Fire Prevention Plan

Geminor UK, St Mark Street, Hull Environmental Permit Variation Application

Geminor UK Limited

Prepared by:

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Basis of Report

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1.0 Introduction

1.1 Report Context

Geminor UK Limited (UK) has retained SLR Consulting Limited (SLR) to prepare a Fire Prevention Plan (FPP) in support of the application to vary the Environmental Permit (EP) (Ref: EPR/GP3303PN) issued under the Environmental Permitting (England and Wales) Regulations (as amended) 2016 for the Materials Recycling Facility (MRF), located on St Mark Street, Hull, HU8 7ED.

This report follows the Environmental Agency (EA) guidance for FPPs[1], and details the required mitigation and management methods to prevent a fire of combustible materials stored on site.

The information contained within this FPP aims to meet the 3 main objectives of the EA FPP Guidance:

- Minimise the likelihood of a fire happening;
- Aim for a fire to be extinguished within 4 hours; and
- Minimise the spread of fire within the site and to neighbouring sites.

Under current fire safety legislation[2], a responsible person must carry out, or appoint a competent person to carry out, a suitable and sufficient fire risk assessment of the risks of fire to employees and others who may be affected by the site.

1.2 Document Revision History

Any changes to the FPP will be labelled in chronological order and the date of the change recorded. All records of the changes will be listed in the revision history in Table 1-1 below.

Table 1-1 Revision History

Version	Reason for Revision	Date of Revision	Signature of Site Manager
1.0	FPP submitted in support of EP application.	December 2019	
2.0	FPP amended during EP determination process.	May 2020	
3.0	FPP amended to reflect updated site layout.	July 2023	
4.0	FPP amended to support bespoke environmental permit variation to increase maximum annual throughput, maximum waste storage capacity, and include additional EWC codes.	2026	

[1] Fire Prevention Plans, May 2018.

[2] Regulatory Reform (Fire Safety) Order 2005

1.3 Current EP

The site operates under a bespoke EP (EA Ref: EPR/GP3303PN) originally issued to Geminor on 6th June 2020. Several administrative variations have been carried out since, and the EP was most recently varied in November 2023 to update Geminor's registered office address.

The EP allows the site to accept dry mixed municipal waste to produce Refuse Derived Fuel (RDF) for onward transfer to the nearby Energy from Waste Facility (EA Ref: EPR/NP3837NV) for incineration. The site also operates as a Waste Material Recycling Facility (MRF) for household, construction and industrial waste destined for recovery at other sites.

1.4 Proposed EP Variation

This EP variation seeks to make the following changes to the EP:

- Increase the maximum annual throughput;
- Add an additional activity to reflect the production of RDF for recovery – variation to the current AR3 activity;
- Include additional EWC codes; and
- Increase the site's maximum waste storage capacity. There are no proposed changes or additions to the waste treatment activities currently carried out at the facility.

1.5 Site Location

The site is situated approximately 1.5km north east of Hull city centre within a predominantly commercial area. The site is bounded by St Mark Street to the south which links to the A1165 to the west. The National Grid Reference (NGR) for the site is TA 10546 29719.

The immediate surrounding land use is predominantly commercial land. There is a residential area approximately 30m to the south along Redcar Street and the River Hull is located approximately 200m north west of the site.

Access to the site is via St Mark Street. The site's location is illustrated on Drawing 001 and the EP boundary and Site Layout is illustrated on Drawing 002.

The surrounding land uses and local receptors within 500m are identified on Drawing 003, in addition to the cultural and natural heritage within 1km,

A summary of the site's immediate surrounding land uses is identified in Table 1-1 below.

Table 1-2 Surrounding Land Uses

Boundary	Description
North	Commercial premises dominate the area, beyond which lies a local cycle path and a railway to the north east.
East	Large areas of commercial premises, with a local cycle path adjacent to the EP boundary, an area of open ground and a small residential area.
South	A small residential area surrounded by commercial premises. Beyond this lies a number of listed buildings, and the A165.
West	Large areas of commercial premises, the River Hull and a number of listed buildings.

1.6 Ecology

1.6.1 European/International Sites

Searches on the Multi-Agency Geographic Information for the Countryside (MAGIC) website confirm that the site is not located within 1km of any statutory designated habitats or non-statutory land designations for ecological protection.

1.6.2 Cultural Heritage

The review of MAGIC revealed that there are several listed buildings within 1km of the site's boundary as illustrated on Drawing 003. The closest of these is the 'James Reckitt Memorial at Reckitt and Colman (Pharmaceutical) Limited', which lies approximately 140m north east of the EP boundary.

The 'Hull Castle, South Blockhouse and part of late 17th century Hull Citadel Fort at Garrison Side' Scheduled Monument lies approximately 870m south of the site.

1.7 Receptors

Table 1-2 and Drawing 002 show the locations of receptors that are considered to be potentially sensitive and could reasonably be affected by the activities occurring on site.

Table 1-3 Identified Receptors

Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary (in metres)
Environmental site setting within 1km of the EP boundary as shown on Drawing 003			
Principal Aquifer	Aquifer	N/A	N/A
Hull Self Storage and Vic Coupland Ltd	**Commercial**	**North**	**Adjacent**
NBM Timber Products Timber yard	Commercial	West	Adjacent
St Mark Street	Local Transport Network	South	Adjacent
Cycle Path	**Local Transport Network**	**East**	**Adjacent**
Autolectric Services	Commercial	South	10
Dortek	Commercial	South	10
Open Ground	Open Ground	South west	10
Professional Washroom Services Northern Ltd	Commercial	East	25
Redcar Street	Residential	South	30
A1165 Cleveland Street	Local Transport Network	North west, west, south west	90
James Reckitt Memorial at Reckitt and Colman (Pharmaceutical) Limited	Listed Building	North east	140
River Hull	Surface Water Feature	North west, west, south west	200

Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary (in metres)
Dansom Lane	**Residential**	**North**	**310**
Holderness Road	**Residential**	**East**	**380**
Open Ground	**Open Ground**	**North**	**390**
Railway	**Local Transport Network**	**North east**	**430**
Hull Castle, South Blockhouse and part of late 17th century Hull Citadel Fort at Garrison Side	Scheduled Monument	South	870

1.8 Windrose

Figure 3-1 shows the wind patterns in 2016 as identified by the Humberside meteorological station. The most prominent wind direction is from the south west to the north east. Winds from the north, east, and west are relatively infrequent.

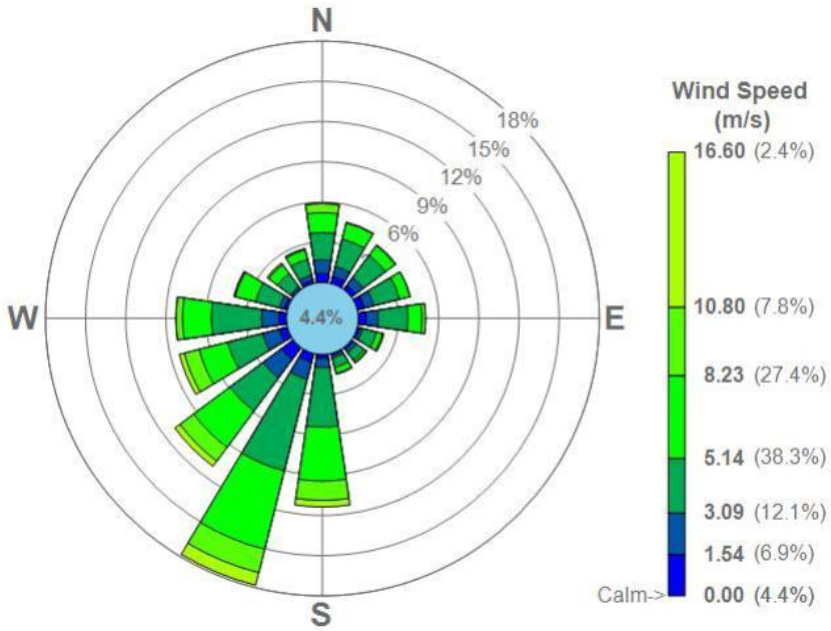


Figure 3-1 Humberside Meteorological Station, 2016

1.9 Site Plan

The site layout is illustrated on Drawing 002.

1.10 Activities at the Site

The site accepts predominately municipal solid waste, as detailed in Table S2.2 of the EP and Table 1-4 below. Within the waste processing building a dedicated storage bay is designated for pre and post treatment, and an additional area is designated for bale storage. For operational reasons, the reception waste storage bay and the outgoing/processed waste storage bay will have dimensions outside of the scope of the EA's FPP Guidance, as detailed in Table 2-1. Alternative measures have

been proposed within Section 2.4.5 to ensure that the site will continue to meet the three objectives of the EA's FPP Guidance.

The maximum storage capacity for each waste storage area is detailed in Table 2-1.

Processed RDF bales will be stored within the designated area of the waste processing building. Bales will be removed from site on stand trailers which are loaded within the building. Drawing 02 illustrates the possible temporary holding areas for the loaded trailers used in the transfer operation. The number of trailers on site is transient across any 24 hour period therefore a permanent location for the transfer operation has not been included.

Geminor propose to accept up to 50,000 tpa of waste astro turf from UK sports pitches under EWC code 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02, and 17 09 03). It is proposed that the waste is accepted, wrapped and removed from site for further processing and recovery only. There would be no treatment of waste astro turf on site. Waste astro turf waste would be accepted on a campaign basis and will arrive suitably sized so that no treatment is required prior to wrapping.

When astro turf is accepted at the facility, RDF processing will temporarily cease and the Astro Turf will be transferred off incoming vehicles in the waste reception building, were it will be baled and wrapped immediately.

Site Management will ensure that astro turf is kept separate from existing operations.

The baled and wrapped astro turf will be transferred to the stand trailers (the locations of which are illustrated on Drawing 002) which are located externally for a maximum of 24 – 48 hours prior to transfer off site.

The site will accept up to 250,000 tonnes per annum (tpa) of non-hazardous waste for treatment.

The maximum waste storage capacity for the site is 1,750 tonnes.

The activities on site comprise the storage and physical treatment of waste by sorting, separation, screening, shredding and baling (and wrapping) for further recovery or disposal. There is no change proposed to waste treatment activities as a result of the EP variation.

The site layout, including waste storage locations have been identified on Drawing 02.

1.11 Waste Types

The EP allows for the following types of waste to be accepted on site which are defined as 'combustible materials' in the FPP Guidance[1]:

- Paper and cardboard;
- General waste (mixed);
- Plastics
- Refuse Derived Fuel (RDF);
- Bulky Wastes;
- Wood;
- Metals; and
- Street-cleaning residues.

The full waste list is included in Table S2.2 of the EP.

1.12 Persistent Organic Pollutants (POPs)

POPs are not accepted on site; therefore this section does not apply. Strict waste acceptance procedures are implemented to ensure that only authorised waste types are accepted on site.

1.13 Environmental Management System

Geminor is externally certified to the following standards, registered through NQA:

- ISO 14001 (Environmental Management);
- ISO 9001 (Quality Management); and
- ISO 45001 (Occupational Health and Safety Management).

The above standards form part of the bespoke Environmental Management System (EMS) that governs operations at this facility.

2.0 Fire Prevention Measures

The following measures are implemented on site to minimise the causes of fire.

2.1 Fire Detection and Alarm System

The site is manned with site operatives present on site between 7am and 3am Monday to Friday and between 7am and 1pm on Saturdays. This will ensure that a fire is detected and managed quickly.

Helios Systems Ltd has been commissioned by Geminor to design, supply, install, test and commission the site's fire detection and alarm systems. The system utilises PYROsmart® panoramic early detection thermal imaging cameras, which constantly scan the area for temperature irregularities in real time. The system is designed to provide full coverage of the waste processing building.

The pre-alarm alert is set at 150ºC, which during operational hours a suitably trained site operatives will investigate the hotspot immediately and determine the best course of action.

The next alarm trigger is set at approximately 190°C, whereby the control panel will indicate that there is a heat spot and the water cannons will be directed to this area.

Outside of operational hours, the nominated contacts will be alerted via mobile phone (simultaneous ring, SMS and emails), and the water cannons will be triggered to the specific heat spot. If for any reason the initial alarm is ignored, and/or it immediately escalates to a surface fire (temperature at approximately 400°C), the suppression system will automatically initiate following a 30 second warning via visual and audible alarms. The suppression system is discussed further in Section 3.1.

The location of the fire suppression system, including the thermal detection cameras and water cannons, is illustrated on Drawing 02.

The transfer of RDF bales off site on stand trailers is subject to regular visual inspection by site operatives throughout the working day. Between 7am and 5pm Monday to Friday, the traffic controller is situated in the yard, and visually monitors the stand trailers for any signs of fire. The site also implements a daily inspection round, night inspection round, daily site diary, and daily fire safety inspection, which are recorded on Geminor's Landax System, examples of which are included as Appendix E.

Site operations are covered 24/7 by the site's CCTV system. The Site Manager and Site Supervisor will be able to access CCTV footage in their office, and 24/7 via mobile phone. If a fire is detected, the Site Manager/Site Supervisor would be notified, and the FRS would be called as appropriate. Outside of operational hours, CCTV is monitored by an external security company. If any fire is detected outside of operational hours via CCTV footage the external security company will contact the FRS and

Site Manager/Site Supervisor immediately using the emergency contact sheet included as Appendix B. The Site Manager/Site Supervisor will attend site immediately.

2.2 Waste Acceptance and Rejection

The site follows strict waste acceptance and rejection procedures ensuring that no non-conforming waste is accepted on site.

The procedure adopted by all site operatives is included as Appendix C.

2.3 Inspection and Amenity Monitoring

The site is continually manned and site operatives are asked to remain vigilant at all times and look out for signs of fire. Staff are trained in how to identify fires and fire hazards on site. Staff also receive training on the use and selection of fire extinguishers, site evacuation and shut down procedures, fire safety and all relevant emergency procedures.

A fire watch is undertaken at the end of every shift. Where possible, mobile and static plant are switched off at least 30 minutes before the last person leaves site and the site manager ensures that an inspection of all waste storage areas is undertaken looking for any signs of fire.

All stockpiles are visually inspected throughout the day and all findings are logged in the Daily Site Log as a minimum. As described in Section 2.1 above, the external stand trailers storing processed RDF bales will be visually inspected on a regular basis by site operatives throughout the working day. Examples of the daily inspections undertaken on site are included as Appendix E.

The site undergoes daily cleaning using brooms, mobile plant and/or wash down hoses/jet wash to prevent a build-up of debris and dust on site.

Daily and weekly monitoring is recorded in line with the requirements of the EP and detailed in the EMS.

2.4 Waste Storage and Quantities

Waste storage on site takes place inside the waste processing building on impermeable concrete surfacing, within the following areas:

1. Reception waste storage bay (W13m x L31.275m x H4m);
2. Outgoing/processed waste storage bay (W13m x L6.5m x H4m);
3. Metal skip (W3.66m x L1.83m x H1.37m); and
4. Bale storage area (W9m x L9m x H4m).

When waste astro turf is received, RDF processing will temporarily pause and the astro turf will be set down next to the processing equipment and wrapped immediately using the existing RDF baler, as illustrated on Drawing 02. In this way, Site Management will ensure that astro turf is kept separate from existing operations. Once wrapped, the waste will be stored in a stand trailer (illustrated on Drawing 02) external to the waste processing building for a maximum of 24-48 hours prior to export from site. Waste astro turf is not considered to be combustible however is described below for context.

Each of the storage areas on site are discussed further below and should be read in conjunction with Drawing 02.

2.4.1 Reception Waste Storage Bay

For operational reasons within the larger reception waste storage bay, loose waste is stored within freeform stockpiles which exceed the maximum pile size detailed in the EA FPP Guidance.

To justify this deviation from the guidance, the robust fire detection, prevention and suppression measures in place at the site are supplemented with additional management techniques to ensure that

the three FPP objectives continue to be met. The alternative measures are further detailed within Section 2.4.5.

Each stockpile will have a maximum height of 4m. The Site Manager is responsible for ensuring that stockpiles are in accordance with Table 2-1. A yellow line is painted at a 4m height around the inside of the bay walls to ensure that the maximum height is not exceeded.

2.4.2 Metal Skip

The shredder benefits from an over-band magnet, to separate metal from the RDF material. Separated metal is stored in a small skip, next to the shredder, within the waste processing building as illustrated on Drawing 02. The skip is removed and replaced, by a third party, within a maximum of 30 days, for further processing at an alternative suitably permitted facility. A maximum of 8 tonnes (6.1m^3) of waste will be stored in the skip at any one time.

2.4.3 Bale Storage

As illustrated on Drawing 02 an area at the south of the waste processing building is designated for RDF bale storage. Bales will be stored for a maximum of 7 days.

Stand trailers temporarily holding RDF bales as part of the transfer off site are situated on impermeable surfacing external to the waste processing building. The number of trailers on site is transient across any 24 hour period therefore a permanent location for the transfer operation has not been included. A maximum of ten will be used at any one time. The stand trailers will typically be removed from site within 24-48 hours.

Bale storage arrangements are described further in Table 2-1 below.

2.4.4 Waste Storage Area Summary

Waste storage areas on site are summarised below in Table 2-1 and are illustrated on Drawing 02. Waste storage areas highlighted in grey are not considered to be combustible in accordance with EA FPP Guidance, but are included in Table 2-1 for completeness.

Table 2-1 Mixed Municipal Waste: Waste Types, Storage Time and Dimensions

Waste Storage Area	Waste Type	Max Storage Time (Days)	Storage Arrangement	Max Length (m)	Max Width (m)	Max Height (m)	Max Volume (m^3)
Reception Waste Storage Bay (inside waste processing building)	Incoming loose RDF and all other waste types if and when storage required	3	Un-processed loose stockpile	31.275	13	5[3]	1626.3[4]

[3] The height of the bay storage walls is 5m, however a freeboard of a minimum of 1m will be maintained at all times, so waste will only be stored to a maximum height of 4m.

[4] It is noted that the dimensions of the large reception waste storage bay is outside of the scope of the EA's FPP Guidance. Alternative measures have been proposed within Section 2.4.5 to ensure that the site will continue to meet the three objectives of the EA's FPP Guidance.

Waste Storage Area	Waste Type	Max Storage Time (Days)	Storage Arrangement	Max Length (m)	Max Width (m)	Max Height (m)	Max Volume (m^3)
Outgoing/Processed Waste Storage Bay (inside waste processing building)	Processed loose waste, and all other waste types if and when storage required	3	Processed loose stockpile	6.5	13	5^3	422.5
8 Yard Metal Skip (inside waste processing building)	Metal separated from RDF material	30	8 Yard Skip	3.66	1.83	1.37	6.1
RDF Bale Storage (inside waste processing building)	RDF Bales	7	Bales	9	9	4	324
External Stand Trailer Transfer Operation	RDF/Astro Turf Bales	1-2 (usually removed from site on a daily basis and replaced with an empty container)	Bales	13.6	2.4	2.7	89

The inside of the building has a 5m high concrete wall running along the back of the bays.

2.4.4.1 Separation Distances

Waste is stored within the designated waste storage areas as illustrated on Drawing 02. Separation distances will be reduced due to the fire wall construction as detailed below in Section 2.4.4.2. Where there is no segregation provided by a firewall, the waste will be at least 6m from the perimeter, buildings, and other combustible or flammable materials.

2.4.4.2 Fire Walls

The reception waste storage bay and the outgoing/processed waste storage bay are both constructed from interlocking concrete block walls in accordance with current standards to ensure that the appropriate standards of fire resistance are met. This specification has been established by Ashcourt Group Limited and evidence is included in Appendix D. The construction of the walls offers a thermal barrier and prevents thermal transfer from one bay to another. This meets the fire resistance period of 120 minutes, to allow the waste to be isolated and a fire to be extinguished within 4 hours as set out in the EA's FPP Guidance.

2.4.5 Alternative Measures

There is an operational requirement to store un-processed waste in the reception waste storage bay in a large stockpile which exceeds the maximum dimensions and pile size detailed in the EA's FPP Guidance. To justify this deviation from the guidance, robust fire detection, prevention, and suppression measures in place at the site are supplemented with additional management techniques.

The three main FPP objectives will continue to be met on site in the following ways:

2.4.5.1 Minimise the Likelihood of a Fire Happening

During normal operations, Geminor process all waste on a daily basis and clear the pre-treated waste pile within the reception waste storage bay by the end of the working day. To provide a degree of flexibility the maximum storage time for the waste stored in the reception bay is up to three days. The short retention times within the waste processing building will minimise the likelihood of a fire happening.

The waste processing building benefits from a robust Helios automated, integrated early fire detection and suppression system as detailed in Sections 2.1, 3.1.1, and 3.4.1 in addition to the fire prevention measures detailed in Section 2.0.

Furthermore, the site is monitored by CCTV 24/7 as described in Section 2.1, and regular inspections are undertaken during operational hours as evidenced by Appendix E to ensure that any fire is detected and managed quickly. During operational hours Fire Marshals are present on site who are specifically trained in how to identify and assess a fire and implement fire procedures on site, further minimising the likelihood of a fire.

2.4.5.2 Aim for a Fire to be Extinguished within Four Hours

A robust, fast-acting, automated Helios fire detection and suppression system is installed within the waste processing building as described in Sections 2.1, 3.1.1, and 3.4.1. The system is fully integrated, and designed to provide localised suppression via the Rosenbauer water cannons which provide full coverage of all waste material stored within the building. Each water cannon has a capacity of up to 1500 litres/minute and further benefits from the addition of the wetting agent. The wetting agent removes the heat element of the combustion triangle (oxygen, heat, and fuel) thereby reducing the flashpoint whilst simultaneously removing the fuel source.

The system is fully set up to manage any incident that may occur on site, and therefore extinguish any fire within four hours.

2.4.5.3 Minimise the Spread of Fire within the Site and to Neighbouring Sites

The management of fire spread on site is detailed in Section 3. The site's early detection system, and integrated, extensive fire suppression system will further minimise the spread of fire both within the site and to neighbouring sites.

2.4.6 Manage Storage Time

Geminor implement stock management procedures which are effective in limiting the likelihood of self-combustion of materials stored on site. Maximum waste storage times are shown in Table 2-1 above.

2.4.6.1 Method Used to Record and Manage the Storage of all Waste on Site

The quantity of waste accepted and despatched from the facility is measured via the weighbridge. The weighbridge operators record the following within Geminor's electronic waste tracking system Gemisoft:

- Date the waste arrives on site;

- Date the waste was first produced, if it is likely to cause odour;
- List of Waste (LoW) code;
- Vehicle registration number;
- Name of haulage company;
- Name of driver;
- Waste Carrier's registration number;
- Waste producer (waste origin);
- Description;
- Weight; and
- Waste collection point.

Wastes are characterised, as required under the Duty of Care requirements, prior to acceptance of the delivery. On inspection, deliveries which do not have the required information, will either have to produce the correct information, or will be refused entry to the Site. All deliveries and removals from the site are recorded in Geminor's electronic waste tracking system Gemisoft and records will be kept accessible for inspection by management and the EA.

2.4.6.2 Stock Rotation Policy

Arrangements on site ensure a 'first in, first out' approach is adopted so that storage of waste does not exceed the prescribed duration. The Site Management is responsible for stock rotation on site and ensures that waste with the earliest storage dates is processed first and removed from site first. This is managed via Geminor's Gemisoft system.

2.4.7 Non-Waste Materials

The site stores non-waste materials that are not covered by the FPP Guidance but are considered in this FPP due to the potential for them to cause or increase the impact of a fire on the site. The materials and their storage arrangements are shown in Table 2-3 below and illustrated on Drawing 002.

Table 2-2 Non-Waste Materials: Storage Arrangements

Type	Storage Location	Storage Arrangement
Gas Bottles	Eastern side of the waste processing building (external).	Locked gas cylinder cage.
Fuel Storage (Diesel Tank)	South west corner of the waste processing building (external).	Tank surrounded by a leakage containment bund capable of containing at least 110% of the volume of the largest container within the bund.
Ad Blue Tank	South west corner of the waste processing building (external).	Tank surrounded by a leakage containment bund capable of containing at least 110% of the volume of the largest container within the bund.
COSHH Storage Area	Western side of waste processing building (external).	Dedicated COSHH container surrounded by a leakage containment bund capable of containing at least 110% of the volume of the largest container within the bund.

Type	Storage Location	Storage Arrangement
Wetting Agent Storage for Helios fire suppression system	Within Helios fire suppression system area, east of waste processing building.	Biodegradable, environmentally friendly wetting agent (required for the fire suppression system) stored in IBC.

2.5 Monitor and Control Temperature

2.5.1 Bale Storage Area

As detailed in this FPP, suitably qualified site operatives will carry out daily checks of the site to identify the risks and in particular visually inspect bale storage and transfer areas. Between 7am and 5pm Monday to Friday, the traffic controller is situated in the yard, and visually monitors the stand trailers for any signs of fire. The site also implements a daily inspection round, night inspection round, daily site diary, and daily fire safety inspection, which are recorded on Geminor's Landax System, examples of which are included as Appendix E.

The bale storage area within the waste processing building will be covered by the bespoke Helios system. External transfer operations will be covered by the site's 24/7 CCTV system which can be monitored both on site, and remotely by the Site Manager and Operations Manager, and outside of hours by an external security company.

Geminor will apply a 'first in, first out' principle, to prevent the build-up of heat in the waste. Stand trailers will typically be removed from site on a daily basis, and replaced with an empty trailer to limit the likelihood of heat build-up.

Wastes will not be driven over by on site plant to avoid compaction, which has the potential to contribute to a build-up of heat within the pile.

Temperature probing is not deemed necessary as the internal bale storage area is covered by the Helios System, and the external area is monitored using the 24/7 CCTV system and regular visual inspection.

2.5.2 Incoming and Outgoing/Processed Waste Storage Bays – Loose Material

The potential for hotspots to develop within loose material stockpiles, stored within the bays, is very low. Waste will be processed on a daily basis and will be stored for up to 72 hours as a maximum. The loose material storage bays will be covered by the bespoke Helios system.

2.5.3 Metal Storage Skip

The potential for hotspots to develop within the metal storage skip is very low. The skip will be emptied entirely, at least every 30 days, and will be removed to an alternative suitably permitted site. The skip will be covered by the bespoke Helios system.

In addition, suitably qualified site operatives will carry out daily visual checks of the site to identify the risks.

To summarise, waste will be managed as follows to minimise self-combustion:

- Waste storage times will be minimised;
- Risk factors (e.g. mixing of materials and heat generated during treatment) will be reduced;
- Waste storage areas will be minimised; and
- External heating during hot weather will be minimised by avoiding ignition hot spots / concentrated beams of sunlight or glare reflected onto stockpiles through surfaces.

2.6 Controlling Temperature

The following actions are taken to control temperature, reduce the risk of hot spots, and to minimise the risk of self-combustion within waste storage areas:

- Waste storage times are minimised by using a first in, first out principle;
- The waste tracking system Gemisoft allows real time management of waste storage times and will be used daily to assess the quantity of waste awaiting treatment and the amount due to be removed from site;
- Hotspots will be detected and controlled by the automatic fire detection system, 24/7 CCTV, and regular visual inspections as described in Section 2.1; and
- Waste is regularly moved, processed and removed from site therefore due to the nature of operations on site, waste is routinely turned releasing any heat generated within the pile.

2.7 Plant and Equipment on Site

The following items of fixed and mobile plant (or an equivalent) will be held on site:

- 1 x Tyron Shredder;
- 2 x Teletrucks
- 1 x Cherry Picker;
- 2 x Senebogans;
- 1 x Loading Shovel;
- 1 x Tug;
- 1 x Wrapper;
- 1 x Bailer;
- 1 x Telehandler.

This list is indicative, but fully represents the type of plant that will be used on site.

The machinery will be maintained in line with Geminor's maintenance procedure. All plant and equipment will receive annual Lifting Operations and Lifting Equipment Regulations (LOLER) and Provision and Use of Work Equipment Regulations (PUWER) inspections. Daily checks will be carried out on all mobile plant and any findings will be recorded on the Maintenance, Service and Repair checklist, and example of which is enclosed in Appendix E. All mobile and fixed plant servicing and maintenance will be carried out as per the manufacturer's instructions. Any defects that might harm the environment will be entered into the incident management system.

In accordance with Geminor's insurer's requirements, all plant is cleaned down every night to ensure no build-up of dust/combustible material.

All plant is fitted with on-board fire systems other than the teletrucks which are fitted with fire extinguishers within the cab.

A mobile plant storage area is provided both externally to the south of the waste processing building on impermeable surfacing, and within the waste processing building as illustrated on Drawing 002. During the week when the site operates night shifts, the mobile plant storage area within the waste processing building will be used whereas when night shift is not operating the external mobile plant storage area will be utilised as appropriate. The storage areas are located at a distance of over 6m from any combustible waste.

Any mobile plant requiring maintenance is temporarily stored within the most appropriate mobile plant storage area.

Plant and equipment will be visually inspected prior to every use to ensure it is fit for purpose.

2.8 Training

A copy of the FPP is held within the site office.

Staff receive training on the use and selection of fire extinguishers, site evacuation, fire safety, the use of the drainage isolation valve and all relevant emergency procedures.

All staff and contractors working on site are made aware of the contents of the FPP and the procedures that are in place in the event of a fire on site during their induction and periodic refresher. Contractors working on site will be made aware as part of on site working procedures. This will ensure that all staff and contractors know what they must do:

- To prevent a fire happening; and
- During a fire if one breaks out.

The staff training is regularly refreshed particularly in the event of non-compliance.

Staff will receive training on the management of RDF bales within the stand trailers.

Certain staff members on site are trained as Fire Marshals and a Fire Marshal is always present on site.

The procedures for fires discovered on site are provided both in the site's EMS and on-site notice boards.

Geminor will conduct a test of the FPP at least once a year, or in the event of any significant changes to site operations, to ensure that the contents are still relevant and that all staff members' knowledge is current and up to date. If any issues are found during these fire drills, the FPP will be updated or amended accordingly, and site operatives will be re-trained.

Regular checks are made of all escape routes and equipment.

The FPP is kept under regular review and revised where necessary, for example if:

- There is a reason to suspect it no longer meets the FPP objectives;
- The site has a fire or identifies a near miss of a fire;
- On site activities/operations are changed;
- The environment surrounding the site changes; or
- The EA ask Geminor to revise the FPP due to concern over the risk posed by on site operations.

2.9 Security Measures

The site will be enclosed by perimeter fencing and site entrance gates designed to prevent unauthorised access.

The gates, fencing and walls will be inspected weekly to identify any weaknesses or defects. Any defects identified will be repaired with a temporary solution within 24 hours, with a permanent fix implemented within 7 days, unless a timescale is otherwise agreed with the EA.

When storing waste, the stand trailers are sealed and secured by closing the curtains, and doors, unless waste loading/unloading is taking place.

The site benefits from CCTV that covers the inside the waste processing building and the external yard area. Access to CCTV footage will be available for the Site Manager and the Operational Manager. All doors to buildings will be locked when not in use.

2.10 Fire Sources and Prevention Measures

Table 2-3 below provides a summary of the potential causes of fire on site and associated preventative measures and is taken from the FPP guidance.

Table 2-3 Fire Sources and Preventative Measures

Cause	Preventative Measure
Arson and Vandalism	The site will have a number of security measures in place to limit the likelihood of arson or vandalism including: • Perimeter fencing with a gated entrance which is locked if appropriate; • Lockable doors on the processing building and office/welfare facilities; • Stand trailers will be sealed and secured with curtains and doors unless waste loading/unloading is taking place; • Full 24/7 CCTV coverage; • Inspection and maintenance procedures; and • A visitor sign in system. An external security company hold a key to the site, and will be contacted automatically if an activation message is received from the Helios fire detection/suppression system/fire panel system (via both SMS and email). The site is enclosed on all sides, as illustrated on Drawing 002, by commercial/industrial premises and St Marks Road to the south. In the event of a breach of security at the site, the cause will be investigated and appropriate mitigation measures implemented. This will be recorded in the Daily Site Log and Incident Management System. Records maintained will include inspections and maintenance of doors and locks, breaches of security, investigations and actions taken.
Self-Combustion	Effective stock management will limit the likelihood of the self-combustion of materials stored on site. As such, the site has waste acceptance and stock management procedures which are upheld by all employees at the site, as detailed in Section 2.0. Only wastes included in Table 1-3 above, as stated in the EP, are accepted at the site. Non-waste materials that pose a risk of self-combustion are stored as indicated in Table 2-2.
Plant or equipment	Plant and equipment are maintained in accordance with the manufacturer's recommendations. Most new plant on site is fitted with telematics (where possible), which automatically highlights any faults, and local suppression as part of the minimum design specifications. Plant and equipment are operated in accordance with the manufacturer's instruction manuals. Instruction manuals for plant and equipment are held either on site or online if a hardcopy is not available from the manufacturer. Induction training and refresher training is provided to staff in the safe operation of plant and equipment relevant to their role, in accordance with the EMS.

Cause	Preventative Measure
	Inspection of plant and equipment is undertaken on a daily basis to check for faults and ensure appropriate safeguards are in place. The procedure also covers general housekeeping and cleaning of plant and all equipment on site. Storage of mobile plant is detailed in Section 2.6 above. In the event of a failure or suspected fault with an item of plant or piece of equipment, the operator will ensure that the equipment is shut off in a safe manner and not used until the equipment can be repaired or replaced.
Industrial Heaters	No industrial heaters are utilised on site. Wall mounted convection heaters are provided in the office and welfare areas. The Site Supervisor ensures the heater is switched off at the end of the working day. There is no heating provided in the waste processing building.
Electrical faults (including damaged or exposed electrical cables)	Regular safety checks and daily site inspections are recorded in the site diary. All building electrics are fully certified by a qualified electrician. Annual PAT testing of any on site portable electrical appliances is carried out.
Naked lights	No naked lights are permitted on site.
Discarded Smoking materials	A designated smoking shelter will be provided, as illustrated on Drawing 002. The shelter is located a minimum of 6m from any combustible waste. No smoking outside of the designated shelter is permitted on site.
Hot works	Geminor operates a permit to work system which includes a 60 minute fire watch by a competent person at the end of the works. No hot works are undertaken by staff unless they are trained and have the relevant permit to work. Any works conducted outside of dedicated workshops takes place in a cleared area of the site at least 6m from any combustible wastes. A site operative performs a continuous fire watch during the hot work and for a minimum of 60 minutes after the work is completed.
Hot Exhausts	Vehicles are turned off when not in use. Consideration will be given to the high risk time for hot exhausts (one hour after switch off when dust can settle on hot surfaces) and wherever possible vehicles are given time to cool down prior to site staff leaving site at the end of a shift. Geminor staff parking is located to the south east of the site, illustrated on Drawing 002.
Open Burning	Burning will not be permitted on site. If any fires are found at sites located in close proximity, Geminor will report the incident to the FRS and Police authorities.
Build-up of loose combustible waste, dust and fluff	As outlined in Section 2.3, the site undergoes daily cleaning using brooms, mobile plant and/or wash down hoses/jet wash to prevent a build-up of debris and dust on site. Housekeeping will be extended to cover the areas occupied by the external RDF stand trailers. Geminor adopt good housekeeping measures on site.
Reactions between incompatible materials	Strict waste acceptance procedures implemented on site will ensure only permitted wastes are accepted. Unauthorised wastes will be quarantined and incompatible wastes will be separated.

Cause	Preventative Measure
Neighbouring sites	The site will be located within an area of commercial/industrial properties. Employees will remain aware at all times and report activities or behaviour which could represent a fire risk from neighbouring sites to the Site Manager. The manager will then take action as appropriate to address the risk.
Incompatible Wastes (including reactions between incompatible materials)	All wastes arriving onsite will be checked in accordance with the waste acceptance procedure included within Section 2.2 to ensure no materials of unknown composition are accepted at the site.
Leaks and Spillages of Oils and Fuel	Spillages and leakages of fuels and oils will be prevented through the application of measures detailed within the Accident Management Plan.
Hot loads deposited at site	No burning, reactive / reacting or visibly hot (producing steam or heat) loads will be accepted on site. In accordance with the Waste Acceptance Procedure included within Section 2.2, each load will be visually inspected at the site entrance to ensure compatibility with accompanying delivery notes, therefore minimising prohibited wastes and the acceptance of hot loads. Instructions will be given to customers to ensure no hot loads are accepted on site. Should a hot load be deposited on site, it will immediately be removed to the non-compliant waste bay as detailed in section 3.8.1.1 and removed from site the same day to a suitably licenced facility for disposal.
Batteries	All waste arriving on site is checked in accordance with the waste acceptance procedure as detailed in Section 2.2. Should batteries be identified within the waste stream during visual inspection they will be removed and placed in the designated quarantine area as illustrated on Drawing 002. Batteries will be stored in appropriate covered weatherproof containers to prevent them from coming into contact with any liquids and from being damaged.
Hot and Dry Weather	During periods of extreme hot weather (defined as temperatures higher than 25 C on two consecutive days) the following actions will be carried out: • Concentrated beams of sunlight or glare reflected onto stockpiles through surfaces will be minimised; • Bales will be dampened by spraying with water to reduce the risk of ignition; • Visual inspection of waste storage areas will be increased to four times per shift.

3.0 Fire Management

3.1 Containing and Mitigating Fires

3.1.1 Automatic Fire Suppression System

Helios Systems Ltd has been commissioned by Geminor to design, supply, install, test and commission the site's fire suppression system. The suppression system is designed to be fully integrated with the detection system outlined in Section 2.1 and utilises Rosenbauer water cannons. The water cannons are designed to provide full coverage of all waste material stored within the waste treatment and storage building.

Based upon the most recent WISH burn trials, Geminor have elected to add an environmentally friendly biodegradable wetting agent to the water supply for the suppression system to more efficiently supress a fire. This works by removing the heat element of the combustion triangle (oxygen, heat and fuel) thereby reducing the flashpoint whilst simultaneously removing the fuel source.

Full details of the automatic water-based fire suppression system are included within Appendix A.

3.1.2 Manual Fire Suppression

Foam, water, carbon dioxide and powder extinguishers are provided on site, as illustrated on Drawing 002. The extinguishers are inspected annually.

The waste reception buildings are constructed to the appropriate standards. Should fire compromise the stability or integrity, the buildings and site will be immediately evacuated.

3.1.3 Site Plans

Up-to-date site plans will be on display in the site office and detail:

- Site layout;
- Waste storage arrangements;
- Firefighting equipment locations (Pollution Control Equipment);
- Fire detection and suppression equipment; and
- Personal Protection Equipment (PPE).

In addition, all procedures relating to emergency procedures on site, including fires, will be held within the site office and where they will be easily found and readily available.

3.2 Fire Drills on Site

A fire drill will be carried out and documented on a 6 monthly basis.

This FPP will be implemented across the site and all fire management equipment will be tested at least on an annual basis.

If any issues are found during these fire drills, the FPP will be updated or amended accordingly and site operatives will be re-trained.

Regular checks are made of all escape routes and equipment.

3.3 Emergency Contact Details

An emergency contact sheet is included in Appendix B. In the event of a fire the following procedure will be followed:

- The Site Manager or individual nominated by the Site Manager will locate the emergency contact list included in Appendix B;
- In the event of a large fire, 999 will be dialled first;
- The Site Manager or individual nominated by the Site Manager will phone each of the local businesses included in Appendix B, followed by the sewage service if appropriate to do so; and
- Finally the EA incident hotline will be dialled once the situation is under control.

3.4 Site Procedures

3.4.1 Fire within Storage Areas Covered by Helios (Waste Processing Building)

3.4.1.1 Small Fire or Hotspot

As detailed in Section 2.1, upon alarm initial alarm trigger at approximately 150°C, the Helios control panel will indicate that there is a heat spot and the nominated contacts will be alerted via mobile phone (simultaneous ring, SMS and emails).

During operational hours, suitably trained site operatives will investigate the hotspot immediately and determine the best course of action. Potential courses of action include:

- Utilising mobile plant to pull the affected waste into the open away from other waste that the fire could spread to;
- Extinguish immediately[5] utilising fire extinguishers stored on site; or
- Utilising mobile plant to move the affected waste to the most appropriate quarantine area to be extinguished[6].

Outside of operational hours, the Site Supervisor and external security company (key holder) will be the nominated point of contact.

Once a small fire is dealt with the remaining area will be visually inspected immediately by site operatives for any signs that a fire / smouldering waste remains. The same procedure, detailed in this section, will be implemented should this be the case.

3.4.1.2 Uncontainable Small Fire or Large Fire

If for any reason the initial alarm is ignored, and/or it immediately escalates to a surface fire (temperature at approximately 400°C), the suppression system will automatically initiate following a 30 second warning via visual and audible alarms.

In this instance, the following procedure will be followed:

- The Site Supervisor, external security company, and FRS will be contacted immediately via simultaneous ring, SMS and emails. The local sewerage service and EA will be notified at the first opportune moment.
- Following arrival of the FRS, all site staff will take instructions which may include any of the following:
    - If possible, waste that is unburnt will be dampened down to prevent the fire from spreading further;
    - If possible, unburned wastes will be separated from the fire using heavy plant;
    - The burning area will be isolated, and attempts will be made to extinguish the fire utilising the onsite fire extinguishers if safe to do so; and
    - The site and buildings will be evacuated.

[5] Should a single item of the waste stream be alight, and the fire is well contained, then the waste will be doused / use of extinguisher as it is pulled from the waste pile. The burned / fire- damaged portion is then removed to the quarantine area and the remaining waste returned to the pile.

[6] If the fire is not easily contained to a single item, then the obviously alight portion of the waste will be removed to the quarantine area.

3.4.2 Fire Outside of Area Covered by Helios

Any fire outside of the area covered by the Helios system will be managed as follows.

3.4.2.1 Small Fire or Hotspot

Smaller fires or areas of smouldering waste within an area of the site not covered by the automatic suppression system (i.e. the external RDF bale stand trailers), will be dealt with on site by trained operatives using onsite firefighting equipment. The operative will use the relevant fire extinguisher and/or fire hose and will direct this into the container storing the waste.

Depending on the size, location and nature of the fire the stand trailer containing the burning waste may be pulled away from the other stand trailers and into the open, or quarantine area if appropriate. Mobile plant will be utilised to pull the stand trailer into the open, away from any further waste that could become alight on contact. If safe to do so the fire will be extinguished immediately using the fire extinguishers or fire hose. Competent staff will be available throughout operational ours to operate waste handling plant.

Once a small fire is dealt with the remaining area will be visually inspected immediately by site operated for any signs that a fire/smouldering waste still remains. The same procedure, detailed in this Section, will be implemented should this be the case.

3.4.2.2 Uncontainable Small Fire or Large Fire

The following procedure is in place on site that will be followed in the event of a small fire becoming uncontainable or in the event of a major fire on-site in an area not covered by the automatic suppression system:

- The Site Manager and FRS will be notified immediately and the EA as soon as practicable;
- Following arrival of the FRS, all site staff will take instructions from the FRS which may include any of the following:
    - If possible, waste that is unburnt will be dampened down using a fire hose to prevent the fire from spreading further;
    - If possible, unburned material will be separated from the fire using mobile plant;
    - The burning area will be isolated, and attempts will be made to extinguish the fire utilising the onsite fire extinguishers if safe to do so; and
    - The site and buildings will be evacuated.

In the event of a major fire on site outside of operational hours, outside of the coverage of the Helios system the Site Manager would be notified by the external company monitoring the CCTV system, and would be able to view the site remotely via mobile phone. The Site Manager would contact the FRS, and attend site immediately.

3.5 Fire Waters

3.5.1 Site Drainage

All waste storage and treatment activities on site take place on impermeable surfacing. Site drainage is shown on Drawing 04 and is managed as follows:

3.5.1.1 Waste Processing Building

The building benefits from impermeable surfacing throughout and any water released from the water cannons via the Helios System or through firefighting will be contained in the building.

3.5.1.2 External Yard

There is no permanent storage of waste in the external yard area. The yard area benefits from a mixture of permeable and impermeable surfacing (as illustrated on Drawing 002), enclosed by kerbing on the boundary where impermeable surfacing meets permeable surfacing.

Bales will be removed from site on stand trailers which are loaded within the building. Drawing 02 illustrates the possible temporary holding areas for the loaded trailers used in the transfer operation. The number of trailers on site is transient across any 24 hour period therefore a permanent location for the transfer operation has not been included. Bales are double wrapped and sealed in plastic lined stand trailers.

All runoff collected within this area drains to a central point in the yard, where via underground pipework, runoff will flow to an interceptor, before transferring to a surface water flow control box (to regulate the release of surface water to sewer). A penstock isolation valve is installed at the release point to sewer, which will be closed by site operatives if required (i.e. during a fire event).

3.5.2 Firewater Supply

The FRS may collect and reuse firewater run off as part of normal operating procedures. Sources of water available on site:

- 1 x 72,000 litre water tank (for use by Helios system only);
- 1 x Hydrant; and
- The on board water supply from FRS vehicles.

3.5.3 Firewater Calculations

Within the waste processing building the Helios system is designed to provide localised suppression via the Rosenbauer water cannons. Each water cannon has a capacity of up to 1500 litres/minute and further benefits from the addition of the wetting agent to the water tank. A dedicated 72,000 litre water tank will supply a continuous stream of water (up to 1500 litres/minute) to 2 cannons for 45 minutes.

The Waste Industry Safety and Health Form (WISH) have released their latest findings for their waste fire trails[7], which provide a summary of baled waste tests using water, foam and a mixture of water and wetting agent. A summary table taken from this note is detailed in Table 3-1 below:

Table 3-1 Summary Table of Baled Waste Tests

Media	Detail	Volume of water used	Time to extinguish
Water	2 x 45mm jets at 7 bar	20,000 litres	20 minutes (not extinguished)
Foam	Class A wet solution CAF, 2 x 128litre/minute jets	1,800 litres	7 minutes
Water plus wetting agent	2 x 45mm jets at 7 bar, with wetting agent at 0.3% by volume	1,800 litres	2 minutes

The trials showed that the addition of a wetting agent proved the most effective with fires being extinguished in, on average, 2 minutes with the least run-off.

[7] WISH INFO 05 Waste fire burn trials summary report version 2 October 2018.

It is therefore not considered appropriate to apply the EAs firewater calculations as the volume of water will be reduced due to the wetting agent and the automatic suppression system aims to extinguish any fire within 60 minutes.

3.5.4 Firewater Containment

During a fire it is proposed that the building will be utilised to contain firewater from the Helios system. The building has an area of approximately 3,600m^2, therefore the 72,000 litres contained within the water tank can be contained up to a height of approximately 2cm. As detailed in Section 3.5.1, the site is fully contained, and the penstock valve will be manually closed to ensure no release of firewater to sewer.

3.6 Management after a Fire Event

After a fire event, the following procedure will be implemented depending on the severity of the fire:

- A small and containable fire that can be safely dealt with in-house using suitably trained staff and firefighting equipment located on site: The fire will be recorded in the site diary, including the causes of the fire and methods used to manage the fire. An assessment will be carried out to determine whether further mitigation measures could have prevented the fire. Any outcomes to be implemented onsite will be incorporated within this FPP and the site's EMS as required.
- A larger fire that requires the presence of the FRS: If the site operatives have been told to evacuate or cease operations by the FRS, the site will wait until told safe to re-enter site and resume operations. Any closure of the site will be followed by informing customers and the regulatory authorities. The fire will be recorded in the Daily Site Log and in an online incident report and will detail the causes of the fire and methods used to manage the fire. An assessment will be carried out to determine whether further mitigation measures could have prevented the fire. Any outcomes to be implemented onsite will be incorporated within this FPP and the site's EMS as required.

Should damage be sufficient to prevent the site from being able to accept and store waste, the site will cease accepting waste and will divert to a suitably licensed facility. There are a number of suitably licensed facilities within Hull that Geminor are aware of, and so therefore depending on that severity of the fire these operators will be contacted.

The Site Manager will liaise with the EA to determine a plan-of-action to introduce normal operations at the site, and the timescales involved to achieve this.

3.7 Clearing and Decontaminating the Site after a Fire

Site Management will determine what decontamination and cleaning measures will be required to be carried out proportionately to the impact caused by the fire. Measures to be implemented include (but are not limited to):

- Fire waters accumulated within the site boundary will be sampled and analysed. Once composition of the water is known, it will be transferred off site by tankers for removal to an offsite treatment facility.
- Site mobile plant will be used to move and manage solids and sludges generated during the fire, material will be moved into stockpiles within the site boundary as a temporary measure. The material will then be sampled and tested. Once the composition is known, and offsite treatment/disposal route will be known, and so will therefore be transferred off site to a suitably licensed facility.
- Once any solids and sludges have been removed from the site, the affected areas will be washed down and any runoff will be collected within the site boundary and removed off site by tankers to a suitably licensed facility.

The following steps would be taken in order to bring back the facility into operation;

- All site infrastructure and plant will be inspected to ascertain the extent of the damage or the repairs/work that will be needed to rectify any faults. This assessment will be undertaken by a suitably qualified individual. Technically competent managers and/or engineers and/or the insurance company will assess the degree of damage caused by a fire and the residual risk from fire damaged waste, emissions or equipment. It is recognised that dependant on the level of damage of some items of plant, may be beyond effective repair and under these conditions the plant will be replaced.
- Plant will be safely re-commissioned if repairs/replacements have been put in place.
- The cause of the fire will be investigated, in conjunction with the FRS, to confirm the cause of the fire and identify any operational changes that will need to be made to prevent a fire from occurring in the future.

The period of time taken to restore the site or affected part of the site to operational status will be determined by the nature and extent of the fire. If the affected area does not impact the rest of the site's operation, operations will re-start as and when appropriate.

3.8 Quarantine Area

The site benefits from a dedicated fire management quarantine area and a non-compliant waste quarantine bay. The Site Manager will instruct site operatives when and how to use the quarantine areas.

The locations of the two quarantine areas are illustrated on Drawing 02 and detailed in Table 3-2 below.

The largest stockpile on site is 1,626.3m^3, and therefore combined the fire management quarantine area and the non-compliant quarantine bay can hold at least 50% of the largest stockpile (817m^3).

Table 3-2 Quarantine Area Dimensions

Quarantine Area	Primary Use	Length (m)	Width (m)	Height (m)	Volume (m^3)
Dedicated	Separation of unburnt waste (External).	9.5	9.2	4	349.6
Non-compliant waste bay[8]	The temporary storage of non-compliant waste (Internal).	13	9	4	468

3.8.1.1 Non-Compliant Waste Quarantine Area

In the event of non-compliant waste being identified within the waste load, the vehicle will be requested to remove the load off site immediately. If the vehicle has already unloaded the waste, it will be moved to the relevant quarantine area and removed off site within 72 hours.

The non-compliant waste quarantine area can also be used flexibly to hold any hot loads, burning waste or unburnt waste, following the below procedure in Section 3.8.1.2. If non-conforming waste is stored within the quarantine area it would be moved by site operatives within an hour in the event of a fire.

[8] This bay will be cleared of sorted waste if non-compliant waste requires storage before removal off site.

3.8.1.2 Fire Management Quarantine Area

Burning waste will be kept within the waste processing building within the cover of the Helios system. If safe to do so, unburnt waste could be separated from the pile to reduce the fire spread.

The fire management quarantine area maintains a separation distance of at least 6m around all sides at all times combined with the non-compliant quarantine area can hold at least 50% of the largest waste storage area on site.

The placement of the quarantine area is based on the following factors:

- It provides an open area of the site to allow for the prompt and direct removal of smouldering, burning or fire damaged wastes from the waste storage and to allow access by the FRS; and
- Proximity to flammable liquids – the quarantine area is situated at least 6m from any potentially flammable liquids on site such as diesel tanks.

The Site Management will instruct all site operatives when and how the unburnt waste, will be moved to the appropriate quarantine area. The following procedure will be implemented on site:

- When it is safe to do so, unburnt waste will be separated from the waste storage area by on site plant and transferred to the fire management quarantine area;
- The movement of the waste will be overseen at all times by the Site Manager to minimise any spillages and ensure the area is not overfilled;
- To limit any spillages, plant will not be overfilled when moving the waste; and
- Unburnt waste will be transferred back to the waste processing building as soon as possible.

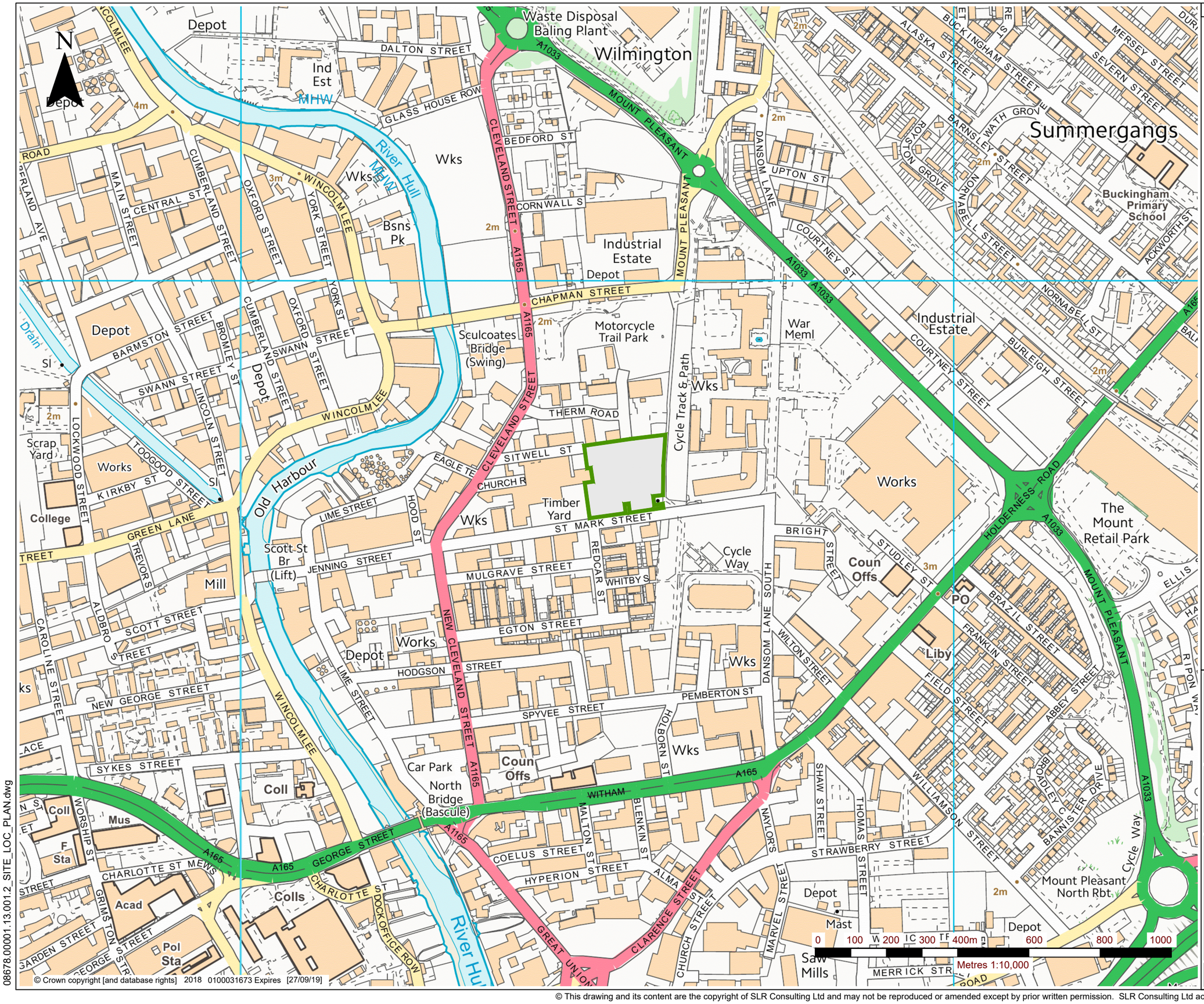
All site operatives will be trained to follow this FPP and all procedures listed in the above sections.

4.0 Conclusion

This FPP is considered to be a ‘working’ document that is reviewed and updated annually or as required should any of the following occur:

- A fire on site;
- A change or review of legislation; or
- If the site is instructed to do so by the EA.

It is the responsibility of the Site Manager or nominated person to maintain this FPP and to ensure it is adhered to in the event of a fire on site.



LEGEND

ENVIRONMENTAL PERMIT BOUNDARY

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MATERIALS RECYCLING FACILITY
ST MARKS STREET

ENVIRONMENTAL PERMIT APPLICATION

SITE LOCATION PLAN

DRAWING 001

Scale 1:10,000 @ A3

Date AUGUST 2019

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N

Metal Skip

Gas Storage Cage

Odour Abatement System Unit

Helios Fire Suppression System

Electric ACB

Site Offices

Weighbridge Out

Staff Parking

Fire Assembly Point

Bicycle Storage

Emergency Access

Emergency Access

Emergency Access

Empty Stand Trailer Storage Area

Electricity Sub Station

LV Kiosk

Location of Penstock Valve

Adblue Tank

COSHH

Diesel Tank

Fire Bay

Weighbridge In

Surface Water Flow Control Feature Box (underground)

Hgv In

HGV Out

St Mark Street

13.00

31.275

6.5

13.00

9.625

9

9

DOOR

9.2

6.5

0 5 10 15 20 25 30 35 40 45 50m

Scale 1:500

Legend:

- Environmental Permit Boundary
- Kerbing Around Site
- Buildings
- Tarmac Surfacing
- Impermeable Surfacing
- Permeable Surfacing
- Stand Trailer Temporarily holding RDF Bales / Astro Turf - Transfer Operation
- Quarantine Area
- Overnight Mobile Plant Storage Area
- Non-compliant Waste Bay
- Incoming Waste Storage Bays
- Processed Waste (Loose) Storage Bays
- RDF Bales Storage Bays
- Waste Processing Area
- Metal Skip
- Fire Hydrant
- Fire Extinguisher
- Location of Heat Detectors and Water Cannons
- Wetting Agent Storage
- Fire Exit
- Fire Suppression 50,000 Litre Tank and Associated Infrastructure
- Heat Detection Scanning Area and Fire Suppression Attack Zone

Rev	Amendments	Date	By	Chk	Auth
3	Layout clarified	12/24	TS	HK	SP
2	Further layout changes	07/24	TS	KH	GS
1	Layout of trailers amended	06/24	TS	KH	GS

SLR

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Client: Geminor

Project: Materials Recycling Facility St Marks Street Environmental Permit Variation

Figure Title: Indicative Detailed Site Layout, Fire Management and Prevention Plan

Scale	SLR Project No.
1:500 @ A2	416.065261.00001

Designed	Drawn	Checked	Authorised
	TS	KH	GS
Date	Date	Date	Date
	April 2024	April 2024	April 2024

Figure Number: 02 Rev.: 3

09/12/2024

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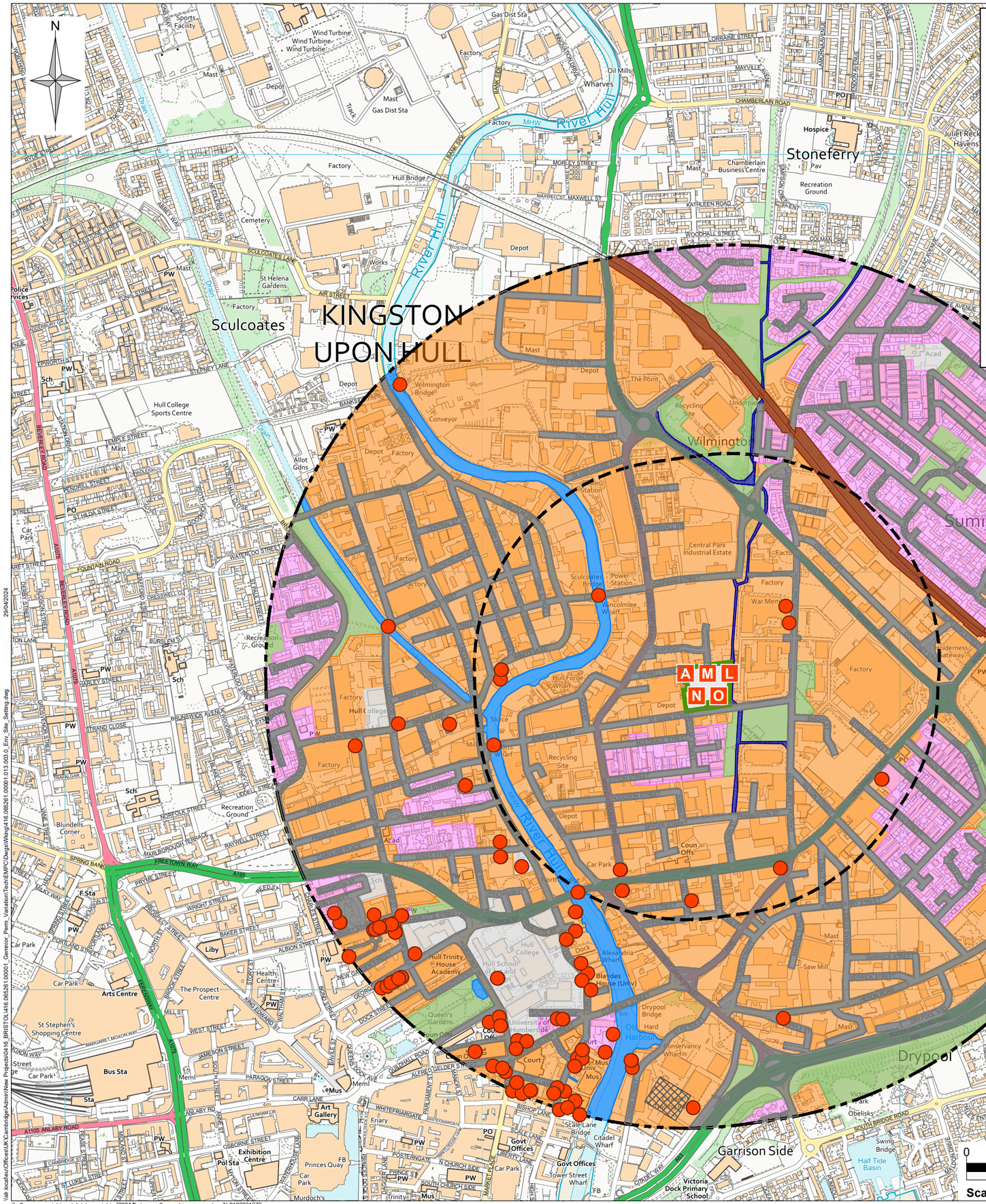

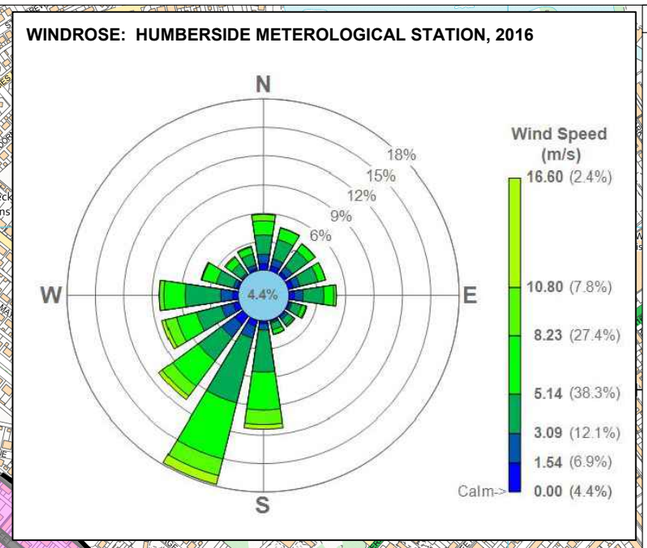

Legend:

- Environmental Permit Boundary
- 500m Boundary Offset
- 1km Boundary Offset
- Local Road Network
- Residential
- Commercial / Industrial
- Open Water / Ditches
- Open Ground
- Railway
- Cycleway
- Education
- Listed Buildings
- Scheduled Monuments

Source Terms

- A Airborne Emissions
- L Litter
- O Odour
- M Mud on Road
- N Noise

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Client: Geminor

Project: Materials Recycling Facility St Marks Street Environmental Permit Variation

Figure Title: Environmental Site Setting

Scale		SLR Project No.
1:10,000	@ A3	416.065261.00001

Designed	Drawn	Checked	Authorised
	TS	KH	GS
Date	Date	Date	Date
	April 2024	April 2024	April 2024

Figure Number: 03 Rev.: 0

29/04/2024

\\slr.local\eu\Offices\UK\Cambridge\Admin\New Projects\0416_BRISTOL\416.065261.00001_Geminor_Perm_Variation\Tech\EMPC\Dwgs\Wkng\416.065261.00001.013.003.0_Env_Site_Setting.dwg

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N

Metal Skip

Gas Storage Cage

Odour Abatement System Unit

Helios Fire Suppression System

Electric ACB

Adblue Tank

COSHH

Diesel Tank

Interceptor

Site Offices

Fire Bay

Weighbridge In

Weighbridge Out

Staff Parking

Surface Water Flow Control Feature Box
(underground)

Fire Assembly Point

Bicycle Storage

HGV Out

Hgv In

Emergency Access

Emergency Access

Electricity Sub Station

LV Kiosk

Location of Penstock Valve

Emergency Access

St Mark Street

0 5 10 15 20 25 30 35 40 45 50m

Scale 1:500

Legend:

- Environmental Permit Boundary
- Kerbing Around Site
- Buildings
- Tarmac Surfacing
- Impermeable Surfacing
- Permeable Surfacing
- Stand Trailer Temporarily holding RDF Bales / Astro Turf - Transfer Operation
- Waste Processing Area
- Waste Storage Area
- Overnight Mobile Plant Storage Area
- Quarantine Area
- Combined Drain
- Drainage Channels
- Surface Water Drainage
- Foul Drainage
- Manhole Covers
- Fall of Site
- Surface Water Flow Control Feature

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Client: Geminor

Project: Materials Recycling Facility St Marks Street Environmental Permit Variation

Figure Title: Site Drainage Plan

Scale	SLR Project No.
1:500 @ A2	416.065261.00001

Designed	Drawn	Checked	Authorised
	TS	KH	GS
Date	Date	Date	Date
	April 2024	April 2024	April 2024

Figure Number: 04

Rev.: 0

09/12/2024

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Appendix A Helios Specification

Helios Systems Ltd

Geminor Ltd
Innovation Centre 3,
Keele University Science Park,
Staffordshire
ST5 5NP
1st February 2019

Project-no.	your reference	your customer number	contact	date
KB01599-1	Geminor (Hull)	HEL002GEM	GA	1st February 2019

Quote KB01599-1
Project: Geminor Hull New MRF Processing shed
Turret Extinguishing System prepared to be controlled by PYROsmart early warning fire detection IR camera system for temperature surveillance and fire protection. System to be supplied with 2no active cannon system. Technical container will consist of pump system wetting agent additive tank 2no zoned pressure valves Fire alarm control panel.

Extinguishing Areas: Zone 1 2500m²,
Flow Rate: 1,500 L/min
Extinguishing time: 60 Minutes
Delivery time approx. 14 weeks after a technical and commercial agreement is in place. Freight and packaging to be invoiced at cost at time of delivery.

Fully automatic turret firefighting system

	2	**0010**	**Turret RM15 MJ12 "Standard"** (1500 *L/min @ 10 bar)* The RM15 MJ12 is an electronically controlled turret for low rates up to 1500 L/min at 10bar pressure (530 gal/min @ 150 psi)		
			Technical Data: ▪ Body: corrosion resistant light alloy, RAL7016 paint covering, maintenance free deep groove ball bearings for rotation and vertical movement. ▪ Drive: direct current electric motors, worm drive ▪ Rotation (Auto): Max 340° ▪ Elevation: -90° to +45° ▪ Flange Connection: DN50, Vertical. ▪ Operating Power: 24 VDC ▪ Nozzle type: O stream nozzle for water, non-air aspirated foam and CAFS ▪ Nozzle Setting: 2000 L/min at 10 bar pressure at turret flange ▪ Nozzle jetting: Electrical full/spray jet adjustment, drive for jet adjustment via linear motor. ▪ Throw Pattern: 4 step regulation from full to spray jet. ▪ Control: CAN-BUS 2.0 ▪ Operating Temperature: -40° to +85° ▪ For manual turret operation (Via remote joysticks) and automatic operation in combination with PYROsmart Infra-Red detection system. ▪ Nozzle protection cap ▪ Signal Lamp ▪ Weight: 20Kg ▪ Dimensions: (LxWxH) 640 x 230 x 408 mm ▪ **item No PP004-W009**		

	2	0020	**Flange for turret RM15C Stationary** **DN50 / DN100** **Item No: 855601-001**		
	2	0030	**Mounting console for turret RM15**		
			▪ Steel console for turret to enable wall mounting ▪ Furthermore, the console serves to connect he pipes with the turret ▪ Type: Steel S235JR Hot dipped galvanized ▪ Item No PP004-K001		
	2	0040	**Control Distribution for turret RM15 MJ12**		
			▪ Power supply unit (230V 50Hz Input 24V Output) ▪ Electric circuit fuse (16A 230V) or 24v control circuit ▪ Control module jetter ▪ CAN-bus interface ▪ Diagnosis connector (Interface for maintenance) ▪ Anti-condensation heating element (50W / 230v) with control cabinet thermostat ▪ Distribution panel dimensions 600 x 600 x 210mm ▪ Protectin rating: IP54 ▪ Item No PP004-V004		
	2	0045	**Joystick remote control for 1 turret**		
			▪ The remote control is in a housing with straps that can be placed around the fire fighters neck to have hands free for operation. ▪ Clear arrangement of control elements because of the arrangement maloperation must be avoided. Control elements light up when activated. Pictograms for the description of each control function. ▪ Signal transmission via a CAN-bus ▪ Protection rating: IP54 Functions ▪ One start button for the operation of one turret ▪ Activation / Deactivation button for turret stop/go button ▪ Joystick for the operation of the turret ▪ Water On/Off ▪ Change of the nozzle from full to spray jet in steps ▪ Foaming agent Yes ▪ Item No PP004-J010		
	2	111	**Control distributor for joystick remote control for 1 turret**		
			▪ Power supply unit (230V 50Hz / 24V output) ▪ Electrical circuit fuse (16A 230V) ▪ Circuit fuse for 1 turret ▪ Control board for joystick remote control ▪ CAN-bus Interface ▪ Diagnosis connector (Interface for maintenance) ▪ Anti-condensation heating element (50W / 230v) with control cabinet thermostat ▪ Distribution panel dimensions 800 x 800 x 400mm ▪ Protection rating: IP54 ▪ Lock: ready for install of a 40mm half cylinder barrel type lock. ▪ **Item No PP004-J020**		

	1	111a	**Plant control room container**		

- External dimensions: 6m x 2.5m x 2.6m
- Interior dimensions: 5.8m x 2.3m
- Height plus 120mm for jack rings
- Total height: 2.72m
- Clear space height: 2.3m
- Total length inc gutters 6.16m
- Dead weight: 2.6 Tonnes
- Payload on the crane hook 2.6 Tonnes

Floor

- Structure from the inside to the outside waterproof glued plywood thickness 18mm steel cross members 60mm mineral wool insulation, fire protection class A (incombustible) according to DIN EN 13501, doubling on the cross members to avoid cold bridges, sub floor of galvanized steel sheet
- Live Load 4kN/m2

Floor covering

- See below

External walls

- Wall structure from the outside to the inside: Galfan sheet, zinc aluminum alloy, fastened by bolt series, steel frame work, 50mm mineral wool insulation in-between, Fire protection class A1 according to DIN EN 13501, Lining of galvanized profiled metal sheet unpainted thickness 0.63mm profile depth 10mm screwed and riveted
- External paint of the walls: ecofriendly non-lead and low solvent high-solid two-part paint pack flame red RAL3000 normal dry layer thickness 50-60µm

Roof and Ceiling

- Roof designed as a box type. Roof structure from the outside to the inside: Overhead guard of Galvanized sheet with trapezoidal corrugations, plastic cover, plastic film as a barrier, steel structure of sectional tube 80mm mineral wool insulation in between, fire protection class A1 according to DIN EN 13501, Lining f galvanized profiled metal sheet, unpainted thickness 0.63mm profile depth 10mm, screwed and riveted.
- Snow load: 1.4kN/m2

Insulation values according to the object-related heat protection evidence

- External walls: 0.74 w/m2K
- Floor: 0.43 w/m2K
- Ceiling/Roof: 0.39 w/m2K

Additional Equipment

- 1 set crane suspension device, 4 eyelet rings on the roof for each, including connecting rod and mounted and covered in the walls, fastened to the bottom side, designed for A.M payload.

Ventilation/air supply

- 2 sets forced ventilation, internal and external grill plate, with an inserted standard dust filter, position according to the drawing, 1 PC for each door wing on the bottom and in the middle.

Bottom side

- 3 sets Reinforced IPB 100 crossbeams instead of the standard crossbeams below the round tank
- 1 set of steel plates 200mm wide thickness 10mm position according to your specifications mounted as a reinforcement below the floor plate, inc bottom side reinforcement: 3 pcs 900mm long
- 1 set 4 pcs unscrewable fastening angels 60/100/100mm screwed to the bottom side each with 2 drills diameter 23mm for customer providing bolting to foundation of flooring.

Floor Plate

- 1 set waterproof glued plywood plate thickness 18mm

Floor covering

- 1 set aluminum stud plate 2.5mm individual runs screwed or riveted to the floor plate

Wall Framework

- 1 set reinforced wall framework profiles size 80mm

Ceiling and wall lining

- 1 set steel profiled metal sheet thickness 0.63mm galvanized profile depth 10mm screwed and riveted.

External doors

- 1 pc double swinging door element 1750 x 2000 x 40mm thick door leaf rebated on 3 sides. Door panels galvanized steel sheet on both sides sheet thickness 0.6mm close meshed honeycomb insert completely glued to the door panels
- Door furniture on the active leaf: mortice lock with lever DIN 18251 Class 3 with profile cylinder and plastic handle set.
- Furniture on the inactive leaf screwed on aluminum stop section with sealing 2no tilting flush bolts.
- Clear head room: 1686 x 1968mm
- Active Leaf: DIN left
- Inactive Leaf: DIN right

Electrical Installation

- 1 pc fuse board with miniature circuit breakers inc 0.03A of earth leakage circuit breaker including terminal block for customer provided power supply distribution board on the right-hand side of the supplied pump control cabinet
- 1 pc spare automatic device 16A for customer provided fire alarm system
- 2 pcs surface mounted luminaire 1 x 58W with prismatic diffuser
- 1 pc switched earth socket combination socket outlet UK 230V
- 1 pc earthed socket outlet for heater
- 1 pc Stiebel Eltron wall convector Type CNS200S inc wall holder 230V power
- 1 pc Maico EN20 Ventilator volumetric capacity at 0PAa 420m2/h inc auto shutter AS20 controlled via hydrostat dependent on-air moisture
- 1 pc Maico room stat
- 1 pc electrical circuit diagram
- 1 pc electrical check according to BSI and DIN

Miscellaneous

- 1 pc wall bushing round with wall cladding according to the drawing clear diameter 180mm as a cable bushing for the main distribution system position according to the drawing under the switchgear cabinet.

Item No PP006-CZ01

1	0070	**Wetting Agent Tank 1000L** **Inc piping between tank and foam proportioner**			
		▪ **1 pc Storage Tank made of PE** **Mark of conformity:** GBCS **Medium:** Foam Liquid **Effective Volume:** 0.5m3 **Diameter:** 950mm (Inside) **Total Height:** 900mm **Operating Temp:** 30° max **Design:** Container with flat bottom and conical cover According to the regulations the tank will have to be installed in a collection tank. If not, you may have to meet the requirements of DiBt. The cover design is made for an inside hall install. ▪ **1 pc Collection Tank made of PE** **Mark of conformity:** GBCS **Medium:** Foam Liquid **Effective Volume:** 0.5m3 **Diameter:** 1200mm (Inside) **Total Height:** 600mm Collecting device with firmly welded on bottom and reinforced of upper breach. ▪ 1 pc Level indicator ▪ 1 pc Manhole ▪ 1 pc PE vent bend ▪ 1 pc PE Nozzle d 63 for filling ▪ 1 pc PE bleeder unit cover built in. ▪ 1 pc PE lifting lugs ▪ 1 pc Overfill guard ▪ 1 pc Leakage probe **Item No PP006-S001**		
1	0080	**UPA Booster pump**			
		Booster pump including control junction box and onsite implementing. Power: 1500L/min boosting to approx. 14 bars Technical details in combination with the water tank must be checked before start of assembly. The pump is only projected to supply one turret at a time. **Item No PP006-P000**			
2	0100	**Inbal Valve DN100**			
		▪ Sectional valve turret ▪ The Inbal valve utilizes the unique NMMP design which ensures a long life and reliable operation ▪ The small physical dimensions and the low weight enable the Inbal valve and the control trim assembly to occupy much less space and significantly reduce time and labor needed for the installation. ▪ The Inbal valve with stands pressure surges and is entirely resistant to false tripping ▪ Opening is quick yet smooth virtually eliminating water hammer ▪ The valve is rated at 21 bars ▪ The valve is controlled via a magnetic valve 24vDC ▪ Inc manual butterfly valve			

			Item No PP006-V102		
	1	**0110**	**Pressure maintaining pump**		
			▪ Pressure maintaining system for the minimisation of the switching frequency of the water pump. **Model** ▪ Pressure compensating vessel with pretensioned membrane and inspection glass internally coated design approved. ▪ According to industry safety regs ▪ Piping ready for operation with check and shut off valve. **Item No PP006-P001**		
	1	**0120**	**ColdFire 1000 L Container**		
			▪ Wetting agent used at max 1% to volume of water. ▪ Internal approvals EN1568 Part 3 ▪ Freezing point -15° **Item No 705411**		
	1	**0130**	**Firedos FD2500 1% Freshwater**		
			A hydraulic mechanical proportioning system consisting of a hydraulic motor riving an extinguishing foam agent pump mechanically. The proportioning rate must remain constant at variable operating parameters such as volumetric flow rate and operating pressure. The proportioning systems functions without the usage of electrical or pneumatic energy. The drive is provided pump the pumped fresh water. All connecting pipework is proved on the inbuilt skid based system. ▪ Flow Rate: 250 L/min to 2500 L/min ▪ Operating temp: 5 to 50° ▪ Max Operating pressure: 16bar ▪ Nominal Ad mix rate: 1% ▪ Weight: 73Kg ▪ Bore: DN100 ▪ Connection hydraulic motor: 4“ male thread BSP ▪ Connection foam pump: 1 ¼“ Fem BSP ▪ Connection foam return line: 1“ Fem BSP ▪ Connection relief valve: ¾“ Fem BSP ▪ Dimensions: 789 x 363 x 486. **Item No PP007-FF10**		
	2	**0140**	**Extinguisher distributor**		
			Assembling of the whole extinguisher distributor from the water pump admixing system INBAL valves in technical container inc all fittings installation and material. Material: Black carbon steel tubes outside RAL3000 Powder coated System: VICTAULIC or equivalent **Item No PP006-R000**		
	1	**0150**	**Miscellaneous mounting material**		
			Delivery and mounting of special brackets, clamp construction and substructure constructions for the fixture of piping at deviations from the standard mounting Consisting of		

			▪ Mounting Rails ▪ Rail connectors ▪ Consoles ▪ Threaded rods ▪ Screws nuts and anchors ▪ Material: Hot dip galvanized steel **Item No PP006-RD02**		
	1	**0160**	**Extinguishing system control center**		
			▪ Control unit for pump ▪ For 4 extinguishing zones ▪ Including approx. 40 control inputs and 20 control outputs ▪ Emergency power supply via UPS ▪ Fixed control distributor housing ▪ Integration of all fault indications in the central plant room and the water reservoir ▪ Siren and flashing beacon in the extinguishing zones ▪ E Stop buttons in extinguishing zones ▪ Completely wired and assembled ▪ Connection signal transmission to the existing fire alarm system. ▪ Including mounting connection works and start-up commissioning. **Item No PP006-CS04**		
	150	**0170**	**Piping DN100 complete, RAL3000**		
			▪ Welded threaded steel pipe, RAL 3000 coated on the outside. ▪ Including shipping mounting parts fitted and materials ▪ System: conventional threaded screw connections **Item No PP006-RS08**		
	80	**0180**	**Piping DN32 complete, RAL3000**		
			▪ Welded threaded steel pipe, RAL 3000 coated on the outside. ▪ Including shipping mounting parts fitted and materials ▪ System: conventional threaded screw connections **Item No PP006-RS02**		
	1	**0190**	**Mounting components**		
			▪ If not stated differently, the mounting costs are included in the prices of the components. The quoted prices are flat prices. **Item No PP009-M001**		
	1	**200**	**Approval**		
			Item No PP009-A000		
	1	**210**	**Startup and commissioning**		
			Item No PP009-I000		
	1	**220**	**Project Monitoring**		

			Item No PP009-P000		
	1	**230**	**Additional services**		
			Mounting inc construction supervision onsite Commissioning and test run of the extinguishing system Hydraulic calculations of the pipelines Training of the operating personnel Acceptance by authorized experts Travel hotel expenses and all expenses for mounting and commissioning. **Item No PP006-B000**		
	1	**235**	**Documentation**		
			System documentation (Delivered as a hard copy in English) **Item No PP009-D000**		
	1	**200**	**Services not included**		
			▪ Works outside of normal working hours (Overtime) ▪ Construction of walls or ceilings and any opening of brick ▪ Construction and design of water tank foundations ▪ Anchoring of any suggested tank system. ▪ Required scaffold or lifting platforms ▪ Execution of any electrical supply to the system ▪ Welding and mounting of possibly needed special constructions ▪ Possibly necessary insulation work for the piping ▪ Earthing and lighting protection works ▪ clarification of issues with the authority's insurance fire departments **Item No PP006-BN00**		
			Costs		
			Full system turnkey installation and commissioning as detailed above.		**£305,600.00**
			Delivery		
			DAP Market Drayton (Incoterms 2010) By Truck		
			Payment		
			45% down payment with order. **45% prepayment, before delivery of the major components and starting the assembling.** **10% payment after completion of system in Colnbrook** **Immediate payment upon receipt of each staged invoice.**		

Terms and conditions and scope of goods and services:

Cabling:	System components are delivered ex works. They will be installed on site according to a schematic drawing of the agreed system layout/structure supplied to the client prior to installation. A skilled member of our electrical team will install all network and data cabling with regards to the cabling/wiring of the PYROsmart® and Rosenbauer system. All cabling/wiring between sub distribution container, central control room, CIE and the system components is to be installed and charged for at cost at the end of the project. No costs have been added to this proposal for any of the cable runs between the technical container and the Terminal operations room.
Installation:	Installation will take place once the cabling has been completed.
Commissioning and test operation:	Once the mounting has been completed, we will commission the system and prepare it for test operation. This might take up to 4 weeks. The test operation will run for another 4 weeks. For this, DSL or UMTS remote access is required. Commissioning Detail: ▪ Install cameras on mounts provided ▪ Cable from camera position to network box ▪ Connect patch fibre box to PYROsmart box connect to PC ▪ Run System diagnostics ▪ Individually set up each camera to scan designated areas as per preliminary plans ▪ Test run each camera for operation and detection including hot spot tests and alarms ▪ Each camera to be run independently for 3 hours to define scope of scan and exclude any zones of heat which may not want to be alerted. ▪ Once individual tests have been completed a full system run will be started with all cameras reporting data and displayed in the office. ▪ 2 days of spot checks and random heat source test including false alarms and heat test throughout the site. ▪ Once all the above has been completed the system will handed over on day 3. ▪ Thereafter we will attend site as required to assess the system and make any changes as requested. ▪ We will also spend 1 days per week over 4 weeks fine detailing the system and adjusting temperatures and scope of scan as defined by site requirements. ▪ Training on the system will begin once all systems have been set up and shaken down. Training should take no more than 2 days to complete. A separate training plan will be provided.
Remote access:	Remote access to the system is a prerequisite for a fast and cost-effective support of all alterations, maintenance issues or malfunctions. Should it not be available, further costs (alternative infrastructure, travel expenses) will be incurred. These will be billed separately, in connection with each operation.
Maintenance contract:	A maintenance contract can be offered on request.
Installation:	System components are delivered ex works. They will be installed on site according to a schematic drawing of the agreed system layout/structure supplied to the client prior to installation. A skilled member of our electrical team will install all network and data cabling with regards to the cabling/wiring of the PYROsmart® and Rosenbauer system. All cabling/wiring between sub distribution container, central control room, CIE and the system components is to be installed and charged for at cost at the end of the project. No costs have been added to this proposal for any of the cable runs between the technical container and the Terminal operations room.

Initial Infrastructure required before installation.	Client needs to ensure all foundation bases and footings are suitable to support the lateral loads of both the Technical container and GRP water tank. The cost of survey and installation of suitable foundation is at the clients cost. It is also the client's responsibility to provide a 100Kw 160-amp 3-phase power supply to the location of the technical container. Both the above items need to be installed and available prior to installation of any of the equipment. All cables from Network boxes to system terminal box is to be pre-installed prior to cannon system being fitted and all cable costs will be charged for once the project has been installed and commissioned. All fiber optics and can bus cables to be supplied at additional cost to this quotation. The client needs to ensure sufficient room in underground ducting and existing cable trays to allow passage of all cable systems. If further containment is required that is at the clients cost.
Shipment:	Ex works, delivery, transport and packaging costs, transport insurance 2 % of material value or self-insurer
Delivery time:	approx. 14 weeks from technically and commercially settled order
Validity:	10th February 2019
VAT ID	200793631

Prices: All stated prices are understood purely net cash, plus value added tax and costs for dispatch, transport and packaging (ex-works). Cost calculation shall be in Sterling.

Payment conditions: 10 days net from issue of invoice. After that period the total amount payable shall be increased by 1%. For every additional month of delay in payment, the total amount payable shall be increased by another per cent. Transport insurance: 2% of value of goods. Retention of title: The goods supplied by us shall remain the property of EAG until payment is fully affected. Warranty: The warranty period is 24 months, starting at the date of delivery. Any deficiencies or defects that occur due to incorrect handling are excluded from this warranty. Place of jurisdiction and place of fulfilment is the local court of Manchester. In general, our terms and conditions in their currently applicable version apply, which we are happy to provide on request.

I trust you will find the above proposal to be of interest and I look forward to hearing from you soon to discuss this project in further detail. In the meantime, should you have any further question then please do not hesitate to call me on any of the numbers below.

Once again thank you for your interest in our range of early warning fire detection cameras.

Yours Sincerely

Garry Adey
Managing Director
M.07597 033512
T. 084504745670

Helios Systems Ltd

Geminor Ltd,
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www.heliossystems.uk

project-no.	your reference	client reference	contact	contact direct dial	date
KB1599-1	Fire Detection	GEM24-001	GA	07597033512	1st February 2019

PYROsmart®- Quotation KB1599-1
Indoor waste storage and processing area for Geminor Ltd.
PYROsmart® infrared based early warning fire detection system for monitoring temperature anomalies inclusive of automatic control of foam cannons.

Title 10: PYROsmart® early warning fire detection for Indoor Waste Storage and processing area.
PYROsmart® early warning fire detection system

10.01	**2**	**A-04**	**PYROsmart® Basic 320** (*76.800 IR pixel, auto focus)*	**20.916,00**	**41,832.00**
			Fixed infrared camera and data analysis system in metal casing including: ▪ IR camera with 78.800 IR pixel resolution, -20 to 350°C max., 0.05°C resolution, further temperature ranges available ▪ IR camera with auto focus ▪ 24° x 19° angle – other lenses available (see B-06) ▪ integrated PC with intelligent early warning fire detection ▪ cooling and blow-cleaning of the lens ▪ 3 CIE compatible potential-free interfaces ▪ 3D mounting device ▪ compatible plugs for all other PYROsmart® systems ▪ protection class: casing suitable for rough conditions, all plugs IP 67 classified		
10.02	**2**	**B-01**	**Video option** (*integrated fast lens video zoom camera)*	**3.129,00**	**6,258.00**
			Video functionality in Basic casing ▪ 14-fold zoom video camera with low-light-function ▪ signal processing via integrated PC ▪ controlled by PYROsmart® software, parallel to IR functionality ▪ software suited for **abiroVISION® Panorama** video view		
10.03	**2**	**B-02**	**Scan option:** *(Intelligent high-performance drive for pan-/tilt head to monitor large areas)*	**10.384,00**	**20,768.00**
			High performance – pan-/tilt head ▪ maintenance-free, patented precision double drive, laid out for continual operation 24/7. ▪ controlled via integrated PC without additional external cabling ▪ ¾ ball bearing scan with minimum space requirements ▪ Integrated processor-controlled panorama-function ▪ Movement fully monitored ▪ 5-year warranty for mechanics and electronic drive. Valid from date of delivery.		

10.04	**2**	**B-03**	**abiroVISION® Panorama (server license)** *(requires art. B-02)*	**5.197,50**	**10,395.00**
			With **abiroVISION® Panorama** vision the whole area to be monitored can be analysed and displayed as an overall panoramic picture both as a thermal and video image (the latter applies only if video option, art. B-01, has been selected). ▪ enables the patented vertical and horizontal joining of the individual thermal and video images and their provision to the PYROsmart-network ▪ **abiroVISION® Panorama** server software license valid for one PYROsmart® as stand-alone early warning temperature monitoring system. Each PYROsmart® system acts as an independent server, feeding data to various components (terminals, data storage, extinguishing controls, etc.) via this special server software. *A description of **abiroVISION® Panorama** can be found under art. F-02.*		
10.05	**2**	**B-04**	**PYROcal® option** *(integrated automatic calibration to guarantee accurate measuring, requires article B-02 „scan-function “)*	**1.323,00**	**2,646.00**
			Integrated check source ▪ multi-temperature check source, integrated in casing. Is used as a self-test device for the IR camera. ▪ detects camera and system faults as well as lens soiling ▪ control and analysis via integrated PC – no extra cabling required! ▪ Software interface signals faults ▪ fulfills the specific requirements of VdS guideline 3189		
10.07	**2**	**B-08**	**PYROsmart® junction box fibre optics** *The junction box simplifies installation and actively converts the network signal to the PYROsmart® system*	**724,50**	**1,449.00**
			▪ active fibre optics GBIT- RJ45 converter (with extended operational temperature range) ▪ terminal clamps for the system cable ▪ fully mounted and checked ▪ robust casing for wall mounting ▪ The system cable is part of the initial delivery of a PYROsmart® system. Any repeat orders are without system cable and need to be ordered separately.		

PYROsmart® mounting

10.08	**2**	**C-01**	**PYROsmart® mounting model 1 –** *for external and internal fitting, suitable for T-beam, screwed or clamped*	**514,50**	**1,029.00**
			 ▪ material: galvanized steel ▪ made to specification ▪ model may differ from picture and vary according to required mounting angle		

PYROsmart® network / supply center
NVZ-1

10.09	**2**	**D-01**	**Control cabinet NVZ -1** *(electric/network supply center for one PYROsmart® system, expandable for extinguishing PC)*	**3.412,50**	**6,825.00**
			Stainless steel control cabinet; measurements approx. 800 x 600 x 220 mm mounted with the following top hat rail modules: ▪ equipped for 1 PYROsmart® system		

			▪ software controlled COP maintenance switch with signal lamp on front to disable signals to CIE ▪ separate cutout switch for the most important components ▪ central power switch ▪ FI protected plug and internal lighting ▪ GBIT-supply center ▪ monitored power supply units ▪ SMARTbox: intelligent monitoring to auto-correct detected faults ▪ fully mounted and checked ▪ power: 230V / approx. 120VA ▪ protection class: IP 66 ▪ diagrams in German or English ▪ external UPS, VdS guideline 3189 requirement ▪ open-ended for: - extinguishing control PC (art. E-07, E-08) - internal power-supply unit (art. D-02) - fibre optics (art. D-16) - GPRS-remote maintenance (art. D-17)		
10.10	**2**	**D-02**	**Internal power-supply unit for control cabinet NVZ -1 UPS**	**327,60**	**655.20**
			▪ please note: to comply with VdS guideline 3189 articles D-03 or D-05 are required, which can be retrofitted ▪ installation and test at assembly 24V / 5A with active signal output		

NVZ – control cabinet options

10.13	**2**	**D-18**	**NVZ- optical converter -option** *Control panel add-on for active signal conversion and transmission for optical fibre cables*	**724,50**	**1,449.00**
			▪ Active fibre optics GBIT- switch in FX technology ▪ laid out for increased operational temperatures of up to 70°C ▪ managed switch – can be extended to ring main ▪ up to 4 fibre optics channels possible ▪ control via SMARTbox ▪ fully mounted and checked		
10.20	**1**	**D-19**	**Signaling and remote maintenance module (mobile network)**	**2.047,50**	**2.047,50**
			Functionality: The PYROsmart® remote maintenance and watchdog system fulfills more than one task. ▪ It enables signaling of pre-alarm, alarm, and error status signals via email to several users of the client (also as a text message with costs through service providers). ▪ Through a secure gateway, it generates access to the PYROsmart® system, and can use both a network based broadband or an M2M mobile connection. ▪ It enables remote expert access, reducing support costs for commissioning, daily operation, and on-site maintenance. ▪ Any unexpected events can be dealt with quickly and cost-effectively, and operational delays as well as travel expenses for otherwise necessary services are avoided. ▪ A continuous operational status report to the central OIS-Monitoring-System prevents faults and failures. (OIS = ORGLMEISTER Infrarot-Systeme GmbH Co. KG) ▪ The continuous operational status report to the central OIS service department is also part of warranty and maintenance agreements with OIS or one of its partners. ▪ It simplifies regular software updates.		

			Delivery scope: ▪ combined broadband / radio signaling module with integrated dual-purpose network router and security gateway as modular packaging system in control cabinet ▪ installation of the module in the control cabinet ▪ installation of external antenna to control cabinet for radio connection ▪ procurement and installation of PYROsmart® remote maintenance software ▪ TeamViewer pro software licence ▪ set up of signals and indication groups ▪ documentation and administration of service indications ▪ set up of OIS PYROsmart® monitoring system for client-specific requirements ▪ commissioning and test Please note: either a data SIM card or broadband access must be provided by client. This will be individually determined by our project management.		

Title 20: PYROsmart® - intelligent automatic extinguishing control

20.1	**2**	**E-05**	**PYROsmart® - *EXTING-pro*** Extinguishing software package for precise control of water turrets and other extinguishing systems *(aimed extinguishing, requires article B03 and F02)*	**10.342,50**	**20,685.00**
			Intelligent software add-on to "PS-Terminal®PanoramaView "(software for thermal monitoring of processes and storage areas to avoid fires) which activates and accurately controls water turrets and other extinguishing systems. Main features: ▪ Based on PYROsmart® - *EXTING-field* functionality ▪ Control of extinguishing activity in real time – also in case of substantial smoke emission. ▪ Intelligent control of water turret for early suppression of detected hot spots. Calculation of 3D-extinguishing regime and alignment of water turret. Integrated watchdog feature for water turret. ▪ Intelligent control of water turret valves, depending on distance. ▪ Intelligent activation of other extinguishing systems (e.g. designated areas of spray deluge or foam extinguishing systems) to suppress potential fires.		
20.2	**1**	**E-07**	**Active extinguishing control for control cabinet**	**2.394,00**	**4,788.00**
			▪ Control of 1 water turret ▪ addition to control cabinet ▪ industrial PC with extended temperature range, top hat rail mounting ▪ Can bus compatible ▪ SMARTbox control ▪ includes set up of extinguishing software (article E-04 or E-05) ▪ inclusive of local network test		

Title 30: Operating equipment and software features
Software packages

30.1	**1**	**F-01**	**Software package PS-Terminal® "Basis "**	**1.942,50**	**1.942,50**
			Basic version of the abiroVISION® - early warning fire detection software, for stationary PYROsmart® systems. ▪ **Easy operation** via standard or touchscreen PC. ▪ **PYROsmart® fire analysis:** intelligent detection of fires based on temperature development and limit analysis ▪ **Time profiles:** e.g. day/night operation		

- **Real time IR and video images**: continual updates of images (video requires item 103).
- **Data recorder:** IR images are recorded to analyze fire origin and its causes.
- **Remote maintenance interface**
- **Acoustic signal**
- Can be upgraded to **abiroVISION® SektioScan** or **PanoramaView**

Free software updates for a period of 2 years from delivery.

Basic version of PS-Terminal - early fire-detection software for non-scanning, permanently installed versions of PYROsmart® (article A-01 to A-05).

Intelligent software for thermal monitoring of processes and areas to avoid fires. The operating principle is to detect the cause of fires (overheating, the development of hotspots or fires concealed by material) in their formation phase and thereby remove the disturbance variables of day-to-day operation.

The software is configured as a client/server solution. It is therefore easy to expand the PYROsmart system by adding extra workstations and PYROsmart early fire-detection systems.

Easy operation: Via a standard or touchscreen PC.

PYROsmart® fire analysis: Intelligent detection of dangerous surface temperatures (hotspots or fire) by analysing temperature thresholds, heat increases over time and other analysis functions.

Time profiles: Several time profiles with special analysis functions can be created, e.g. for daytime/night-time operation.

Real-time thermography and video image representation*: The thermal image and video image are continuously updated.

Incident-controlled data logging: Thermal image sequences can be recorded and reproduced on any hard drive or network drive. These can be used to recreate a fire-triggering situation. The following criteria can be set:

Start data recording manually

Always record all data

Record data once a fire pre-alarm message has been issued

Record data once a fire alarm message has been issued

Remote maintenance interface: Convenient interface for questions on events, updating software and maintenance purposes. Fast on-site support without travel costs.

Colour display: The area being monitored is displayed as a high-resolution, black-and-white thermal image. The fire pre-alarm zones are marked in yellow-orange and any detected fires are shown in a "fire alarm" colour scheme.

This display will not attract your attention while there is no fire. In critical situations, potentially hazardous areas are clearly marked in the alarm colours. Together with the audible signal, this indicates that you should act quickly.

Besides the VdS-compatible PYROsmart infrared colour scheme – the result of many years of practical experience and cooperation with customers – it is possible to create customer-specific colour schemes.

Audible signal/connection to the central fire alarm system: Various audible signals will sound in the event of a fire pre-alarm or fire alarm. Corresponding signalling outputs activating a central fire alarm system are triggered at the same time.

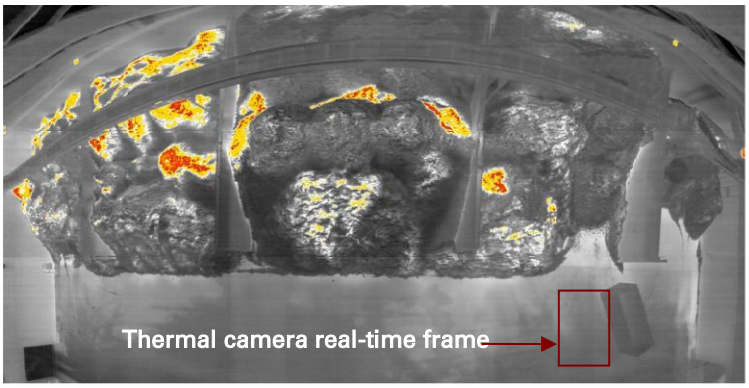
Can be expanded subsequently with the abiroVISION® PanoramaView software package (article F-02).

Overview of general functions:

Fire analysis using temperature threshold analysis and analysis of the temperature over time.

Direct display of the temperature at any point on the thermal image.

Automatic/manual focusing of the infrared camera (provided that this function is supported by the camera).

			Convenient data player/data recorder that records and reproduces the operating statuses alongside the infrared and video data. List of events with operator-controlled image frame memory. Continuous recording and display of the minimum, maximum and average value with graphics showing the temperature over time. Zooming and automatic focusing of the video camera. Camera-specific fault messages for: Air supply, faults in the control electronics, moisture and temperature of the compressed air, communication problems, general malfunctions. Several different versions of the PYROsmart® camera system can be analysed at the same time. Maintenance can be carried out on the software system and entire system remotely. In case of changes to operating conditions or problems, OIS can intervene and provide support quickly. Device settings and alarm values can be saved to ensure that a device can be replaced quickly in the case of damage or malfunction. Different password levels separate access to the program by operators and administrators. A standard setting is configured with the end customer and can be called up at any time. This prevents the system from failing when operated incorrectly. Free software updates for two years from the delivery date		
30.2	**1**	**F-02**	**abiroVISION® PanoramaView option** *(add-on, requires item F-01)*	**8.295,00**	**8.295,00**
			The PanoramaView option is an add-on to the abiroVISION® PS Terminal "Basis" software program and enables the display of the entire area to be monitored in one overall view, both as an IR and video image.  PanoramaView – thermography of an 80 m long input hall, boxes with different recycled materials. ▪ The panoramic thermal image is patented internationally by ORGLMEISTER Infrarot-Systeme. ▪ It greatly simplifies local mapping and analysis in the case of fire as it considers more than just one specific area. ▪ Intelligent, event-related early fire detection is not just based on a collection of individual infrared images, but on the entire detection area to be monitored. ▪ This makes it much easier to eliminate everyday disturbance variables, such as the hot exhaust gases emitted by a transport vehicle. ▪ Integrated, intelligent user override function with VdS-compatible, automatic safety reset. ▪ Users can switch quickly between the infrared image or video image in the foreground, including all infrared temperature details in the respective image background. ▪ PanoramaView is a prerequisite for direct automatic extinguishing (article E-05).		

Operating units (in control room, driver's cabin)

30.3	**1**	**G-01**	**Standard operation terminal**	**3.517,50**	**3.517,50**
			Among other things, the operator terminal is designed to set the parameters of the PYROsmart system. The operator can detect the current temperature situation at an early stage and thereby a possible fire in its formation phase. By analysing the player data displayed, the causes of a fire situation can be recreated. The standard operator terminal is designed for clean rooms with suitable space for the mini-tower, mouse and keyboard. Suitable installation locations: ▪ control room ▪ crane operator's cabin Consists of: ▪ PC (Dell minitower or comparable), suitable for continual operation ▪ USB mouse and keyboard ▪ 24"table top flat screen, 1920 x 1080 pixel ▪ software PYROsmart® FP-terminal (client license for the operating terminal) ▪ Windows 7 Pro license ▪ Integrated optical data network (if required) ▪ set up charge for standard PS-Terminal software ▪ system check ▪ 2-year warranty		

Title 40: Additional equipment, spare parts

40.4	**1**	**H-07**	**Drawings and documentation** *(1 x printed versions,1 x CD)*	**997,50**	**997,50**
			Includes: ▪ documentation and drawings in German and English; 1 printed copy, electronic file additionally on CD-ROM ▪ If requested, translations into other languages are charged according to actual costs. The translation is done by professional expert translators.		

Title 50: Services and travel expenses

50.1	**1**	**M-05**	**Commissioning of the system on site**	**1.141,00**	**1.141,00**
			Commissioning includes the final PYROsmart system functional test, the functional test involving an extinguishing system (if available) and adjustment to the local operating conditions. The aim of commissioning is to prepare the system for the test run. Scope of services: ▪ Checking camera position and alignment of brackets ▪ Checking cabling/earthing and the assembly of system components ▪ System switch-on ▪ Preparation and testing of remote access ▪ Configuration of the system to the local parameters ▪ Checking basic functions and the connection to other signalling systems (extinguishing systems, central fire alarm system) ▪ Training the operating staff for the test run ▪ Training on how to change a PYROsmart ▪ Testing the compressed-air supply and setting the purge air volume if necessary ▪ Preparing the system for the test run ▪ Handover of the necessary documents for the test run		

			The costs are calculated on a project-specific basis according to the time required for commissioning on site (depending on the size of plant and the local conditions, up to two Helios employees on site and one remote software engineer via remote access may be required), accommodation costs. For further details, see the service limitations at the end of the proposal.		
50.2	**10**	**M-06**	**Installation of full camera system**	**£750.00**	**7,500.00**
			Installation of the entire PYROsmart system including cabling and containment. Scope of services: ▪ Install and fixing of network boxes ▪ Install and fixing of junction boxes ▪ Install and fixing of Camera mounts and cameras ▪ Cabling between cameras and network boxes ▪ Cabling between Network boxes and operating terminals ▪ Installation of terminal network box ▪ Installation of PC and TV screen for system operation. ▪ 240v Power must be supplied at each network box position by client in ready for connection to each camera. ▪ No costs have been calculated for additional ducting or drawing fibre cable through to the operations room.		

Costs

Cost Title 10 + 20	**Indoor waste storage and processing area** PYROsmart Equipment + Intelligent Control of extinguishing systems	120,826.70
Cost Title 30	Operating equipment and software features and Software packages	13,755.00
Cost Title 40	Additional system equipment, spare parts	997,50
Total		**135,579.20**
Cost Title 50	Installation and commissioning including travel expenses	8,641,00
Final total net:		**144,220.20**

Scope of services:

Installation	System components are delivered ex works. They will be installed on site according to a schematic drawing of the agreed system layout/structure supplied to the client prior to installation. A skilled member of our installation team will be carrying out the installation and cabling/wiring of the PYROsmart® system. All cabling/wiring between sub distribution, central control room, CIE and the system components is by the client.
Hardware equipment and placement of components	The project preplanning and design including the requirements of respective technical equipment are based on the provided specifications, plans and photos. Changes may arise due to the on-site situation regarding the possible detection and placement of the PYROsmart® systems. Therefore, the exact placement of the individual PYROsmart® systems can only be confirmed after a site visit.
Compressed air supply	The permanent supply of oil-free, dry compressed air, reduced to 1 bar air pressure per PYROsmart® system is an operational prerequisite in dusty environments, and is offered separately or may be provided by the customer/a third party. Helios does not fit the compressed air lines or carry out the pneumatic calculations.
Commissioning and test operation	Once the mounting has been completed, we will commission the system and prepare it for test operation. This might take up to 4 weeks. The test operation will run for another 4 weeks. For this, broad band or UMTS remote access is required.

Remote access	Remote access to the system is a prerequisite for a fast and cost-effective support of all alterations, maintenance issues or malfunctions. Should it not be available, further costs (alternative infrastructure, travel expenses) will be incurred. These will be billed separately, in connection with each operation.
Maintenance contract	A maintenance contract can be offered on request. If the system is to comply with VdS guideline 3189, it is obligatory to have a maintenance contract in place.
Commissioning of the system on site	Prerequisites for commissioning: ▪ Working, operational remote access must be available (broadband, UMTS, GSM) with a minimum transmission rate of 6 Kbit/s. ▪ All components must be correctly installed and connected. ▪ If necessary, compressed air must be ready for operation, connected to the respective PYROsmart® system via hydraulic hose. ▪ If an extinguishing system is to be triggered or controlled by the PYROsmart® system, this must be fully operational. The company must deploy staff to operate the system during commissioning. Extinguishing trials are to be arranged beforehand with the system operator. ▪ If the PYROsmart® system is to be connected to a central fire alarm system, authorised operating staff must be made available for this system. ▪ All system components must be accessible for commissioning. Should lifting platforms or aerial platforms be required, they must be provided. Possible obstructions (e.g. warehouse stock in a recycling plant) beneath the fire monitoring site must be removed. If the prerequisites are not available at the time of commissioning and if it is not possible to remedy this on the same day so that planned commissioning can be carried out on the agreed date, the commissioning costs must be reimbursed by the client (even if commissioning has not started), unless commissioning is cancelled 48 hours before it is due to begin. In this case, recommissioning is chargeable. Additional work, resulting from failure to provide the prerequisites for commissioning, is billed subsequently. All additional travel expenses are to be covered by the client.
System training on site	If the staff requiring training are not present at the agreed time, and if it is not possible to carry out the training session on the agreed date, then the client must bear the training costs, unless the training session is cancelled at least 48 hours before it is due to start. In this case, another training session is chargeable. Additional training times, resulting from postponement of the agreed training period, are billed subsequently. All additional travel expenses are to be covered by the client.
Handover of the system to the purchaser	If the prerequisites and staff required for handover are not present at the agreed time, and if it is not possible to carry out the handover on the agreed date, then the client must bear the handover costs, unless the handover is cancelled at least 48 hours before it is due to start. In this case, another handover is chargeable. Additional handover times, resulting from postponement of the agreed handover period, are billed subsequently. All additional travel expenses are to be covered by the client.
Supervising an expert inspection/acceptance	If, through no fault of our own, supervision cannot be carried out at the agreed time and date, then the client must pay the costs incurred, unless the service is cancelled at least 48 hours before it is due to start. All additional travel expenses are to be covered by the client.
Supervision of the PYROsmart® system assembly by qualified staff	If, through no fault of our own, supervision cannot be carried out at the agreed time and date, then the client must pay the costs incurred, unless the service is cancelled at least 48 hours before it is due to start. All additional travel expenses are to be covered by the client.
Commissioning of fire-fighting monitors by Rosenbauer	If the staff required are not available at the time of commissioning and if it is not possible to remedy this on the same day in order to carry out commissioning on the agreed date, then the purchaser must pay the commissioning costs, unless commissioning is cancelled 48 hours before it is due to start. In this case, recommissioning is chargeable. Additional work resulting from failure to provide the prerequisites for commissioning is billed subsequently. All additional travel expenses are to be covered by the client.
Initial Infrastructure required before installation.	Client needs to ensure all foundation bases and footings are suitable to support the lateral loads of both the Technical container and GRP water tank. The cost of survey and installation of suitable foundation is at the clients cost. It is also the client's responsibility to provide a 100Kw 160-amp 3-phase power supply to the location of the technical container. Both the above items need to be installed and available prior to installation of any of the equipment.

Terms and conditions

Shipment	ex works, exclusive of customs charges
Delivery time	approx. 10 weeks from technically and commercially settled order
Validity	3 months from date of issue
Payment	in line with project progress, 10 days from invoice issue, net: • 45 % after assignment • 45 % after delivery • 10 % after commissioning
VAT ID	200793631

Special terms: This proposal is only intended for the addressee. It is forbidden to allow third parties access to this proposal or parts thereof. Where applicable, this also applies to the appendices to the proposal letter. Any infringement will result in liability for damages. **Prices:** All stated prices are understood purely net cash, plus value added tax and costs for dispatch, transport and packaging (ex works). Cost calculation shall be in Sterling. **Payment conditions:** 10 days net from issue of invoice. After that period the total amount payable shall be increased by 1%. For every additional month of delay in payment, the total amount payable shall be increased by another per cent. **Retention of title**: The goods supplied by us shall remain the property of Helios Systems Ltd until payment is fully effected. **Warranty**: The warranty period is 24 months, starting at the date of delivery. Any deficiencies or defects that occur due to incorrect handling are excluded from this warranty. Place of jurisdiction and place of fulfilment is the local court of Manchester. In general, our terms and conditions in their currently applicable version apply, which we are happy to provide on request.

Preliminary Planning for the

Indoor Waste Storage and Processing Area at

Geminor Ltd.

for Hull Facility.

by Garry Adey

Version 1:0 24th January 2019

Helios Systems Ltd
Suite 2.09
Blackbox
Beech Lane
Wilmslow
SK9 5ER
Tel:0161 226 1885

Geminor Ltd (Hull)

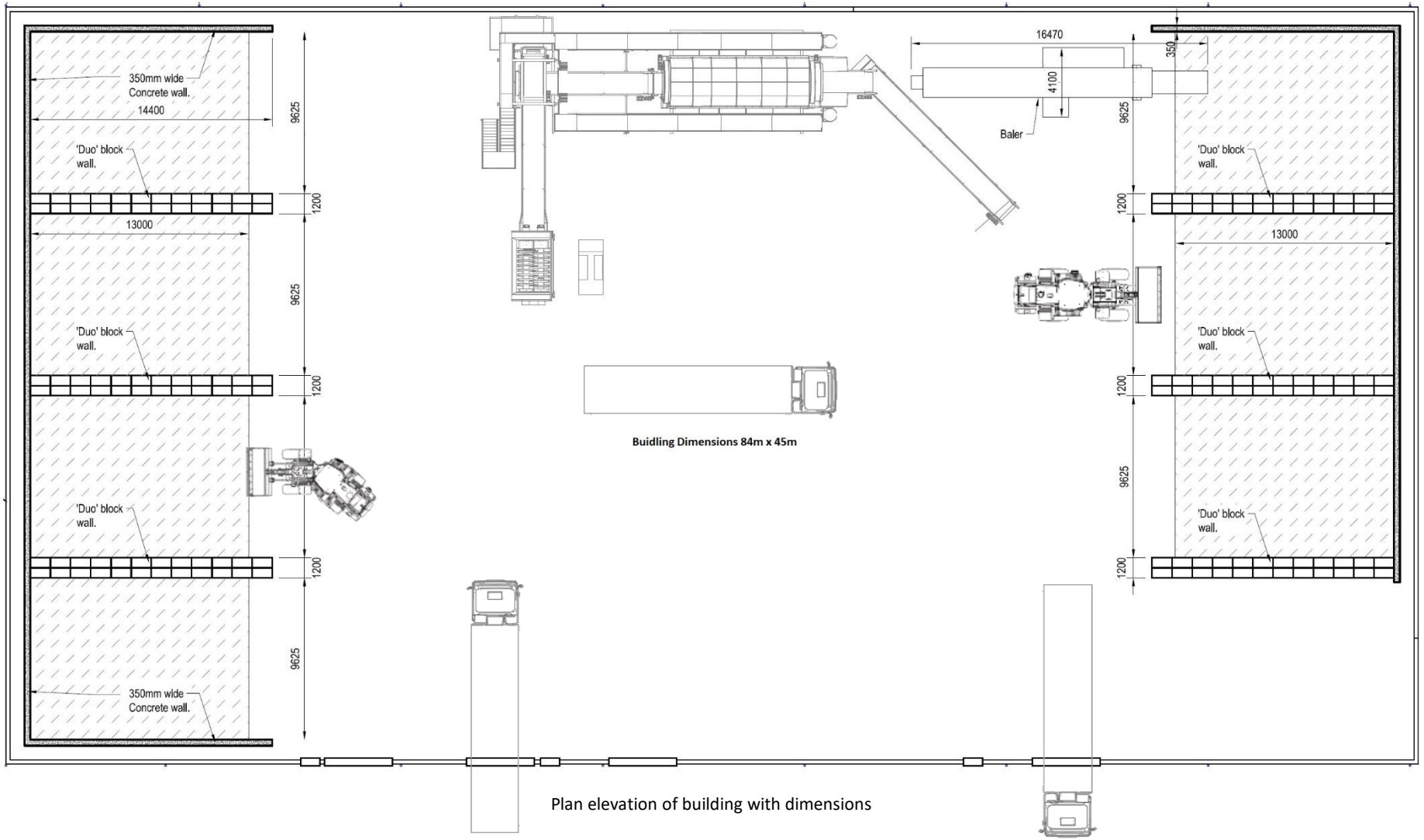
Project Design

Helios Systems Ltd

Site layout plan

Geminor Ltd (Hull) Project Design

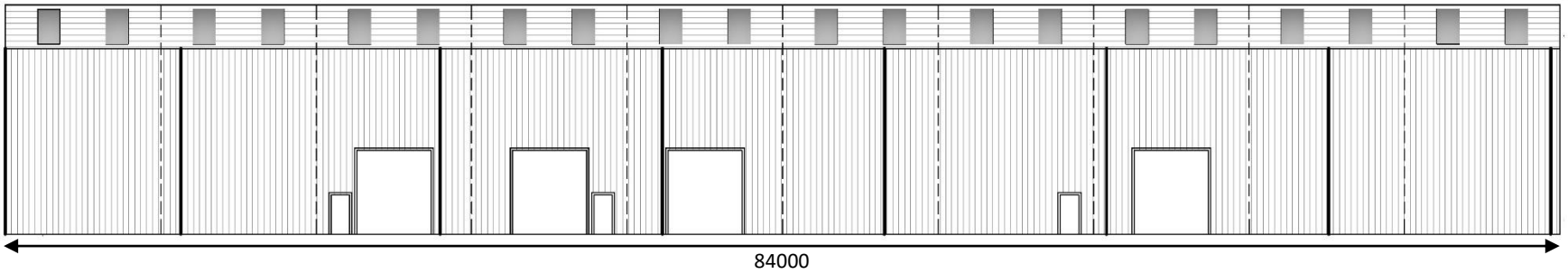
PYROsmart® Early warning heat detection Risk Zones



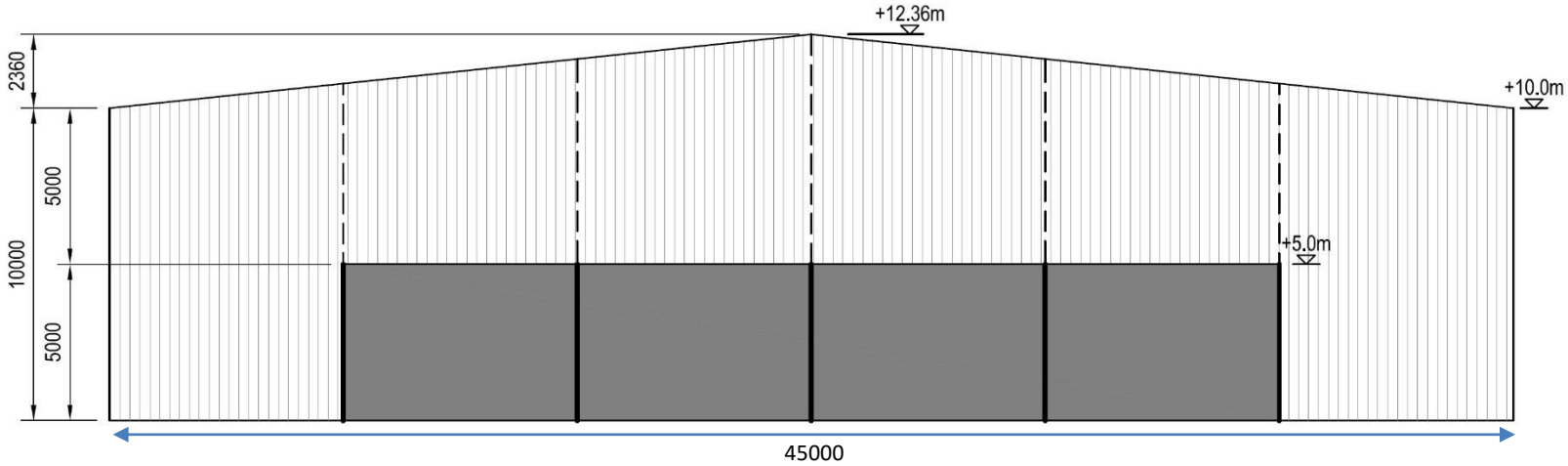
Plan elevation of building with dimensions

Geminor Ltd (Hull) Project Design

PYROsmart® Early warning heat detection Risk Zones



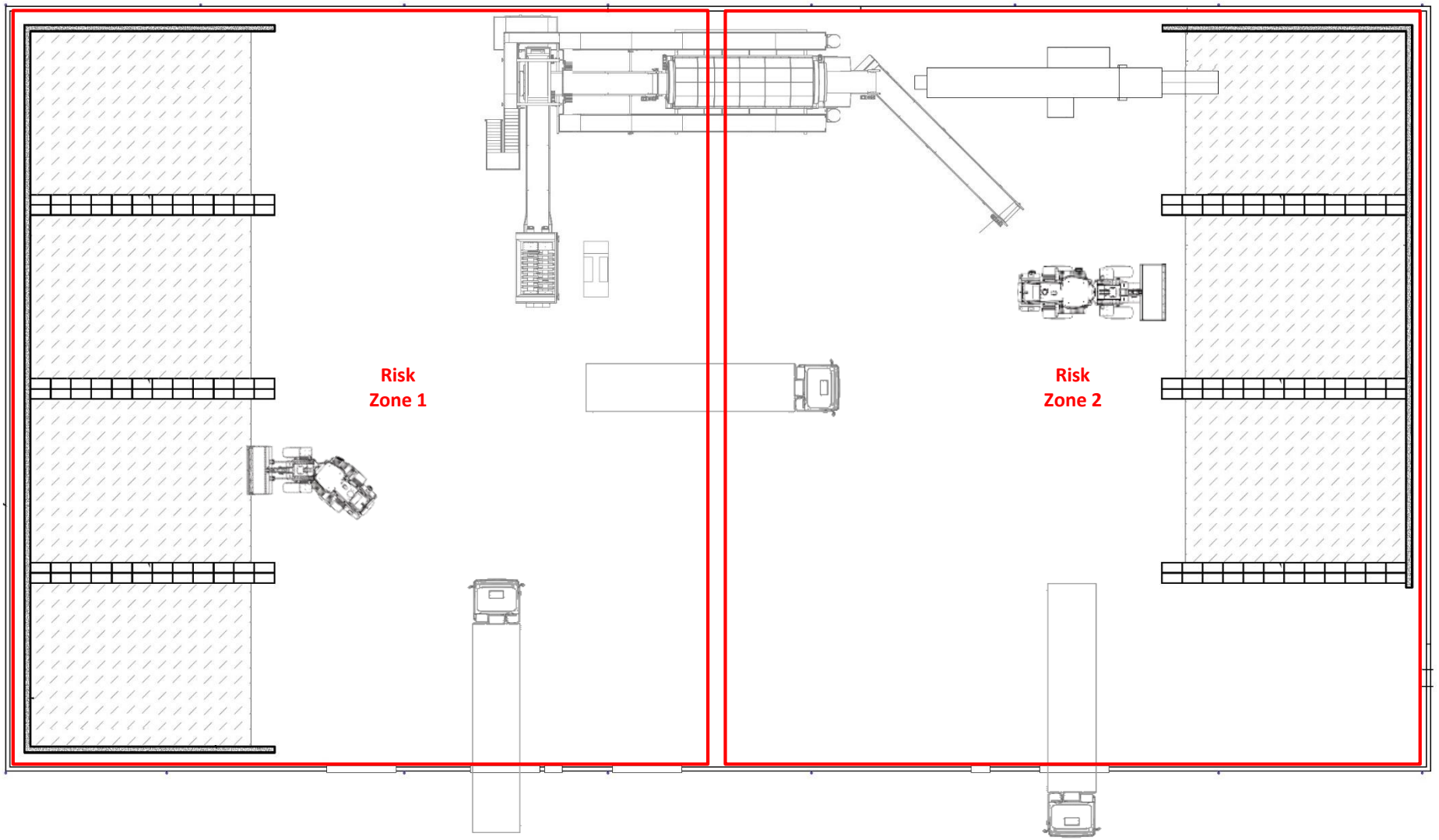
Front elevation of building



Side elevation with dimensions

Geminor Ltd (Hull) Project Design

PYROsmart® Early warning heat detection Risk Zones



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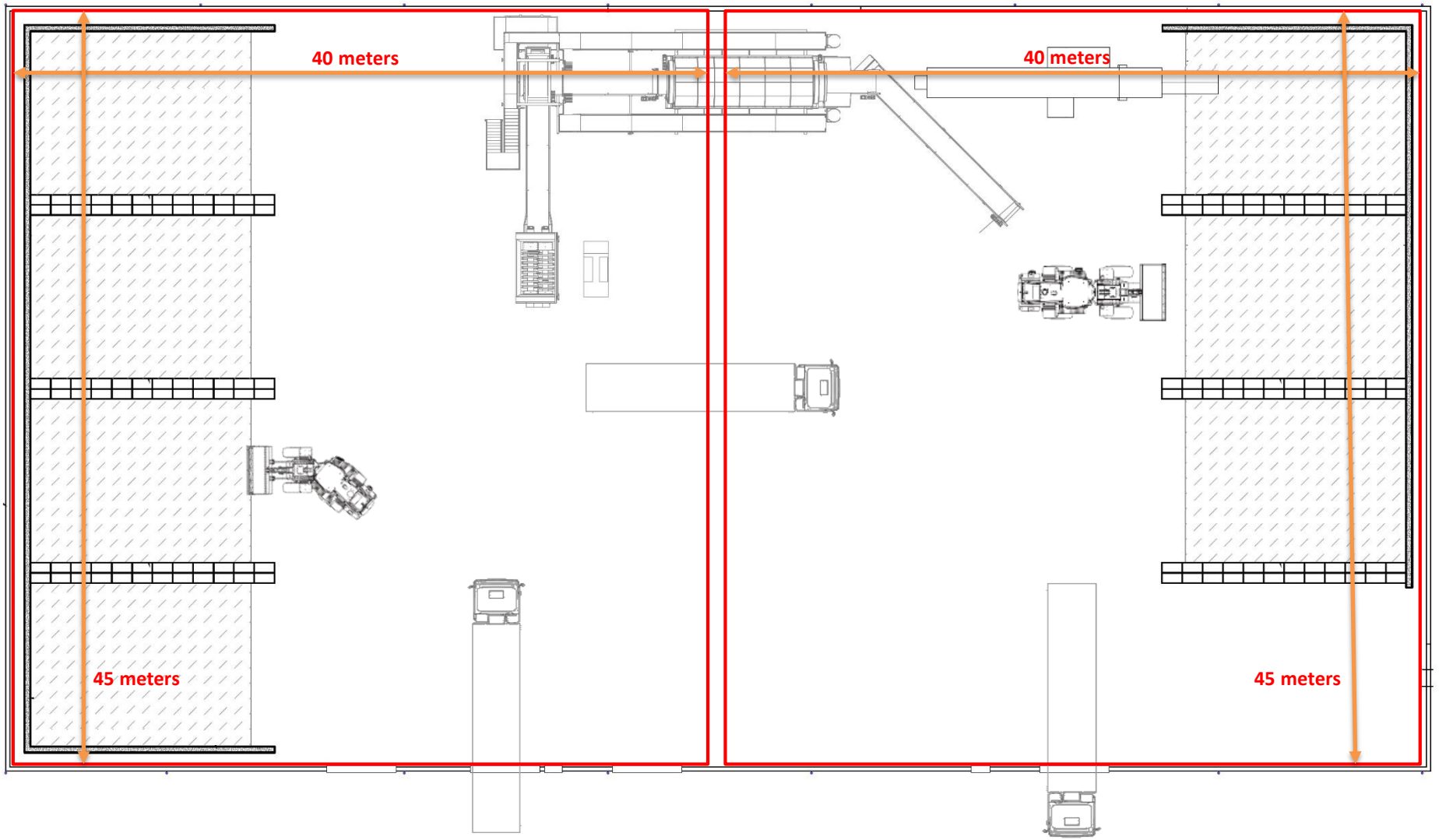
PYROsmart® Early warning heat detection Risk Zone Dimensions



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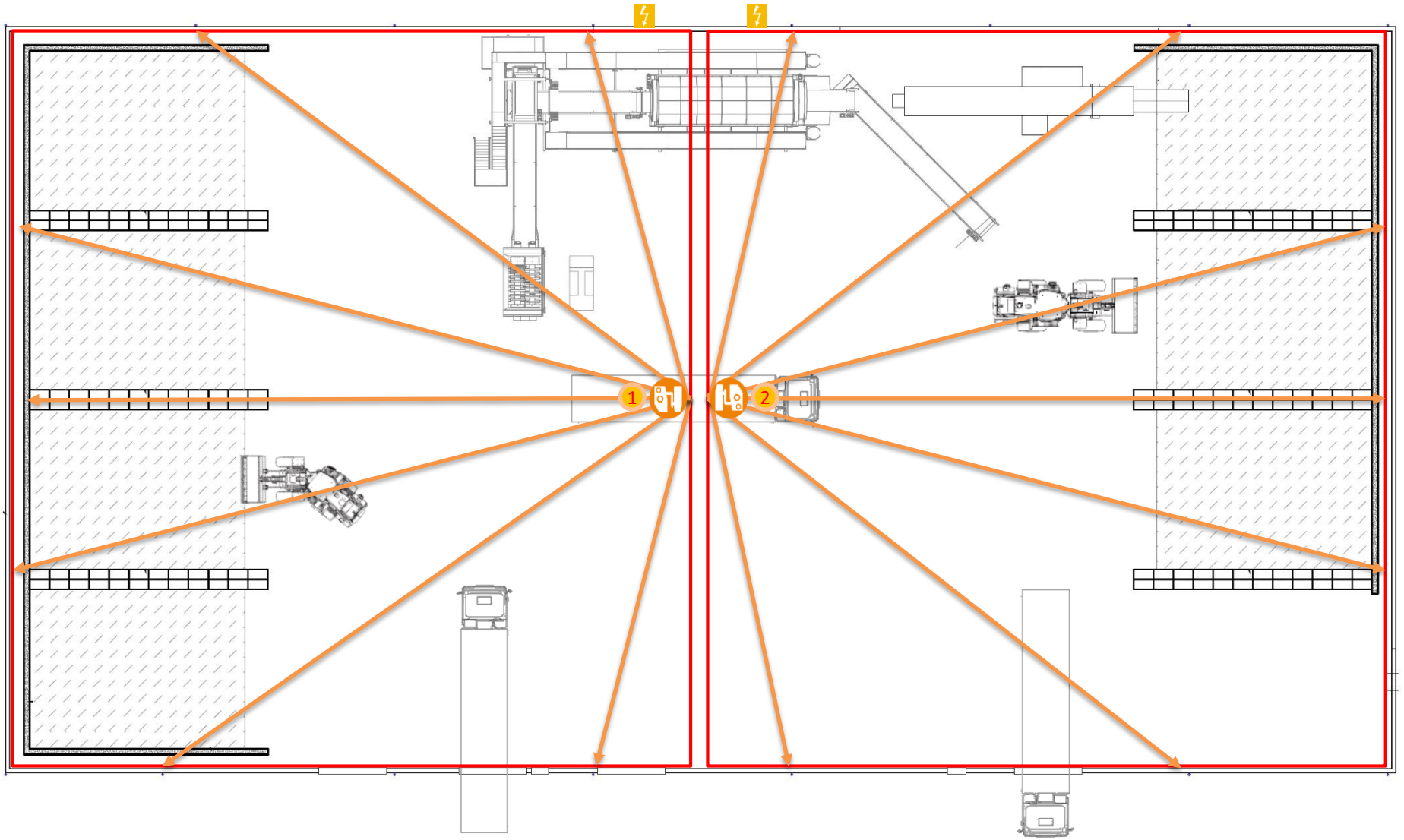
PYROsmart® Early warning heat detection hall scanning cameras



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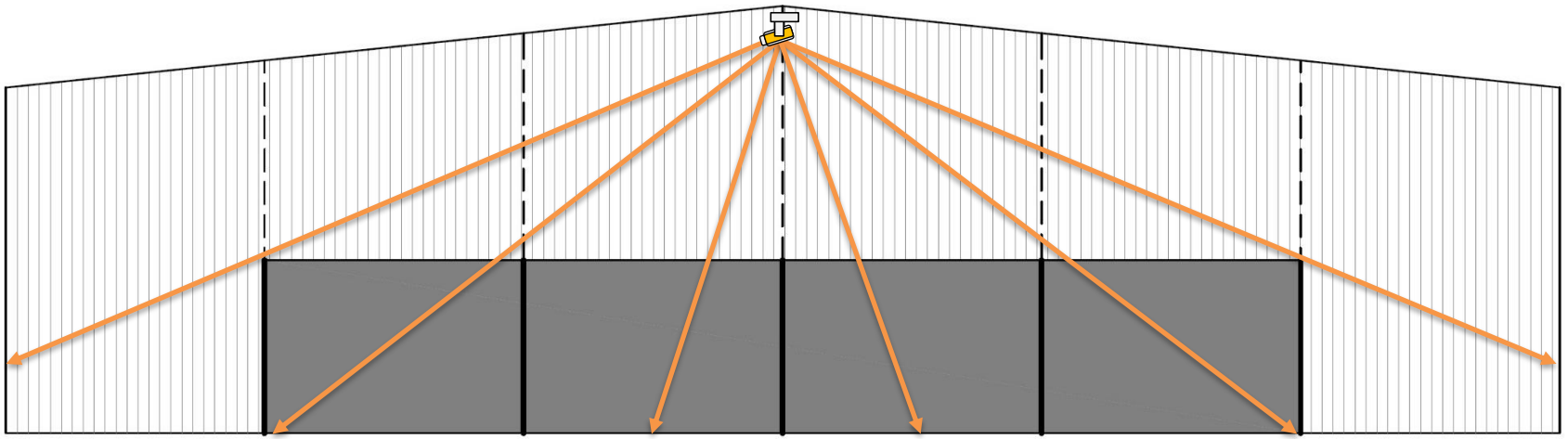
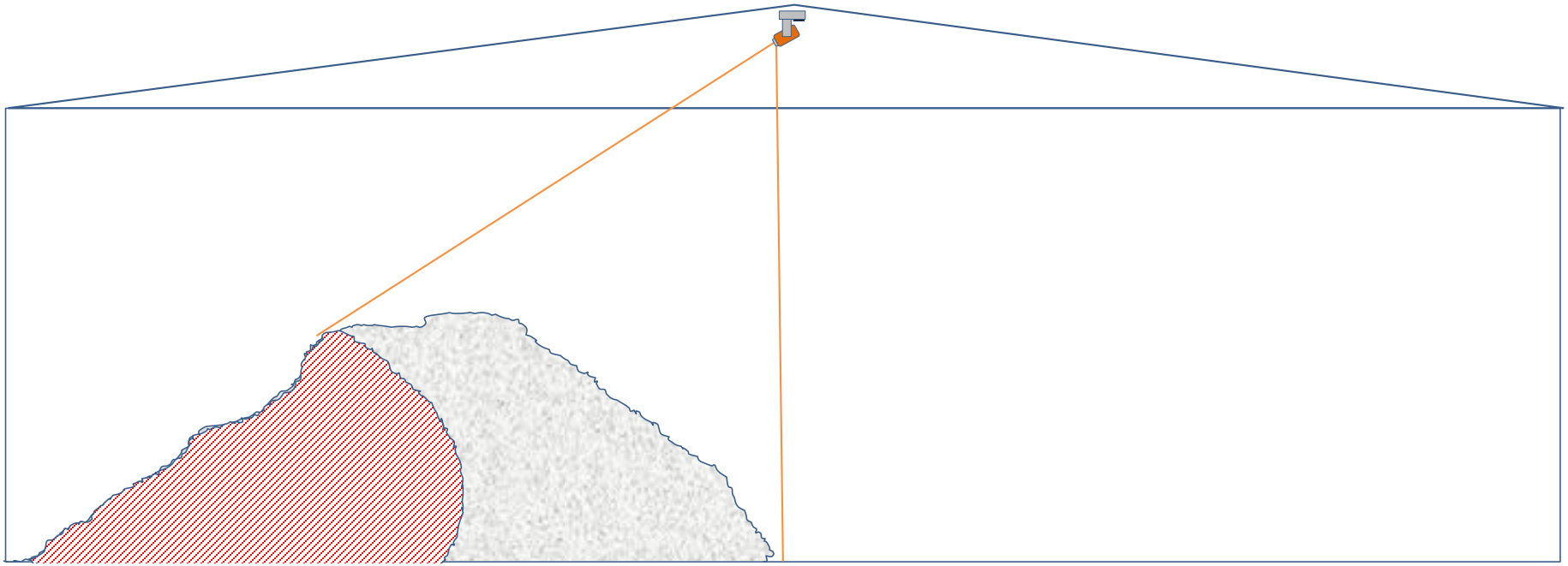
PYROsmart® Early warning heat detection hall scanning cameras



PYROsmart centrally located at apex 12m above stock pile giving optimum scope of view and un-hindered detection

Geminor Ltd (Hull) Project Design

PYROsmart® Single camera blindspot generation

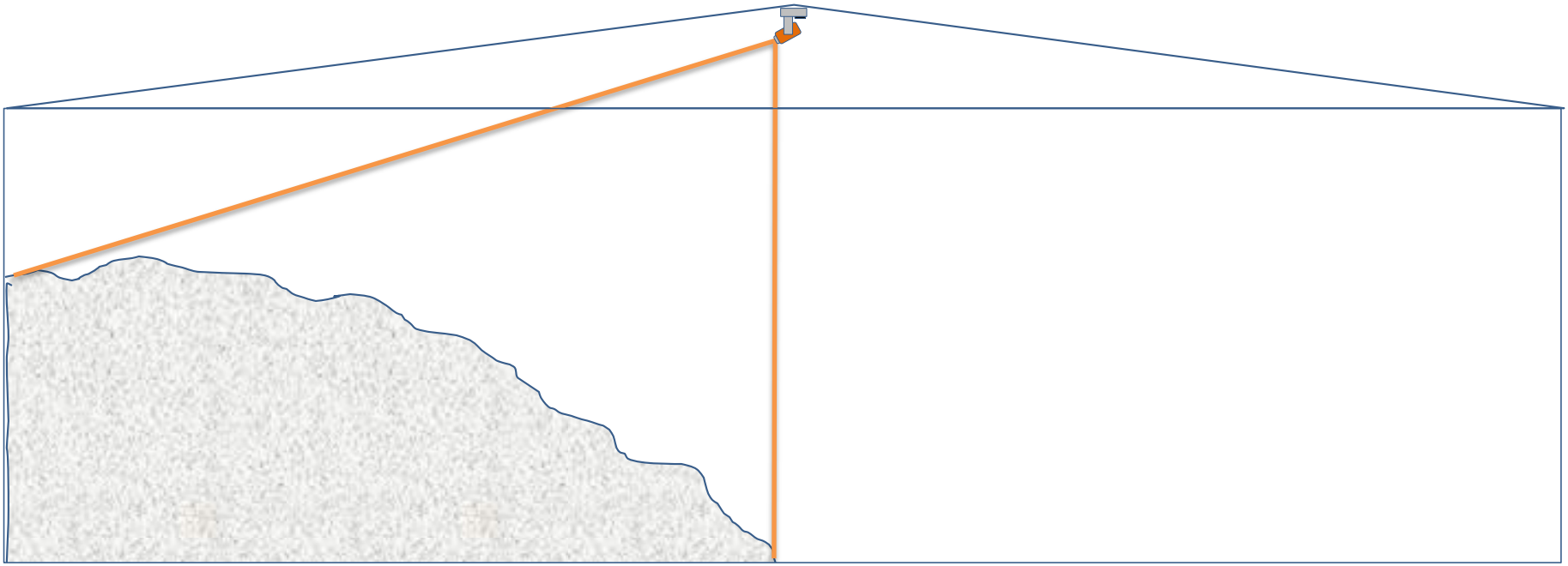


Stock piles must always be pushed up against concrete push walls to stop valleys being created which create huge blind spots

Geminor Ltd (Hull) Project Design

Helios Systems Ltd

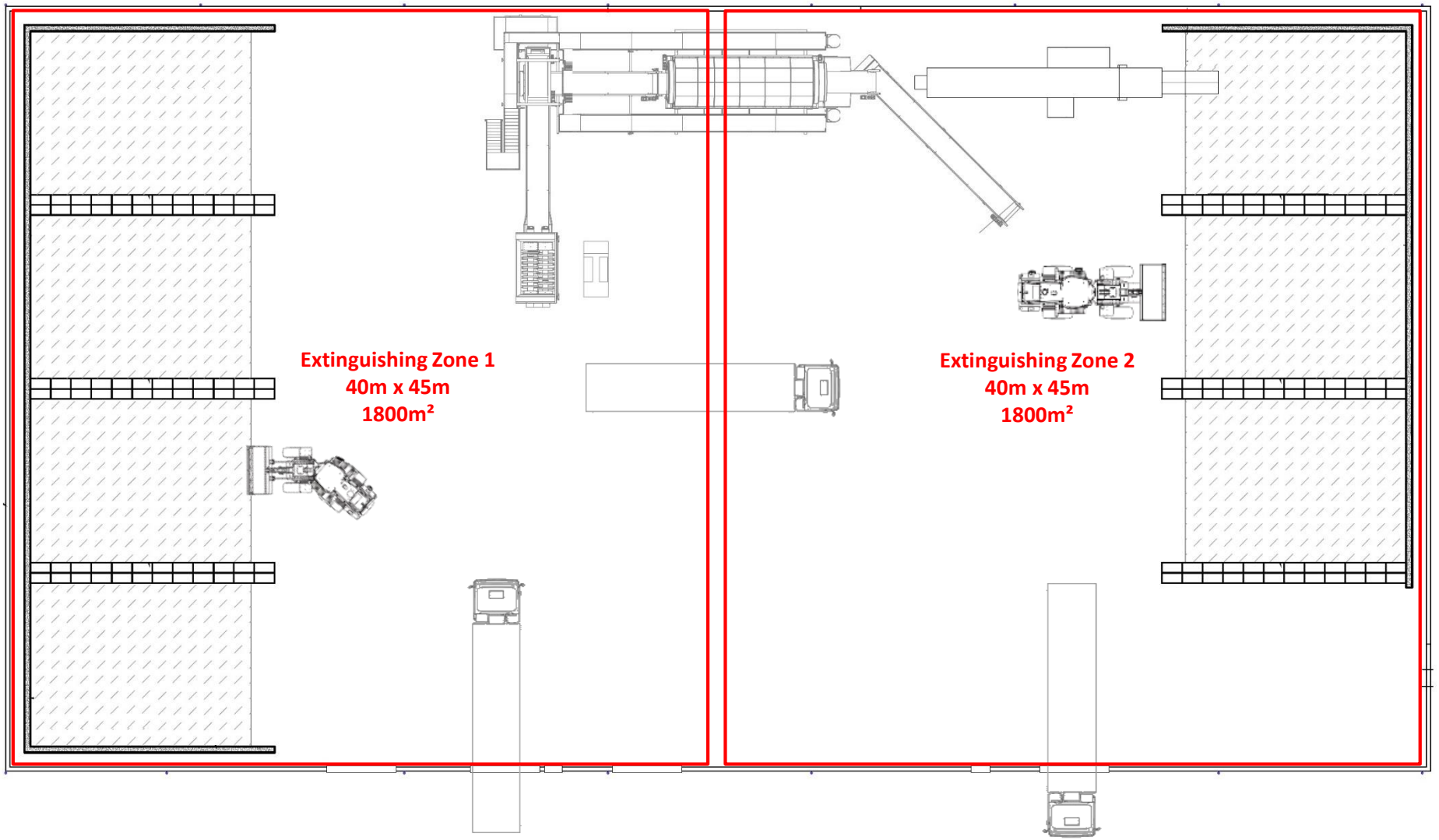
PYROsmart® Single camera. Prime location zero blindspot generation



Stock piles pushed up against push walls allow the PYROsmart system to effectively scan and detect potential fire risks with no blind spots

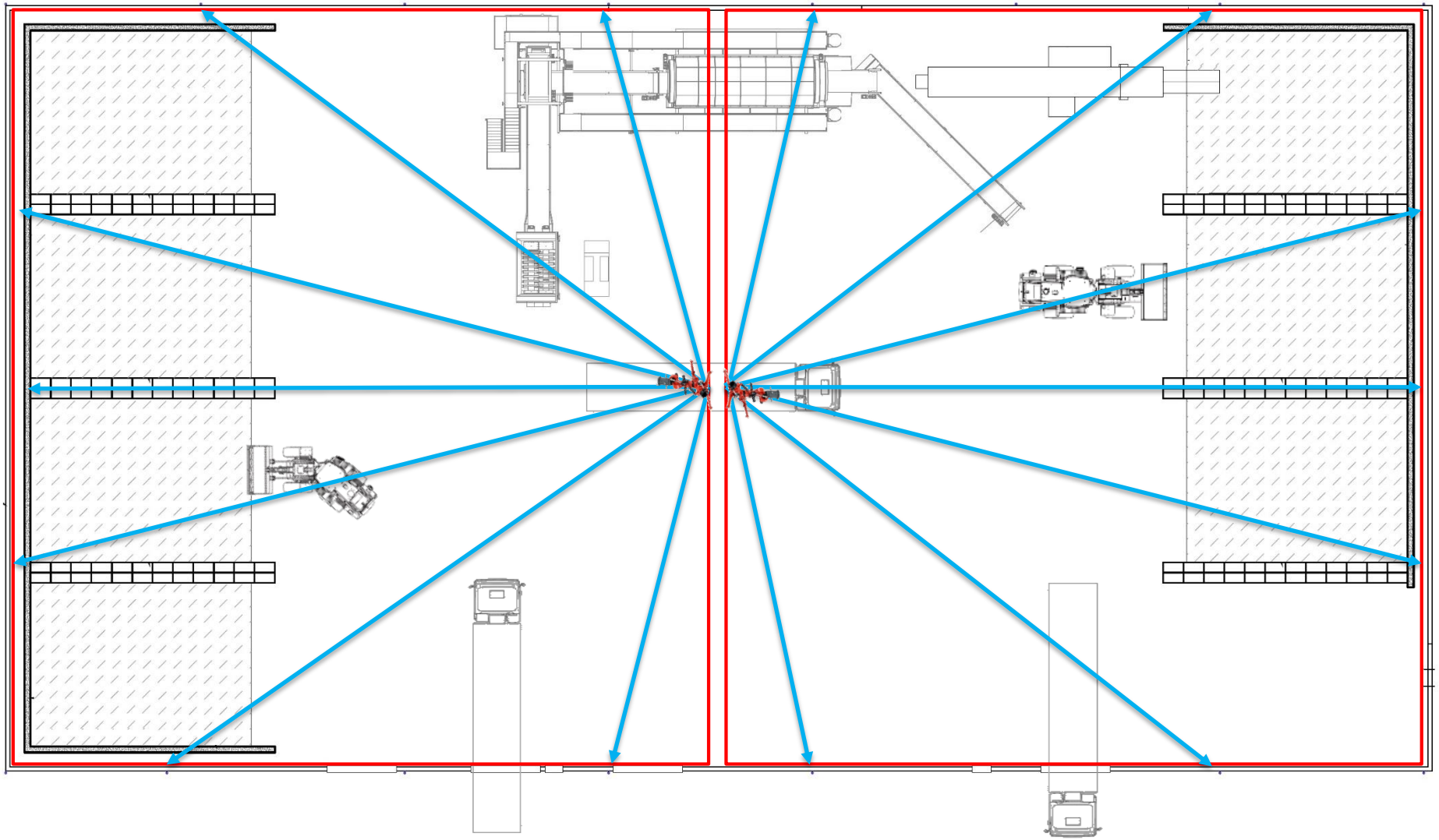
Geminor Ltd (Hull) Project Design

Rosenbauer® Automatic Suppression zone areas



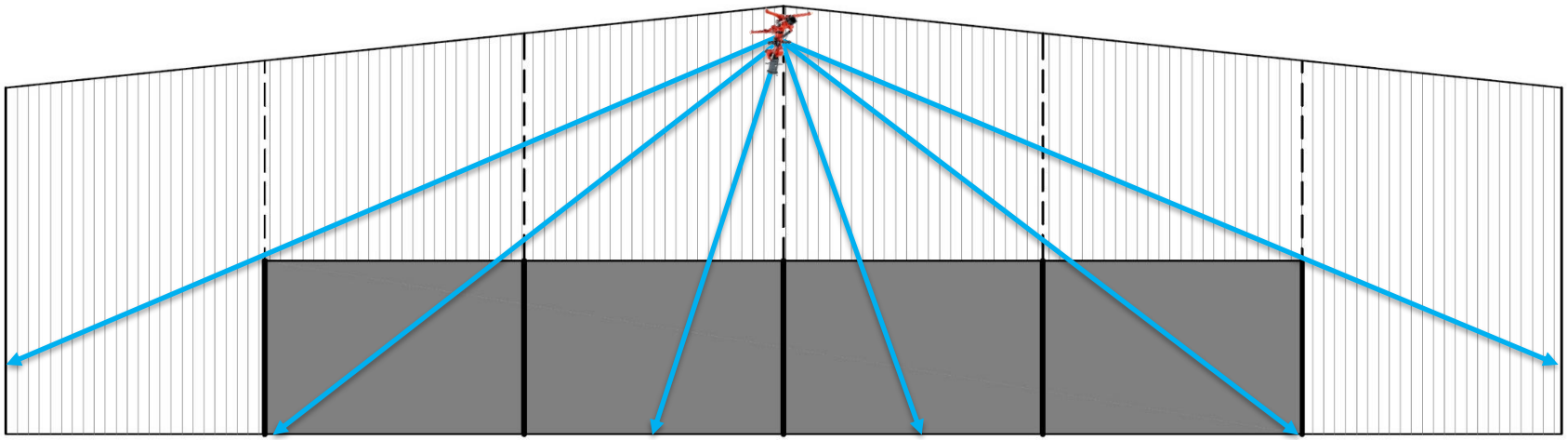
Geminor Ltd (Hull) Project Design

Rosenbauer® Automatic Suppression Attack Zones



Geminor Ltd (Hull) Project Design

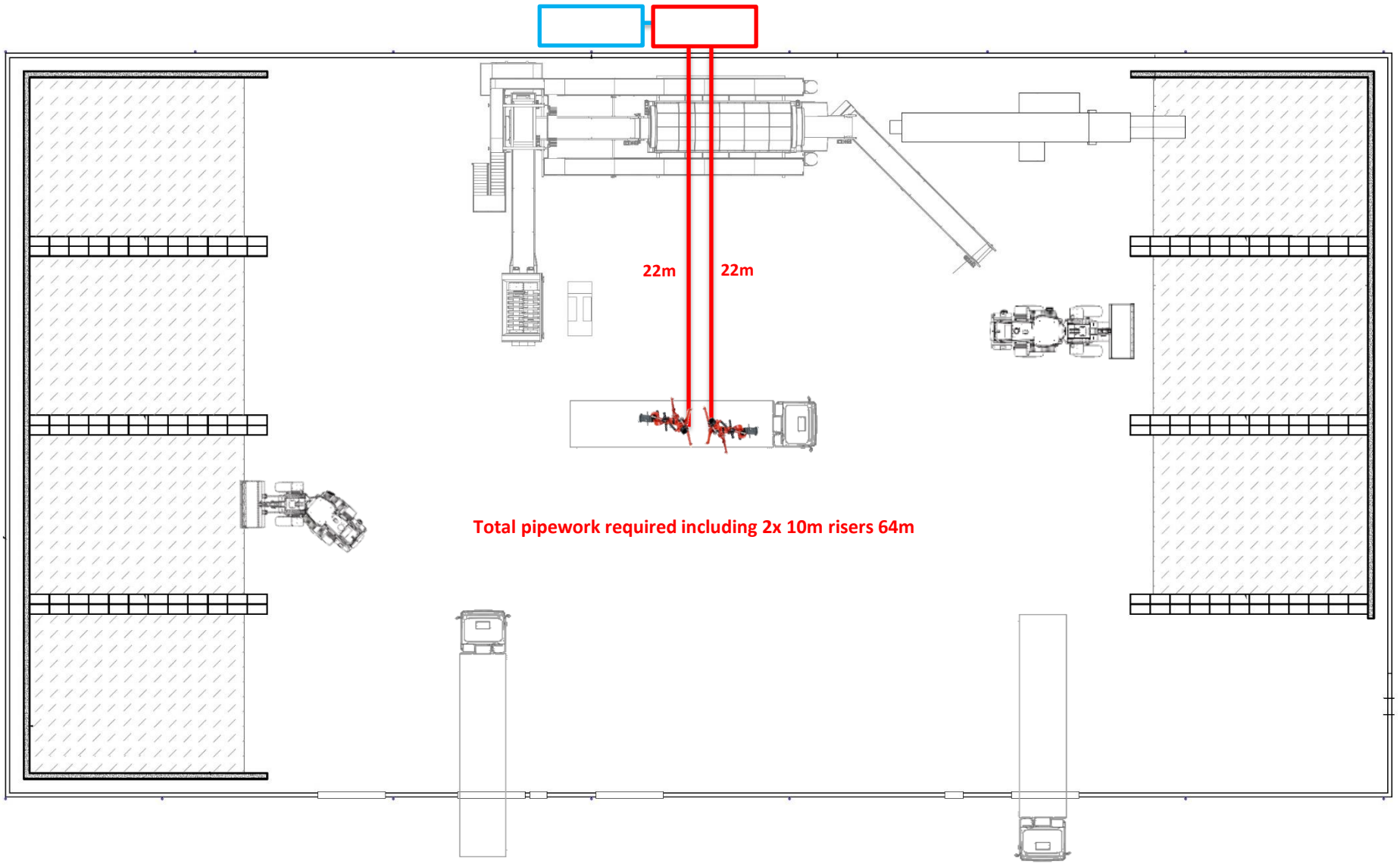
Rosenbauer® Automatic Suppression Attack Zones



Back to back RM15c turrets mounted at 12m high will allow 100% suppression within the hall.

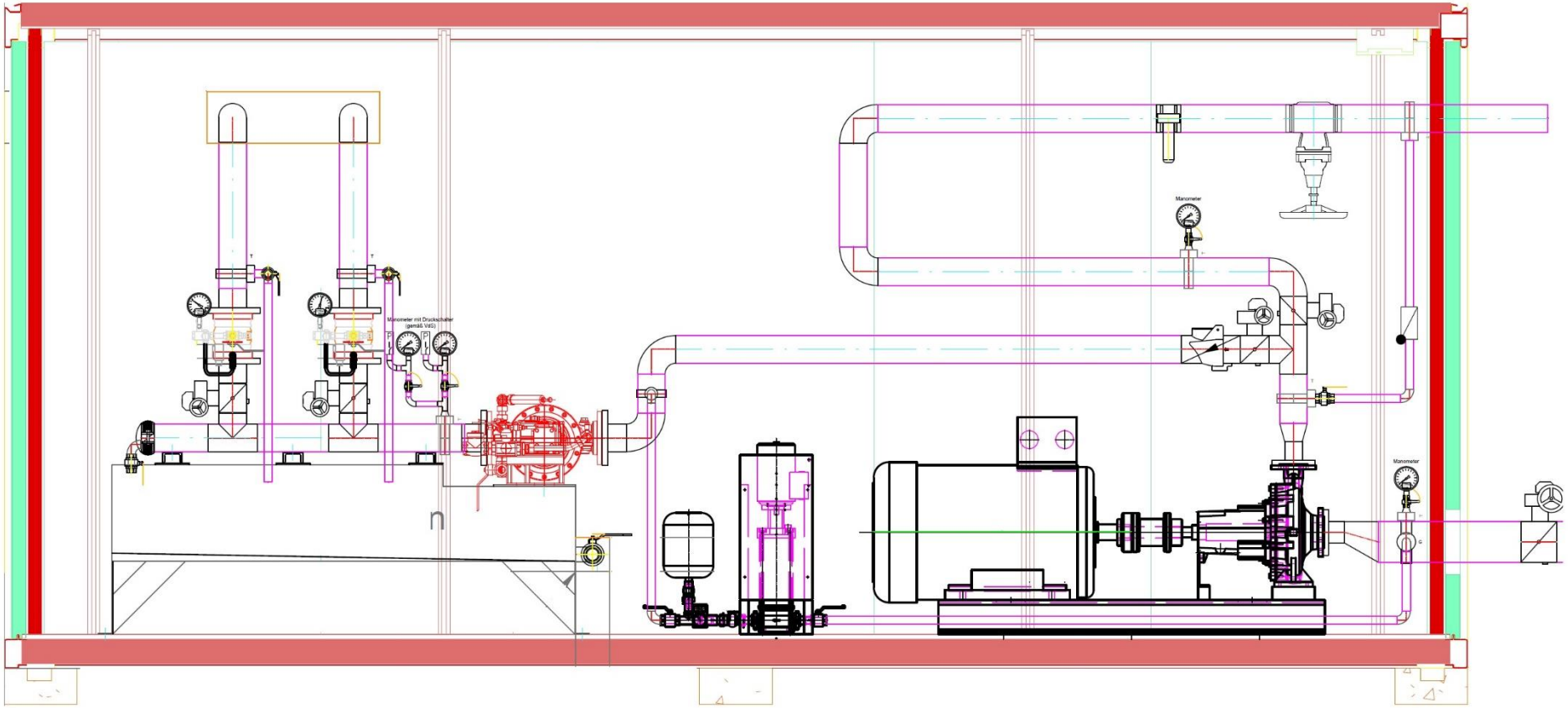
Geminor Ltd (Hull) Project Design

Rosenbauer® Automatic Suppression System Pipe plans



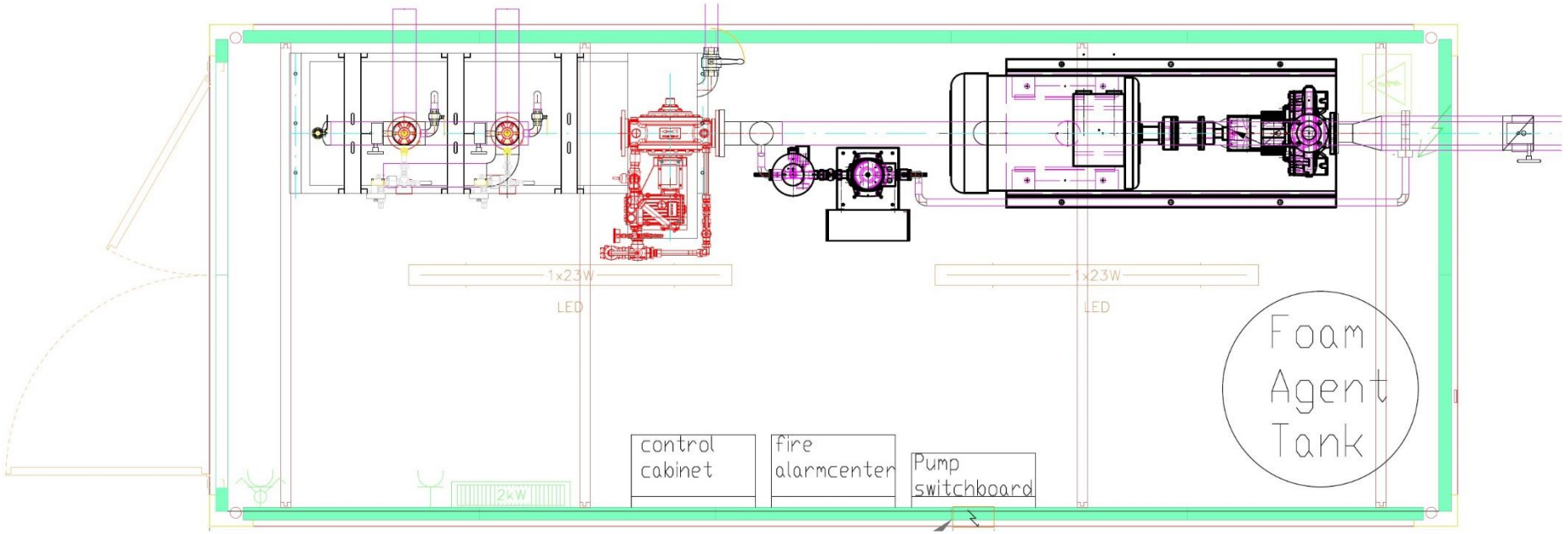
Geminor Ltd (Hull) Project Design

Rosenbauer® Automatic Suppression System Container layout proposed



Geminor Ltd (Hull) Project Design

Rosenbauer® Automatic Suppression System Container layout proposed



Geminor Ltd (Hull) Project Design

PYROsmart® Rosenbauer System Delivery and Installation

- System components are delivered ex works. A schematic drawing of the agreed system layout/structure will be supplied to you to prepare for installation. All cabling/wiring between sub-distribution, control room, CIE and the system components is by the client.
- The operating terminal shall be situated in the office building. All cabling will be done in fiber-optic cables; the required fiber-optic data converters are part of the quote.
- Under very dusty and dirty conditions, compressed air is to be supplied by the client to keep the PYROsmart® clean and functional. Alternatively, we can offer to provide a reciprocating piston compressor or air dryer.
- A skilled member of staff will train you and your installation team with regards to the cabling/wiring of the PYROsmart® system.
- A suitable foundation base needs to be prepared prior to water tank being installed. A full detailed spec will be sent prior to client agreeing terms.
- Its is the clients responsibility to supply a 3 phase 160amp electrical supply to the location of the Technical container. This is a pre-requisite and needs to be in place prior to installation of equipment.
- Once the mounting has been completed, we will commission the system and prepare it for test operation. This might take up to 2 weeks. The test operation will run for another 4 weeks.
- Remote access to the system via broadband or UMTS is a prerequisite for the commissioning of the system, and for the fast and cost-effective support of all alterations, maintenance issues or malfunctions.
- All drawings are indicative as a full site survey has not been completed. These preliminary plans are for indicative costing purposes. A full site survey will need to be carried out for both cabling and water supply for the fire suppression system.
- These drawings and proposals have been based on the visit by our Mr. Garry Adey who has assessed to the best of his ability and with limited access provided by the client. Full site/building drawings/plans will need to be provided to give full costings for the whole install this preliminary plan is used for indicative costing purposes only. Costs may change due to feasibility and accessibility in running cables and power to each point. These costs will be agreed once a site survey has been completed by our engineers. All cable and piping plans are subject to change dependent on the outcome of a full site survey.

Appendix B Emergency Contact Sheet

Emergency Contact List

Fire Service (in the event of a major fire)

- 999 or 112

Environment Agency Hotline (24-hour service)

- 0800 80 70 60

Local Businesses (with associated directions)

- Hull Self Storage (north): 01482 330784;
- Hella Autoelectric Services (south): 01482 224475
- Dortek (south): 01482 226848
- Stayfast Industrial Supplies Ltd (west): 01482 834343
- Hull Trinity House Academy (southwest): 01482 326421
- Mersey Primary Academy (northeast): 01482 327417
- Buckingham Primary Academy (northeast): 01482 328661
- Estcourt Primary Academy (east): 01482 224336

Sewage Service – Yorkshire Water Emergency Number (24-hour service)

- 03451 242 424

Geminor UK Limited, Materials Recycling Facility

- Site Manager: Ian Hurst: 07596 567335
  David Singh: 0777 234 0648;
- Site Supervisor: Stephen Smith: 0750 068 7350; and
- Operations Manager: James Crouch: 0792 140 5512.

Appendix C Waste Acceptance Procedure

Schedule 2 Council's Requirements

Residual Waste Processing Specification

Annex 2 - Waste Acceptance Procedure

1. Purpose

The purpose of the Waste Acceptance Procedure (WAP) is to ensure that all Contract Waste is received appropriately by the Contractor at the Residual Waste Processing Facility (the Facility).

The WAP outlines the process and standards for Waste Acceptance at the Facility, the responsibility of the Council and the Contractor, and defines the actions to be taken when Contract Waste delivered by the Council or collected by the Contractor from the Transfer Loading Stations (TLS) does not meet the Contamination Thresholds for Residual Waste outlined in the Waste Acceptance Criteria at Appendix 1 to this WAP.

2. Pre-Acceptance Waste Procedure

The Contractor will ensure that all waste destined to be accepted at the Facility, meets the Waste Acceptance Criteria detailed in Appendix 1 to this WAP.

3. Waste Acceptance

3.1. Responsibility

The Contractor is responsible for collecting Contract Waste from the TLS and receiving it at the Facility.

The Council is responsible for the direct delivery of Contract Waste to the Facility and (via the TLS Operator) for loading the Contractor's vehicles with Contract Waste at the TLS.

In the event that Contract Waste collected from the TLS or delivered directly to the Facility does not meet the Contamination Thresholds when it is received at the Facility, the Waste remains Contract Waste and it will be managed in accordance with the WAP.

The Contractor is responsible for monitoring each individual Load of Contract Waste for compliance with the Contamination Thresholds.

3.2. Accepted Material

The Waste Acceptance Criteria for Contract Waste, including a list of targeted materials and Contamination Thresholds are detailed at Appendix 1.

3.3. Delivery of Waste by Authorised Vehicles and by Contractor's Vehicles

The Contractor's Service Delivery Plan will outline the Contractor's operating procedure in connection with the Acceptance of Waste at the Facility. The procedure will be required to cover weighing, tipping and inspection as set out below.

When an Authorised Vehicle or a Contractor's vehicle delivering Contract Waste arrives at the Facility, the vehicle will be weighed and the driver will confirm the type of Waste being delivered. The Contractor shall then direct the driver to the designated tipping area.

3.4. Initial Inspection

Once the vehicle has deposited its Load in the designated tipping area the Contractor shall carry out an initial inspection of each Load for Contamination in accordance with the Waste Acceptance Criteria. If the Load passes the initial inspection then it shall be deemed as meeting the Contamination Thresholds.

3.5. Contamination and Prohibited Materials

The Council's TLS Operator will Accept Contract Waste at the TLS and take similar steps to those outlined in paragraph **3.6** below to reduce Contamination in the Contract Waste loaded on to the Contractor's vehicles. The process will help ensure that Contract Waste predominantly meets the Contamination Thresholds.

It is not practical to ensure that Contract Waste delivered to the Facility by the Council or loaded on to the Contractor's vehicles at the TLS is completely free of Contamination. The Contractor shall Accept as Contract Waste, all Waste delivered or collected in connection with the Contract.

Contamination is defined as any material contained in Contract Waste that is not targeted or Accepted by the Council as specified in the Waste Acceptance Criteria.

Prohibited Materials include any material which would put the Contractor in breach of any Consent applying to the Facility. Prohibited Materials shall be regarded as Contamination.

The Council will not knowingly deliver Prohibited Materials to the Facility or arrange for it to be loaded into the Contractor's vehicles.

3.6. Waste Reclassification Criteria

All Loads shall be subject to the following procedures:

I. A Load that contains Contamination levels below the Contamination Thresholds as outlined in the Waste Acceptance Criteria, which requires no additional work to remove, shall be Accepted;

II. A Load shall only be reclassified following agreement with the Supervising Officer and/or in accordance with paragraphs **3.7** and **3.8** below;

III. A Load shall not be reclassified where Contamination or Prohibited Materials can be readily isolated and removed within ten (10) minutes, by minimal and safe use of a loading shovel, hand sorting or picking. In this circumstance only the element of Contamination and/or Prohibited Materials shall be removed and reclassified as Contamination;

IV. Subject to (II) and (III) above, where a Load of Contract Waste cannot be brought within the Contamination Thresholds, the Load shall be reclassified and Accepted as a contaminated Load;

V. The Contractor shall take all reasonable steps to manage and process the contaminated Load at the Facility. Where Prohibited Materials or contaminated Loads are removed from the Facility the Contractor shall arrange for its disposal at the lowest cost permitted facility. Any additional cost will be borne by the Council based on Verifiable Actual Costs; and

VI. Where the Contractor identifies to the Supervising Officer that a Load is contaminated, the Supervising Officer will use their reasonable endeavours to ensure that the source of the Contamination is identified and future Contamination minimised.

3.7. Council Notification & Joint Inspection

Except in cases of emergency, or regulatory restriction, any Prohibited Material or Load deemed by the Contractor not to meet the Contamination Thresholds will be quarantined and stored separately on site for up to twenty four (24) hours pending a joint inspection by the Contractor, the Supervising Officer and in the case of Contract Waste collected from a TLS, the TLS Operator.

Where the Contractor believes a Load does not comply with the Contamination Thresholds the Contractor will supply to the Council, and the TLS Operator if appropriate, within one (1) hour, details of the Prohibited Materials or contaminated Load. This should include:

- The estimated level of Contamination;
- A broad description of the nature of the Load and/or contaminated material;
- The vehicle registration number; and
- Arrival time at the site and whether the Contractor is able to separate and remove Contamination or Prohibited Material.

Where a joint inspection is not possible the Contractor will, in addition, provide the Supervising Officer with photographic evidence of the Contamination.

3.8. Agreement on Reclassification

Where the Contractor and the Supervising Officer agree that any Load of Contract Waste failed to meet the Contamination Thresholds such Loads shall be reclassified in accordance with the Criteria at 2.6 above.

3.9. Not used

3.10. Quality Issues and Contamination

The Contractor's Representative and the Supervising Officer will continually review quality and Contamination issues, and seek ways to secure remedial action as soon as practicable.

The WAP and Waste Acceptance Criteria may be varied by agreement between the Contractor and the Supervising Officer. Acceptance of any reasonable request by the Council shall not be unreasonably withheld by the Contractor.

Appendix 1: Waste Acceptance Criteria

Table 1.

Accepted	Targeted	Non - Targeted	Contamination Thresholds
Residual Waste from households or flats	Waste not able to be recycled, re-used or composted including: Kerbside collected Waste Kerbside Dry Recyclable Waste or Organic Waste that is reclassified as Waste due to excess Contamination.	• Mechanical street sweepings • Gully Waste • Clinical Waste • Hazardous Waste • Parks Waste • Any bulky item that will not fit in a standard 240 litre wheeled bin, e.g. mattresses, large domestic appliances etc.	Any Load containing 10% or more non-targeted materials by weight. Any Prohibited Materials that would put the Contractor in breach of any Environmental Permit or other regulatory Consent applying to the Facility.

Appendix D Bay Wall Fire Resistance Specification

MIX DESIGN CERTIFICATE

Customer: Ashcourt Aggregates Date: 10/05/2023

Site: Block Making Zone, Foster Street, Hull

LINE	GRADE	MIN CEM	MAX WCR	Agg/Cem R	CEMENT	AGG	ADMIX	SLUMP
1	P330	330	-	3.35	CEM I	20mm	WRA	S3/100

Material Details

MATERIALS	SUPPLIER	SOURCE	DESCRIPTION
AGG1	Stema Shipping	Jelsa Quarry	4/20mm Granite
AGG2	Stema Shipping	Jelse Quarry	4/10mm Granite
AGG3	Ashcourt Aggregates	Pocklington	0-4Amm Sand
AGG4	Stema Shipping	Hull	Marine Sand
AGG5	Ashcourt Aggregates	Hull	Marine Sand
CEMENT	Titan	Deprano, Greece	Cem I 52.5N
GGBS	LKAB	Scunthorpe	GGBS EN 15167-1 :2006
PFA	Cemblend	Eemshaven	EN450N
ADMIX1	Chryso	Daventry	Quad 420

Mix

LINE	1
AGG1	1105
AGG2	0
AGG3	0
AGG4	0
AGG5	790
CEMENT	330
GGBS	0
PFA	0
ADMIX1	1.65
ADMIX3	
WATER	170
Fines %	0.00
WCR	0.51

FIRE RESISTANCE OF CONCRETE

Overall, concrete is a highly fire-resistant material that is commonly used in construction for its ability to withstand extreme heat and protect the surrounding areas from fire damage. The fire resistance of concrete is determined by a number of factors, including the type of cement used, the aggregate materials, and the curing process. Generally, concrete with a higher density, such as those with heavier aggregate materials, tend to have better fire resistance than those with lower density. Concrete also has a low thermal conductivity, which helps to slow down the spread of heat during a fire.

Fire resistance

Ashcourt Concrete Ltd, Foster Street, Kingston Upon Hull, HU8 8BT.
Tel: 01482 442288 Email: info@ashcourt.com www.ashcourt.com

HUMBERSIDE MATERIALS LABORATORY LTD

Atherton Way, Brigg
North Lincolnshire, DN20 8AR
Tel _Fax 01652 652753
e-mail info@humbersidematerialslab.co.uk

UKAS TESTING 1890

DETERMINATION OF COMPRESSIVE STRENGTH

Sample Ref C / 66950 **Client** Ashcourt Concrete

Concrete mix details P330 100%04MMA CEm1 WRA

Site Ashcourt Concrete (Q.M. Cubes) Location Foster Street
Supplier Ashcourt / Foster Street Delivery No 2394826

Client sample No	FS693	Sample Method	not stated
Date/Time sampled	04/04/23 11:10:00	Date recieved	11/04/23
Sampled by	Client (Tested as Received)	/	not stated
Time batched	11:01:00	Time placed	11:30:00
Cube compaction	Tamped	Site curing	Tank
Slump mm 100	Air content %	Other details	

Determination of cube strength : BS EN 12390 - 3: 2009, Curing at laboratory to BS EN 12390 - 2: 2009
Density determined by water displacement BS EN 12390 - 7: 2009 @ Permanent Laboratory

Portion	Client Sample No	Age/date of test	Dimensions (mm) (Designated or Actual)	Load kN	Density Kg/m3	Strength N/mm2	* Test Class
01	FS693 66950	7 11/04/23	100.0 100.0 100.0	492.9	2,440	**49.3**	BSEN
		Perpendicularity of moulded faces - Pass			*Flatness of moulded faces - Pass*		
02	FS693 66950	28 02/05/23	100.0 100.0 100.0	603.0	2,430	**60.3**	BSEN
		Perpendicularity of moulded faces - Pass			*Flatness of moulded faces - Pass*		
03	FS693 66950	28 02/05/23	100.0 100.0 100.0	597.0	2,440	**59.7**	BSEN
		Perpendicularity of moulded faces - Pass			*Flatness of moulded faces - Pass*		

Cubes tested in a saturated state unless otherwise stated *Rate of load 0.6N/mm2/sec (Class 1)*
Cubes with test class BSEN are designated dimensions, Annex B or NS are actual dimensions
** NS - These test results relate to cubes which do not meet the dimensional and/or shape requirements of BSEN 12390-1*

Comments
Abnormal failures none none

File Ref 0741/ 3679 G
Date reported 03/05/23

D.A. Driver M.W. Driver C. Driver
Directors

Certificate of sampling when submitted is retained by the Laboratory and available upon request
Test results detailed in this reporta relate only to the samples submitted. Sampling data supplied by the client may affect the validity of the test

End of Report

Appendix E Example Daily Site Inspection Checklists

HULL - Daily Site Diary

Direct connection: https://geminor.landax.no/survey/results/edit/11668

Geminor AS
Helganesvegen 41
4262 Avaldsnes
E-mail: post@geminor.no

Checklist:	**HULL - Daily Site Diary**
Number:	**177**
Checklist version:	**1**
Date:	**02.07.2024 17:33**
Responsible:	**Dylan Hames**
Department:	**HUB**
Connected to location:	**Invest » Geminor Group » Geminor United Kingdom » Hull - HUB**

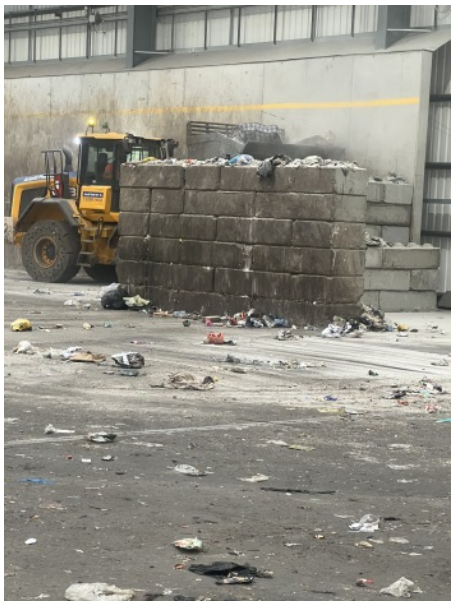
1 To be completed at the end of each working day.

2 Date and Time

02.07.2024 05:29

3 Estimation of unprocessed waste (in Tonnes)

0



4 Estimation of Processed 300mm waste (in Tonnes)

110

5 Total number of round bales on site

256

6 Total number of square bales on site (wrapped)

0

7 Total number of square bales on site (un-wrapped)

0

8 Metals on site (in Tonnes)

1 ton

9 Any spillages? (if 'yes' please add details in comments box)

◯ Yes

(X) No

10 Any fires top report? (if 'yes' please add details in comments box)

- ◯ Yes
- (X) No

11 Any wind blown litter on site? (if 'yes' please add details in comments box)

- ◯ Yes
- (X) No

12 All doors working and closed at end of day ? (if 'yes' please add details in comments box)

- (X) Yes
- ◯ No

13 Fire system working and in auto ? (if 'yes' please add details in comments box)

- (X) Yes
- ◯ No

14 CCTV in operation and working ? (if 'yes' please add details in comments box)

- (X) Yes
- ◯ No

15 Any complaints received ? (if 'yes' please add details in comments box)

- ◯ Yes
- (X) No

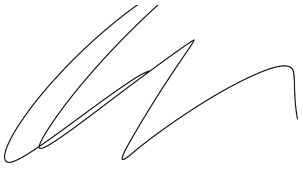
16 Drainage system working and not full (alarms) ? (if 'yes' please add details in comments box)

- (X) Yes
- ◯ No

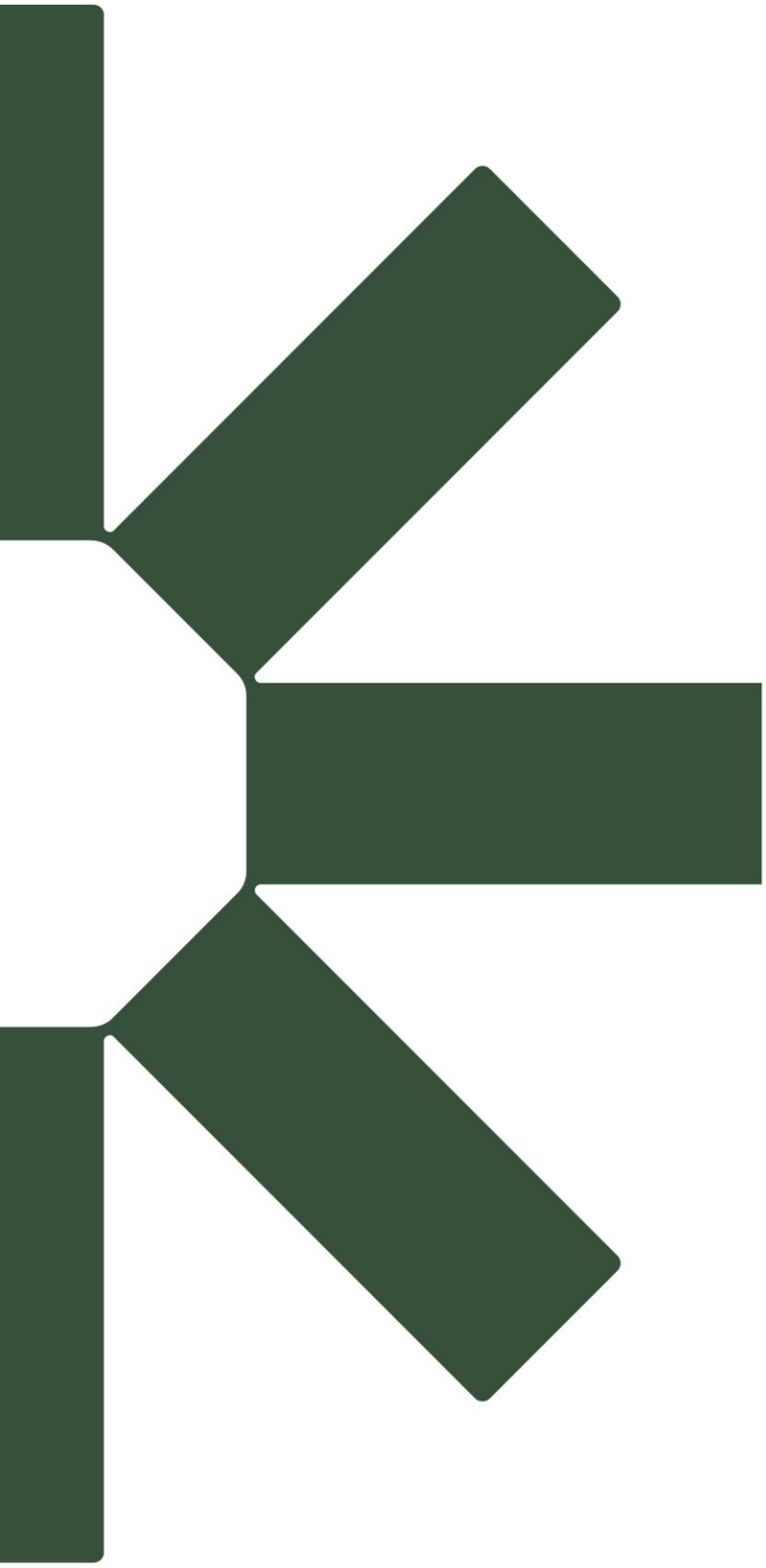
17 Any extra comments?

No

18 Sign - I confirm the above report is correct and a true report of the site



Date: 03.07.2024 kl. 17.48.15



Making Sustainability Happen