



**TEES VALLEY ENERGY RECOVERY FACILITY**



**CONSTRUCTION ENVIRONMENTAL  
MANAGEMENT PLAN – ANNEX 5**

**NOISE AND VIBRATION MANAGEMENT  
PLAN**

**GRANGETOWN PRARIE, GRANGETOWN,  
REDCAR, TS6 6TY.**

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## ACRONYMS/TERMS USED IN THIS REPORT

CEMP	Construction Environmental Management Plan
CPP	Construction Phase Plan
ERF	Energy Recovery Facility
ES	Environmental Statement
FCC	FCC Waste Services(UK) Limited
HGV	Heavy Goods Vehicle
HSE	Health, Safety, and Environment
HZI	Hitachi Zosen Inova
NVMP	Noise and Vibration Management Plan

## REVISION HISTORY

Revision Number	Sections Affected	Changes by	Reviewed by	Date
1	All	ECL	FCC	23.08.2021
2	1.2, 2.1	ECL	FCC	01.03.2023

## **1. INTRODUCTION**

### **1.1. Overview**

- 1.1.1. Condition 4 of the outline planning permission (Reference No: R/2019/0767/OOM) requires a Construction Environmental Management Plan (“CEMP”) to be prepared to support the delivery of the development proposals.
- 1.1.2. This document details the methods to be used to control the emission of noise and vibration from construction works along with mitigation measures employed.
- 1.1.3. This document provides information required to enable Condition 4 i to be discharged.
- 1.1.4. A copy of this Noise and Vibration Management Plan (“NVMP”) shall be provided to all contractor and subcontractor representatives who are subsequently required to plan and execute their work in line with the requirements and measures outlined in the document.

### **1.2. Project Information**

- 1.2.1. The project concerned is that of the Tees Valley Energy Recovery Facility (“ERF”) located at, Grangetown Prairie, Grangetown, Redcar, TS6 6TY.
- 1.2.2. The nature of the project is the design, building, and commissioning of a new Energy Recovery Facility as described in detail in the CEMP (Document Reference, 50134216\_1.0) and associated Construction Phase Plan (“CPP”) (Document Reference, 50134151\_1.0).

## 2. RELATED DOCUMENTS

### 2.1. Overview

2.1.1. Table 1 provides further documents which should be read in conjunction with this Noise and Vibration Management Plan.

**Table 1: Related Documents**

<b>Document Reference</b>	<b>Document Title</b>
50134216_1.0	Construction Environmental Management Plan
50134151_1.0	Construction Phase Plan
AA 426 04	Incident Reporting and Investigation Procedure
	Site Environmental Awareness Training
To be provided prior to the commencement of construction	Project Complaints Register Template
	Monthly HSE Reporting Form
	Noise Survey Report Template
	Non-Conformance, Corrective and Preventative Action Procedure

### 3. POTENTIAL NOISE AND VIBRATION SOURCES

#### 3.1. Overview

- 3.1.1. Chapter 12 of the Environmental Statement (“ES”) (Volume 1, December 2019) provides an assessment of the potential effects of construction noise and vibration. Additionally, the ES presented the noise predictions for highest likely construction and decommissioning noise for existing residential receptors.
- 3.1.2. Initial Development Site preparation works is likely to involve the movement of soils and the construction of new buildings and infrastructure. A range of plant and equipment shall be used on the Development Site throughout the duration of construction, including:
- excavators;
  - haulage;
  - lorries;
  - piling rigs;
  - cranes;
  - dumpers;
  - concrete mixers;
  - diggers; and
  - paving machines.
- 3.1.3. In addition, ancillary equipment such as small generators and compressors may also be operating on occasions during the construction period. It should be noted that the use of temporary generators – petrol or diesel – will be reduced by using mains electricity or battery powered equipment where reasonably practicable.
- 3.1.4. The noisiest activities are expected to be generated during soil movement and piling work during the initial stages of the Proposed Development when excavators, piling rigs, dozers or similar may be in use.

## 4. CONSTRUCTION EMISSION NOISE LIMIT

### 4.1. Overview

- 4.1.1. Guidance BS5228:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites, Part 1: Noise’<sup>1</sup> sets out a methodology for predicting noise levels arising from a wide variety of construction/demolition and related activities.
- 4.1.2. BS5228-1:2009+A1:2014 also provides sound power levels generated by a wide variety of mobile equipment, some of which are likely to be used on the Development Site.
- 4.1.3. Noise levels generated by the Development Site operations and experienced at local receptors will depend upon a number of variables, the most significant of which are:
- the amount of noise generated by plant and equipment being used at the Development Site, generally expressed as a sound power level;
  - the periods of operation of the plant at the Development Site, known as the “on-time”;
  - the distance between the noise source and the receptor, known as the “stand-off”;
  - the attenuation due to ground absorption or barrier screening effects; and
  - the reflections of noise due to the presence of hard vertical faces such as walls.
- 4.1.4. Applicable noise limits provided by the ‘Code of Practice for Noise and Vibration Control on Construction and Open Sites’ are as follows:
- construction noise (all site operations): 70dB LAeq12hr (1m façade) ‘best practicable means’ applied at all times in accordance with BS5228 guidance; and
  - construction (piling). 75dB LAeq1hr (1m façade), 80dB LA01 (1hr) ‘best practicable means’ applied at all times in accordance with BS5228 guidance.

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<sup>1</sup> BS5228:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites, Part 1: Noise, available online at, <https://www.legislation.gov.uk/uksi/2015/227>. Accessed June 2021.

## 5. CONSTRUCTION NOISE CONTROL

### 5.1. Overview

5.1.1. The following noise control measures shall be implemented to ensure effective control of noise and vibration nuisances.

### 5.2. Noise Control Measures

#### No External Positioned Amplified Sound

5.2.1. No amplified sound shall be generated within the Development Site.

5.2.2. This shall not apply in the event of an emergency or emergency drills required to meet health and safety requirements.

5.2.3. This shall also not apply to the amplified noise generated by construction plant reversing alarms which are necessary to ensure the safe movement of Development Site Vehicles.

#### Reversing Alarms

5.2.4. Where possible all mobile construction plant will be fitted with low noise or “white spectrum” reversing alarms to minimise the annoyance to local residents due to noise generated from construction plant.

5.2.5. White noise reversing alarms emit bursts of noise consisting of randomly generated frequencies reproduced equally across the audible frequency range. This reduces the tonality and coherent nature of traditional ‘beep’ style alarms, therefore reducing the nuisance factor.

5.2.6. The requirement for low noise reversing alarms will be placed on all contractors undertaking work activities on the Development Site.

#### Mitigation Measures

5.2.7. All construction contractors will be required to follow standard good construction practice as outlined in BS5228-1:2009+A1:2014 and BS5228-2:2009+A1:2014. This will include the following measures:

- electrical items of plant will be used instead of diesel plant where possible particularly in sensitive locations;
- plant will be started up sequentially;
- internal haul roads will be well maintained and avoid steep gradients where possible;
- loading/unloading activities will be located away from residential properties and shielded from those properties where practicable;
- drop heights of materials will be minimised;
- continuous noisy plant will be housed in acoustic enclosures, where practicable;



- effective exhaust silencing and plant muffling equipment will be fitted and maintained in good working order;
- static plant known to generate significant levels of vibration will be fitted with vibration dampening features;
- equipment will be well maintained and where possible will be used in the mode of operation that minimises noise;
- plant and equipment will be shut down when not in use;
- semi-static equipment will be sited and orientated as far as is reasonably practicable away from occupied buildings and, where feasible, will be fitted with suitable enclosures;
- mobile construction plant will be located, as far as is reasonably practicable, away from adjacent occupied buildings or as close as possible to noise barriers or site hoardings to provide additional screening from sensitive noise receptors;
- vehicles will not wait or queue on the public highway with engines idling;
- reversing alarms will incorporate one of the following features where practicable: directional sounders, broadband signals, self-adjusting sounders or flashing warning lights. Alternative comparable systems may be used to minimise noise and nuisance from reversing alarms;
- all appropriate staff and their contractor's personnel will be instructed on BPM measures to reduce noise and vibration as part of their induction training, and followed up by 'Tool Box' talks;
- noisy activities will be staggered in time and space where feasible;
- loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials around the Development Site and other potentially noisy activities will be conducted in such a manner as to limit noise generation and where possible will be conducted away from noise sensitive areas;
- the Development Site layout (on-site construction traffic routes) shall be designed to minimise the need for reversing;
- only designated haul routes will be used;
- upon completion of the building all doors will be closed where possible to retain noise to the internal of the structure;
- a complaint procedure will be in place which will require action in the event of any noise or vibration complaints on the Development Site;
- deviation from approved method statements to be permitted only with prior approval from the contractor and other relevant parties, facilitated by formal review before any deviation is undertaken;
- hearing protection meeting the requirements of EN 352 or equivalent must be worn as indicated by contractor risk assessments or when noise levels exceed 80 decibels;
- the concrete batching plant will be located to gain the maximum benefit from separation distance to receptors and screening from existing buildings or landforms;
- hydraulic techniques for breaking to be used in preference to percussive techniques where possible; and
- all deliveries will be as per construction working hours and as per traffic management plan.

### **Development Site Area**

- 5.2.8. All construction activities shall be undertaken within the designated operational Development Site boundaries, including areas designed to accommodate stockpiles and haul routes.

### **Erection of Physical Barriers**

- 5.2.9. Where deemed appropriate through risk assessment, physical barriers shall be erected around activities which are expected to generate particularly high noise levels to provide screening attenuation.

### **Training**

- 5.2.10. All Development Site personnel shall receive training appropriate to the nature of their roles and responsibility, training shall include specific information in relation to noise and vibration management.
- 5.2.11. All staff shall receive induction training incorporating environmental awareness training, in addition to specific training in noise and vibration if their work activities are assessed as being particularly noise/vibration emission prone. On site 'Tool Box' training shall enable Development Site workers to understand how their actions will affect the environment and potentially impact upon sensitive receptors in the vicinity of their work areas.

### **Construction Hours**

- 5.2.12. Construction hours shall be limited to non-sensitive times of the day. The Development Site is open to Contractors for work between the following hours on a normal basis:
- Monday to Friday 07:00 to 19:00 (start up from 06:00)
  - Saturday and Sunday 07:00 to 16:00
  - Public and Bank Holidays 07:00 to 19:00 as required for works on site.

### **Day and Night Activities**

- 5.2.13. The following plant/activities shall be restricted to the daytime period only:
- impact wrenches;
  - concrete scabbling;
  - external earthworks; and
  - concrete jack hammering.
- 5.2.14. It may be necessary for some construction activities (except the ones mentioned above) would be undertaken outside these hours e.g. during the internal fit out of buildings, delivery of abnormal loads by reason of instruction/order from the local police or the relevant highway authority, or due to exceptional works (such as time dependent concrete pours). Heavy Goods Vehicle ("HGV") movements would not be permitted outside the hours outlined above without prior written agreement from the Planning Authority and operations would not exceed any noise limits imposed as part of the permission.

- 5.2.15. Some construction deadlines may require a 24 hour working period, should this need arise, arrangements will be agreed with all relevant parties prior to the commencement of works outside of normal hours.

## 6. COMPLAINTS PROCEDURE

### 6.1. Overview

6.1.1. Noise impacts can be a source of concern for local residents and businesses during a major construction project. It is inevitable that the construction works for a project of this nature will result in an increase in the local noise climate during certain periods of the construction programme. As such, community relations will be an important element of the management of the Development Site ensuring that any noise and vibration complaints are effectively dealt with will be an important part of the management of the construction phase.

### 6.2. Complaint Response

6.2.1. The actions to be taken in case of a complaint will be described in the Incident Reporting and Investigation Procedure.

6.2.2. This procedure outlines that:

- before construction commences a dedicated 24h contact number will be provided for local residences to phone, should they have any queries or complaints;
- the person making the complaint should be directed to the most senior member of the Development Site personnel;
- if possible, the complaint should be dealt with immediately. If not, the person should be given some indication of when they will receive a response to their complaint either by letter or by phone call; and
- details of each complaint and the steps taken should be recorded on a suitable Project Complaints Register.

6.2.3. Investigation may be required to ascertain the circumstances of a complaint. For example, if noise is an issue, it may be necessary to carry out a noise survey.

6.2.4. General roles and responsibilities of the Development Site Manger and the Development Site Environmental Advisor are described in the CEMP.

6.2.5. With regard to complaints, the Development Site Manager is ensuring that complaints from the general public are recorded, investigated and corrective action is taken in a timely manner (if required).

6.2.6. The Development Site Environmental Advisor shall ensure that all appropriate mitigation measures are adopted to reduce / minimise environmental impacts of the construction works.

6.2.7. The Development Site Environmental Advisor shall:

- identify the activities that were being undertaken at the time of the complaint to identify potential noise sources;
- make sure that the potential noise source will be investigated; and
- determine if any of the general mitigation control measures listed in Chapter 3 are not being adopted.

- 6.2.8. If a breach in the use of the prescribed mitigation measures is identified, this will be rectified and where appropriate additional training will be provided to site staff.
- 6.2.9. Any corrective actions will be recorded against the complaint within the Project Complaints Register and reported within the environmental monitoring reports.
- 6.2.10. If a complaint is received that may indicate that noise impacts are occurring outside the working hours prescribed above, it will be fully investigated, and a response provided to the complainant confirming any corrective actions that will be undertaken to prevent re-occurrence.
- 6.2.11. If repeated noise complaints are received from residential receptors, then a noise monitoring programme will be instigated by the Development Site HSE Advisor in agreement with the authorities.
- 6.2.12. All complaint logs and corrective action reports shall be made available for inspection by the Planning Authority within five days of receiving a request to review such information.

## **7. COMMUNITY LIASON GROUP**

- 7.1.1. The Community Liaison Group shall be informed on the measures undertaken to minimise noise emissions. Results of the noise measurement will be shared with the Group if required.
- 7.1.2. Members off the Group are asked to raise any issues regarding noise in order to find a satisfactory solution.

## 8. MEASURING, MONITORING, AND RECORDING

### 8.1. Purpose

- 8.1.1. Noise monitoring will facilitate the acquisition of noise emissions to demonstrate to the Planning Authority that the development is being constructed within the specified noise limits and in such a manner as to minimise the noise impact on any noise-sensitive receptors. In the event that the noise limits are breached, the noise monitoring scheme will prompt remedial actions to ensure on-going future compliance.
- 8.1.2. Measuring and monitoring will be carried out during the course of the project at a frequency of four times per year and specifically during high-risk activities or should a noise complaint be received. The results of this monitoring will be recorded in a suitable format and compared against agreed noise levels.

### 8.2. Noise Measurement Equipment

- 8.2.1. Environmental noise levels shall be measured using sound level meters conforming the latest versions of British Standard EN 61672-1:2003 *Electro-acoustics, Sound Level Meters, Specifications*.
- 8.2.2. Sound level meters shall be field calibrated before and after monitoring using an acoustic calibrator conforming to the latest version of British Standard EN 60942:2003.

### 8.3. Noise Survey Methodology

- 8.3.1. The monitoring of noise shall be undertaken by a suitably qualified acoustician.
- 8.3.2. The noise measurements shall be undertaken during a normal working daytime, during typical working hours, avoiding meal breaks and times when construction plant and equipment associated with works are not operational.
- 8.3.3. The sound level meter shall be positioned such that the microphone is located 1.2 to 1.5m above local ground level in free-field conditions, i.e., at least 3.5m from the nearest vertical, reflecting surface, at all survey locations.
- 8.3.4. Operational noise levels shall be measured over a single 1-hour period with noise levels logged every 5 minutes during a normal working day.
- 8.3.5. During monitoring the following monitoring equipment and Development Site specific information shall be recorded:
- the measured values of LAeq together with details of the appropriate time periods;
  - details of the instrumentation and measurement methods used, including details of any sampling techniques, position of microphone(s) in relation to the Development Site and system calibration data;
  - any factors that might adversely affected the reliability or accuracy of the measurements;
  - plans of the Development Site and neighbourhood showing the position of plant, associated buildings and notes of site activities during monitoring period(s);

- notes on weather conditions, including where relevant, wind speed/direction, temperature, presence of precipitation, etc.; and
- time, date and name of person carrying out the measurement.

### **Frequency of Measurements**

- 8.3.6. Noise monitoring shall be flexible in its frequency and an assessment of the risk of potential impact should be made for all construction operations associated with the Development Site and is likely to only be required should noise complaints arise, however, a minimum of four noise monitoring exercises will be undertaken annually.
- 8.3.7. Construction works will take approximately 36 months to complete. Initially, only minor works will be undertaken. Following initial works, the main ground and concrete works will be carried out prior to mechanical erection of the facility.
- 8.3.8. With reference to the Development Site construction phases, it is considered that no monitoring session should be undertaken within the first two-months of the work when minor works are being undertaken. Once the main works have commenced, noise monitoring will be undertaken to establish a base line construction noise. A review shall be undertaken after the first 3-months in consultation with the Planning Authority, to determine the frequency for any further noise monitoring.
- 8.3.9. Additional monitoring shall be undertaken if particularly noisy activities, such as piling, are being carried out at positions on the Development Site close to individual receptors.

## **8.4. Reporting**

- 8.4.1. On completion of each noise survey, a report shall be prepared and issued by Hitachi Zosen Inova (“HZI”) in a format suitable for submission to the Planning Authority. Depending on the prevailing weather conditions, the report shall be submitted within ten working days of a written request to undertake the monitoring.
- 8.4.2. The report shall contain, as a minimum:
- results of the noise survey including confirmation whether the construction operations are within the specified limits;
  - details of the instrumentation used including calibration details;
  - details of the prevailing weather conditions on the day of the survey;
  - details of the audibility of the Development Site at the nearest noise-sensitive receptors; and
  - details of any extraneous noise sources that may have influenced the noise climate.



## **8.5. Non-Compliance with Noise Limits**

- 8.5.1. Where noise levels are exceeded, an investigation into the cause of the limit breach will be take place and corrective actions shall be implemented if required. Corrective actions will be formally recorded, assigned to an individual and tracked to completion.
- 8.5.2. All corrective action and complaint logs will be made available within 5 days of the complaint/breach taking place.
- 8.5.3. Where the breach is outside of limits agreed with external agencies this will be reported to that agency as required.

## **8.6. Programme of Implementation**

- 8.6.1. The approved noise monitoring scheme shall be implemented within two-weeks of commencement of construction works. The first noise survey shall be undertaken as soon as weather conditions are suitable for environmental noise measurement and shall be repeated at the frequency outlined above until agreed otherwise with the Planning Authority.

## **8.7. Data Retention**

- 8.7.1. Noise survey data obtained during routine noise surveys shall be retained by HZI or by agreement by their sub-consultant for the full duration of the construction operations.