

**H1 Assessment to Support an application to vary an existing bespoke installation permit and add Grade A Wood Processing at Mill Farm, Stone Road, Chebsey, Stafford, ST21 6NX**

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**On behalf of: Mill Farm Recycling Ltd**

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ETL956/2025

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## QUALITY CONTROL

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## Abbreviations

AAD	Ambient Air Directive
AQMA	Air Quality Management Area
AQIA	Air Quality Impact Assessment
AQS	Air Quality Standards
AW	Ancient Woodland
Defra	Department for the Environment, Food and Rural Affairs
EA	Environment Agency
EAL	Environmental Assessment Level
ELV	Emission Limit Value
ETL	Earthcare Technical Ltd
H1	H1 Assessment
IAQM	Institute of Air Quality Management
kWe	Kilowatts electrical output
LWS	Local wildlife site
NMVOC	Non-methane VOCs
NO	Nitrous oxide
PC	Process Contribution
PEC	Predicted environmental concentration
PM <sub>2.5</sub>	Particulate matter less than 2.5 micrometres in diameter
PM <sub>10</sub>	Particulate matter less than 10 micrometres in diameter
PVRV	Pressure and vacuum relief valve
SBC	Stafford Borough Council
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TVOC	Total gaseous and vaporous organic substances, expressed as total organic carbon
VOC	Volatile organic compounds

# 1 Introduction

## 1.1 Background

This H1 Assessment (H1) has been prepared by Earthcare Technical Ltd (ETL) on behalf of Mill Farm Recycling Ltd in support of an application for the variation of a bespoke environmental permit (Ref: EPR/XP3198EF) at Mill Farm, Stone Road, Chebsey, Stafford, ST21 6NX, centred at SJ 85306 29458, hereafter referred to as the 'Site'. The Site operates activities associated with green waste composting, the sorting of wood materials, the chipping (shredding) and milling of Grade A wood, the drying of wood materials on drying floors and the storage of waste and the storage and blending of BS3882 soil and compost products.

An H1 risk assessment using the H1 tool, which is a conservative tool, is used to screen out the pollutants from the proposed emission sources that do not require further assessment. Pollutants that do not screen out need to be considered in an Air Quality Impact Assessment (AQIA) which would use detailed dispersion modelling.

The emissions to air to be considered are those from:

- A1: Milling Hall Haas dust extraction system
- A2: Bedding plant building Haas dust extraction system
- A3: Generator 1 serving wood processing equipment in the Main building
- A4: Generator 2 serving Bedding plant building

Figure 1 shows the Site location and green line denoting the permit boundary, Figure 2 provides a more detailed view of the permit boundary including emission points.

## 1.2 Site description

The Site comprises a lower yard for composting and material reception and an upper yard where the wood treatment activities are carried out within dedicated buildings and/or drying bays. The emissions to air, A1-A4, shown in Figure 2, are in the upper yard.

The Site lies in a semi-rural location, 263m south of the Stone Road, B5026, approximately 654m northwest of the village of Chebsey and 2.2km east of Eccleshall. The closest human receptor is Mill Farm farmhouse which lies 20m from the permit boundary. The next nearest receptor is The Vicarage / Vicarage Fields which lies 325m east south-east of the Site. It does not lie in an Air Quality Management Area (AQMA); there are no AQMAs in Stafford Borough Council (SBC) area.<sup>1</sup>

There are no Special Areas of Conservation (SACs) or Special Protection Areas (SPAs) within 10km of the Site and no Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs) within 2km. Midland Meres and Mosses Phase 3 Ramsar site lies 4.75km to the west of the Site; it is coincident with Cop Mere SSSI. There are five Local Wildlife Sites within 2km, two of which are also Ancient Woodland (AW).

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<sup>1</sup> Stafford Borough Council (2024) 2024 Air Quality Annual Status Report (ASR), June 2024

### **1.3 Scope of this report**

This report describes: the processes on Site relevant to emissions to air (Section 2); the H1 tool and assessment criteria (section 3); the assessment methodology and source data (section 4); the results of the impact assessment (section 5); and concludes in section 6. Appendix A shows the H1 input and output tables; Appendices B to D contain the technical specifications of emission sources A1 to A4.

## 2 Process description and emissions to air

The Environmental Management System Manual<sup>2</sup> provides a description of the processes at the Site. Fugitive dust and odour emissions have been considered in the Environmental Management System Manual, and in the Dust and Emissions Management Plan (MIL-OD-10) and the Odour Management Plan (MIL-OD-06) respectively. This section provides a summary of the those processes relevant to identifying the stack emissions to air.

The wood waste activities undertaken are the transfer and treatment of non-hazardous waste wood namely:

- Storage of Grade A non-hazardous wood<sup>3</sup> on a concrete surface with sealed drainage
- Shredding, milling, chipping and screening of wood within dedicated buildings with dust abatement units
- Drying of wood products within dedicated drying bays
- Storage of wood products on an impermeable surface within a building, and
- Loading and dispatch of products.

Figure 3 shows the buildings in the upper yard of the Site.

The Grade A wood is stored until pre-shredding through a 125mm basket in the Komtech screening equipment building (building 13 in Figure 3). The timber is then stored in a clean area of the yard (storage bays 1a-1c in Figure 3) ready to be transported to the mill, the Main wood processing building (building 2 in Figure 3). In the Main wood processing building, the pre-shred wood is fed into the plant hopper which passes under a magnet before it is milled through a 40mm screen. The milled material then passes over another magnet and then enters an eddy current separator which removes all nonmagnetic metals. A chip screen separates the material into three particle sizes, three separated products. The three separate products are then moisture tested and dried on Drying floors (building 5a-5f in Figure 3), if required, to get the product below 25% moisture. Product is regularly moisture tested when on the drying floor and removed once under 25%. Product is then moved to clean product storage bays (buildings 10-12 in Figure 3) ready for loading and dispatch. Bedding material is dispatched from the Bedding plant building (building 6 in Figure 3).

There is a dedicated dust extraction unit (HAAS HZM1600) on the Main wood processing building (building 2 in Figure 3), which can treat up to 27,000m<sup>3</sup>/h of air from the building. There is a single point source emission from this extraction, A1 in Figure 2, which exhausts horizontally. The maximum dust concentration as specified by HAAS who manufactured and installed the extraction unit is 3mg/m<sup>3</sup>. The technical specification of the dust extraction unit is given in Appendix A. The unit is powered by a diesel generator, A3 in Figure 2, a Kohler SDMO V770C2

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<sup>2</sup> ETL (2025) Mill Farm Recycling Limited, Green Waste Composting Facility and Grade A wood processing, Environmental Management System Manual Version 6, May 2025, MIL-OD-01

<sup>3</sup> Waste Wood Assessment Guidance for the UK Waste Wood Industry, Wood Recyclers' Association, Version 4, November 2024

(Appendix B). The dust extraction unit and diesel generator both operate for half the working week.

A second HAAS dust extraction unit serves the Bedding plant building (building 6 in Figure 3). It can treat up to 15,000m<sup>3</sup>/h of air from the building; the system directs dust into a bag under the filter. There is a single point source emission from this extraction, A2 in Figure 2, which exhausts vertically downwards. The maximum dust concentration as specified by HAAS who manufactured and installed the extraction unit is 5mg/m<sup>3</sup>. The technical specification of the dust extraction unit is given in Appendix C, supplemented by data supplied by CRJ Services.<sup>4</sup> The unit is powered by a diesel generator, A4 in Figure 2, also a Kohler SDMO V770C2 (Appendix B). The dust extraction unit and diesel generator both operate for half the working week.

Heat for the drying floors is provided by 3No. biomass boilers (Heizomat, RHK-AK), housed in building 21 of Figure 3, which lies outside the permit boundary. They have not been assessed as part of the H1 assessment but have been modelled in the AQIA for their impact on local background concentrations.

Table 1 gives a summary of the emission sources that have been modelled in the H1 assessment.

**Table 1 Modelled sources**

Source	Emissions	Modelled operational profile
A1 Dust extraction unit, building 2	Dust modelled as PM <sub>10</sub> PM <sub>2.5</sub> (assumed to have the same emission rate as PM <sub>10</sub> )	Operates for half of operational hours: half of Monday to Friday, 0730-1700, when A2 and A4 are not operational. 15% of hours
A2 Dust extraction unit, building 6	Dust modelled as PM <sub>10</sub> PM <sub>2.5</sub> (assumed to have the same emission rate as PM <sub>10</sub> )	Operates for half of operational hours: half of Monday to Friday, 0730-1700, when A1 and A3 are not operational. 15% of hours
A3 Diesel generator powering A1 A4 Diesel generator powering A2	PM <sub>10</sub> , CO, TVOC, NOx, PM <sub>2.5</sub> (assumed to have the same emission rate as PM <sub>10</sub> )	A3, same hours as A1 A4, same hours as A2
<b>Notes:</b> PM <sub>10</sub> Particulate matter less than 10 micrometres in diameter PM <sub>2.5</sub> Particulate matter less than 2.5 micrometres in diameter CO Carbon monoxide TVOC Total Volatile Organic Compounds NOx Oxides of nitrogen: NO nitrous oxide and NO <sub>2</sub> nitrogen dioxide		

<sup>4</sup> CRJ Services: 15,000m<sup>3</sup>/h air volume; 6.735m to bottom edge of exhaust; downward-facing outlet; residual dust content < 5mg/m<sup>3</sup>

### 3 Assessment Methodology

#### 3.1 H1 Emissions to air screening assessment

The H1 screening evaluation has been undertaken following H1 methodology, set out in Environment Agency (EA) guidance<sup>5</sup> and using the EA H1 Assessment Tool spreadsheet (v9.2).<sup>6</sup>

#### 3.2 Assessment criteria

##### 3.2.1 Air Quality Standards and Critical Levels – Human Health

Table 2 sets out those Air quality strategy (AQS) objectives, Ambient Air Directive (AAD) Limit Values and Environmental Assessment Levels (EALs) for the protection of human health that are relevant to this assessment in determining receptor exposure. In the H1 Assessment Tool these are all referred to as EALs.

**Table 2 Air Quality Standards and critical levels for human health**

Substance	Emission period	Limit (average)	Standard	Exceedances <sup>1</sup>
TVOC as formaldehyde <sup>2</sup>	30 minutes	100 µg/m <sup>3</sup>	EAL	None
TVOC as formaldehyde <sup>2</sup>	Annual	5 µg/m <sup>3</sup>	EAL	None
CO	8 hour running average across a 24-hour period	10,000 µg/m <sup>3</sup>	AAD Limit Value	None
NO <sub>2</sub>	1 hour	200 µg/m <sup>3</sup>	AAD Limit Value	Up to 18 1-hour periods
NO <sub>2</sub>	Annual	40 µg/m <sup>3</sup>	AAD Limit Value	None
PM <sub>10</sub>	1 hour	50 µg/m <sup>3</sup>	AAD Limit Value	Up to 35 times a year
PM <sub>10</sub>	Annual	40 µg/m <sup>3</sup>	AAD Limit Value	None
PM <sub>2.5</sub>	Annual	20 µg/m <sup>3</sup>	AAD Limit Value	None
<p>Notes: from <a href="https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit">https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit</a>  AQS: Air quality strategy; AAD: Ambient Air Directive; EAL: Environmental Assessment Level  <sup>1</sup>number of times a year that the limit may be exceeded  <sup>2</sup>Formaldehyde is a TVOC</p>				

<sup>5</sup> Environment Agency and Department for Environment, Food & Rural Affairs, Air emissions risk assessment for your environmental permit, Available at: <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit> [Accessed 29 July 2025]

<sup>6</sup> Atmospheric Dispersion Modelling Liaison Committee, H1 Risk Assessment Tool, Available at: <https://admlc.com/h1-tool/> [Accessed July 2025]

### 3.2.2 Environmental standards for protected conservation areas

The AQS objectives and AAD Limit Values for the protection of vegetation and ecosystems applicable to this assessment are presented in Table 3. For 24-hour NO<sub>x</sub> there are two values of the EAL: 75µg/m<sup>3</sup> and 200µg/m<sup>3</sup>. The latter, higher EAL applies where ozone is below the AOT40<sup>7</sup> critical level and sulphur dioxide is below the lower critical level of 10µg/m<sup>3</sup>. H1 uses the lower critical level of 75µg/m<sup>3</sup> by default.

**Table 3 Environmental Standards for protected conservation areas**

Substance	Target	Emission period
Nitrogen oxides (expressed as nitrogen dioxide) <sup>1</sup>	30 µg/m <sup>3</sup>	Annual
Nitrogen oxides (expressed as nitrogen dioxide)	75 µg/m <sup>3</sup> 200 µg/m <sup>3</sup> for detailed assessments where the ozone is below the AOT40 critical level <sup>7</sup> and sulphur dioxide is below the lower critical level of 10 µg/m <sup>3</sup>	Daily
Notes: from <a href="https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit">https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit</a> <sup>1</sup> 30 µg/m <sup>3</sup> is an AAD Limit Value		

<sup>7</sup> The sum of difference between hourly ozone concentration and 40ppb for each hour when the concentration exceeds 40ppb during a relevant growing season (May to July) averaged over five years Available at: <https://www.eea.europa.eu/help/glossary/eea-glossary/aot40> [Accessed: 29 July 2025]

## 4 Environment Agency Risk Assessment

The current evaluation is based on EA risk assessment guidance<sup>5</sup> to determine the significance of the predicted impact. The guidance provides screening criteria for quantifying the environmental impacts of emissions to air. The criteria include long and short-term Environmental Assessment Levels (EALs).

The guidance considers initial H1 screening and then detailed modelling. At the initial screening stage, **Test 1**, long-term and short-term concentrations due to the sources entered, referred to as the Process Contribution (PC) can be screened out from further assessment if:

- the short-term PC is less than 10% of the short-term environmental standard, and
- the long-term PC is less than 1% of the long-term environmental standard.

The second stage of screening, **Test 2**, considers the background concentration as well as the PC.

The background values used are the values at the closest receptor to the Site, Mill Farm (farmhouse), as reported in the AQIA for this permit variation application.<sup>8</sup> They were sourced from the Defra background pollutant maps<sup>9</sup> for NO<sub>x</sub>, NO<sub>2</sub>, CO and PM<sub>10</sub>. PM<sub>2.5</sub> is taken from the Stafford Borough Council Annual Status report and formaldehyde from a rural monitoring campaign.<sup>10</sup> The values are shown in use in Table A5, they are:

- NO<sub>x</sub>: 5.6µg/m<sup>3</sup>
- NO<sub>2</sub>: 4.5µg/m<sup>3</sup>
- CO: 1,653µg/m<sup>3</sup>
- Formaldehyde: 0.90µg/m<sup>3</sup>
- PM<sub>10</sub>: 10.3µg/m<sup>3</sup>
- PM<sub>2.5</sub>: 7.2µg/m<sup>3</sup>

The Predicted Environmental Concentration (PEC) is the sum of the PC and background concentration. A further assessment is not needed if:

- for human receptors only, the short-term PC is less than 20% of the short-term environmental standards minus twice the long-term background concentration i.e., less than 20% of the 'Headroom', and
- the long-term PEC is less than 70% of the long-term environmental standards.

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<sup>8</sup> ETL (2025) Air Quality Impact Assessment to Support a Permit Application for Green Waste Composting Facility and Grade A Wood Processing at Mill Farm, Stone Road, Chebsey, Stafford, ST21 6NX, Doc Ref: ETL956\_AQIA\_V1.0\_Mill Farm\_July25, July 2025

<sup>9</sup> Defra, Background Maps, Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html> [Accessed July 2025]

<sup>10</sup> AIR QUALITY EXPERT GROUP (2020) Non-methane Volatile Organic Compounds in the UK, Prepared for: Department for Environment, Food and Rural Affairs; Scottish Government; Welsh Government; and Department of Agriculture, Environment and Rural Affairs in Northern Ireland



In accordance with the guidance, it is not necessary to calculate PEC for short-term targets. For an ecological receptor, if the short-term PC exceeds 10% of the EAL, detailed modelling is required.

If the PC cannot be screened out on that basis, the guidance outlines further steps, including detailed modelling, which may lead to a requirement to carry out a cost-benefit analysis.

### 3.1 H1 inputs – Process emissions

Table 4 details the source geometry, parameters, manufacturers' ELVs, design emission limits and calculated emissions for the Dust extraction systems A1 and A2, and the Diesel generators A3 and A4. Technical data for A1-A4 are given in Appendices B to Appendix D.

The input data entered in the H1 Assessment Tool is shown in Appendix A, Tables A.1 and A.2. The effective stack height has been calculated for each point source in accordance with EA guidance.<sup>6</sup> All the sources exhaust at heights lower than the ridge of the adjacent building and therefore all effective source heights were 0m.

For A3 and A4 ELVs are specified for TVOC (or hydrocarbons) for which there are no EALs. There is an EAL for formaldehyde, one component of TVOC. An AEA Technology report on the Speciation of UK emissions of non-methane volatile organic compounds (2002)<sup>11</sup> reported on a series of VOC species profiles available for stationary combustion sources, covering a range of fuel types and scale of combustion. Diesel generators emit methane and non-methane VOCs (NMVOCs). The NMVOCs comprise: acetone (13.46%), butane (15.73%), formaldehyde (47.19%) and hexane (5.62%).<sup>11</sup> Formaldehyde is not only the greatest proportion of NMVOCs emitted, it is also the NMVOC with the most stringent EALs and therefore emissions of formaldehyde from the diesel generators have been modelled, assuming 47.19% of the TVOCs are formaldehyde. Note that use of 47.19% of TVOC is conservative as not all TVOC is non-methane VOC.

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<sup>11</sup>N R Passant (2002) Speciation of UK emissions of non-methane volatile organic compounds. Reference: AEAT/ENV/R/0545 Issue 1

**Table 4 Dust extraction system and Diesel generator emission parameters**

Parameter	Units	Dust extraction system, A1	Dust extraction system, A2	Diesel generators, A3, A4
Location	Easting, Northing	385277, 329627	385321, 329643	385251, 329588 385322, 329641
Electrical output PRP	kWe	n/a	n/a	560
Stack height	m	8.52	6.00	2.5
Effective stack height	m	0	0	0
Internal diameter at exit	m	0.63	0.63	0.25
Volume flow rate (dry)	Nm <sup>3</sup> /s	7.50	4.17	1.61
Volume flow rate (dry)	Nm <sup>3</sup> /h	27,000	15,000	5,783
Velocity	m/s	24.1 (0) <sup>1</sup>	13.4 (0) <sup>2</sup>	92.8
Temperature	°C	Ambient	Ambient	501
Emission concentration /rate PM <sub>10</sub>	-	3 mg/m <sup>3 3</sup>	5 mg/m <sup>3 3</sup>	0.02 g/kW.h / 1.94mg/Nm <sup>3</sup>
Emission rate CO	g/kW.h	n/a	n/a	0.28 g/kW.h / 27.11mg/Nm <sup>3</sup>
Emission rate TVOC	g/kW.h	n/a	n/a	0.09 <sup>4</sup> / 8.72mg/Nm <sup>3</sup>
Emission rate NOx	g/kW.h	n/a	n/a	5.2 <sup>4</sup> / 504mg/Nm <sup>3</sup>
Emission rate PM <sub>10</sub>	g/s	0.0225	0.0208	0.003
Emission rate CO	g/s	n/a	n/a	0.044
Emission rate formaldehyde	g/s	n/a	n/a	0.007 <sup>5</sup>
Emission rate NOx	g/s	n/a	n/a	0.800
<b>Notes:</b> n/a = not applicable <sup>1</sup> Horizontal emission below roof height, modelled as 0m/s <sup>2</sup> Vertical downwards emission below roof height, modelled as 0m/s <sup>3</sup> Assumed at actual conditions <sup>4</sup> Specification (Appendix B) gives HC+NOx = 5.29 g/kW/h, where HC is hydrocarbons, taken as TVOC <sup>5</sup> Formaldehyde is 47.19% of the non-methane VOCs				

## 5 Results of the Impact Assessment

Output tables from the H1 Assessment Tool are shown in Appendix A, Tables A.3 to A.7. Table A.3 shows the long-term and short-term PCs and EALs for each pollutant.

### 5.1 Air impact screening

Test 1 of the assessment compared the long-term and short-term PCs calculated by the H1 Assessment Tool with the relevant EALs.

Test 2 compared the long-term PECs are compared with the EALs and the short-term PCs with Headroom (EAL minus twice the long-term background concentration).

The results of Air Impact Screening Test 1 and Test 2 are summarised in Table 5.

**Table 5 Summary of Test 1 and Test 2 Screening results**

Substance	Test 1	Test 2
Particulates (PM <sub>10</sub> )	Fail	Fail
Particulates (PM <sub>2.5</sub> )	Fail	Pass
Carbon monoxide	Pass	
Formaldehyde	Fail	Fail
Nitrogen dioxide	Fail	Fail

The H1 assessment determined that emissions of PM<sub>2.5</sub> and CO can be screened out from further assessment. PM<sub>10</sub>, formaldehyde and NO<sub>2</sub> require further assessment using detailed modelling.

### 5.2 Deposition to land

It is not possible to assess deposition to land from air using the current version of the H1 Risk Assessment Tool (version 9.2).<sup>6</sup>

## 6 Conclusion

This H1 Assessment has been produced on behalf of Mill Farm Recycling Ltd in support of an application for the variation of a bespoke environmental permit (Ref: EPR/XP3198EF) at Mill Farm, Stone Road, Chebsey, Stafford, ST21 6NX.

The H1 Assessment Tool spreadsheet v.9.2 has been used for quantitative assessment of point emission sources: dust extraction systems A1 and A2, and the diesel generator which power them, A3 and A4. ELVs were specified by the plant manufacturers.

The H1 assessment determined that emissions of  $PM_{2.5}$  and OC can be screened out from further assessment. Emissions of  $PM_{10}$ , formaldehyde and  $NO_2$  require further assessment using detailed modelling. The AQIA<sup>8</sup> submitted as part of this permit variation application provides the necessary further assessment.

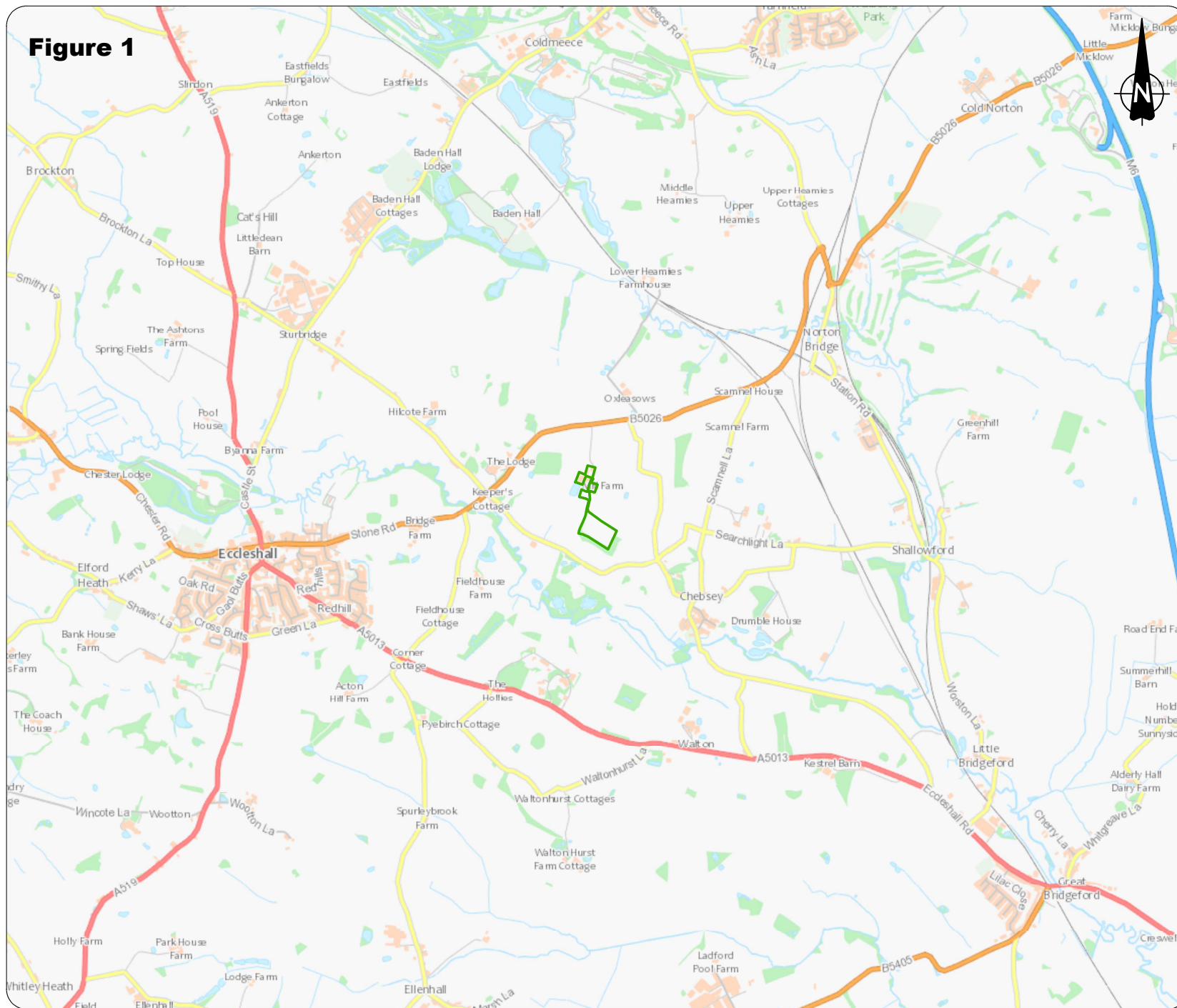
## Figures

Figure 1 Site location with green line permit boundary

Figure 2 Site layout and emission point plan


Figure 3 Buildings in the Upper Yard

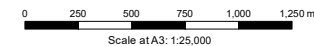
## Figure 1



REVISIONS					
REV	DATE	DESCRIPTION	DWN	CHK	APP
-	19/06 2025	First Issue	JJ	ESP	ESP
A	28/07 2025	Second Issue	JJ	ESP	ESP

### LEGEND

 Permit boundary



Client  
Mill Farm Recycling Limited

Project	ETL956/Permit Variation 2025
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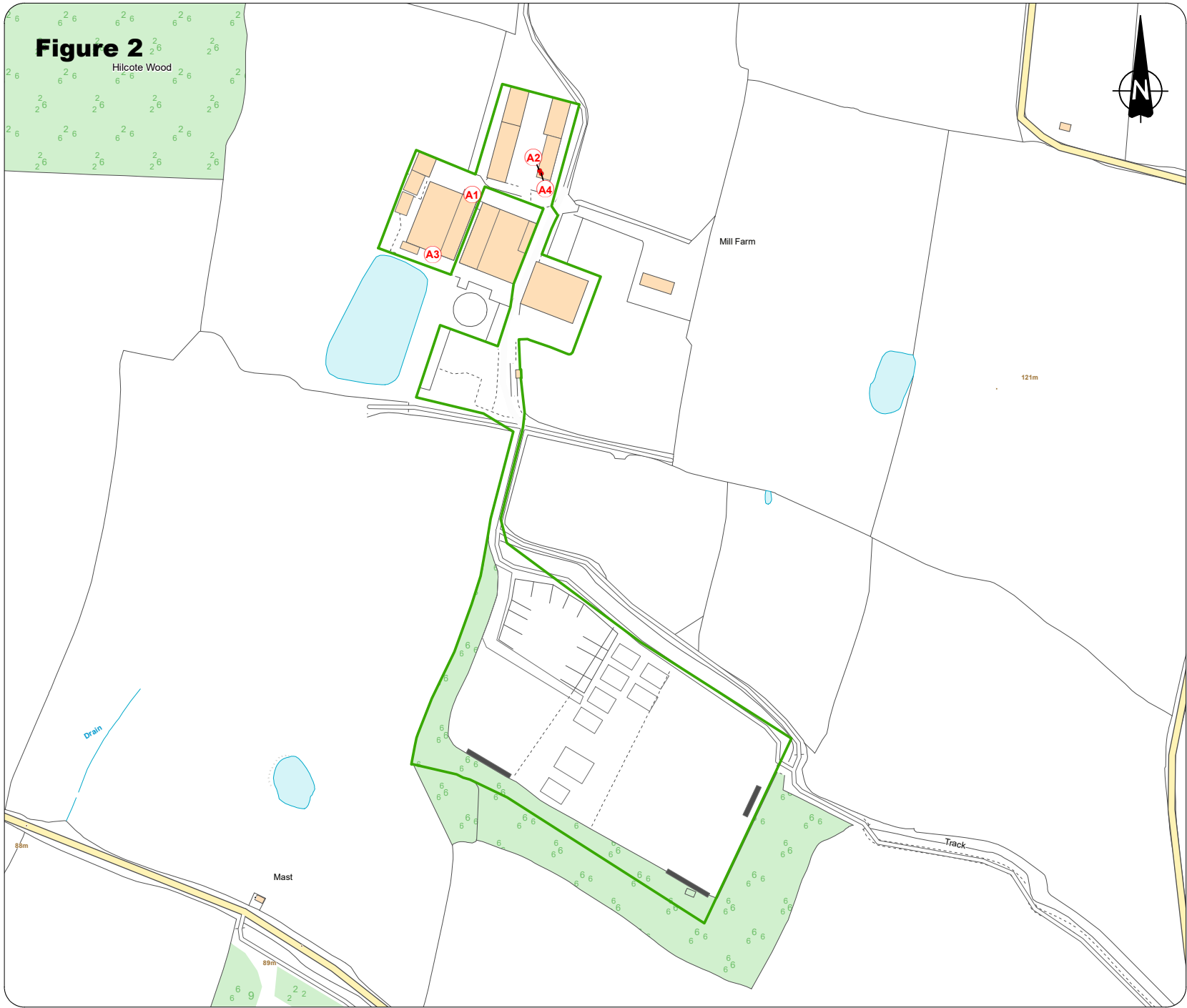
Title	Site Location Plan
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Date July 2025		Scale 1:25,000	Sheet Size A3
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REV	DATE	DESCRIPTION	DWN	CHK	APP
-	19/06 2025	First Issue	JJ	ESP	ESP
A	28/07 2025	Second Issue	JJ	ESP	ESP

**LEGEND**

- Permit boundary
- Emission point to air
- E Emission point to air

A1	Dust abatement plant for main wood processing building
A2	Dust abatement plant for bedding plant
A3	Diesel generator 1 for main wood processing building
A4	Diesel generator 2 for bedding plant

0 25 50 75 100 125 m  
Scale at A3: 1:2,500

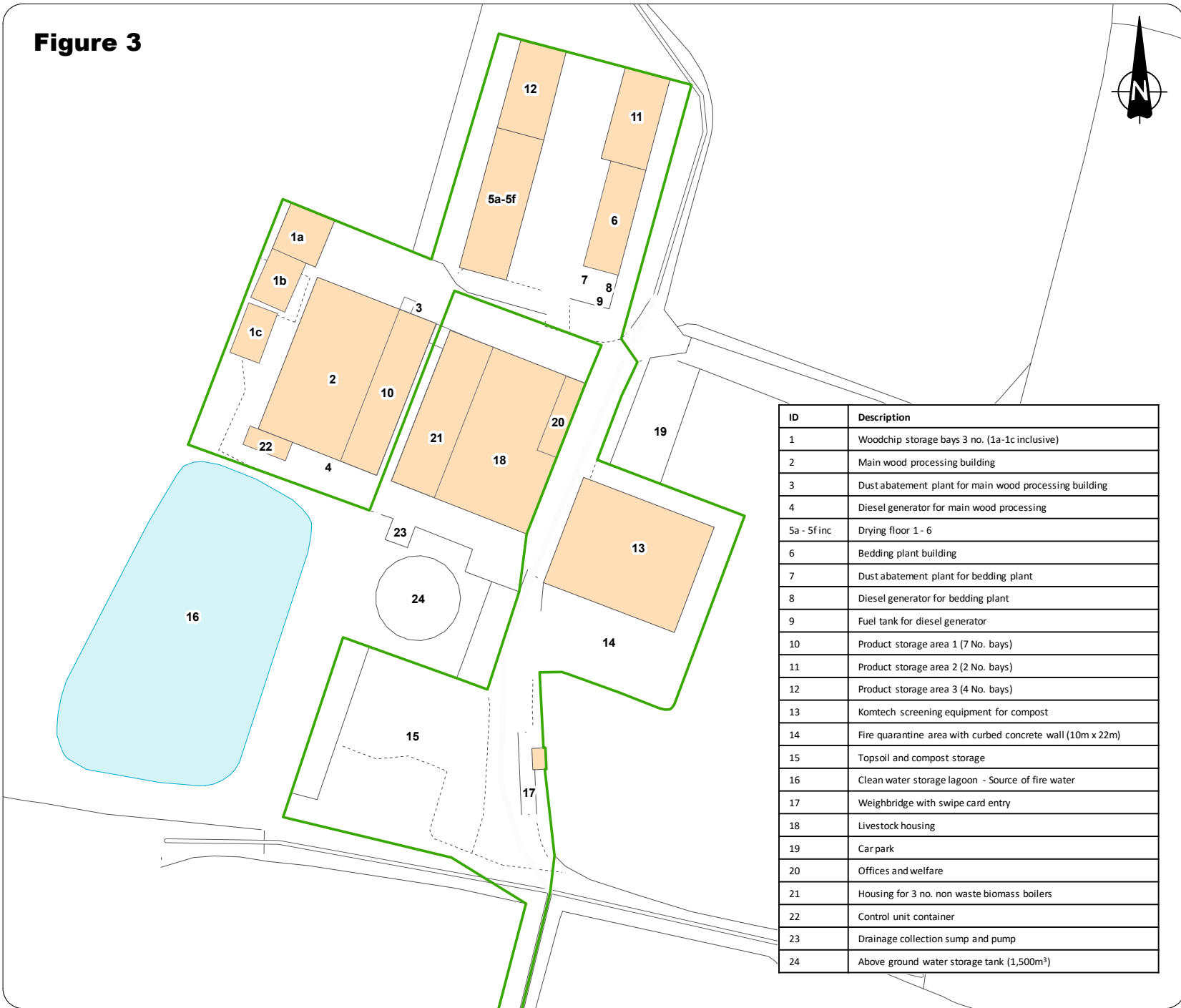
Client	Mill Farm Recycling Limited
Project	ETL956/Permit Variation 2025
Title	Permit Boundary and Emission Point Plan

**Earthcare**  
TECHNICAL

Manor Farm  
Chalton  
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Hants PO8 0BG  
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enquiries@earthcaretechnical.co.uk  
www.earthcaretechnical.co.uk

Drawn JJ	Checked ESP	Approved ESP	Revision REV A
Date July 2025	Scale 1:2,500	Sheet Size A3	
Drawing Number ETL956/MIL/PBPEPP/EPR02	File Reference ETL956		

Figure 3



REVISIONS					
REV	DATE	DESCRIPTION	DWN	CHK	APP
-	19/06 2025	First Issue	JJ	ESP	ESP
A	28/07 2025	Second Issue	JJ	ESP	ESP

LEGEND

Permit boundary

01020304050

Scale at A3: 1:1,000

Client	Mill Farm Recycling Limited
Project	ETL956/Permit Variation 2025
Title	Site Layout - Upper Yard

Earthcare

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Drawn JJ	Checked ESP	Approved ESP	Revision REV A
Date July 2025	Scale 1:1,000	Sheet Size A3	
Drawing Number ETL956MILSLPEPR04 Page 1 of 2			File Reference ETL956



## Appendix A H1 Assessment Tool Input and Output

**Table A. 1 Input: Air release points**

Release point code	Location or grid reference	Activity/Activities	Effective height (metres)	Dispersion factor (Long term)	Dispersion factor (short term)	Dispersion factor (monthly)	Efflux velocity (m/s)	Total flow (m3/h)
A1	385277_329627	Dust abatement	0	148	3900	529	0	27,000
A2	385321_329643	Dust abatement	0	148	3900	529	0	15,000
A3	385251_329588	Generating power	0	148	3900	529	92.8	5,783
A4	385322_329641	Generating power	0	148	3900	529	92.8	5,783

**Table A. 2 Input: Emissions inventory**

Release Point	Substance	Measurement method	Operating mode(%)	Long term conc (mg/m3)	Release rate g/s (long term)	Measurement basis (Long term)	Short term conc (mg/m3)	Release rate g/s (short term)	Measurement basis (short term)	Annual rate (t/yr)	Long term PC (ug/m3)	Short term PC (ug/m3)	Total Flow (m3/h)
A1	Particulates (PM10)	Estimated	15%	3	0.02	Manufacturer's data	3	0.02	Manufacturer's data	0.11	0.4995	51.77	27000.00
A1	Particulates (PM2.5)	Estimated	15%	3	0.02	Manufacturer's data	3	0.02	Manufacturer's data	0.11	0.4995	87.75	27000.00
A2	Particulates (PM10)	Estimated	15%	5	0.02	Manufacturer's data	5	0.02	Manufacturer's data	0.10	0.46	47.94	15000.00
A2	Particulates (PM2.5)	Estimated	15%	5	0.02	Manufacturer's data	5	0.02	Manufacturer's data	0.10	0.46	81.25	15000.00
A3	Particulates (PM10)	Estimated	15%	1.94	0.00	Manufacturer's data	1.94	0.00	Manufacturer's data	0.01	0.07	7.17	5783.00
A3	Particulates (PM2.5)	Estimated	15%	1.94	0.00	Manufacturer's data	1.94	0.00	Manufacturer's data	0.01	0.07	12.15	5783.00
A3	Carbon monoxide	Estimated	15%	27.11	0.04	Manufacturer's data	27.11	0.04	Manufacturer's data	0.21	0.97	118.89	5783.00
A3	Formaldehyde	Estimated	15%	4.11	0.01	Manufacturer's data	4.11	0.01	Manufacturer's data	0.03	0.15	33.47	5783.00
A3	Nitrogen dioxide	Estimated	15%	504	0.81	Manufacturer's data	504	0.81	Manufacturer's data	3.83	17.97	1578.76	5783.00
A3	Nitrogen oxides (as NO2) (ecological)	Estimated	15%	504	0.81	Manufacturer's data	504	0.81	Manufacturer's data	3.83	17.97	1862.94	5783.00
A4	Particulates (PM10)	Estimated	15%	1.94	0.00	Manufacturer's data	1.94	0.00	Manufacturer's data	0.01	0.07	7.17	5783.00
A4	Particulates (PM2.5)	Estimated	15%	1.94	0.00	Manufacturer's data	1.94	0.00	Manufacturer's data	0.01	0.07	12.15	5783.00
A4	Carbon monoxide	Estimated	15%	27.11	0.04	Manufacturer's data	27.11	0.04	Manufacturer's data	0.21	0.97	118.89	5783.00
A4	Formaldehyde	Estimated	15%	4.11	0.01	Manufacturer's data	4.11	0.01	Manufacturer's data	0.03	0.15	33.47	5783.00
A4	Nitrogen dioxide	Estimated	15%	504	0.81	Manufacturer's data	504	0.81	Manufacturer's data	3.83	17.97	1578.76	5783.00
A4	Nitrogen oxides (as NO2) (ecological)	Estimated	15%	504	0.81	Manufacturer's data	504	0.81	Manufacturer's data	3.83	17.97	1862.94	5783.00

**Table A. 3 Output: Air impacts – pollutants**

Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	Long term modelled PC	Short term EAL (ug/m3)	Short term PC (ug/m3)	Short term modelled PC
1	Particulates (PM10)	40	1.100367913		50	114.0516472	
2	Particulates (PM2.5)	20	1.100367913		0	193.3078767	
3	Carbon monoxide	0	1.93		10000	237.78	
4	Formaldehyde	5	0.29		100	66.95	
5	Nitrogen dioxide	40	35.95		200	3157.52	
6	Nitrogen oxides (as NO2) (ecological)	30	35.95		75	3725.87	

**Table A. 4 Output: Air impacts – Test 1**

Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	%PC of EAL (long term)	>1% of EAL? (long term)	Short term EAL (ug/m3)	Short term PC (ug/m3)	%PC of EAL (short term)	>10% of EAL? (short term)
1	Particulates (PM10)	40	1.100367913	2.75%	fail	50	114.0516472	228.10%	fail
2	Particulates (PM2.5)	20	1.100367913	5.50%	fail	0	193.3078767		
3	Carbon monoxide	0	1.933584603			10000	237.7786472	2.38%	pass
4	Formaldehyde	5	0.29314027	5.86%	fail	100	66.9468995	66.95%	fail
5	Nitrogen dioxide	40	35.947128	89.87%	fail	200	3157.518	1578.76%	fail
6	Nitrogen oxides (as NO2) (ecological)	30	35.947128	119.82%	fail	75	3725.87124	4967.83%	fail

**Table A. 5 Output: Air impacts – Test 2**

Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	Air Background conc (ug/m3)	%PC of headroom (long term)	PEC Long term (ug/m3)	%PEC of EAL% (Long term)	%PEC of EAL>70%? (long)	Short term EAL (ug/m3)	Short term PC (ug/m3)	%PC of the EAL- 2*background	%PC of headroom >=20%? (short)
1	Particulates (PM10)	40	1.100367913	10.3	4%	11.40	28.50%	pass	50	114.0516472	387.93%	fail
2	Particulates (PM2.5)	20	1.100367913	7.2	9%	8.30	41.50%	pass	0	193.3078767		
4	Formaldehyde	5	0.29314027	0.9	7%	1.19	23.86%	pass	100	66.9468995	68.17%	fail
5	Nitrogen dioxide	40	35.947128	4.5	101%	40.45	101.12%	fail	200	3157.518	1653.15%	fail
6	Nitrogen oxides (as NO2) (ecological)	30	35.947128	5.6	100%	41.55	138.49%	fail	75	3725.87124	5839.92%	fail

**Table A. 6 Results: Air Assessment**

Option	Substance	Test 1	Test 2
1	Particulates (PM10)	Fail	Fail
1	Particulates (PM2.5)	Fail	Pass
1	Carbon monoxide	Pass	
1	Formaldehyde	Fail	Fail
1	Nitrogen dioxide	Fail	Fail
1	Nitrogen oxides (as NO2) (ecological)	Fail	Fail

## **Appendix B Technical specification: Dust extraction system for Main wood processing building (A1)**

## RJT Ainsworth: HAAS Wood Storage & Processing Facility

### **Filter Unit – Dust Extraction System** **Volume / capacity 27.000 m³/h**

#### **Project basics**

job description:	central dust suppression
process:	waste wood processing
characteristics of dust:	fine and dry
raw gas concentration:	max. 25 g/m³
kind of operation:	multi-shift operation
volume flow:	27.000m³/h
installation filter:	outdoor
sound level:	max. 85 dB(A)
way of disposal:	rotary valve 1,5 m above floor level
clean-air guidance:	exhaust air tune above roof, approx. 12 m
residual dust content:	< 3 mg/m³

#### **Bag filter system, type RTFAE-240S--JET FS**

Filter surface:	243 m²
Air-to-cloth ratio:	111 m³/m²/h (27.000 m³/h)
No. of bag filters:	121 pcs
Length of bag filters:	4.000 mm

#### **Technical data:**

- Filter media PE, 550 g/m², oil- and water repellent
- Filter bags NW 160 mm with internal filter cages, galvanized
- Pressure air pulse cleaning for providing continuous operation of the filter, incl. filter control (pressure or time dependant control) with control unit (output 4...20 mA)
- Pressure air tanks and jet lances with nozzles for low consumption of pressure air during the cleaning process
- Filter housing made of galvanized steel sheet S= 3mm and static verification of pressure resistance
- Certified pressure relief panels (ATEX) incl. pressure relief channel to front, max. length 1.000 mm
- Material hopper with inside large screw-conveyor (NW 400) incl. gear motor and bearings as well as connection to rotary valve
- Large raw gas section as a large expansion room for air calming
- Discharge air connection nozzle according to local necessity
- Filter base frame in welded hot-dip galvanized steel-construction incl. dry extinguishing pipe according to DIN EN 12 779
- dimensions: approx. 2.816 x 2.816 x 10.285 mm
- Ground clearing upper edge FFB to UK rotary valve 1.500 mm

*Compressor ?*

**Rotary valve, Type RTZ5050ATEX-S-SEW**

zone 20/22

gear box product SEW: 1,5 kW

inlet 500x500; outlet 350x500

CE type examination according to regulation 94/9/EG

as a protection system for explosion decoupling in potentially explosive areas  
(pressure-shock-proof and flame-propagation-proof up to 0.4 bar)

**Non-return valve; Type RSK 630**

Ø 630 mm with EC type examination according to 94/9/EC

**High performance - radial – ventilator**

volume flow: 27.000 m<sup>3</sup>/h

total pressure increase: 3.500 Pa

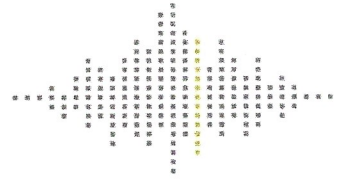
drive motor: 37 kW

- nominal rotation speed: 1.480 rpm
- sound pressure level in 1 m 85 dB(A)
- welded housing
- welded impeller, with hub have static and dynamic DIN 1940 G6,3
- inspection drain
- inspection cover
- rubber vibration damper
- motor (IE3)

1. <b>Personal Information</b> Name: <b>John Doe</b> Date of Birth: <b>12/15/1980</b> Gender: <b>Male</b> Address: <b>123 Main St, Anytown, CA 90210</b> Phone: <b>(555) 123-4567</b> Email: <b>john.doe@example.com</b>	<b>Checklist</b> 1. <input checked="" type="checkbox"/> ID Card 2. <input checked="" type="checkbox"/> Social Security Card 3. <input checked="" type="checkbox"/> Driver's License 4. <input checked="" type="checkbox"/> Health Insurance Card 5. <input checked="" type="checkbox"/> Passport 6. <input checked="" type="checkbox"/> Birth Certificate 7. <input checked="" type="checkbox"/> Marriage Certificate 8. <input checked="" type="checkbox"/> Divorce Certificate 9. <input checked="" type="checkbox"/> Death Certificate 10. <input checked="" type="checkbox"/> Other	<b>Medical Info</b> Blood Type: <b>A+</b> Allergies: <b>None</b> Current Medication: <b>None</b> Last Medical Exam: <b>12/01/2023</b> Referring Physician: <b>Dr. Smith</b> Hospital: <b>St. Mary's Hospital</b> Insurance Provider: <b>Blue Cross</b> Policy Number: <b>123456789</b> Group Number: <b>987654321</b> Effective Date: <b>01/01/2024</b> Expiration Date: <b>12/31/2024</b> Renewal Date: <b>01/01/2025</b> Contact Person: <b>John Doe</b> Contact Phone: <b>(555) 123-4567</b> Contact Email: <b>john.doe@example.com</b> Signature: <b>John Doe</b> Date: <b>12/15/2023</b>
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**Reference:** Mill Farm, Chebsey

**Project No:** 1112359

**Date:** 7th June 2019

## Technical Note

Re: Dust Extract Plant. Serving Milling Hall. Sound Level Assessment.

### Introduction

1. An application has been submitted to Staffordshire County Council<sup>1</sup> by Wardell Armstrong, on behalf of Mill farm, for a new Pre-Shredding Facility. The new facility would be at the location of a previously permitted, but not fully built, Anaerobic Digester (AD) building on Mill Farm.
2. A decision on the Pre-Shredding facility has been postponed, pending submission by the Applicant, of an assessment of sound from a recently installed Dust Extract Plant at the (Replacement) Milling Hall. The Dust Extract Plant is itself the subject of a planning application (retrospective) to Stafford Borough Council. Staffordshire County Council wish the contribution of sound from the Dust Extract Plant to be included in the assessment of sound of the proposed Pre-Shredding Facility.
3. The likely levels of sound associated with the proposed Pre-Shredding plant were reported by Sharps Redmore<sup>2</sup> in the Technical Note dated 28th March 2019. (Copy attached for ease of reference). That particular Note was additional to one dated 31st October 2018.
4. The October 2018 Note examined Pre-Shredding operational sound, inclusive of the Milling Building, to the bungalow on Stone Road some 400m west of the Milling Building. It did not include the Dust Extract Plant. Accordingly, this is now added.
5. The March 2019 Note examined Pre-Shredding, Milling and Composting sound levels in the context of Field House Farm, some 940m south of the Milling Building. It did not include the Dust Extract Plant. Accordingly, this is now added.
6. In the preparation of sound level assessments on these topics to date, Sharps Redmore has relied on its submissions of 9th April 2018, 5th October 2017 and 20th May 2015. These have each been reviewed by the planning authorities and to be succinct, they are not appended to this current Technical Note.

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<sup>1</sup> Staffordshire County Council. App.n ref: S.18/12/467W

Extension of time to determine the waste planning application.

<sup>2</sup> Sharps Redmore. 28th March 2019. Project No. 1112359. Technical Note.



7. The following sections of this Technical Note consider Dust Extract Fan sound to the bungalow on Stone Road and the farm house at Field House Farm. Firstly however, the Dust Extract Fan system and sound details are summarised.

#### **Dust Extract Fan**

8. The image inserted beneath is courtesy of the Applicant. The 'tower' unit comprises a fan (at low level, on the ground), a filter housing (rectangular tall section) and ductwork. The fan exhausts filtered air to atmosphere from the duct which rises vertically to roof ridge level. This duct incorporates an attenuator. (The slightly 'fattened' section of circular duct at the base of the duct). The exhaust points horizontally, to the east. The Milling Hall access door is to the right of the equipment. The background view is to the south-west.



9. The Applicant has been provided with information which indicates the following:
- Sound power level to outlet, 105 dB, excluding attenuator.
  - Sound power level from fan casing, 96 dB.
  - Attenuator, sound reduction of 11 dB.

**Table 13**  
**Cumulative Levels**  
**Stone Road Bungalow**

Contribution	Value
Dust Extract Fan. (This Technical Note, Table 12)	33 dB $L_{Aeq,1hr,free-field}$
Milling Hall Plant. (SR Tech Note, 31st October 2018)	36 dB $L_{Aeq,1hr,free-field}$
Tractor & Trailer movements (SR Tech Note, 31st October 2018)	31 dB $L_{Aeq,1hr,free-field}$
Pre-Shred Building. (SR Tech Note, 31st October 2018)	38 dB $L_{Aeq,1hr,free-field}$
Combined Level	41 dB $L_{Aeq,1hr,free-field}$
Rating Level. (No character-corrections*)	41 dB $L_{Ar,1hr,free-field}$
Permitted Level. (Background +5 dB)	43 dB to 47 dB
Is permitted Level expected to be satisfactorily met?	Yes

\*No, because the source values are below the existing ambient and/or are of a character typical of a farming environment

14. The combined level at 41 dB is the same as expected without the Dust Extract Plant.

**Receptor: Field House Farm**

15. The dwelling on the farm is approximately 970 metres from the Dust Extract Plant. The fan itself is fully shielded by the Milling Hall and adjacent farm buildings. The exhaust duct termination is orientated approximately 120° away from Field House Farm.
16. Table 16 sets out the calculation steps of the Dust Extract Plant to the Field House Farm dwelling.

**Table 16**  
**Dust Extract Fan. Prediction to Field House Farm dwelling**

Calculation Steps	Value	
Fan source	Outlet	Casing
$L_{WA}$ given by the supplier	105 dB	96 dB
Exhaust side attenuator	-11 dB	n/a
Exhaust terminal directivity, 120°	-3 dB	n/a
Shielding by Mill Farm buildings	n/a	-15 dB
Adjust for 970m distance	-71 dB	-68 dB
Adjust for air & ground absorption, plus downwind enhancement	-2 dB	+2 dB
$L_{Aeq,1hr,free-field}$ each	18 dB	15 dB
$L_{Aeq,1hr,free-field}$ , combined = 20 dB		



10. These values are used to calculate the sound level at the two receptors. The emission values are not unusual for this type of plant and are not 'high'. In context, they would be similar to the level of a lorry or tractor engine on 'idle/tide-over.' Given the above, the calculations are kept brief and robust. By robust, Sharps Redmore means that not every attenuating mechanism during sound propagation has been included. Accordingly, the reality would likely be for levels lower than forecast.

#### Receptor: Stone Road

11. This bungalow is approximately 440m from the Dust Extract Plant, the exhaust duct termination of which is orientated almost 180° away. The intervening land is mostly open agricultural land. It rises to a gentle crest at the woodland area, the effects of which would be to attenuate sound from the plant. For simplicity, only modest account is taken of these attenuating mechanisms.
12. Table 12 sets out the calculation steps of Dust Extract Plant sound to the Stone Road bungalow receptor.

**Table 12**  
**Dust Extract Fan. Prediction to Stone Road bungalow**

Calculation steps	Value	
	Outlet	Casing
Fan source		
L <sub>WA</sub> given by supplier	105 dB	96 dB
Exhaust duct losses	Ignore	n/a
Exhaust side attenuator	-11 dB	n/a
Exhaust terminal directivity, 180°	-6 dB	n/a
Adjust for 440m distance	-64 dB	-61 dB
Adjust for air and ground absorption, plus downwind enhancement	-1 dB	-3 dB
L <sub>Aeq,1hr,free-field</sub> each	23 dB	32 dB
<b>L<sub>Aeq,1hr,free-field</sub> combined = 33 dB</b>		

13. Table 13 takes this 33 dB L<sub>Aeq</sub> value and adds the previously-derived sound levels for the Milling Hall, the Pre-Shred Building and Tractor movements. These are then compared with the permitted level at this location of between 43 dB and 47 dB (rating level). The sources of information are referenced appropriately.

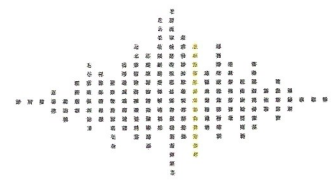
17. The Sharps Redmore Technical Note dated 28th March 2019 examined the sound contributions to Field House Farm comprising the Pre-Shred Building, Vehicle movements, Milling and occasional compost Turning. That combination was reported as:
- 36 dB  $L_{Aeq,1hr,free-field}$ , excluding occasional Turning
  - 41 dB  $L_{Aeq,1hr,free-field}$ , including occasional Turning
18. In the context of the 36 dB to 41 dB  $L_{Aeq}$  range, as above, a level of 20 dB  $L_{Aeq}$  from the Dust Extract Plant would not be additive. Accordingly, the 45 dB  $L_{Aeq,1hr,free-field}$  sound level limit relevant to Field House Farm would remain satisfactorily met.

#### **Conclusions**

19. The Dust Extract Plant is positioned and orientated well and an attenuator is incorporated on the exhaust side. The analysis and findings summarised in this Technical Note indicates the fan sound levels reaching Stone Road and Field House Farm would not add to the Mill Farm activity levels previously assessed. They would remain satisfactory in the context of the sound level limit values at the receptors.

**Dean E Barke** MSc MIOA

Attachment: Technical Note dated 28th March 2019



**Reference:** Mill Farm Chebsey

**Project No:** 1112359

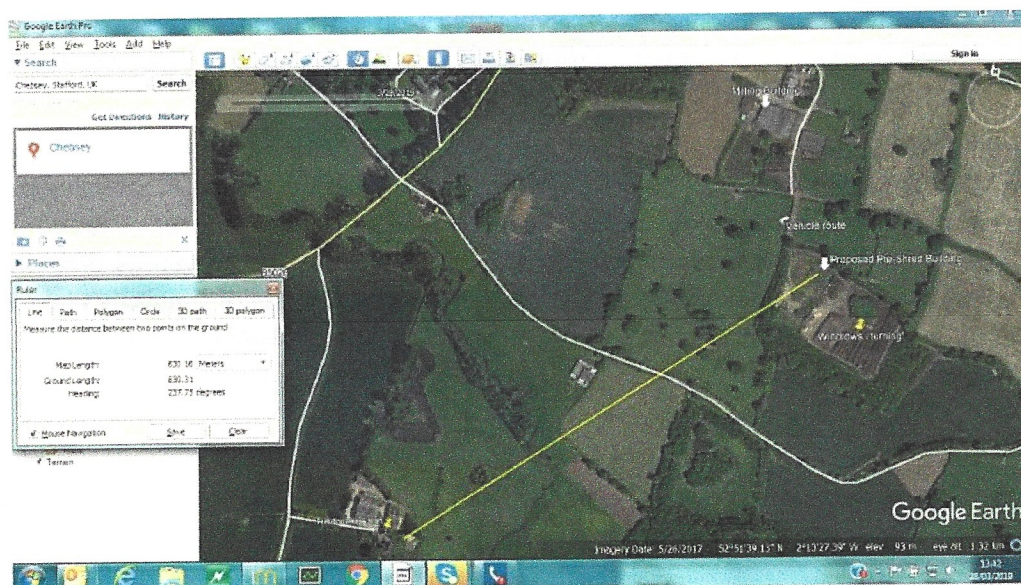
**Date:** 28th March 2019

## Technical Note

Re: Proposed Building for the Pre-Shredding of Wood Waste.  
Additional Information on Likely Sound Emissions.

### Introduction

- 1 An application has been submitted by Wardell Armstrong (on behalf of Mill Farm), to Staffordshire County Council, reference S.18/12/467W. The Application seeks permission for the former (part-built) Anaerobic Digester (AD) building to be demolished and a new building constructed in its place for the Pre-Shredding of wood waste.
- 2 A statement on sound emissions<sup>1</sup> accompanied the planning submissions. That Statement examined the likely effect on the closest and most directly-in-line property on Stone Road. A satisfactory outcome was forecast.
- 3 Staffordshire County Council have now requested an additional receptor be considered, that being Field House Farm. The dwelling at Field House Farm lies approximately 850 metres to the south-west of the proposed Pre-Shred building, as illustrated on the image beneath.



<sup>1</sup> Sharps Redmore. 31st October 2018. Technical Note  
Project N<sup>o</sup> 1112359

#### Head Office

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**Sharps Redmore Partnership Limited** Registered in England No. 2593855

**Directors** RD Sullivan BA(Hons), PhD, CEng, MIOA, MAAS, MASA, DE Barke MSc, MIOA; KJ Metcalfe BSc(Hons), MIOA

**Company Consultant** TL Redmore BEng, MSc, PhD, MIOA



- 4 In considering the Field House Farm receptor, the cumulative effect (of sound) from Milling operations is to be taken into account. Milling operations are permitted in a building among others at the northern part of Mill Farm as high-lighted on the image inserted at paragraph 3 above. The Milling building is approximately 950 metres from the Field House Farm dwelling.

### **The Pre-Shredding**

- 5 The site plan attached as Attachment 1 to this Technical Note shows the proposed Shredder Building and its elevations. The 'west elevation' shows the access door position. A loading shovel (or similar) would travel back and forth between the shredder in the building and the stockpile of wood waste to be held on the concrete storage pad.
- 6 Although the access door would have a roller-shutter fitting, that would be for closing and securing the building at the end of working. It would not be opened and closed for every movement of the shovel. Such doors are not sufficiently fast-acting to respond to vehicle movements and accordingly, Sharps Redmore have examined the sound emissions on the basis of the door remaining fully open all of the time during Pre-Shred machine operations.
- 7 Previous assessments by Sharps Redmore have developed a sound emission value for the door aperture of 105 dB  $L_{WA}'$ . ( $L_{WA}'$  – the apparent sound power level).

### **Vehicle Movements**

- 8 Sharps Redmore understand there would be, on average, 12-off vehicle (tractor and trailer) movements per hour between the Pre-Shred facility and the Milling Hall. These have previously been modelled (to the Stone Road bungalow receptor) at a sound output of 104 dB ( $L_{WA}'$ ) and haul speed equivalent to completing 1-off movement/journey in one minute.

### **Milling**

- 9 The sound levels measured and adopted for the plant within and on the outside of the Milling building have been reported<sup>2</sup> by Sharps Redmore as 61 dB  $L_{Aeq,t}$  at 40m. That value included a proportion of sound from the north elevation loading door aperture. That contribution would not feature in the sound propagation to Field House Farm given its orientation and shielding by the Milling building itself. However, in the interests of simplicity and resilience, the same value is used in the forecast of sound propagating to Field House Farm.

---

<sup>2</sup> Sharps Redmore. 9th April 2018. Report. Project No. 1112359.



## Sound Level Prediction and Assessment

- 10 A cumulative sound level prediction is made to the dwelling at Field House Farm using the output values presented above. In addition to these day-to-day operations, account is also taken of the occasional 'turning' of the windrows on the composting pad. (See this area at Attachment 1). Sharps Redmore have measured this process on an occasion in the past and found it to be 71 dB  $L_{Aeq,t}$  at a distance of 25m.
- 11 Table 11 sets out the calculations and assessment for the key proposed, permitted and occasional operations. The not-to-exceed value for Mill Farm operations reaching Field House Farm is 45 dB  $L_{Aeq,1hr,free-field}$ .

**Table 11**

### Sound Level Prediction and Assessment

#### To Field House Farm dwelling

Calculation Steps	Activity			
	Pre-Shred	Vehicles	Milling	Turning (Occasional)
<b>Prediction</b>				
Source value, as derived from site	105 dB $L_{WA}'$	104 dB $L_{WA}'$	61 dB $L_{Aeq,t}$	71 dB $L_{Aeq,t}$
Source value distance	n/a	n/a	40m	25m
Assessment time period 't'	1-hour	1-hour	1-hour	1-hour
Distance to receptor, adopt	830m	850m	940m	850m
Adjust for distance*	-66 dB	-69 dB	-30 dB	-31 dB
Adjust for barrier, southern boundary	-3 dB	Ignore	Not applicable	Ignore
Adjust for absorption	-3 dB	-3 dB	-4 dB	-3 dB
Adjust for light breeze, NE	+2 dB	+2 dB	+2 dB	+2 dB
Adjust for 1 minute vehicle movements	n/a	-18 dB	n/a	n/a
Adjust for 12-off movements**	n/a	+11 dB	n/a	n/a
Estimated $L_{Aeq,1hr,free-field}$	35 dB	27 dB	29 dB	39 dB
<b>Total of Three = 36 dB</b>	✓	✓	✓	X
<b>Total of Four = 39 dB</b>	✓	✓	✓	✓
<b>Assessment</b>				
<b>Limit = 45 dB</b>				
<b>Limit achieved ? = Yes</b>				
<b>Conclude = Satisfactory</b>				
*including 'soft' ground attenuation				
**per hour on average				

- 12 The expectation is for the 45 dB  $L_{Aeq,1hr,free-field}$  limit for Mill Farm site operations to be satisfactorily achieved at the Field House Farm dwelling receptor point.

**Dean E Barke** MSc. MIOA

Attachments: 1. Site Layout and Elevation drawings

DRAFT

## **Appendix C Technical specification: Diesel generators, Kohler SDMO V770C2, (A3, A4)**



#### DESCRIPTIVE

- Electronic governor
- Mechanically welded chassis with antivibration suspension
- Main line circuit breaker
- Radiator for core temperature of 48/50°C max with mechanical fan
- Protective grille for fan and rotating parts (CE option)
- 9 dB(A) silencer supplied separately
- Charger DC starting battery with electrolyte
- 24 V charge alternator and starter
- Delivered with oil and coolant -30°C
- Manual for use and installation

#### POWER DEFINITION

PRP : Prime Power is available for an unlimited number of annual operating hours in variable load applications, in accordance with ISO 8528-1. ESP : The standby power rating is applicable for supplying emergency power in variable load applications in accordance with ISO 8528-1. Overload is not allowed.

#### TERMS OF USE

According to the standard, the nominal power assigned by the genset is given for 25°C Air Intlet Temperature, of a barometric pressure of 100 kPa (100 m A.S.L), and 30 % relative humidity. For particular conditions in your installation, refer to the derating table.

#### ASSOCIATED UNCERTAINTY

For the generating sets used indoor, where the acoustic pressure levels depends on the installation conditions, it is not possible to specify the ambient noise level in the exploitation and maintenance instructions . You will also find in our exploitation and maintenance instructions a warning concerning the air noise dangers and the need to implement appropriated preventive measures.

## V770C2

Engine ref.	TWD1645GE
Alternator ref.	KH02850T
Performance class	G3

#### GENERAL CHARACTERISTICS

Frequency (Hz)	50 Hz
Voltage (V)	400/230
Standard Control Panel	APM403
Optional control panel	APM802
Optional Control Panel	M80
Optional control panel	NA

#### POWER

Voltage	ESP		PRP		Standby Amps
	kWe	kVA	kWe	kVA	
415/240	616	770	560	700	1071
400/230	616	770	560	700	1111
380/220	616	770	560	700	1170
240 TRI	616	770	560	700	1852
230 TRI	616	770	560	700	1933
220 TRI	616	770	560	700	2021

#### DIMENSIONS COMPACT VERSION

Length (mm)	3470
Width (mm)	1630
Height (mm)	2048
Dry weight (kg)	4270
Tank capacity (L)	610

#### DIMENSIONS SOUNDPROOFED VERSION

Type soundproofing	M230
Length (mm)	5023
Width (mm)	1630
Height (mm)	2672
Dry weight (kg)	5790
Tank capacity (L)	610
Acoustic pressure level @1m in dB(A)	85
Sound power level guaranteed (Lwa)	105
Acoustic pressure level @7m in dB(A)	75

### GENERAL ENGINE DATA

Engine brand	VOLVO
Engine ref.	TWD1645GE
Air inlet system	Turbo
Cylinders configuration	L
Number of cylinders	6
Displacement (L)	16,12
Charge Air coolant	Air/Water DC
Bore (mm) x Stroke (mm)	144 x 165
Compression ratio	16.8 : 1
Speed (RPM)	1500
Pistons speed (m/s)	8,25
Maximum stand-by power at rated RPM (kW)	675
Frequency regulation, steady state (%)	
BMEP @ PRP 50 Hz (bar)	30,40
Governor type	Electronic

### COOLING SYSTEM

Radiator & Engine capacity (L)	151
Fan power (kW)	21
Fan air flow w/o restriction (m3/s)	
Available restriction on air flow (mm H2O)	
Type of coolant	Glycol-Ethylene

### EMISSIONS

Emission PM (g/kW.h)	0,02
Emission CO (g/kW.h)	0,28
Emission HC+NOx (g/kWh)	5,29
Emission HC (g/kW.h)	0,09

### EXHAUST

Exhaust gas temperature @ ESP 50Hz (°C)	501
Exhaust gas flow @ ESP 50Hz (L/s)	1767
Max. exhaust back pressure (mm H2O)	1000

### FUEL

Consumption @ 100% load ESP (L/h)	157,20
Consumption @ 100% PRP load (L/h)	143,70
Consumption @ 75% PRP load (L/h)	107,70
Consumption @ 50% PRP load (L/h)	73,60
Maximum fuel pump flow (L/h)	177

### OIL

Oil system capacity including filters (L)	48
Min. oil pressure (bar)	
Max. oil pressure (bar)	5
Oil consumption 100% ESP 50Hz (L/h)	0,11
Oil sump capacity (L)	42

### HEAT BALANCE

Heat rejection to exhaust (kW)	473
Radiated heat to ambient (kW)	26
Heat rejection to coolant HT (kW)	259

### AIR INTAKE

Max. intake restriction (mm H2O)	500
Intake air flow (L/s)	725,50

### GENERAL DATA

Alternator ref.	KH02850T
Number of Phase	Three phase
Power factor (Cos Phi)	0,80
Altitude (m)	0 à 1000
Overspeed (rpm)	2250
Number of pole	4
Capacity for maintaining short circuit at 3 In for 10 s	Yes
Insulation class	H
T° class (H/125°), continuous 40°C	H / 125°K
T° class (H/163°C), standby 27°C	H / 163°K
Total Harmonic Distortion in no-load DHT (%)	<4
AVR Regulation	Yes
Total Harmonic Distortion, on linear load DHT (%)	<4
Wave form : NEMA=TIF	<50
Wave form : CEI=FHT	<2
Number of bearing	Single Bearing
Coupling	Direct
Voltage regulation at established rating (+/- %)	0,50
Recovery time (Delta U = 20% transient) (ms)	500
Indication of protection	IP 23
Technology	Brushless

### OTHER DATA

Continuous Nominal Rating 40°C (kVA)	730
Standby Rating 27°C (kVA)	810
Efficiencies 100% of load (%)	94,30
Air flow (m3/s)	1
Short circuit ratio (Kcc)	0,4210
Direct axis synchro reactance unsaturated (Xd) (%)	294
Quadra axis synchro reactance unsaturated (Xq) (%)	150
Open circuit time constant (T'do) (ms)	2074
Direct axis transient reactance saturated (X'd) (%)	14,20
Short circuit transient time constant (T'd) (ms)	100
Direct axis subtransient reactance saturated (X''d) (%)	11,30
Subtransient time constant (T''d) (ms)	10
Quadra axis subtransient reactance saturated (X''q) (%)	12,80
Subtransient time constant (T''q) (ms)	10
Zero sequence reactance unsaturated (Xo) (%)	0,50
Negative sequence reactance saturated (X2) (%)	12,10
Armature time constant (Ta) (ms)	15
No load excitation current (io) (A)	1,11
Full load excitation current (ic) (A)	4,13
Full load excitation voltage (uc) (V)	46,90
Engine start (Delta U = 20% perm. or 30% trans.) (kVA)	1439,30
Transient dip (4/4 load) - PF : 0,8 AR (%)	10
No load losses (W)	10302,5
Heat rejection (W)	9
Unbalanced load acceptance ratio (%)	35232,6
	0
	60

## DIMENSIONS

### Dimensions soundproofed version

Type soundproofing	M230
Length (mm)	5023
Width (mm)	1630
Height (mm)	2672
Dry weight (kg)	5790
Tank capacity (L)	610
Acoustic pressure level @1m in dB(A)	85
Sound power level guaranteed (Lwa)	105
Acoustic pressure level @7m in dB(A)	75

### Dimensions DW soundproofed version

Type soundproofing	M230 DW
Length (mm)	5083
Width (mm)	1690
Height (mm)	2932
Dry weight (kg)	6380

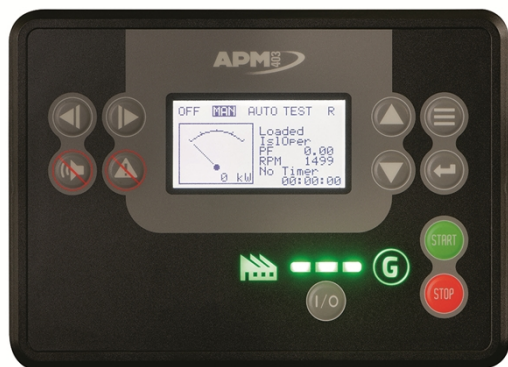
### Dimensions DW compact version

Type soundproofing	
Length (mm)	5083
Width (mm)	1630
Height (mm)	2310
Dry weight (kg)	4890
Tank capacity (L)	1950
Acoustic pressure level @1m in dB(A)	
Sound power level guaranteed (Lwa)	
Acoustic pressure level @7m in dB(A)	

Tank capacity (L)	1950
Acoustic pressure level @1m in dB(A)	85
Sound power level guaranteed (Lwa)	105
Acoustic pressure level @7m in dB(A)	75



**APM403, basic generating set and power plant control**



The APM403 is a versatile control unit which allows operation in manual or automatic mode  
 Measurements : voltage and current  
 kW/kWh/kVA power meters  
 Standard specifications: Voltmeter, Frequency meter.  
 Optional : Battery ammeter.  
 J1939 CAN ECU engine control  
 Alarms and faults: Oil pressure, Coolant temperature, Overspeed, Start-up failure, alternator min/max, Emergency stop button.  
 Engine parameters: Fuel level, hour counter, battery voltage.  
 Optional (standard at 24V): Oil pressure, water temperature.  
 Event log/ Management of the last 300 genset events.  
 Mains and genset protection  
 Clock management  
 USB connections, USB Host and PC,  
 Communications : RS485 INTERFACE  
 ModBUS protocol /SNMP  
 Optional : Ethernet, GPRS, remote control, 3G, 4G,  
 Websupervisor, SMS, E-mails

**APM802 dedicated to power plant management**



The new APM802 command/control system is specifically designed for operating and monitoring power plants for markets including hospitals, data centres, banks, the oil and gas sector, industries, IPP, rental and mining. This unit is available as standard on all generating sets from 275 Kva designed for coupling. It is optional on the rest of our range.

The Human Machine Interface, designed in collaboration with a company specialising in interface design, facilitates operations with a large 100% touch screen. The pre-configured system for power plant applications features a brand new customisation function which complies with the international standard IEC 61131-3. New communication functions (PLC and regulation), improve the high level of equipment availability in the installation.

**Advantages:**  
 Dedicated to power plant management.  
 Specially researched ergonomics.  
 High level of equipment availability.  
 Modularity and long service life guaranteed.  
 Making it easy to extend the installation

For more information, please refer to the sales documentation.



## M80, transfer of information



The M80 is a dual-function control unit. It can be used as a basic terminal block for connecting a control box and as an instrument panel with a direct read facility, with displays giving a global view of your generating set's basic parameters.

Offers the following functions:

Engine parameters: tachometer, working hours counter, coolant temperature indicator, oil pressure indicator, emergency stop button, customer connection terminal block, CE.

## Basic terminal block



The control unit can be used as a basic terminal block for connecting a control box.

Offers the following functions:

emergency stop button, customer connection terminal block, CE.

## **Appendix D Technical specification: Dust extraction system for Bedding plant building (A2)**

### HAAS Wood Chip Handling System

Infeed material:	Grade A wood
Input:	ca. 0-40 mm wood chips (P40)
Capacity:	ca. 85-90 m³/h (11-13 t/h)
Final product:	0-5 mm (ca. 40%) 5-10 mm (ca. 40%) + 10 mm (ca. 20%)

#### Quotation consisting of:

- Pos 100 1 pc. **HAAS Dosing Hopper**  
for the storage of the incoming wood chips and feeding of the processing line.  
Capacity: ca. 41 m³  
Drive: ca. 2,2 kW  
Width: ca. 2.100 mm  
Length: ca. 8.000 mm  
Height: ca. 2.500 mm  
Belt quality: plate belt  
Carrier height: ca. 50 mm  
Carrier distance: ca. 500 mm  
Incl. chain belt conveyor  
Incl. 8 sturdy supports under the bunker belt incl. adjustable feet to compensate for local conditions  
Incl. chain oiler, automatic oiling by pressure oiler  
Incl. dosing drum; 2,2 kW  
Incl. reversing option to unload the bunker
- Pos 200 1 pc. **HAAS Belt Conveyor**  
**Type HTB 1.400 x 12.400 – covered –**  
For the transport of the material from the Dosing Hopper Pos. 100 to the following customer supplied Morbark Hammermill Pos. 300.  
Conveyor width: ca. 1.400 mm  
Conveyor length: ca. 12.400 mm  
Power: ca. 7,5 kW  
Incl. scraper  
Incl. dust extraction hood
- Pos 300 1 pc. **Morbark Hammermill – customer supplied –**  
To reduce the grain size of the grade A wood chips to sub 10 mm.
- Pos 310 1 pc. **Support for the Morbark Hammermill – customer supplied –**

**The customer is providing the Morbark Hammermill 1500V  
incl. switch and control cabinet.  
Incl. dust extraction hood**

- Pos 400 1 pc. **HAAS Chain Conveyor**  
**Type HKF 1.000 x 13.100**  
For collecting of the fines < 10 mm under the Morbark Hammermill  
Pos. 300 and further transport to the following Flat Screen Pos. 500.  
Conveyor width: ca. 1.000 mm  
Conveyor length: ca. 13.100 mm  
Lower bow: ca. 45°  
Power: ca. 5,5 kW  
Capacity: max. 85-95 m³/h  
Incl. dust extraction hood

Page 3, quotation no. ANG-05649-2, 26.05.2023

- Pos 500 1 pc. **HAAS Flat Screen**  
**Type HPS 100 – customer supplied –**  
to receive the material from Chain Conveyor Pos. 400 and separate  
into following fractions:  
Fraction 1: > 10 mm  
Fraction 2: 5-10 mm  
Fraction 3: < 5 mm  
Active screen deck length: ca. 5.220 mm  
Active screen deck width: ca. 2.000 mm  
Active screen area: ca. 10,3 m²  
Power: ca. 7,5 kW

**Installation on a concrete foundation to be provided by the  
customer**

- Pos 510 1 pc. **HAAS Maintenance Platform**  
Suitable for Flat Screen Pos. 500  
Maintenance Platform with railing  
Incl. stairs with hand rail
- Pos 520 1 pc. **New Infeed and Outfeed chute for customer supplied Flat Screen  
HPS 100 Pos 500**
- Pos 530 3 pc. **Exchange Screen Decks**  
Suitable for Flat Screen Pos. 500 to produce the specified grain sizes.
- Pos 600 1 pc. **HAAS Chain Conveyor**

**Type HKF 650 x 17.800**

For the transportation of the material 0-5 mm to the following  
Conveyor Pos. 700.

Conveyor width: ca. 650 mm

Conveyor length: ca. 17.800 mm

Lower bow: ca. 50°

Upper bow: ca. 50°

Power: ca. 7,5 kW

Capacity: max. 55-60 m³/h

**No supports included. It is assumed that the conveyor is suspended from the bunker walls and customer supplied steel beams.**

Pos 700 1 pc. **HAAS Chain Conveyor**

**Type HKF 650 x 9.100**

For the transportation of the material 0-5 mm to pile.

Conveyor width: ca. 650 mm

Conveyor length: ca. 9.100 mm

Power: ca. 4,0 kW

Capacity: max. 55-60 m³/h

Completely open at the bottom to distribute the material in the storage bay.

**No supports included. It is assumed that the conveyor is suspended from the bunker walls and customer supplied steel beams.**

Pos 800 1 pc. **HAAS Chain Conveyor**

**Type HKF 650 x 11.800**

For the transportation of the material 5-10 mm to the following  
Conveyor Pos. 900.

Conveyor width: ca. 650 mm

Conveyor length: ca. 11.800 mm

Lower bow: ca. 50°

Upper bow: ca. 25°

Power: ca. 5,5 kW

Capacity: max. 55-60 m³/h

**No supports included. It is assumed that the conveyor is suspended from the bunker walls and customer supplied steel beams.**

Pos 900 1 pc. **HAAS Chain Conveyor**

**Type HRKF 650 x 9.100**

For the transportation of the material 5-10 mm to pile.

Conveyor width: ca. 650 mm

Conveyor length: ca. 9.100 mm

Power: ca. 4,0 kW



Capacity: max. 55-60 m<sup>3</sup>/h

Completely open at the bottom to distribute the material in the storage bay.

**No supports included. It is assumed that the conveyor is suspended from the bunker walls and customer supplied steel beams.**

Pos	1.000	1 pc.	<b>HAAS Filter System</b>
			<u>Filter</u>
			Filter area: 200 m <sup>2</sup>
			Filter surface load: 100 m <sup>3</sup> /m <sup>2</sup> /h
			Filter bags: 100 pc., length 4.000 mm
			Filter housing: galvanized steel sheet
			Incl. ducting to approx. <b>4 extraction points</b> : 1x infeed conveyor
			Pos. 200, 2x under customer supplied mill, 1x outfeed conveyor
			Pos. 400
			Incl. inspection door, ladder, standing platform acc. to DIN
			Incl. compressor
			<u>Rotary valve</u>
			Power: 1,5 kW
			<u>Explosion diverter</u>
			For the explosion isolation from the filter to the
			crude gas main, incl. burst disc
			<u>Clean-air fan</u>
			Air volume: ca. 15.000 m <sup>3</sup> /h*
			Power: ca. 30,0 kW
			<u>Sound insulation cabinet</u>
			For the fan
			<u>Clean gas pipe</u>
			Between filter, fan and air duct
			Suspension at the slap
			<u>Incl. switch board</u>
			Sensors are included
			Incl. support structure
			Incl. suitable compressor
			<u>Without walkway</u>

Discharging in customer supplied big bag  
under the filter

\* Based on the assumption that max. 12,500 m<sup>3</sup>  
air/hour is required for the extraction of the  
hammer mill. A definite design of the filter system  
can be done only after confirmation of the  
displaced air of the hammer mill.

- |     |       |       |   |
|-----|-------|-------|---|
| Pos | 1.100 | 1 pc. | <b>10' Shipping Container</b><br>Incl. window<br>Incl. additional entrance door<br>Incl. electrical installations<br>Incl. steel support, staircase with hand rail  |
| Pos | 1.200 | 1 pc. | <b>HAAS Switch &amp; Control Board</b><br>For the automatic adjusting of the HAAS elements indicated here<br>above<br>Including star-triangle control for the main motor and overload<br>control for the transporting elements.<br>Mounted in a control cabinet.<br>Without cabling from the main motors to the cabinet.<br><br><p style="color: red;">The wiring diagram of the Morbark 1500V<br/>Hammermill needs to be provided by the customer.</p> |
| Pos | 1.300 | 1 pc. | <b>Electrical cabling</b><br>of above-mentioned Haas parts on site  |
| Pos | 1.400 | 1 pc. | <b>HAAS Mounting of installations &amp; Start-Up</b><br><u>At disposal from Haas:</u> 1 supervisor, 1 mounting engineer, including<br>preparation, voyage, mounting time (The mounting time is calculated<br>with 7 weeks, 5 days per week, 8 hours per day). Main condition for<br>this calculated time: a freely accessible site, free hall columns for the<br>welding of the steel bedding, etc.)  |

At disposal from the customer:

- Lifting devices, like forklift, crane etc.
- All measures like earth removal, concrete foundations, building works, sealing, static of foundation and building, platform, building techniques, intermediate transports, eventually necessary steel bedding, large surface sheeting if not mentioned.
- Servicing cabins, catwalks, stairs, railings, if not mentioned.
- Necessary current
- Coverings and safety devices if necessary or requested on site
- All steel beddings and foundations have to be prepared and ready before the beginning of the mounting of the installation.
- One of the assemblers should have good acknowledge in welding

techniques.

- Large surface sheeting
- Complete electrical control of the installation elements, if not mentioned
- Complete electronic cabling and electrical installation on site
- If the mounting duration should be longer for reasons that are not in Haas fault or responsibility, Haas will invoice the dead time after the end of the mounting. Ready electrical installation is the condition for immediate setting into service after mounting. Waiting time or a second voyage is not included in the quotation and will be invoiced if requested.

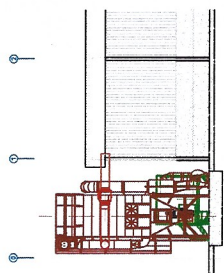
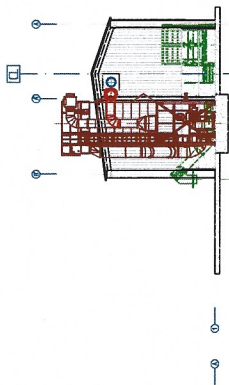
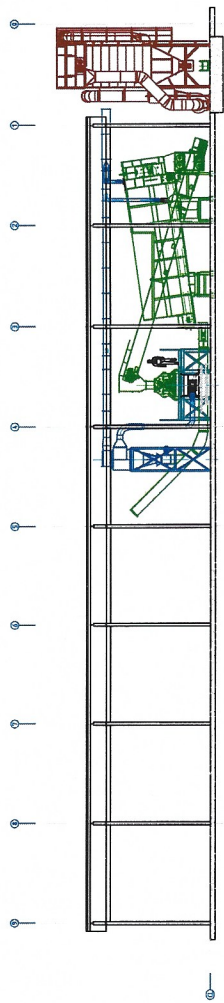
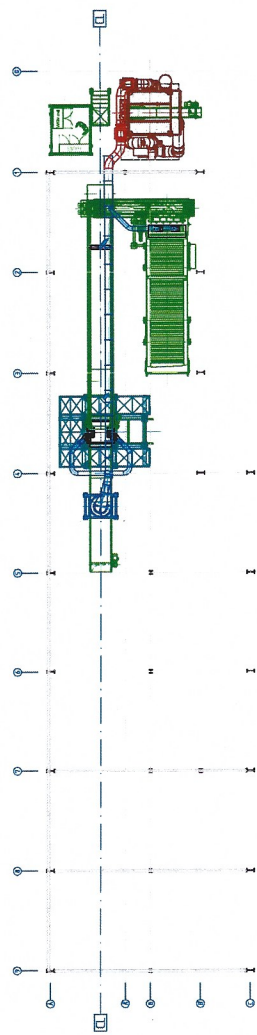
Pos 1.500 1 pc. **Transport cost**  
Transport of Pos. 100 – 1.100  
To DAP RJT & AR Ainsworth, Mill Farm, Stone Road, ST21 6NX  
Chebsey

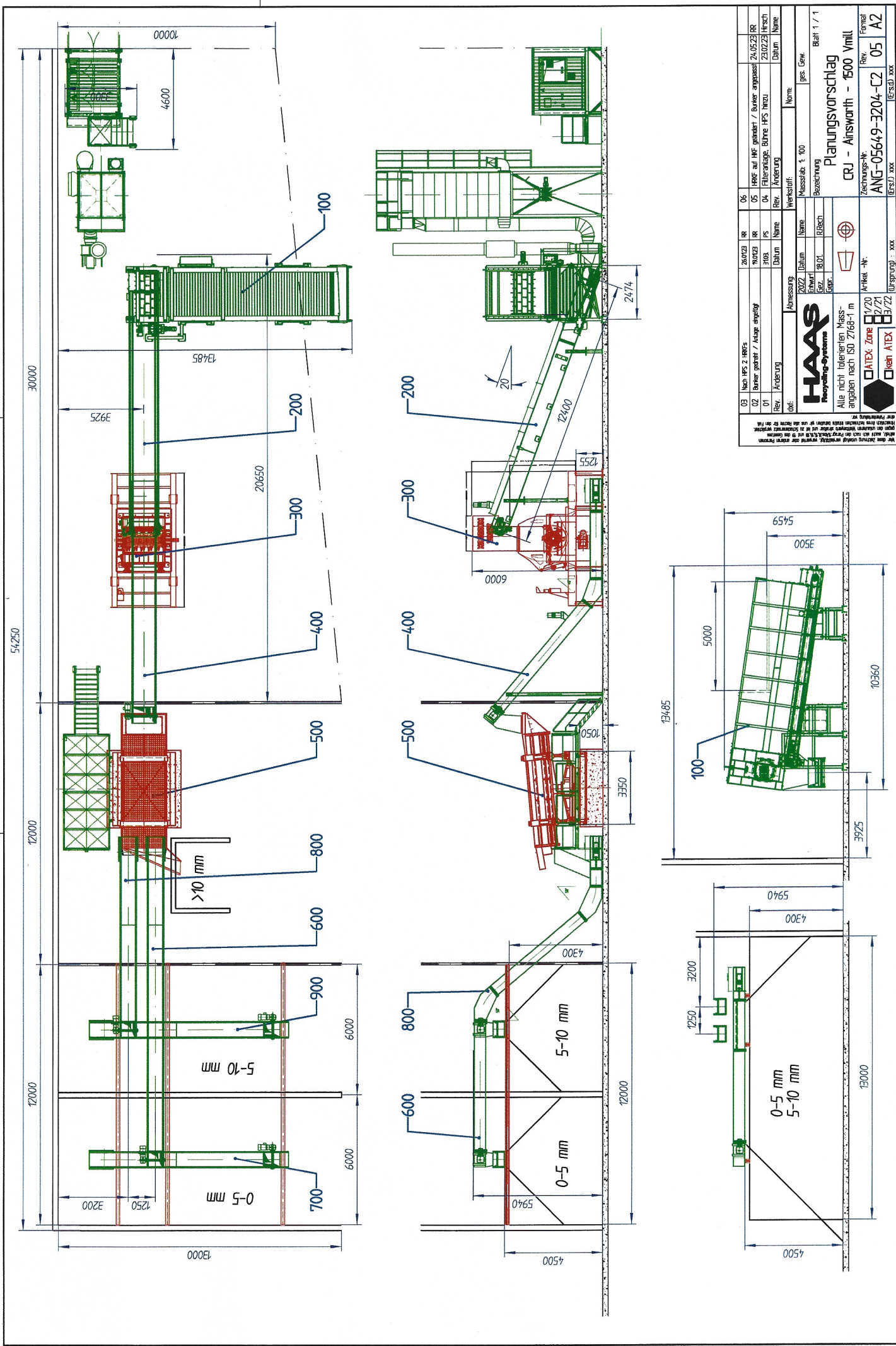
**Total net Price of above mentioned pos 100 – 1.500**








Without Pos. 300, 310, 500

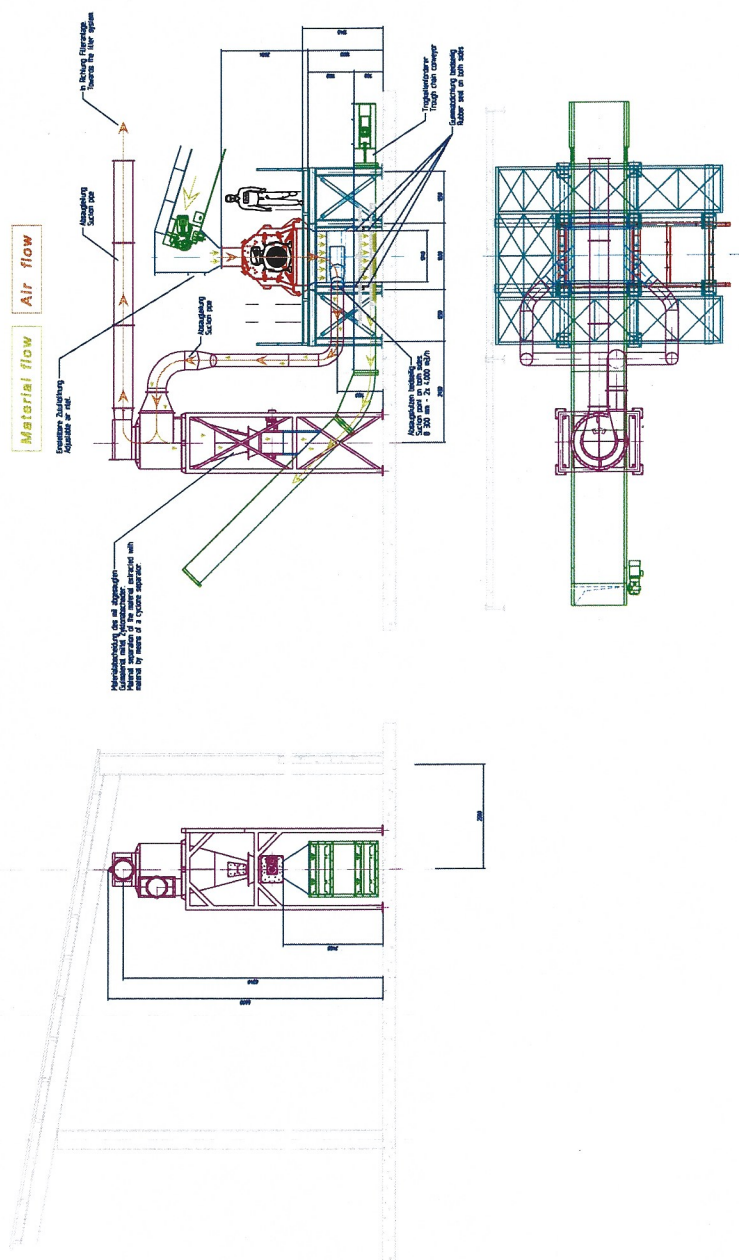
**£795,000.00**



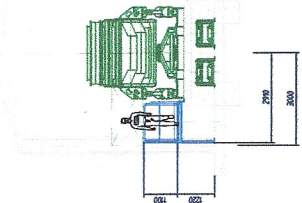
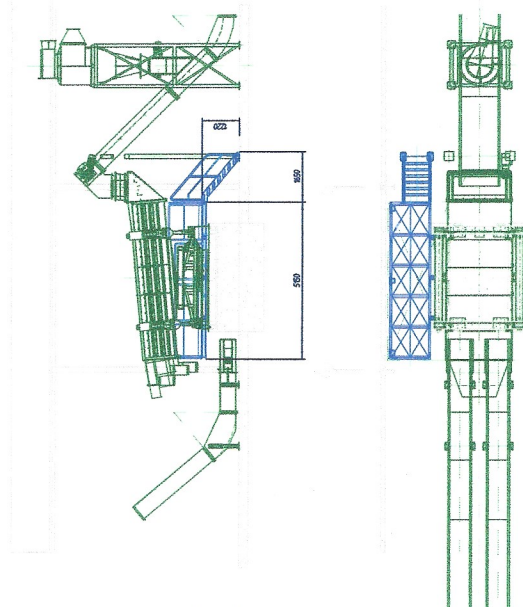




03	Nach IPS 2 HRF's	26.01.23	RR	06	HRF auf HRF geändert / Bunker angepasst	24.02.23	RR	
02	Bunker geändert / Anlage ergänzt	30.01.23	RR	05	Filteranlage, Bühne IPS hinzu	23.02.23	HRR	
01	Rev. Änderung	31.03.23	PS	04	Rev. Änderung			
Rev. Änderung		Datum	Name	Rev.	Änderung	Datum	Name	
Abf.		Anmessung		Werkstoff:		Norm:		
		Erstellt	Massstab: 1:100		ges. Gew.			
		Freigegeben	Bezeichnung		Blatt 1 / 1			
		Gepr.						
Alle nicht tolerierten Massangaben nach ISO 2768-1 m								
		Artikel-Nr.		Zeichnungs-Nr.				
1/20		ANG-05649-3204-C2		Rev.				
2/21		ANG-05649-3204-C2		Formel				
3/22		ANG-05649-3204-C2		A2				
		Ursprung: xxx		Erstellt: xxx				
		Ursprung: xxx		Geprüft: xxx				
		Ursprung: xxx		Freigegeben: xxx				





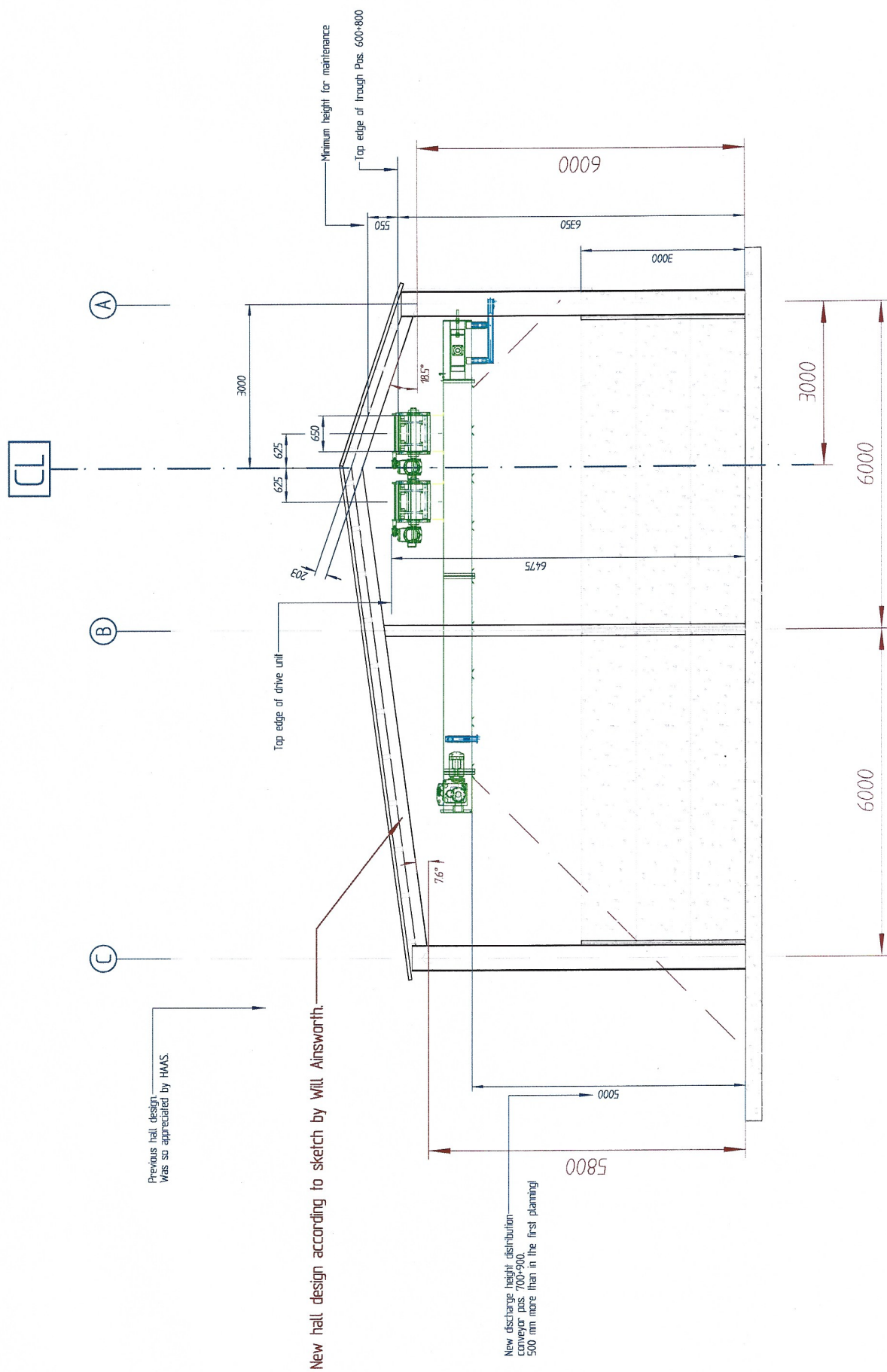


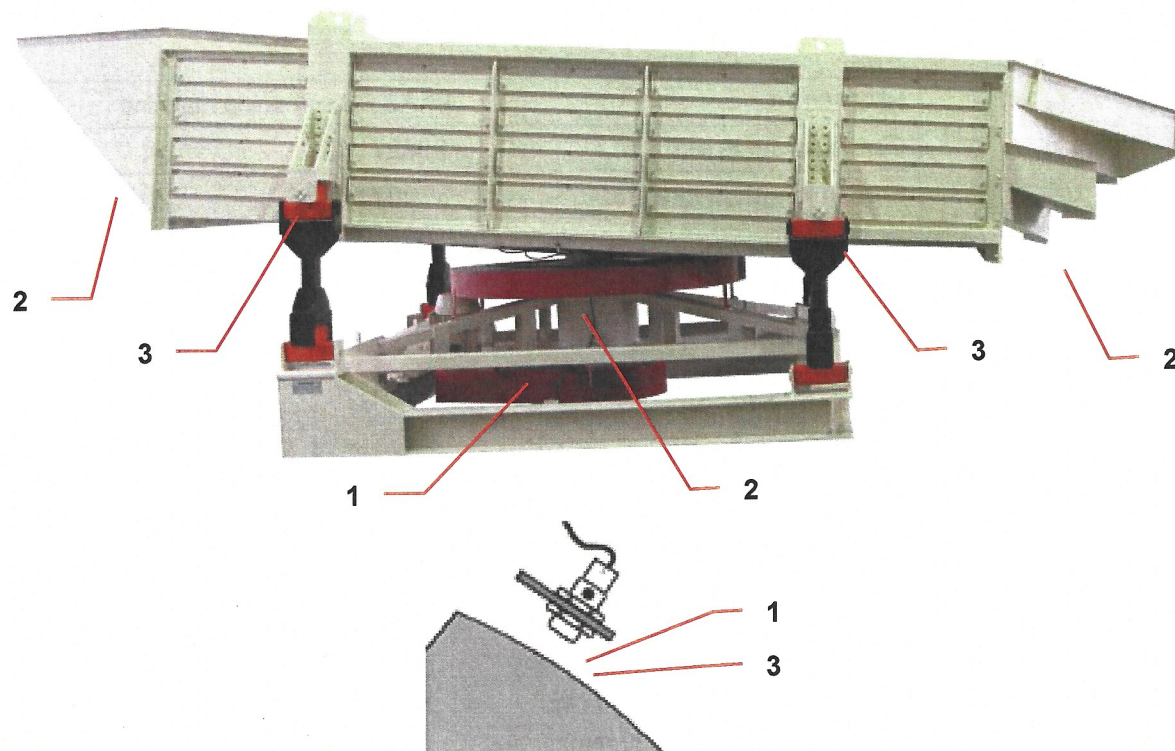
**HAAS**  
Recycling-Systems

33917-510  
- Quotation Plan : Maintenance Platform HPS

27.09.2023 - J. Forst

29/9/23





**Legend:**

1 = Entanglement hazard

2 = Collision hazard

3 = Crushing hazard

### 3.9 Residual risks

**⚠ DANGER**

**Hazards when using the machine without guards and safety devices!**

Extremely serious and possibly fatal injuries may result.

- Ensure the all safety devices and guards are in place when using the machine.
- Perform repairs only in compliance with all of the relevant safety instructions.
- Use anti-fall guards in the case of sub-floor fitting.

## Technical data

### 4 Technical data

#### 4.1 Machine type key

<b>HPS 100</b>	HAAS flat screening machine
<b>Screen width in mm / in:</b>	1 982 / 78.03
<b>Screen length in mm / in:</b>	5 220 / 205.51

#### 4.2 Characteristic data of the machine

##### 4.2.1 Functional data

- Screen surface per level (m<sup>2</sup> / ft<sup>2</sup>): 10.3 / 110.9
- Number of screen levels (qty): 3

##### 4.2.2 Drive

- Type: Electric motor with V-belt drive
- Rated motor power (kW / HP): 7.5 / 10.06
- Nominal motor current (A): 14.8 / 8.6
- Motor speed (min<sup>-1</sup> / rpm): 1 450 / 1 450
- Motor voltage (V): 400 / 690
- Mains frequency (Hz): 50
- Protection category (IP): 55
- Number of V-belts (Z = qty): 5
- Belt profile (P): SPA
- Effective V-belt length (L<sub>w</sub> = mm / in): 3 550 / 139.8
- Output speed (1/min / rpm): 965 / 965
- Test force per V-belt (F = N / ozf): 50 / 179.85
- Depth of impression (first installation) (E<sub>a</sub> = mm / in): 31.60 / 1.244
- Depth of impression (E<sub>a</sub> = mm / in): 34.38 / 1.354
- Additional length (first installation) per 1,000 mm (39.4 in) belt length (mm / in): 1.82 / 0.072
- Additional length per 1,000 mm (39.4 in) belt length (mm / in): 1.19 / 0.047
- Frequency (first installation) (Hz): 22.55
- Frequency (Hz): 19.78
- Motor temperature sensor:
  - no ☐
  - yes ☒
  - PTC ☒ or Pt 100 ☐