 of the NPPF states:

Planning policies and decisions should contribute to and enhance the natural and local environment by ... preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of ...noise pollution.

Section 180 states:

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Section 182 states:

182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

Noise Policy Statement for England

- 3.2 The Noise Policy Statement for England (NPSE) was published in March 2010 and seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. It also sets out the long term vision of Government noise policy:

to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

3.3 The NPSE clarifies that noise should not be considered in isolation of the wider benefits of a scheme or development, and that the intention is to minimise noise and noise effects as far as is reasonably practicable having regard to the underlying principles of sustainable development.

3.4 The explanatory note of NPSE defines the terms used in the NPPF:

2.20: There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

2.21: Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

3.5 The NPSE does not define the SOAEL numerically, stating in paragraph 2.22:

It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

Noise Planning Practice Guidance

3.6 The Noise Planning Practise Guidance (NPPG) was published on 6 March 2014. It provides further guidance on noise and reiterates the guidance within the NPPF and NPSE. It states that:

noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment.

3.7 The NPPG provides advice regarding how to determine the impact of noise, including whether or not a significant adverse effect or adverse effect is occurring or likely to occur and whether or not a good standard of amenity can be achieved.

3.8 It provides more descriptive detail for the definitions of NOEL, LOAEL and SOAEL than the NPSE, but does not specify numerical values. A summary of the advice given is reproduced in Table 1 below.

Table 1 Observed Effect Levels due to Noise (NPPG)

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 <hr/> Lowest Observed Adverse Effect Level	No specific measures required
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; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect <hr/> Significant Observed Adverse Effect Level	Mitigate and reduce to a minimum
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. 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 Adverse Effect	Prevent

Local policy

- 3.9 East Cambridgeshire District Council's Local Plan 2015 outlines the local policies guiding new development in the borough. Policy ENV 9: Pollution relates to noise and states:

All development proposals should minimise, and where possible, reduce all emissions and other forms of pollution, including light and noise pollution, and ensure no deterioration in air and water quality. All applications for development where pollution is suspected must contain sufficient information to enable the Council to make a full assessment of potential hazards and impacts.

...

Conditions may be attached to any planning permission, or Section 106 agreements used, to ensure adequate reduction and management of impacts.

- 3.10 To address the requirements of the national and local policies, the following key acoustic matters have been assessed:

- Noise emissions from mechanical plant and operational activities associated with the crematorium at the positions of existing sensitive receptors in the area;
- Noise from existing noise sources in the area affecting the crematorium.

4. NOISE SURVEY RESULTS

- 4.1 A noise survey was carried out at the site between 12th and 16th November 2020 to assess existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.
- 4.2 Noise levels across the site were dictated by road traffic on Ireton's Way, which is a busy main road carrying regular HGV and agricultural vehicle movements. No significant noise was identified at the site from commercial uses in the area, including Pretoria Energy to the north.
- 4.3 The results of the survey have been used to inform the assessments in the following sections of this report. It should be noted that the survey was carried out during a period when Covid-19 restrictions were in place. This is discussed further later in this report in relation to the final conclusions.

5. NOISE FROM THE CREMATORIUM

5.1 The crematorium will include the following noise sources:

- Noise from mechanical plant
- Noise from operational activities, including congregations, low level music, vehicle movements and servicing.

These are considered in turn below.

Noise from mechanical plant

5.2 To comply with the relevant local and national policies, it is important to ensure that noise from mechanical plant associated with the development will not unacceptably impact nearby sensitive receptors.

5.3 BS4142:2014 – *Methods for rating and assessing industrial and commercial sound* (BS4142) can be used to assess the impact of noise from external industrial and/or commercial noise sources on nearby sensitive receptors. The methodology in BS4142 can be used to set appropriate noise limits for new mechanical plant.

5.4 The BS4142 assessment methodology can be summarised as follows:

1. Measure the existing background noise levels (LA90,T dB) at the locations of nearby noise sensitive receptors during the quietest periods when the noise source(s) under investigation will operate;
2. Predict or measure the noise emissions (LAeq,T dB) from the noise source(s) under investigation at the location(s) of the nearby sensitive receptors, and add corrections for any distinguishable acoustic features (e.g. tones, whines, screeches, hisses etc);
3. Subtract the measured background noise levels (item 1 above) with the measured or predicted rating noise levels (item 2 above) at each sensitive receptor. BS4142 states that:

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

NOTE Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

- 5.5 In our view all new external mechanical plant for the crematorium should be designed so that the rated noise levels are 10 dB lower than the existing background noise levels at the nearest residential properties. This would ensure that noise from the plant has little or no impact at the properties (we consider that background minus 10 dB would be near the limit of audibility and therefore the LOAEL in this case when assessed in accordance with Table 1).
- 5.6 Background noise levels (LA90) at the site were measured as part of a site noise survey as outlined in Appendix 2. The resultant BS4142 noise limits (i.e. 10 dB lower than background) for the new plant are shown in Table 2 below.

Table 2 BS4142 Noise Limits - Free-field Levels

Location	Period	
	Day-time/Evening (0700-2300hrs)	Night-time (2300-0700hrs)
Nearest residential properties	40 dB LAr,Tr	30 dB LAr,Tr

Note 1 The above limits are 'rated' noise levels. Any mechanical plant noise emissions should have appropriate corrections for the character of the noise applied and still meet these limits.

Note 2 Background noise levels in the area during the night-time are very low. A baseline noise limit of 30 dB LAr,Tr has therefore been proposed in line with BS4142 guidance.

- 5.7 Background noise levels in the area are low during the night-time dropping to around 35 dB LA90 during the middle of the night. Given these low noise levels, a baseline noise limit of 30 dB LAr,Tr has been proposed for noise emissions from any mechanical plant that operates during the night.
- 5.8 The crematorium is still at an early design stage and therefore detailed information for the mechanical plant is not yet available. However, the building will have a cremator which will require external ventilation (i.e. supply and extract fans) and external condensers and mechanical plant to ventilate and cool the various spaces within the buildings. This plant will generally only need to run during daytime hours when the crematorium is in use.
- 5.9 It will be straight forward to design the plant systems to comply with the noise limits given in Table 2. This is because the nearest sensitive properties are located around ~230m away. Noise from the plant will reduce significantly over this distance.
- 5.10 As an example, we have calculated that noise from the cremator supply and extract intake/discharge could be up to ~90 dB LAeq,T at 1m whilst still complying with the daytime BS4142 noise limits at the nearest residential properties to the north. This is a very high noise level and would be readily achievable through appropriate design of the plant, including attenuators etc where required. In practice it will be appropriate and straightforward to achieve much lower noise levels and this would be advisable to ensure that plant noise levels do not impact the quality of the crematorium itself.

- 5.11 On the basis of the above, it is our view that planning consent may be granted in relation to noise from mechanical plant associated with the crematorium subject to the detailed design and selection of the plant. This could be controlled by the imposition of a planning condition if deemed necessary by East Cambridge District Council, and this approach would be in line with local Policy ENV 9, which states:

Conditions may be attached to any planning permission, or Section 106 agreements used, to ensure adequate reduction and management of impacts.

Noise from operational activities

- 5.12 Operational activities will include congregations, low-level music, vehicle movements and servicing activities. These are discussed in turn below.

External congregation noise

- 5.13 People are likely to congregate around the building before and after services in the crematorium. The Main Chapel provides seating for up to 108 people however more people could be accommodated if necessary by opening a partition to the entrance foyer. People would only be expected to congregate before and after ceremonies and therefore only during core daytime hours (i.e. 0900-1700hrs). These are the periods when nearby residents will be least sensitive to noise.
- 5.14 Indicative calculations were carried out to predict the noise levels at the positions of the nearest residential receptors during a large external congregation at the crematorium. The calculations were based on a nominal group of 200 people¹. The resultant predicted noise level at the nearest residential properties to the north was ~34 dB LAeq,T.
- 5.15 We expect that this noise would have little or no impact at the nearest properties for the following reasons:
- The predicted noise level is ~16 dB lower than the background noise levels during the daytime. Consequently the noise would be inaudible (or only very faintly audible) at the residential properties.
 - The predicted level is likely a significant overestimation of the actual noise levels that will typically occur given that the groups will normally be much smaller. Furthermore, the calculations do not include any corrections for acoustic screening which would be provided if some or all of the group were situated outside the front entrance of the crematorium (which is where people are most likely to congregate).
- 5.16 On the basis of the above it is our view that noise from people congregating externally around the crematorium should be rated as 'not noticeable' as per the NPPG criteria given in Table 1 and therefore acceptable.

¹ The Sound Power Level (SWL) of a single person talking normally is around 70 dB SWL based on data from Pearson, Bennett & Fidell (1977). The calculations assumed that half of the group would be talking at once. 200 people was considered to represent a rare 'worst case' scenario.

- 5.17 It should be noted that woodland burials are only expected to occur around 15 to 20 times per year with an average of 20 attendees at each, so these are not expected to generate significant noise levels when compared with larger ceremonies in the main building.
- 5.18 It should also be noted that we would expect that the noise from people attending ceremonies at the crematorium would be significantly lower than the noise from people visiting the site under the previous use as Outdoor Centre, which would have likely included some shouting and screaming at times.

Music (and internal congregation) noise

- 5.19 We understand that low level music will be played in the Main Chapel during funeral services. Low level background music may also be played in the Function Building prior to woodland burials.
- 5.20 The impact of this noise on nearby sensitive receptors is expected to be insignificant (i.e. 'not noticeable' as per Table 1) for the following reasons:
- The music (and any noise from the congregation i.e. singing etc) will be low level only. We understand that there is no intention for the crematorium to hold a music or liquor licence.
 - The music will only be played during services, which will occur between 1000-1600hrs when nearby residents will typically be least sensitive to noise.
 - During the services, the windows and doors to the Main Chapel and Function Building will generally be shut and therefore the noise will be well contained within the buildings. This is made possible by the mechanical ventilation and air conditioning that will be provided to the buildings (refer Section 6 below).
 - The nearest residents are located ~230m away from the site and therefore any resultant low level music or congregation noise breakout would be significantly reduced over this distance. We expect that any music breakout noise would consequently be inaudible at the positions of nearby residential properties.
- 5.21 On the basis of the above it is our view that noise from music and internal congregation noise breakout associated with the new crematorium will not adversely impact nearby properties.

Vehicle movements

- 5.22 Noise will also be generated by traffic movements associated with the new crematorium. However, the impact of this noise on nearby sensitive receptors is expected to be insignificant (i.e. 'not noticeable' as per Table 1) for the following reasons:
- The number of traffic movements associated with the new crematorium are expected to be comparable (if not lower) than the previous use as an Outdoor Centre.
 - The proposed site entrance and exit on Ireton's Way will be at the same position as the previous use. The entrance and exit are also located a long distance away from the nearest sensitive receptors (~230m).
 - The car park is in a similar position to the previous car park to the Outdoor Centre.

- Traffic movements associated with the crematorium are expected to only make up a small percentage of total traffic movements on Ireton 's Way. There are also no nearby sensitive receptors located on Ireton's Way.

5.23 On the basis of the above it is our view that noise from vehicle movements associated with the new crematorium will not adversely impact nearby properties.

Servicing noise

5.24 Servicing noise will include deliveries, use of bins, occasional maintenance work etc. This type of noise is only expected to occur sporadically and during the daytime. Given the large distances to surrounding sensitive receptors, a detailed assessment of serving noise is not considered to be necessary. However, if the council were concerned about the potential impact of servicing noise then this would be straight forward to control via the imposition of a suitable planning condition (e.g. requiring an Management Plan or restricting the times of deliveries etc).

5.25 On the basis of the above it is our view that noise from servicing activities will not adversely impact nearby properties (i.e. 'not noticeable' as per Table 1).

5.26 To summarise paragraphs 5.2 to 5.25 above, we believe that it will be straight forward to ensure that noise emissions from the crematorium are acceptable at the positions of nearby residential properties, particularly given the large distance between the crematorium and the nearest residential properties.

6. NOISE AFFECTING THE CREMATORIUM

- 6.1 The noise levels that will exist within the crematorium have also been assessed based on the existing noise environment at the site and outline details for the design of the crematorium.
- 6.2 It should be noted that we consider this aspect of the design to be more of a commercial consideration (i.e. to improve the quality of the crematorium) rather than a planning matter.
- 6.3 Appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in BS8233:2014 '*Guidance on sound insulation and noise reduction for buildings*'.
- 6.4 BS8233 provides the following recommended design criteria for typical internal noise levels in sensitive rooms for 'Places for worship':
- 30-35 dB LAeq,T
- In our view the above criteria would be appropriate for the sensitive areas of the crematorium (e.g. the Main Chapel, Side Chapel, Family Room).
- 6.5 The survey results in Appendix 2 show that noise levels external to the eastern facade of the main crematorium building facing the road will be around 60-65 dB LAeq,T during the daytime. It will therefore be necessary for the external envelope of the crematorium to be capable of reducing noise levels within the rooms by up to 30 dB.
- 6.6 The buildings will be mechanically ventilated including air conditioning. This is beneficial from a sound insulation perspective as it will be possible for the windows and doors to the rooms to stay closed at all times or as necessary.
- 6.7 A reduction of 30 dB from outside to inside will be straightforward to achieve as part of the detailed design of the external facades. This will include the selection of glazing with a suitable acoustic performance. The detailed specification for the facades and the glazing can be determined in due course however a 30 dB reduction is not significant and will be readily achievable.
- 6.8 On the basis of the above it is our view that the site is suitable for the proposed crematorium in relation to existing noise levels and that high quality internal noise environments will be achievable in sensitive rooms of the crematorium subject to appropriate acoustic design. The noise levels that will exist within the crematorium is more of a commercial consideration than a planning matter and this aspect of the design would not need to be controlled via a formal planning condition in our view.

7. CONCLUSIONS

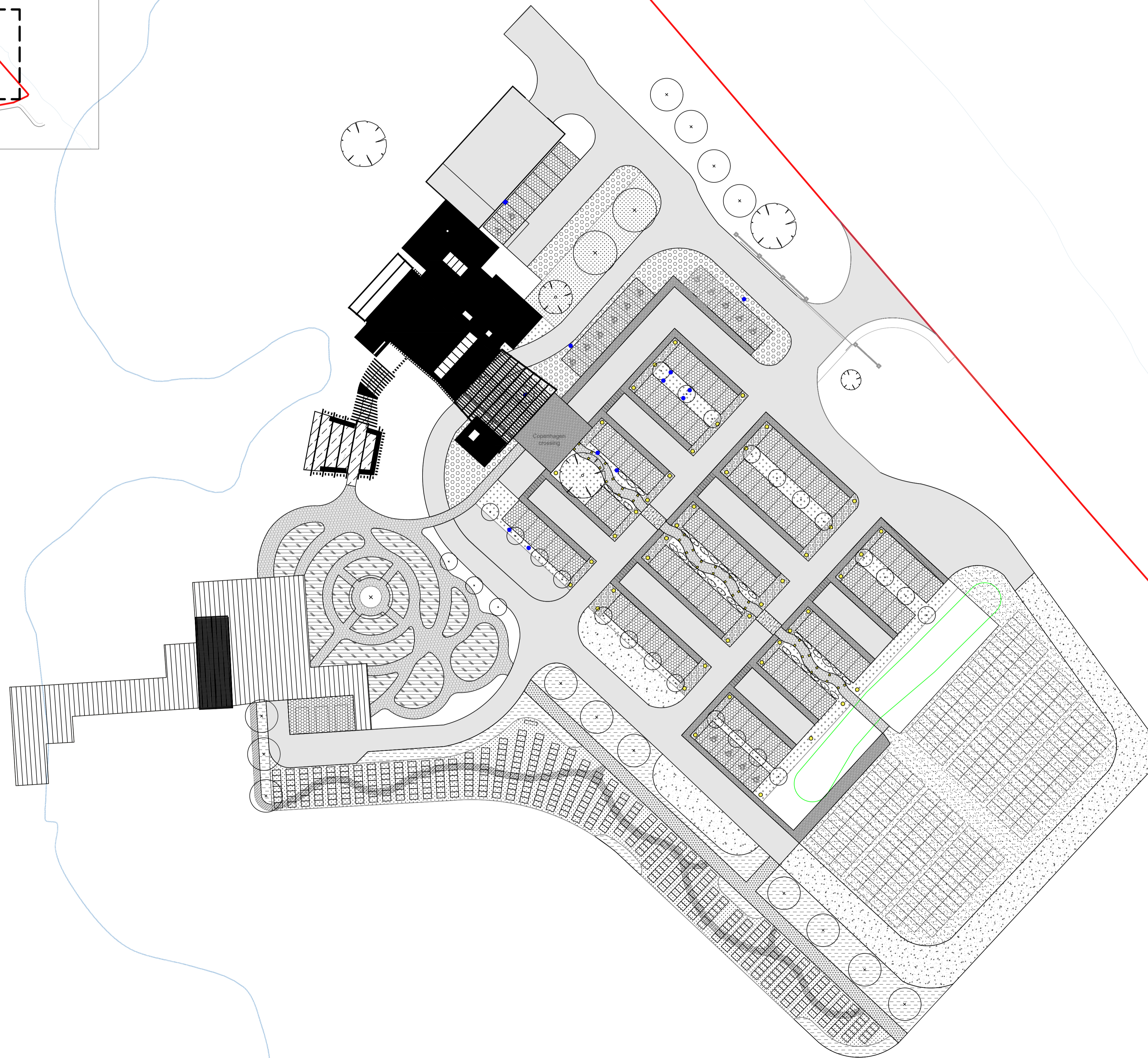
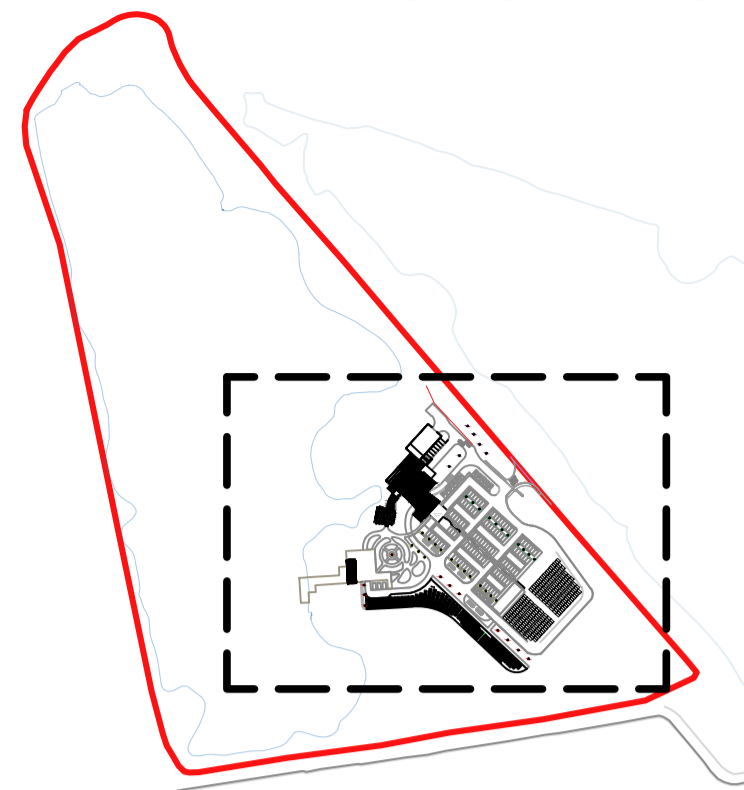
- 7.1 Cass Allen was instructed by The CDS Group to assess the noise impact of a proposed new crematorium at the site of the former Mepal Outdoor Centre in East Cambridgeshire.
- 7.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 7.3 Noise levels across the site are dictated by road traffic on Ireton's Way, which is a busy main road carrying regular HGV and agricultural vehicle movements. No significant noise was identified at the site from commercial uses in the area.
- 7.4 It will be straightforward to design the new plant systems associated with the crematorium (e.g. the cremator, external condensers etc) to achieve appropriate noise levels at the nearest sensitive properties. This could be controlled by the imposition of a planning condition if deemed necessary by East Cambridge District Council.
- 7.5 Noise from people congregating around the crematorium would be rated as 'not noticeable' at the positions of the nearest sensitive properties and is therefore acceptable.
- 7.6 Noise from music, vehicle and servicing activities associated with the new crematorium would also be 'not noticeable' at the nearest sensitive properties and therefore acceptable.
- 7.7 If the council are concerned about the potential impact of servicing noise then this would be straightforward to control via the imposition of a standard planning condition (e.g. restricting the times of deliveries etc).
- 7.8 High quality internal noise environments will be achievable in sensitive rooms of the crematorium subject to appropriate acoustic design of the facades.
- 7.9 In summary of the above it is our view that the site is suitable for the proposed crematorium in relation to noise.
- 7.10 It should also be noted that we would expect that the noise emissions from the proposed crematorium would be lower than previous noise emissions from the current permitted use as an Outdoor Centre.

Note on noise survey validity in relation to Covid-19 restrictions

- 7.11 As discussed in Paragraph 4.3 above, the noise survey was carried out during a period when Covid-19 restrictions were in place. It is possible that noise levels under normal conditions would be slightly higher at the site. However, this would not affect the conclusions reached in our assessment. It would potentially increase the required sound insulation to the crematorium however we expect that any necessary uplift would be minor and straightforward to achieve. This can be assessed further as the design of the crematorium develops and as and when the Covid-19 restrictions are lifted.

Appendix 1 Development Layout

LOCATION PLAN - NOT TO SCALE



- LEGEND**
- Application boundary
 - Existing trees to be retained
 - Existing vegetation group to be retained
 - Existing natural open mosaic to be retained
- SOFT LANDSCAPE**
- Proposed standard and multi stem trees
 - Proposed pleached trees
 - Proposed Praire style planting with topiary
 - Proposed medium scale ornamental planting
 - Proposed small scale ornamental planting
 - Woodland garden planting
 - Native shrub planting
 - Proposed turf
- HARD LANDSCAPE**
- Permeable buff coloured asphalt (coloured to reference the gravel / sand habitats and commercial extraction history)
 - Coloured asphalt to zebra crossings
 - Grid-reinforced buff coloured gravel
 - Block paving such as Marshalls "Modal"
 - Buff coloured, hammered, sawn slab paving
 - Resin bonded gravel surfacing (to be graded with gentle falls towards adjacent soft landscape areas)
 - Hoggin surfacing / crushed stone
 - Timber decking
 - Mown path through unmown grass area
- LIGHTING AND ELECTRIC CAR CHARGERS**
- Free standing electric car charger - 22 no.
 - Wall mounted electric car charger - 2 no.
 - Low level bollard lighting
 - Walkover uplights embedded in paving
- All car park lighting to be on a timer to automatically switch off 30 minutes after site closure
- MISCELLANEOUS**
- Proposed gates and walling

Rev	Date	Description	By
CLIENT			
East Cambridgeshire District Council			
PROJECT			
East Cambridgeshire Crematorium			
TITLE			
General Site Layout Plan			
	Cemeteries & Crematoria		
	Parks & Leisure		
	Environmental Solutions		
The CDS Group Building 51, Wrest Park Silsoe, Bedfordshire MK45 4HS		+44 (0)1525 864387 www.thecdsgroup.co.uk	
Drawn by: JM	Approved by: AJ	Drawing Status: Draft for discussion	
Scale 1:400 @ A1 Sheet 1 of 1		Date: 30th November 2020	
Drawing : D200004-CDS-EN-ZZ-DR-L-001			

Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were generally dictated by road traffic on the A142.

Survey Period:

12/11/2020 to 16/11/2020

Survey Objectives:

- To identify noise sources that contribute to ambient noise levels at the site;
- To measure noise levels around the site over a typical day and night-time period.

Equipment Used (Appendix 1, Table 1):

Type	Manufacturer	Model	Serial Number
Sound level meter ¹	Rion	NL-52	00965090
Calibrator	Rion	NC-74	34551703
Sound level meter ¹ (noise logger)	Rion	NL-32	01182950

Note 1: All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring. Any periods of unattended monitoring that may have been adversely affected by weather conditions have been excluded from the data analysis.

Measurement Positions (Appendix 1, Table 2):

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to A142
N2	
N3	
N4	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Blockmoor Drove
L1	Unattended noise logging position. 1.5m above ground level. Free-field. Direct line of sight to A142

Site Plan showing Measurement Positions (Appendix 1, Figure 1):



Attended Noise Monitoring Results (Appendix 1, Table 3):

Date	Position	Time	Meas. Length	LAeq, dB	LAmx, dB	LA90, dB	Observations
12/11/2020	N1	11:11	5 mins	56	67	45	Noise dictated by road traffic from A142, large number of HGV and tractors, present in every measurement.
		11:16		55	63	41	
	N2	11:25	12 secs	66	72	51	
		11:26	11 secs	64	74	58	
		11:26	9 secs	66	70	57	
		11:26	12 secs	63	69	51	
		11:27	11 secs	67	73	61	
		11:32	5 mins	63	74	44	
		11:37		64	78	42	
	N3	12:35	2 mins	57	65	48	
		12:38		61	74	51	
N4	12:45	19 secs	60	70	46	Noise dictated by road traffic from Blockmoor Drove (grab lorries and tractors)	
	12:46	12 secs	64	72	51		

Attended Noise Monitoring Results (Appendix 1, Table 3):

Date	Position	Time	Meas. Length	LAeq, dB	LAmax, dB	LA90, dB	Observations
		12:47	5 mins	48	65	37	
		12:53		50	70	39	

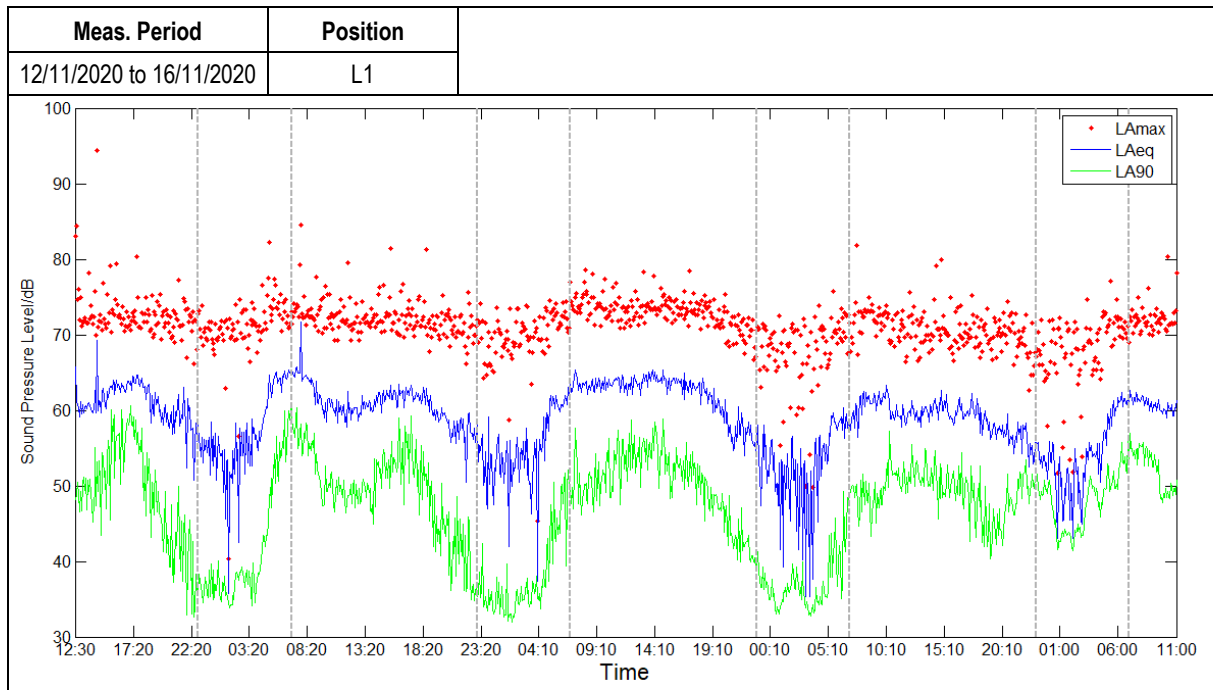
Unattended Noise Monitoring Results (Appendix 1, Table 4):

Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB ¹	LAeq,8hr, dB	LA90,5mins, dB ¹	LAmax, dB ²
12/11/2020 to 16/11/2020	L1	62	50	57	35	73

Note 1: Typical lowest measured during the period shown.

Note 2: Highest typical maximum noise level during the night-time (not exceeded more than 10-15 times per night).

Unattended Noise Monitoring Results (Appendix 1, Figure 2):





Architectural & Environmental Acousticians Noise & Vibration Engineers

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