Polyethylene Terephthalate Plastics Recycling Facility (PETPRF) Fire Prevention Plan

Client: Enviroo Project Company Ltd

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[1] Introduction

[1.1] FPMP Objectives

This Fire Prevention and Mitigation Plan (FPMP) has been produced by Ayesa on behalf of Enviroo Project Company Limited (Enviroo) in support of a permit application to operate a Plastic Recycling Facility (PRF).

This report has been prepared in accordance with the Environment Agency's (Agency) web-based guidance "Fire Prevention Plans: environmental permits (FPMP guidance)" (Updated 11 January 2021)[1] " and Template for a Fire Prevention Plan and document "ESA Waste 28, Reducing Fire Risk at Waste Management Sites (Issue 3 March 2020) (Waste 28)"[2]

The objective of the FPMP is to set out suitable measures to be implemented at the site which:

- 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.

A Fire Strategy Report was prepared by Endeavour Fire Safety Services dated September 2025 to identify the subsequent specification, design, implementation and management of fire safety system and procedures at the site, specifically within the buildings.

[1.2] FPMP implementation and use

The FPMP is a standalone document and will form part of the site's management systems. This FPMP sets out the fire prevention measures and procedures to be utilised at the PRF. The FPMP will be located at the Site office. All site staff will be made aware of the location of this FPMP and be able to access it at all times. Site staff and contractors working on site will be made aware of the contents of the FPMP to aid prevention of fire and how to act during a fire if one breaks out.

The FPMP will be reviewed on an annual basis and in the event of any proposed changes at the Site that may impact the plan. . The annual review will incorporate any changes to the following:

- operations;
- infrastructure;
- sensitive receptors;
- fire risk associated;
- instructed to do so by the Agency;

[1] Fire prevention plans: environmental permits - GOV.UK (www.gov.uk)

[2] WASTE-28.pdf (wishforum.org.uk)

- Fire Prevention Plan guidance; and
- control measures in place.

The emergency procedures set out within the FPMP will be tested through regular exercises (twice annually) to ensure staff are appropriately trained and the procedures in place are effective.

Any fire drills and tests carried will be assessed and where improvements are required these shall be integrated into the FPMP.

[1.3] Cheshire Fire and Rescue Service Liaison

Cheshire Fire and Rescue Service were consulted during the planning process for the wider Protos Resource Recovery Park in which the PRF is located (Plot 13). The consultation was used to discuss water provision and it was agreed that each individual plot will provide a static water tank for the provision of firefighting water and a High Volume Pump access point will be provided to the Manchester Ship Canal.

[2] Site Setting and Operations

[2.1] Site Location

The Site located at Plot 13 of Protos Resource Recovery Park located at Ince Marshes. This covers an area of approximately 54 hectares with various waste and energy industries occupying plots. Adjacent plots comprise a glass bottle manufacturing plant, resource recovery facility and biomass facility. The plastic park will comprise various plastic recycling and recovery facilities and a plastic to hydrogen facility.

The Site occupies an area of approximately 2.3 hectares and is located approximately 1.6km east of the town of Ince, and 1.1km northeast to the town of Elton, within a mixed industrial and semi-rural setting. The site address is Enviroo Project Co., Marsh Lane, Ince, CH2 4FP at approximate National Grid Reference 346508 376458.

The Site lies at circa 8m AOD. There is a fall from west to east with the western boundary at approximately 9m AOD and the eastern boundary at 4.5m AOD. The northern boundary is formed by Marsh Lane, to the northwest is Protos Plot 10b and to the south a restricted byway (public right of way), which runs adjacent to Grinsome Road. The eastern boundary of the Site is located approximately 20m from the restricted byway which links to Marsh Lane to the northeast of the Site.

[2.2] Site Activities

Enviroo propose to accept up to 35,000 tonnes per annum of baled waste plastic for processing comprising sorting, shredding, grinding, heating, washing and drying to create a plastic pellet product which meets end of waste criteria specifically food grade recycled Polyethylene terephthalate (rPET) for the plastic manufacturing sector. Annual production of recycled plastic pellets is estimated at 17,500 tonnes. All activities will be confined within a portal framed modular build warehouse with air extraction and treatment.

The plastic bales will be from waste management companies who have accepted the material from household waste recycling collections. The material will be subject to sorting, either at source or at the facility.

The recycling process involves the following main processes:

- Delivery of baled plastic to Site
- Screening and delabelling
- Sorting and segregation by type and colour
- Reduction in size of plastic waste and washing
- Flaking of PET material and drying
- Extrusion involving blending and heating of flakes to create a PET product

The plastic recycling process is water intensive, and process water will be recirculated and reused where possible. A portion of process water however will require treatment prior to discharge to surface water. An on-site WwTP is to be installed.. Drainage details are discussed in Section 2.4.

[2.3] Site Layout

The Site will be accessed via Marsh Lane to the north. The PRF will comprise a portal framed modular build warehouse building with a pitched roof approximately 170 m in length, 45 m in width and at its highest point will be 17.45 m (PRF Building).

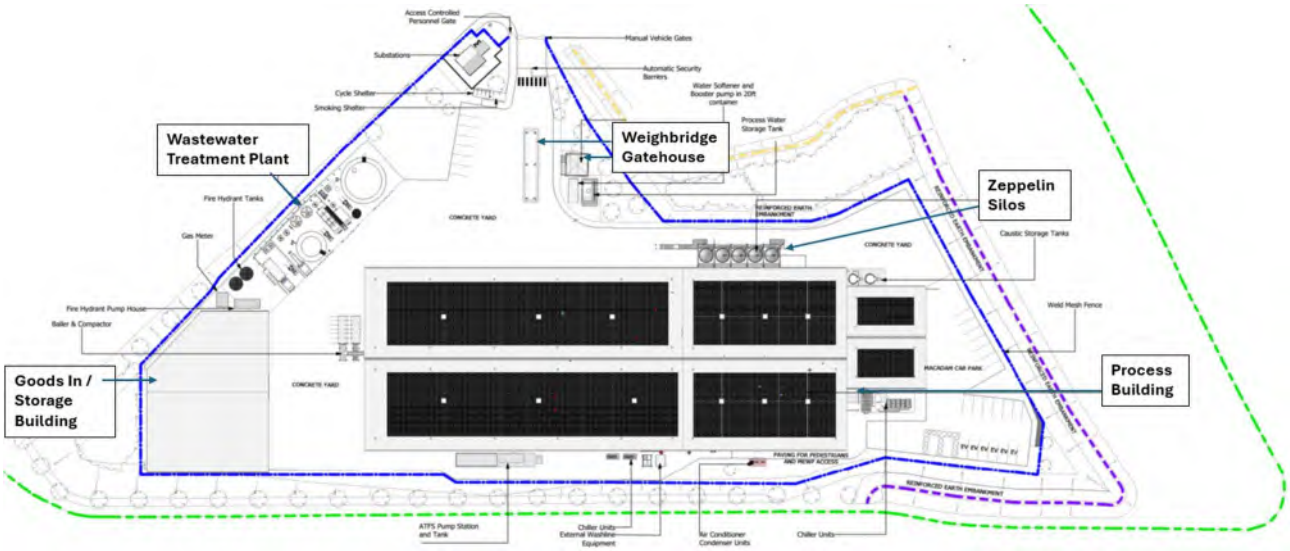
The PRF building will have five vehicular access doors, two on the northern aspect, one on the southern aspect and two on the western aspect to allow delivery of waste plastic and the export of rPET and waste materials. The site layout is shown on drawing reference 250064-WDK-XX-XX-D-A-0400 entitled Proposed Site Plan dated 21 May 2025. A feedstock area is to be located in a separate goods in / storage building to the west of the PRF building.

A weighbridge and weighbridge office will be located adjacent to the Site entrance to the north off Marsh Lane.

To the northwest of the Site will be the WwTP.

An extract of the site layout is provided below at Figure 1.

Figure 1 Site Layout Extract



[2.4] Site Drainage

The Protos Recovery Park (PRP) Surface Waste Management Plan dated December 2023, submitted to discharge condition 23 of the PRP planning permission, describes the approach adopted to the strategic drainage scheme for the recovery park. The scheme includes provision for surface water flows from the wider recovery park and including Plot 13.

Site drainage will comprise two aspects, process water and surface water runoff from external hardstanding. All drainage is required to be discharged to surface water due to there being no sewer connections near the site.

The Site's surface will comprise impermeable kerbed concrete hardstanding with sealed drainage that will collect surface water in a sealed drainage system. Surface water will pass through silt chambers designed to capture sediment and other pollutants and finally through a Class 1 Full Retention Separator prior to discharge off-site. This will comprise surface water runoff from the concrete hardstanding and roof runoff only.

Penstock valves will be in place to enable the surface water system to be isolated in the event of a pollution incident or fire. Surface water will be discharged into the surface water ditch which runs around the north, east and southern boundary of the Site. This ditch is part of the larger Resource Recovery Park drainage network. The drainage ditches form part of a network of main rivers and ordinary watercourses that form part of the Ince Marshes catchment and are drained by the Agency operated surface water pumping station to the north of the site. The water in the drainage ditches eventually flow into the Mersey Estuary.

Process water used in the washing plant processes will be contained and pumped to the on-site WwTP prior to discharge to surface water. Two package treatment plants are to be installed to treat sewage from the site office and security office prior to discharge of the treated liquid effluent to surface water.. The WwTP is discussed in the supporting surface water risk assessment (Report Ref: K0419-AYE-R-ENV-00005).

The good in / storage building will be fully enclosed by perimeter kerbing and a flood barrier system for all entrance and exit points. All drainage will drain to an underground attenuation tank prior to transfer to the WwTP. In the PRF building all drainage will be collected via drainage channels and sump pits. The drainage and process water will be pumped to the WwTP.

[3] Risk of Fire

[3.1] Overview

The wastes to be received at the Site will comprise solely plastic bales. The plastic bales used in the process will be pre-sorted to ensure high PET content and minimum contamination. Due to the source of the plastic bales from other waste recycling facilities it is considered that the plastic will have been subject to separation and sorting however further sorting will be required to ensure the quality food grade specification rPET is achieved.

[3.2] Types of Combustible Materials on Site

The waste materials at the site that have the potential to be considered combustible or low combustible are:

- Plastic bales
- Non-suitable plastic unrecoverable
- Bottle caps
- Labels
- Glass
- Small contaminants

Non-target materials are removed during the sorting and washing process within the PRF building and extruder hall. Temporary stockpiles may form at each end of the processing line. However, this will be limited to small volumes (less than $2m^3$). Wastes will be relocated to external storage. No other wastes will be stored within this area. Temporary waste storage will be minimised as far as reasonably practicable to prevent significant quantities of wastes being stockpiles near to machinery.

This fines and labels removed from the trommel and during pre-wash are conveyed directly to an external storage skip.

Non-target materials will be stored for a maximum of 28 days however maximum storage times will be considerably reduced by the volume per day and storage capacity as well as the customer or onward recipient of the material. Bales will be processed continually however a maximum storage time of 14 days is proposed in the event of plant maintenance and/or repairs.

Table 1 provides the details on the combustible waste types to be stored within the PRF building including the process floor and extruder hall. Storage in the PRF building is intermediary and will be transferred to either external storage or the goods in / storage building for offsite transfer.

Table 1 Combustible Waste Storage

Type	Process	Maximum storage volume internal (m^3)	External Storage Arrangement	Maximum storage duration (days)
Lump / Non Food Pellet / Contaminated Pellet / Unisensor Rejects / Flake Rejections / Air lifted fraction (big bag) / >40mm fraction (in bin) / West fines (batch wash / rinse tank) / Caps & Rings	Sorting / washline	2	Goods In / Storage Building Unnamed bay Size 343m^3 Capacity 215.6m^3	28
Dry fines >12mm / Dry fines <3mm / Flake Sort Dust	Sorting / washline	2	External 35m^3 Skip	28
Eddy Current Rejects / Non-Ferrous Metal	Sorting / washline	2	External 35m^3 Skip	28
Dust and labels aerodynamics / Residue / 2D and fines - ballistics	Sorting / washline	2	Covered compactor skip 35 m^3	28
Ferrous Metal / Baler Wire	Sorting	2	External 35m^3 Skip	28
Outbound BP Bale Store	Sorting / washline	N/A	Goods In / Storage Building Bay 1: Size 171.50m^3 Capacity 142.56 m^3	14
			Goods In / Storage Building Bay 2: Size 343m^3 Capacity 190.08 m^3	14
Inbound Feedstock	Feedstock	N/A	Goods In / Storage Building Bay 3: Size 402.5m^3 Capacity 224.64 m3	14
			Goods In / Storage Building Bay 4: Size 402.5m^3 Capacity 224.64 m3	14
			Goods In / Storage Building Bay 5: Size 402.5m^3 Capacity 224.64 m^3	14
			Goods In / Storage Building Bay 6: Size 402.5m^3 Capacity 224.64 m^3	14
Quarantine Area	N/A	N/A	Goods In / Storage Building Quarantine Bay Size 171.50m^3 Capacity 107.8m^3	28

[3.3] Combustible non-waste Materials

Combustible non-waste materials to be stored on site comprise the recycled PET pellets and flake.

Table 2 identifies combustible non-waste materials, including the final HDPE food grade pellet and HDPE natural flake products are classified as a non-waste in accordance with Article 6 (1) and (2) of the EU Waste Framework Directive (WFD) (2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives). These non-waste materials are stored external and internal to the PRF building. The flaked rPET product are either to be stored in enclosed silos external to the extruder hall or stored in bulk bags on racking in the PRF Building. The areas in which these non-waste materials are stored is identified on the Site Layout Plan (Drawing 02 – Site layout Plan). Procedures will be in place to ensure silos are not over filled or over pressurised.

Table 2 Combustible Non-Waste Materials

Type	Storage Location	Storage Arrangement	Controls
rPET flakes	PRF building	Stored in 1 tonne bulk bags stored on racking in PRF building	Subject to fire detection and fire suppression system in PRF building.
rPET flakes	External to PRF building	Stored in external silo	Silos to be enclosed to minimise the risk of external ignition sources and to facilitate inerting (reducing oxygen levels). Silos to be constructed of fire-resistant materials such as aluminium. Pressure gauges will be installed to ensure silos are not overpressurised. Internal silos subject to fire detection and fire suppression system.
rPET pellets	Internal near the wash plant hall within PRF building.	Stored in internal silo	

[3.4] Flammable Materials on Site

Flammable materials are those which have the potential to be easily ignited and can cause combustible wastes to catch fire. Table 3 details flammable materials stored at the Site.

Table 3 Flammable Materials

Type	Storage Location	Storage Arrangement
Chemical Storage	Next to the extruder hall within PRF building	Containers will be bunded/surrounded by a leakage containment bund capable of containing at least 110% of the volume of the largest container within the

Type	Storage Location	Storage Arrangement
		bund.
2 x Chemical Storage Tanks	Internal near the wash plant hall within PRF building.	Tanks will be surrounded by a leakage containment bund capable of containing at least 110% of the volume of chemical storage required.
Oil Storage	Workshops and maintenance buildings	Containers surrounded by a leakage containment bund capable of containing at least 110% of the volume of the largest container within the bund.

All flammable materials including fuels and oils are stored in accordance with the Oil Storage Regulations (The Control for pollution (Oil Storage) (England) Regulations 2001)).

[4] Receptors

[4.1] Sensitive Receptors

The probability of exposure is determined by the distance of the receptor to the site and the likelihood of the hazard reaching a receptor (e.g. frequency of prevailing wind in the direction). This stage of the assessment assumes that exposure has resulted from an uncontrolled emission i.e. without mitigation. The distance of these receptors to the site boundary, their direction relative to the site and the frequency the wind blows in the direction of the receptor is detailed in Table 4. The locations of most concern are those regularly or permanently occupied by human receptors. Human receptors and sensitive habitats within 1 km of the Site have been identified and are shown on the Sensitive Receptors Plan (Drawing Ref: K0419.1.002).

As stated previously the Site is located at Plot 13 of Protos Plastic Park part of the wider Protos Recovery Park located at Ince Marshes developed by Peel Environmental. This covers an area of approximately 54 hectares with various waste and energy industries occupying plots. Adjacent plots comprise a glass bottle manufacturing plant, resource recovery facility and biomass facility. The plastic park will comprise various plastic recycling and recovery facilities and a plastic to hydrogen facility.

Residential receptors are limited to residential properties located off Orchard Park Lane/Ash Road and residential Properties off Station Road / Ince Orchards which are located over 500 m from the PRF.

Table 4 Sensitive Receptors within 1km

No.	Receptor Description	Receptor Type	Direction from Site	Distance from Site (m)	Frequency Downwind (%)
1	Protos Ince Marsh Resource Recovery Park Industrial Estate Adjacent plots Including Standardkessel Baumgarte GmbH, Ince Park Renewables, Ince Park Biomass Energy Plant, CF Fertilisers UK.	Industrial / Commercial / Road	NW to ESE	10	5.39 to 18.67
2	Ince Marshes/Goldfinch Meadow	Surface Water / Recreational / Footpath	WNW to E	10	6.99 to 18.67
3	Farmland	Industrial / Commercial	NE to SE	220 to 535	2.52 to 10.09
4	Encirc Glass	Surface Water / Commercial / Industrial	S to WNW	230	1.36 to 10.04
5	Railway/Ince and Elton Train Station	Commercial / Recreational	SE to SW	630	1.35 to 2.52
6	Residential properties located off Orchard Park Lane/Ash Road	Residential / Recreational / Road	S to SW	750	1.36 to 2.47
7	Holme Farm/JH Willis & Son	Industrial / Commercial / Surface Water	NW	785	18.67
8	Manchester Ship Canal	Industrial / Commercial / Recreational / Surface Water	N to NNE	795	7.09 to 7.8

No.	Receptor Description	Receptor Type	Direction from Site	Distance from Site (m)	Frequency Downwind (%)
9	Waste Water Pumping Station	Industrial / Commercial	SSW	880	2.47
10	Mersey Estuary (Ramsar/SSSI/SPA)	Surface Water and sensitive habitat	N	880	7.09
11	Hoolpool Gutter	Surface Water	ENE to E	980	6.99 to 10.09
12	Surface water drainage network – Protos SWMP	Surface Water and sensitive habitats	E, N and S	10	1.36 to 7.09
13	Protos Habitat Mitigation Scheme	Sensitive habitats	W to E	100	2.22 to 18.67
14	On-site priority habitat – Woodland Management Plan	Sensitive Habitat	On-site – N	On-site	7.09
15	Marsh Lane	Road	NE to W	10	1.36 to 10.09
16	Ash Road	Road	SW	100	1.89
17	Residential Properties off Station Road / Ince Orchards	Residential	SW	990	1.89

[4.2] Effect of a Fire

The effects of a fire may be both immediate and long term, presenting a significant burden for Enviroo and regulatory agencies. The potential consequences of a fire are reviewed below with reference to Agency guidance and Waste 28:

- Firewater run-off transporting pollutants to surface water and groundwater.
- Thermal radiation harming nearby properties leading to fire spread.
- Creation of hazardous waste by the fire and impacts of firefighting.
- Explosions and projectiles harming sensitive receptors and spreading the fire to unaffected areas.
- Transport disruption resulting from road and rail closures.
- Nuisance from smoke, odour and particulates; and
- Threat to life and property.

If a fire were to occur at the site the fire / smoke emissions are likely to result in an impact in terms of:

- Damage to buildings from explosions or projectiles resulting from the fire.
- Degradation of health to the public, workers in nearby factories or emergency services.
- Physical prevention of access to buildings and businesses downwind of the fire due to fire or smoke hazard. The degree of this impact will decrease with distance from the fire.

- Disruption to normal business operations due to employees / customers being unable to reach places of work.
- Infiltration of smoke into the ventilation systems of adjacent warehouses.
- Potentially hazardous travelling conditions (loss of visibility) arising on transport links downwind of the fire.
- Loss of amenity to domestic receptors downwind of the fire.

A summary of these impacts and how they may affect specific receptors is detailed in Table 5.

Table 5 Relevant Hazard and Pathway

Receptors	Hazard	Pathway
All receptors listed in Table 4.	Explosions and projectiles harming sensitive receptors and spreading the fire to unaffected areas Transport disruption resulting from road and rail closures Nuisance / health impacts from smoke, odour and particulates Pollution of water courses from firewater	Airborne / Site Drainage

[5] Managing Common Causes of Fire

[5.1] Overview

The potential causes of a fire specific to the proposed activities at the PRF are identified with reference to Agency guidance and 'Waste 28' as summarised below:

- Arson or vandalism
- Plant or equipment failure
- Electrical Faults
- Discarded smoking materials
- Hot works, e.g., welding, cutting
- Industrial heaters
- Hot exhausts and engine parts
- Ignition sources
- Batteries
- Batteries from ELVs
- Leaks and spillages of oils and fuels
- Build-up of loose combustible waste
- Reactions between incompatible wastes/materials
- Deposited hot loads
- Hot and dry weather
- Self-combustion of stored waste materials

Any of the causes detailed above has the potential to either ignite the flammable waste types stored at the Site.

The PRF will be operated in accordance with the site's MS. The principal objectives of the MS are to ensure the efficient and safe operation of the site through the implementation of procedures that define staff roles and responsibilities supported by provision of appropriate training.

The MS includes procedures that:

- Control the position and source of ignition such as naked flames or heated elements to ensure adequate distance is maintained from stockpiles of combustible materials;
- Ensure staff and contractors follow safe working practices when undertaking hot work;

- Ensure staff, contractors and visitors are trained or inducted on correct safety and fire prevention procedures; and,
- Defines a regular maintenance and inspection programme for all site areas including machinery and good housekeeping including maintaining levels of dust, fibre and litter to a minimum.

In addition to the above the following control measures will be implemented to minimise any associated fire risks:

- emergency lighting will be provided as appropriate;
- emergency exit routes and signs will be kept clean and clear of obstructions at all times;
- staff will be trained in the use of extinguishers, procedures for fire drills and evacuation; and
- records of training, induction, drills, alarm tests and fire certification will be kept onsite.

[5.1.1] Operational Procedures

Operational measures to be provided at the site include waste acceptance checks. The site has waste acceptance procedures to prevent unauthorised waste being accepted, as far as is practical, and for limiting their potential impact. Control of incoming wastes will be managed according to the Operator's waste acceptance procedures.

All vehicles delivering waste to the facility will be under the control of the site staff, all of whom will have been trained in the procedures for the receipt of waste and the types of waste that are acceptable. The PRF will operate a bale incoming check process to monitor deliveries for smoke, hot spots or active fire. A dedicated offloading area and quarantine area is proposed if problems are identified.

[5.1.2] Neighbouring Sites

The site is located within an area of industrial and commercial properties and large areas of open ground.

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.

[5.2] Preventing Fire – Managing Common Causes of Fire

The potential causes of a fire specific to the proposed activities on this site and the measures employed to prevent them are identified with reference to Agency guidance and 'Waste 28' as summarised below.

[5.2.1] Arson or Vandalism

The PRF will have the following security measures in place to limit the likelihood of arson and/or vandalism that may cause a fire:

- The PRF will operate 24 / 7 and therefore will always be manned excluding public holidays.

- Perimeter fencing is to be installed with a gated entrance. The main entrance gates are locked outside of operating hours between 10pm – 6am.
- The PRF building will have lockable vehicle access doors and entrances.
- CCTV is to be installed with full coverage externally and internal to the PRF and feedstock store buildings. 360° cameras will be installed within PRF and 180° cameras will be installed externally. Thermal cameras are to be installed in the feedstock store.
- Monitored alarm system for the PRF building.
- Inspection and maintenance procedures to check for any unauthorised access and/or damage.
- All visitors to sign in via weighbridge office.
- In the event of an incident a keyholder can remotely operate the main gate to allow access to emergency services or other personnel.

[5.2.2] Plant, Vehicle or Equipment Failure

Plant and machinery may present a fire risk and potential ignition source. Plant and equipment will be maintained in accordance with the manufacturer's recommendations. All new plant on site will be fitted with telematics, which automatically highlights any faults as part of the minimum design specifications.

Plant and equipment will be operated in accordance with the manufacturer's instruction manuals. Instruction manuals for plant and equipment will be held either on site or online if a hardcopy is not available from the manufacturer. Inspection of plant and equipment will be undertaken on a daily basis to check for faults and ensure appropriate safeguards are in place. The procedure will also cover general housekeeping and cleaning of plant and all equipment on site.

Defects are recorded for both fixed plant and mobile plant and measures are put in place to rectify defects and, depending on the critical nature of the defect, it can be classified as urgent.

In the event of plant and equipment failure, all impacted treatment activities will cease to allow investigation and repair. Repairs will be made immediately if possible, with a temporary solution and where practicable afforded a permanent solution within a maximum of 7 working days. In the event that a satisfactory repair cannot be made and there is an opportunity for unabated emissions off site, activities will be suspended until a repair can be made, or new piece of equipment can be sourced.

The PRF process equipment is controlled by a Supervisory Control and Data Acquisition (SCADA) system which comprises networked data communications and graphical user interfaces providing high-level supervision of machines and process. This includes sensors and other alarms such as programmable logic controls which interface with process plant machinery and WwTP treatment facility. The SCADA control system provides alarm history and alarm configurations to inform maintenance and repairs of the equipment where identified and required.

Fire extinguishers are proposed to be installed at strategic locations around the PRF building and fitted inside the cabs of all mobile plant.

[5.2.3] Electrical Faults

All electrics will be inspected and certified by a qualified electrician every 3 years. This includes all fixed wiring and electric cabling that includes any fire detection & alarm system, CCTV system, emergency lighting and machinery checks / services. Annual PAT testing of any on site portable electrical appliances will be carried out.

Hardwire electrical testing will be undertaken periodically across the whole site and defects reported will be repaired as soon as practicable. Any item deemed electrically unsafe will be isolated and removed from service until repaired. Records of faults and/or daily electrical maintenance are recorded in the site diary and actioned as soon as practicably possible.

[5.2.4] Discarded Smoking Materials

Enviroo will enforce a strict no-smoking policy on site.

[5.2.5] Hot Work, e.g. welding, cutting

No hot work is to be undertaken at the site.

[5.2.6] Industrial Heaters

There are no industrial heaters proposed to be on site.

[5.2.7] Hot Exhaust and Engine Parts

Plant and machinery are to be regularly serviced and cleaned in accordance with manufacturers requirements. Servicing by a third-party contractor where required will be undertaken by accredited company.

A 6 m exclusion zone will be maintained between plant or equipment and any combustible waste or flammable material. Plant will be regularly inspected to ensure any wastes are cleared from around exhausts periodically throughout the day with a final inspection at the end of each working day.

Consideration will be given to the high-risk time for hot exhausts (one hour after switching off when dust can settle on hot surfaces) and wherever possible vehicles will be given time to cool down prior to site staff leaving site at the end of a shift.

Fire watches in the form of visual checks will be carried out twice daily (including at the end of every working day) to detect signs of fire caused by dust settling on hot exhaust and engine parts. Fire watch procedures are provided in Table 6.

[5.2.8] Ignition Sources

No combustible or flammable waste is stored within 6 m of any ignition sources.

Ignition sources identified at the Site include:

- Heating or electric equipment – including electrical faults, faulty or damaged wiring – all heating and electric equipment are subject to inspection and maintenance as specified in the sections above for electrical faults.
- Mechanical or electric spark – caused by metal-on-metal contact: this is most likely to occur in the process plant. The processing plant is to be fitted with automatic fire suppression systems. All plant and machinery will be fitted with fire extinguishers.

- Heat from plant and machinery – heat from plant and machinery are managed in accordance with the section on hot exhausts and engine parts.

[5.2.9] Leaks and Spillages of Oils and Fuels

No oils or fuels are proposed to be stored on site. The PRF has been designed to operate as energy efficient as possible with the use of electric mobile plant and equipment.

Tanks containing potentially polluting liquids are constructed so that any leaks/spillages are contained. Tanks will be double skinned and capable of containing at least 110% of the volume of the tank.

[5.2.10] Build-Up of Loose Combustible Waste, Dust and Fluff

All plant is fitted with reverse fans and sealed engine bays to prevent dust or fluff build up and all are fitted with a fire extinguisher.

The waste types to be accepted is limited to baled waste plastic and therefore has limited potential for litter generation. The bales are separated within the proposed purpose built PRF building.

The PRF process will produce fine product material rPET pellets and flake. Processes that have the potential to create dust are to be contained and extracted via designated air extraction systems.

Local exhaust ventilation systems are to be installed. Any fines and particulates that arise from the treatment will be contained via the extraction system to be installed. The proposed design comprises LEV1 serving the mechanical dust generation points of the shredder and sorting plant, and LEV2 a second system which includes the rPET melt and evaporate from the screen changer process areas. The extracted air will be drawn into a centralised ducting system and passed through a baghouse filter system prior to discharge to atmosphere. Both systems would minimise the emission of dust and particulates. There would also be two flues from the natural gas boilers used to heat the process water. The enclosed buildings are also ventilated to provide a safe working environment.

Good housekeeping will also be employed including cleaning to minimise levels of any dust, fibre and loose material that may accumulate within the PRF building. This will be confirmed via daily inspections.

[5.2.11] Reactions between Waste

Waste types to be accepted are limited to plastic bales therefore this is not applicable. Waste acceptance procedures are in place to ensure that no non-permitted wastes are accepted at the Site that may have the potential to react with other non-permitted waste. Wastes to be stored such as non-target materials will be stored separately dependent on the source and in designated areas.

[5.2.12] Hot Loads or Ignited Materials Received at the Site

No ignited loads will be accepted. Robust waste acceptance procedures via bale incoming check process are in place and as such there is negligible risk of hot or ignited materials being accepted. All incoming waste is inspected on receipt for burning, smouldering or smoking waste. Where burning, smouldering or smoking wastes are identified the waste will be rejected. If this is not possible the waste load shall be rejected and stored in the quarantine area for removal from site as soon as practical and by no later than the end of the working day to a suitably permitted facility for disposal. No burning, reactive / reacting or visibly hot (producing steam or heat) loads will be accepted on site. In accordance with the waste Acceptance Procedures 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.

[5.2.13] Self-Combustion of Stored Waste Materials (e.g., chemical oxidation, microbial decomposition)

Plastic bales are to be stored within fire resistant bays within the feedstock store and are only stored for a maximum of 5 working days prior to treatment. Plastic bales are stored inside a designated enclosed area within the building. Visual inspection of the bale storage area is undertaken continual during the working day. The wastes will be subject to thermal detection and fire suppression systems. Externally stored wastes in skips will be enclosed and stored for a maximum of 7 working days.

Vigilance for signs of combustion over this short storage period are implemented as part of the Site waste acceptance procedures, routine/daily Site inspection procedures and comprehensive detection systems.

[5.3] Preventing Self-Combustion

General self-combustion measures comprise:

- Management of Storage Time – maximum storage times are provided in Table 1. However, storage times will be reduced through normal operations due to the continual processing of the waste.
- Monitoring and Controlling Temperature – visual inspection of the wastes will be undertaken in accordance with Table 6. However, the feedstock store and PRF building are subject to a comprehensive fire detection system which is presented in Section 6.2.

The short storage duration of the plastic bales ensure that they do not self-heat which can potentially lead to self-combustion.

[6] Fire Detection and Fire-Fighting Systems

[6.1] Fire Equipment and Infrastructure

[6.1.1] Fire Walls

The covered feedstock store will be located to the northwest of the PRF building. The feedstock store will comprise a purpose built building with concrete hardstanding and sealed drainage. The outer walls will be constructed from pre-cast concrete whilst the inner walls constructed from concrete Legioblock. 6 bays with capacities of up to 388 m^3 are to be located in the feedstore building. These will be 3-sided and constructed from 80 cm thick Legioblock walls. The bays will be constructed from pre-cast concrete blocks up to 3.5 m in height which have an A1 fire-resistant classification in accordance with the REI 240 standards and will be fire resistant for 4 hours. Thermal CCTV cameras are to be installed within the feedstock store. 4 bays (bay 3 to 6) are to be used for feedstock in and have a capacity of 388 m^3 bales. Bays 1 and 2 will be used for waste bale storage and for storage of other waste such as flake reject bags, caps and labels bags, extruder waste and have a capacity of up to 334 $m^{3.}$

Concrete is identified in the FPMP Consultation Response produced by BRE to be a suitable material to use as firewalls. The Waste Industry Safety and Health Forum (WISH) guidance on reducing fire risk at waste management sites specifies that's 300 mm thick concrete provides adequate fire resistance.

Due to operational requirements on site, the 'first in, first out' principle will not be applied. Bales of different grades of plastic will be blended to form the final products. Bales will be processed based on operational requirements and will be stored no longer than 14 days. The bales are subject to a waste tracking system which will ensure that no material is stored longer than 14 days

If a fire is detected it is proposed to leave the material in situ as the fire suppression system will be activated. The fire detection system is centred on the ability to effectively suppress a hotspot or small fire on early detection using the fire suppression system. If safe to do so and under direction from the Site Manager or nominated fire officer, combustible wastes from the adjoining bays may be removed. This will only be under the instruction of Cheshire Fire and Rescue Service. These wastes will be kept under observation in case they also begin to combust.

[6.1.2] Fire Extinguishers

Foam, water, carbon dioxide and powder extinguishers will be provided on site at strategic locations advised from the fire risk assessment. The fire extinguishers will be stored to ensure they cannot be damaged and will be adequately signposted as to the correct use. The extinguishers will be inspected annually.

[6.1.3] Fire Watches

The feedstock store is to be continual inspected as the plastic bales are loaded from the waste reception and storage area for processing. The feedstock store, PRF building and external areas will be covered by comprehensive thermal CCTV cameras connected to the fire suppression system.

Vigilance however for potentially hot loads/signs of combustion (e.g., steam or smoke rising from waste) will form part of the site waste acceptance procedures and routine management of the stored wastes.

Staff are to be fully trained in and aware of the site's waste acceptance and storage procedures. Consequently, continual observations will be being made for the visual triggers detailed below in Table 6 throughout the working day as the site is fully occupied.

Table 6 Detecting and Managing Hotspots

Visual Trigger	Action to be taken
Smoke	Where smoke is identified, the Handheld thermal imaging cameras and temperature probes will be used to monitor the waste. Thermal detection cameras are to be installed in the PRF building and any hotspots will be identified. Where smouldering or burning waste material is identified, the smouldering or burning wastes will be extinguished. Fixed plant is subject to a fire cannon in the PRF building. The Site Manager will carry out checks to confirm that no embers remain and that the associated heat has dissipated completely. **Delivery vehicles and mobile plant** Where smoke is identified from a hot exhaust or engine parts the vehicle or mobile plant will immediately be switched off and the Site operative evacuated. All mobile and fixed plant will be equipped with fire extinguishers and can be used if necessary. The Site Manager will only allow operations to resume once a full inspection of the vehicle/mobile plant confirms it is safe to do so.
Vapour or Steam	Where vapour is identified, the Handheld thermal imaging cameras and temperature probes will be used to monitor the waste. Thermal detection cameras are to be installed in the PRF building and any hotspots will be identified. Fixed plant is subject to a fire cannon in the PRF building. **Delivery Vehicles and mobile plant** Where vapour or steam is identified from a hot exhaust or engine parts the vehicle or mobile plant it may be a sign that the vehicle is overheating. The vehicles and mobile plant will immediately be switched off and the Site operative evacuated. The Site Manager will only allow operations to resume once a full inspection of the vehicle/mobile plant confirms it is safe to do so.

A fire watch will be carried out by the Site Supervisor twice a day (including one end of day check) and will cover the following:

- Confirm no bridging of waste or spilling from bays and that adequate freeboard space is available;
- Confirm no smouldering, burning or heating material is present within any of the stockpiles as well as no signs of smoke or vapour;
- Perform a visual check for any potential sources of ignition such as plant and electrical failure;
- Confirm the PRF building (including plant and machinery) is free from the excessive build-up of dust and litter; and

[6.2] Fire Detection

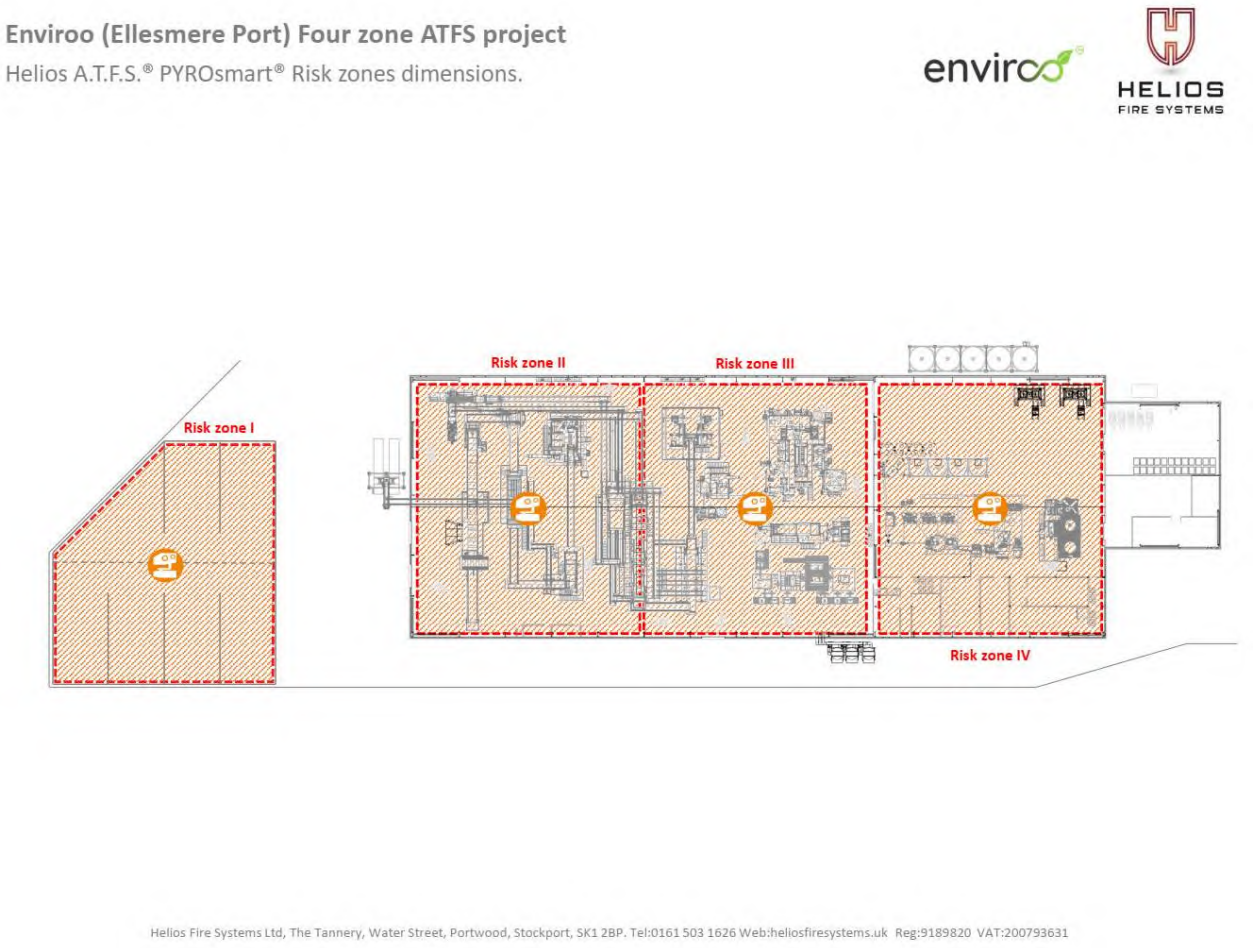
[6.2.1] Detection by CCTV System

The site is to be split into 4 risk zones. Zone 1 comprises the feedstock store. The PRF building is split into 3 risk zones (Zones 2 to 4), the sorting and washing line and the extrusion hall. CCTV is to be installed with full coverage externally and internal to the PRF and feedstock store buildings. The cameras to be installed in each risk zone will comprise a PYROsmart thermal detection system. The PYROsmart pro system uses state-of-the-art infrared and video cameras to continuously scan large areas and objects, measure temperatures and create continuous panoramic thermal imaging. The cameras can detect temperatures ranging from -20 to 350 °C. Potential fire hazards can then be detected as they develop and before a fire starts. When critical temperatures are detected, the system locates the hotspot, triggers an alarm and reports it to the fire alarm control panel. This also activates the alignment of the water turret for fire suppression including early suppression of detected hot spots.

When a localised hotspot is detected, the system initiates a two-stage alarm process:

- Pre-Alarm at 80–90°C, notifying site personnel via email and text alerts, as well as triggering the monitored fire alarm panel. Operators can remotely access the system to visually confirm or dismiss the anomaly.
- Full Alarm at 150°C, automatically escalating to suppression mode.

Figure 2 Indicative locations of fire detection system



The fire suppression system will automatically operate when the heat detection system detects to a rapid rise in temperature. The fire detection system will provide a visual and audible alarm to allow personnel to respond. Fire alarms and push buttons are to be located at strategic locations around the Site as determined by the fire risk assessment.

The alarm and detection system to be installed will meet BS 5839-1:2017 Fire Detection and Fire Alarm Systems for Buildings – Part 1: Code of Practice for Design, Installation, Commissioning and Maintenance of Systems in Non-Domestic Premises.

The Site Manager will be responsible in responding to the event to ensure the correct action is taken. This will include the procedures listed in the Action Plan provided at Section 7.1 & 7.2.

[6.3] Fire suppression system

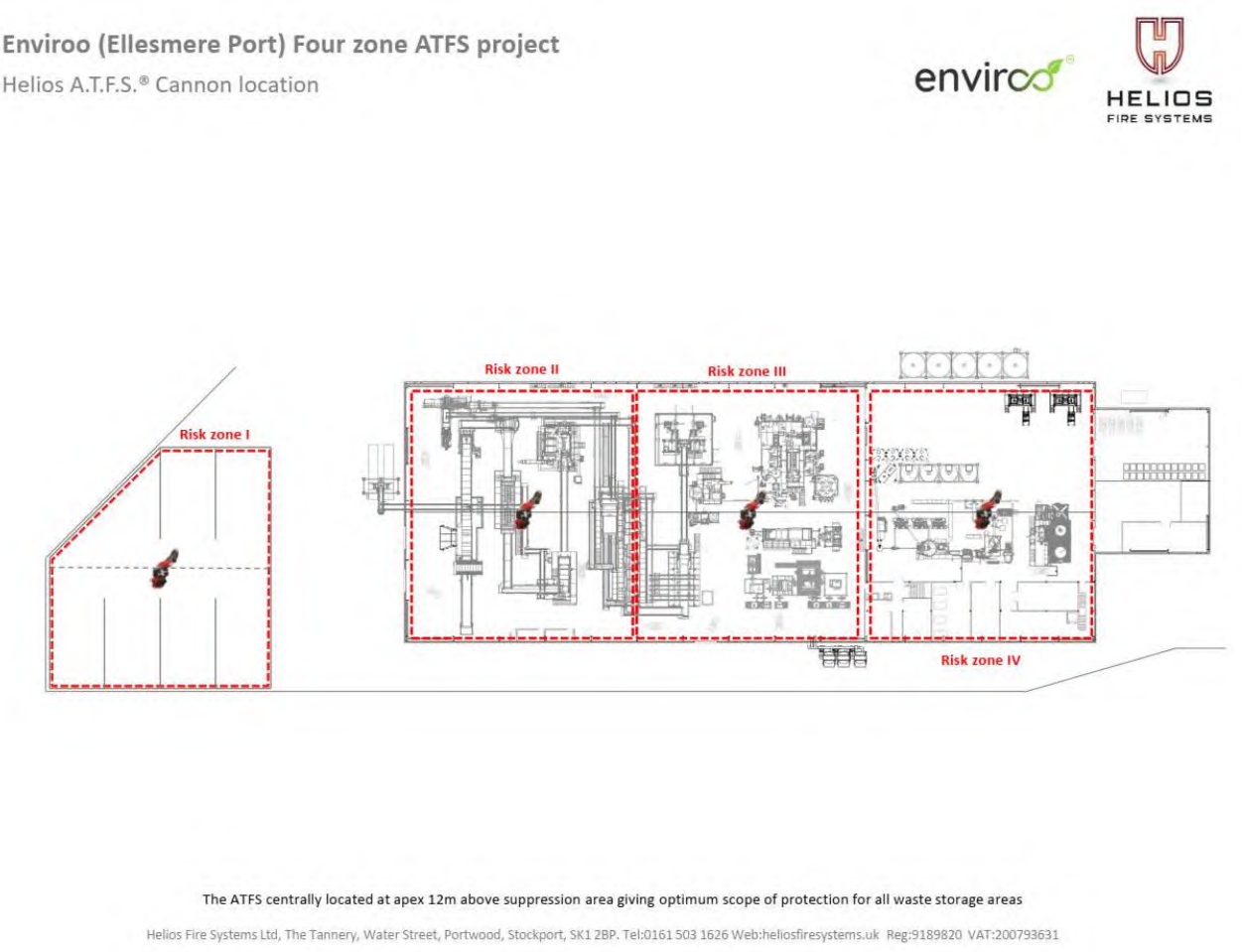
[6.3.1] Fire sprinkler system

A four zone fire suppression system is to be installed comprising 4 water turret cannons which will automatically activate on detection of a fire or thermal change detected via the thermal detection system. Helios A.T.F.S.'s turret extinguishing systems are used where sprinkler and spray water systems offer insufficient protection or could lead to high consequential damage. The extinguishing process is fully automated thanks to the use of turrets in combination with an infrared camera. With turret systems, the extinguishing agent can be utilized in a targeted manner. The system has the following features:

- Precise water or powder extinguishing agent deployment
- Large throw ranges
- Fully automatic control
- Wireless remote control with PYROsmart early warning heat detection system
- Fully automatic oscillating function
- Turret targeted through PYROsmart early warning heat detection system.

The fire suppression system is fully automated with the PYROsmart early warning heat detection system.

Figure 3 Indicative location of fire sprinkler system



[6.4] Quarantine Area

Due to the use of fire walls at the site it is considered safer to leave the combustible material in situ if a fire is detected. It is considered that the comprehensive fire suppression system will provide early detection and suppression of any potential fire. The location of the quarantine area will be located in Bay 1, 50% for the quarantine area which will be separated by fire walls.

A separation distance of at least 6 m will be provided around the potential quarantined waste area and other combustible and/or flammable materials unless separated by fire walls.

The quarantine area may be used for the temporary storage of unburnt waste. Unburnt waste will only be moved if safe to do so and under the instruction of Cheshire Fire and Rescue Service.

[6.5] Water Supply

The water supply requirements are provided in Table 7.

Table 7 Water Supply Requirements

Maximum pile volume in cubic metres	Water supply needed in litres per minute	Overall water supply needed over 3 hours in litres	Total water available on site in litres
215.6 m^3 Plastic Bale storage bay	1,438	258,849 or 258.85 m^3	Fire water tank on site – capacity of 100 m^3. Mains water supply and sump (240 m^3) beneath the building

An ATFS pump station is to be located to the south of the PRF building. The ATFS pump station will be connected to 100,000 Ltr water tank with a back-up generator. The use of a comprehensive fire detection and suppression system reduces the requirement for the full water supply due to early detection and action, targeted response and the application of a wetting agent. The water when pumped is mixed with the Cold Fire wetting agent. Cold fire is an environmentally friendly fire extinguishing agent that cools surfaces 21 times faster than water, effectively removing heat and fuel sources to prevent reignition. The flow rate provided by the pump station is 1,500 litres per minute. During the Full alarm and extinguishing mode, the PYROsmart system will continue to monitor all areas for heat sources and look for further fire breakout. If all heat sources, then fall below both Pre-alarm and full alarm statuses the camera system shuts off the water to ensure minimal fire water usage. The water turret cannons can also be manually operated via the PYROsmart thermal detection system.

As part of the Fire Strategy Report two fire hydrants have been identified at 96 m to the north and 105 m to the southwest of the site as shown on the extract Figure 5 below.

Figure 4 Surrounding Hydrant Measurements

[7] Containing and Mitigating the Effect of a Fire

[7.1] Fire Detected – Action Plan

There will be designated Fire Wardens and First Aiders on site at all times.

In the event of a fire the following actions will be taken:

Discovery of a Fire
Any outbreak of fire at the site shall be treated as an emergency and if a fire is discovered the following actions will be undertaken:

- Any outbreak of fire at the Site shall be treated as an emergency. The fire detection system will detect any fire and sound a fire alarm. If a fire is detected prior to the fire detection system the alarm will be manually sounded via fire alarm points.
- Ring the Fire and Rescue Service immediately by dialling 999. The Site Manager to liaise with the Fire and Rescue Service and will coordinate further activities; and
- Where it is safe to do so, without endangering the safety of persons, immediate action shall be taken to extinguish the fire using the site fire extinguishers by the Fire Marshalls. If it is not safe to do so then report to the fire assembly point.

Further actions to be taken by the Site Manager comprise the following:

- A check shall be conducted to ensure that all persons present on the Site are safe and accounted for as required for Fire Emergencies. Using clock cards and/or staff and visitor signing in sheets.
- The Site Manager is to contact the Agency by telephone and in writing, as soon as reasonably practicable but within 24 hours, after the outbreak of a fire to advise them of the incident and of the action taken.
- Communication with local businesses and residents identified in the sensitive receptor table above will be undertaken in the event of a fire to reduce any environmental damage and risks to human health associated with smoke and dust. Communication will be carried out via door to door. A list of the contact details of the neighbouring businesses will be obtained and kept updated to ensure the Site Manager or nominated deputy can call the relevant contacts to inform them of a fire.
- Upon the outbreak of fire the receipt of waste at the site is to be suspended and not resumed until authorised by the Site Manager after consultation with the Fire and Rescue Service and the Agency. All waste will be diverted to other suitable facilities as listed in the site's MS.
- Collected fire water to be retained as specified in Section 7.3.2. Any retained firewater will be removed from site by tanker if necessary for suitable disposal.

Additional fire/emergency procedures will be in place at the Site and informed by the Fire Risk Assessment. The procedures will detail the actions which need to be taken in the event of a fire including what actions are to be taken during a Fire Alarm. Notices will be installed at strategic

locations around the Site to inform staff of the actions to be taken in the event of discovering a fire or hearing the fire alarm.

[7.2] Management of Fire Water

The Site is to be located on impermeable reenforced concrete slab with sealed drainage with shut off valves. The entire perimeter of the slab is to be kerbed.

The feedstock store will be fully enclosed by perimeter kerbing. The entrances will either have permanent speed bumps or deployable booms across entrance and exit points. The store will have an area of approximately 1,181.25 m^2 and can therefore contain 118 m^3 (118,000 litres) of firewater up to a depth of 0.10 m. As a secondary means of containment on site, an underground attenuation tank will be able to hold 100 m^3. In the event of a fire, the pump to the WwTP will be switched off to ensure any potentially contaminated firewater is kept within the attenuation tank and not pumped to the WwTP. If the attenuation tank is used to temporarily store fire water, the contents will be tested prior to treatment by diverting around the WwTP. If the firewater is not of a suitable composition for treatment in the WwTP discharge, it will be removed from site via tanker to a suitably licenced facility.

If the attenuation tank becomes full, any firewater will remain on the concrete pad however fire water within the feedstock store will be retained within the enclosed building.

There are no direct releases off-site other than via the engineered surface water drainage systems or via the discharge from the WwTP as discussed above.

All drainage infrastructures will be inspected daily, and maintained and repaired as necessary.

The system contains automatic shut off valves that can prevent discharge from site should a spillage occur, or to prevent the escape of firewater. All key holders are informed and trained on how to activate the shut off valves for the interceptors.

[7.3] Post Incident Procedures

[7.3.1] Diversion of wastes and ceasing of operations

In the event that the damage caused by a fire results in the continued prevention of site operations, the site will cease to accept waste and continue to divert deliveries to a suitability licenced facility in accordance with the Sites Contingency Procedures.

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

Contingency procedures detail the actions to be taken by the Site to inform suppliers and customers and arrange for diversion of wastes.

A list of approved suppliers and facilities is to be maintained as part of the Environmental Management System (EMS).

[7.3.2] Disposal of Fire Water

All fire water will be disposed of in accordance with the Water UK Protocol for the disposal of contaminated water and associated wastes at incidents . After the fire is extinguished plans will immediately be made to dispose of any fire water.

Fire Water will either be pumped into tankers and sent off site to permitted or authorised waste management business or be treated in the WwTP if tested and shown that the WwTP is suitable for treatment and if approved by the Agency.

Enviroo will maintain a list of Approved Contractors as part of its EMS which provides a list of contractors that may be used to provide road tankers to remove fire water for offsite treatment and disposal at a permitted treatment and disposal facility. The list will be reviewed on an annual basis.

All 'Duty of Care' obligations will be complied with at all stages of the removal of fire water.

[7.3.3] Disposal of Burnt Material/Waste

The disposal of burnt material / waste will be dependent on the type of waste or material that caught fire and the degree of combustion. An assessment will be undertaken to ascertain the condition of the waste / material. Enviroo will have a list of Approved Contractors to which burnt material or waste can be sent. This list will be routinely updated.

All 'Duty of Care' obligations will be complied with at all stages of the removal of combusted waste and / or material.

[7.3.4] Site Clearance

Once the site has been cleared of any affected wastes, the infrastructure, including impermeable pavement will be inspected as required by suitably qualified engineers to determine whether any repairs are required.

If the fire was limited to only part of the site, operations at the site will be restricted to the unaffected area, providing that the site can comply in full with the permit conditions. No operations will commence in the affected area until all inspections and necessary repairs have been undertaken.

The Agency will be notified of the inspections and repairs undertaken within five working days and the recommencement of full site operations. All repairs will be undertaken with independent CQA supervision.

Following any incident, the event will be recorded and reported for inclusion within the site's MS.

Where it is considered that there is considerable contamination the Government Decontamination Service can be contacted for advice on clean-up protocols.

Site operations will not be recommenced until deemed safe to do so by the Fire and Rescue Service and the Agency.

[7.4] Emergency Contact Details

Table 8 below provides relevant contact details for external parties (Agency and Cheshire Fire and Rescue Service) to be used in the event of a fire on Site.

Table 8 Emergency Contact Details

Contact	Contact details	Name	Telephone Number	Email
Environment Agency	Incident Switchboard	N/A	0800 80 70 60	N/A
	Emergency	N/A	999	N/A

Contact	Contact details	Name	Telephone Number	Email
Cheshire Fire and Rescue Service	Cheshire Fire and Rescue Service	N/A	01606 868700	N/A

Appendix A – Fire Strategy Report

ENDEAVOUR

FIRE SAFETY SERVICES

FIRE STRATEGY REPORT

Survey Address:
Plot 13, Protos
Ince Park
Cheshire
CH2 4RB

Prepared for:
Shawton Engineering
Sankey Valley Industrial Estate
Junction Lane
Newton-le-Willows
WA12 8DN

Prepared by James Doyle CMIOSH, MIFireE

Review History			
Revision	**Date**	**Description**	**Reviewed By**
A	10/09/2025	Initial draft report	James Doyle CMIOSH, MIFireE

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1.0 Purpose of a Fire Strategy

Endeavour Fire Safety Services have been commissioned by Shawton Engineering to provide a Fire Strategy Report for Enviroo Warehouse, Cheshire.

Notwithstanding the specific requirements of legislation, it is increasingly recognised that there is a need to ensure that appropriate and effective precautions have been taken to ensure that the potential threat of fire is, as far as reasonably practicable, minimised and that any fire incidents are properly and promptly managed and dealt with.

Within the UK, and elsewhere, fire safety legislation has historically been produced in a piecemeal fashion, usually as a result of an actual fire incident. Furthermore, fire safety and protection standardisation has become a complex issue with many British, European and International Standards covering various specific areas of the subject. Combine this with special requirements of bodies such as the Insurers, and this could lead to a general confusion in the specification and implementation of the various parts that make up the fire safety and protection arrangements being put into place.

Therefore, the purpose of this Fire Strategy is to provide an overriding document which sets out the base requirements to satisfy objectives for fire safety within the building. This document encompasses a set of principles governing the subsequent specification, design, implementation and management of fire safety systems and procedures throughout the building.

This report is intended solely for the use of Shawton Engineering. Use or reliance by any third party is not permitted without prior written consent from Endeavour Fire Safety Services. Any unauthorised use will render the report invalid and shall release Endeavour Fire Safety Services from all liability arising from such use.

1.1 Specification

Life Safety
The primary objective of this Fire Strategy is Life Safety:
The ‘Life Safety’ objective is designed to ensure that all persons, should they need to be, can be evacuated safely from any part of the building in the event of a 'single fire' incident to a place of ultimate safety.

The regular occupants of the building are familiar with the building, its layout and the means of escape provisions. This Fire Strategy also considers visitors and contractors who may be less familiar with the building and any subsequent additional provisions that are required.

Property Protection
Although in many cases the objective for property protection is over and above the requirements of national legislation, the surveyed building is considered an expensive asset. Therefore, the 'Property Protection' objective is designed to protect the property from the effects of fire, minimising damage and thereby minimising the disruption to the Client and the occupants.

Business Continuity
Business continuity (normal operation) is a major factor for consideration. The occupants therefore shall ensure that any impact from fire within their demised areas is minimised through safety procedures, policy and liaison with the Building Management Team.

1.2 Responsibility for Maintaining a Fire Strategy

The responsibility for maintaining this Fire Strategy lies with the "Responsible Person", as defined under the Regulatory Reform (Fire Safety) Order 2005 (subsequently referred to as the Fire Safety Order)

The Responsible Person should ensure that all elements of the Fire Strategy remain up to date with the correct information, ensuring that this document reflects the fire safety provisions and is regulatory compliant. It is recommended that the Fire Strategy is reviewed on an annual basis.

Any alteration or works to the building should ensure they do not impact on the underlying principles governing the subsequent specification, design, implementation and management of fire safety systems and procedures throughout the building.

1.3 Agreed Limitations and Assumptions of the Fire Strategy

This Fire Strategy considers the effect of the fire safety provisions implemented within the building, against the applied risk profiles on a holistic basis as opposed to considering each provision individually.

Agreed limitations for this Fire Strategy are as follows:

- The Fire Strategy will look to ensure conformance with the relevant approved codes of practice / guidance documents which in turn will support compliance with The Regulatory Reform (Fire Safety) Order 2005. The primary applicable code will be the BS 9999:2017-Code of practice for fire safety in the design, management and use of buildings.
- The Fire Strategy is focused on achieving the objectives which are listed above. Anything which is outside the scope of these objectives will likely fall outside the scope of this document.
- Where information contained within this Fire Strategy has been compiled from information identified during a site survey and/or information provided by the Client and other third-party data such as plans and drawings etc.

Under the Fire Safety Order, the 'Responsible Person' has a duty to undertake general fire precautions.

The Responsible Person must take such general fire precautions as will ensure, so far as is reasonably practicable, the safety of any of their employees and in relation to relevant persons who are not their employees, take such general fire precautions as may reasonably be required in the circumstances of the case to ensure that the premises are safe and facilitating Fire and Rescue Service operations.

Life safety protection is founded on a suitable means of escape from the building and the limitation of ignition, fire propagation and fire spread impacting on the means of escape.

The Fire Strategy has been designed to demonstrate and evidence how the means of escape provisions interact with the premises and occupancy to ensure occupants can safely and quickly evacuate the building in the event of a fire.

This Fire Strategy also demonstrates the methods in which the building design meets the requirements of the relevant legislation and standards at the time of its design, construction completion and provides a detailed philosophy around which the fire safety and fire protection measures are defined. It contains key information on the specification of fire safety systems, and the management organisation for controlling fire safety in accordance with The Regulatory Reform (Fire Safety) Order 2005.

1.4 Performance Based Design

Where any aspect of the fire safety provisions lies outside of the recommendations of prescribed guidance, an alternative approach may be adopted to demonstrate at the very least a comparable level of fire safety is provided.

This Fire Strategy considers the total fire safety package within the building to provide a functional and practical solution to fire safety provision.

1.5 Other Factors Taken into Account

In assessing the fire safety provisions to meet the requirements of this Fire Strategy, the following factors have been considered:

- Anticipated probability of a fire occurring.
- Anticipated severity of fire.
- Ability of the building structure to resist the spread of fire and smoke.
- Historic aspects of the building.
- Consequential danger to persons in and around the building.
- Legislation and guidance introduced since the building was originally constructed, or last altered

1.6 Assumptions

Fires do not normally start in two different places in a building at the same time. Initially, a fire will create a hazard only in the part in which it starts and is unlikely, at this stage, to involve a large area. The fire may subsequently spread to other parts of the building, usually along the circulation routes.

The items that are first to be ignited are often furnishings and other items. It is less likely that the fire will originate in the structure of the building itself and the risk of it originating accidentally in circulation areas is limited, provided that the combustible content of such areas is restricted.

As different occupants of the building may have differing levels of familiarity with the building and the means of escape strategy, the onus is therefore on the Building Management Team to formalise a strategy to enable effective fire safety procedures to be followed in the event of an emergency. This strategy must be unified throughout the building.

Managing fire safety is the whole process throughout the life of the building, starting with the initial design, which is intended both to minimise the incidents of fire and to ensure that when a fire does occur, appropriate fire safety systems (including active, passive and procedural systems) are in place and are fully functional.

The management of fire safety is thus an essential element in averting disaster in the event of a fire. Although many buildings will never have a serious life-threatening fire, it is essential for fire safety procedures to be planned and implemented for every building.

2.0 Fire Strategy – Validity and Review

It is important that this Fire Strategy also reflects how fire safety is managed and how the fire safety systems and arrangements interface within the building. For this to remain valid, any changes that may affect the fire safety arrangements MUST be reported to the Responsible Person(s) who is responsible for ensuring that this Fire Strategy is reviewed, amended as is necessary and republished. These changes could include:

- alterations to the layout – those that affect means of escape or fire safety for example.
- alterations to fire safety provisions and systems within the premises.
- changes of key personnel, management and/or management arrangements; and
- changes in the fire load and/or processes undertaken by tenants which have a substantive effect on the building.

It is also recommended that this Fire Strategy is reviewed after completion of a Fire Risk Assessment or an evacuation of the building to ensure that any lessons learnt can be accommodated within the review.

2.1 Scope

The premises is a new-build facility designed to accommodate large-scale industrial recycling operations. It comprises a primary process building assigned to the industrial purpose group, a dedicated storage building functioning as ancillary warehousing, and associated office and amenity accommodation.

The operational environment involves the processing and storage of combustible plastics alongside associated chemicals and industrial plant, presenting a fire hazard profile that demands a carefully considered and robust fire strategy to ensure regulatory compliance, life safety, and business continuity.

This Fire Strategy has considered any additional requirements associated with the secondary objectives of 'Property Protection' and 'Business Continuity', and any information relating to 'variations to the prescriptive approach' are on the basis of primary objective being 'Life Safety'.

2.2 Applicable Legislation

The following legislation is applicable to this building and has been incorporated within this report:

- Building Regulations 2010: The functional requirements of the Building Regulations with regard to fire safety must be satisfied.
- The Construction (Design and Management) Regulations 2015: Projects undertaken within the UK are subject to the requirements of the CDM Regulations. The CDM Regulations place more responsibility on the client to comply with the legislation.
- Regulatory Reform (Fire Safety) Order 2005: This legislation applies to all non-domestic premises in England and Wales. The duty for compliance and accountability with this Order lies with the 'responsible person' who has a duty to ensure that regular fire risk assessments are undertaken and that fire risks are removed, reduced or controlled.
- BS 9999:2017-Code of practice for fire safety in the design, management and use of buildings.
- Additional Legislation: The primary legislation is described above. However other legislation will apply, for example Health and Safety. The additional legislation will have an impact on the fire safety systems and design of the building.

2.3 Fire Engineering Legislation

Under the Building Regulations a building owner is required to provide an adequate level of life safety to the building by providing suitable means of escape, means of warning occupants of a fire, limiting internal fire spread, protecting adjacent property from fire, and facilitating Fire Service operations.

This can be achieved by the adoption of standard guidance as documented within Approved Document B (ADB). However, ADB further recognises that alternative solutions may provide a more appropriate design by use of an alternative approach which is detailed in the following extract:

"The fire safety requirements of the Building Regulations will probably be satisfied by the following relevant guidance in this approved document. However, approved documents provide guidance for some common building situations, and there may be alternative methods of complying with the Building Regulation requirements."

Unless explicitly stated otherwise in this report, all aspects of the residential areas of the building are to be in full accordance with BS 9999:2017-Code of practice for fire safety in the design, management and use of buildings. Applying BS 9999 instead of solely following Approved Document B offers the advantage of a performance-based, risk-assessed approach that is better suited to the industrial environment.

While ADB sets rigid prescriptive limits that could constrain the design, BS 9999 allows greater flexibility by linking requirements to occupancy type, fire growth rates, and the strength of fire safety management systems already mandated under COMAH. This enables the project to justify practical solutions, integrate fire engineering where necessary, and provide a more credible, auditable framework for Building Control, insurers, and the Fire & Rescue Service.

This report has not yet been approved and should not be relied upon for design until it has been agreed with the relevant approval bodies be this the Fire Service and/or Building Control.

Measures detailed in this strategy will need to be considered by the Responsible Person in developing the Fire Management Plan and Risk Assessment for the site to discharge the operator's responsibility under The Regulatory Reform (Fire Safety) Order 2005 (RRFSO).

3.0 Premises Details

<table>
<tr><th>Title</th><th colspan="3">Project Specification</th></tr>
<tr><td>Description</td><td colspan="3">This strategy covers a recycling facility comprising a main warehouse with a relative height of 12m, supporting large-scale processing and storage operations, together with lower-height office and canteen accommodation under 3m, and a separate goods-in storage unit. The warehouse is provided with multiple perimeter exits to facilitate evacuation, while the office and canteen areas are served by segregated exit arrangements.</td></tr>
<tr><td>Legislation</td><td colspan="3">BS9999</td></tr>
<tr><td rowspan="4">Purpose Group(s)</td><td colspan="3">As per Table D1 of BS9999. Designation for this development is:</td></tr>
<tr><td>Title</td><td>Group</td><td>Purpose</td></tr>
<tr><td>Office</td><td>A2</td><td>Office units</td></tr>
<tr><td>Process and Warehouse</td><td>A3</td><td>Process and Goods In</td></tr>
<tr><td>Evacuation Strategy</td><td colspan="3">It is expected that a 'simultaneous' evacuation strategy will be implemented in all units. The evacuation in case of fire will simply be by means of everyone reacting to the warning signal given when a fire is discovered, then making their way, by the means of escape, to a place of safety away from the premises.</td></tr>
</table>

4.0 Means of Warning and Escape

The fire safety measures provided, are based on the use of the building, fire loads, occupancy characteristics and building management as detailed above.

Evacuation Strategy

It is expected that a 'simultaneous' evacuation strategy will be implemented in all units. The evacuation in case of fire will simply be by means of everyone reacting to the warning signal given when a fire is discovered, then making their way, by the means of escape, to a place of safety away from the premises.

Process Hazards

Hazard classification for industrial or process areas is typically determined by the nature of materials handled, the configuration of the process, and the potential for fire growth or explosion.

Where a normal hazard classification is proposed, the following mitigating factors support its justification:

- Materials are stored in sealed containers, significantly reducing the risk of vapour/dust release, ignition, or uncontrolled fire load.
- Process pipework operates as a closed system, with minimal opportunity for leakage, exposure, or atmospheric contamination.
- Designated DSEAR zones are not normally occupied during active processing, limiting personnel exposure and reducing life safety risk.
- Ventilation systems are designed to prevent accumulation of flammable vapours/dust, with airflow rates and extraction points validated through risk assessment. Dust
- Ignition sources are controlled or eliminated, with equipment rated appropriately for any residual hazardous zones (e.g. ATEX-rated components).
- Emergency procedures and access controls are in place to prevent unauthorised entry during active processing or maintenance.

Fire Alarm

The fire alarm coverage is to be provided in accordance with Table 1.

Table 1: Fire Alarm Provision

Occupancy	Alarm Coverage	Design Standard	Sounders	Manual Call Points
Process Area	L2	BS5839:1	Yes	Yes
Office Area	M	BS5839:1	Yes	Yes
Ancillary & Non-Residential Areas	L2	BS5839:1	Yes	Yes
Storage - Goods In	L2	BS5839:1	Yes	Yes

The process areas, ancillary zones, and goods-in sections are designated for Category L2 coverage, ensuring automatic detection in escape routes and high-risk zones. Office areas are assigned Category M (although L2 could be considered to standardise the approach), relying solely on manual call points due to lower fire risk and familiar occupancy.

All zones are equipped with sounders and manual call points to support effective evacuation and meet audibility requirements. This layered approach reflects a risk-based application of BS 9999 principles, balancing life safety with operational practicality across the site.

Sounders will be located throughout the building in accordance with BS 5839-1, where there is excessive ambient noise in the industrial unit other forms of alarm, such as VAD's, may be required. As the end use of the building is unknown, the necessary alarm types should be reviewed at fit out stage.

The detail of the system design will need to account for any specific fit out risks. The fire detection and alarm system for the full building should be fully commissioned prior to occupation of the building.

In accordance with the recommendations of BS 5839-1 the design certificate for the scheme should be submitted to the approving authority before installation of the fire alarm system on site.

Helios Fire Systems - Automatic Targeted Firefighting System (A.T.F.S.)

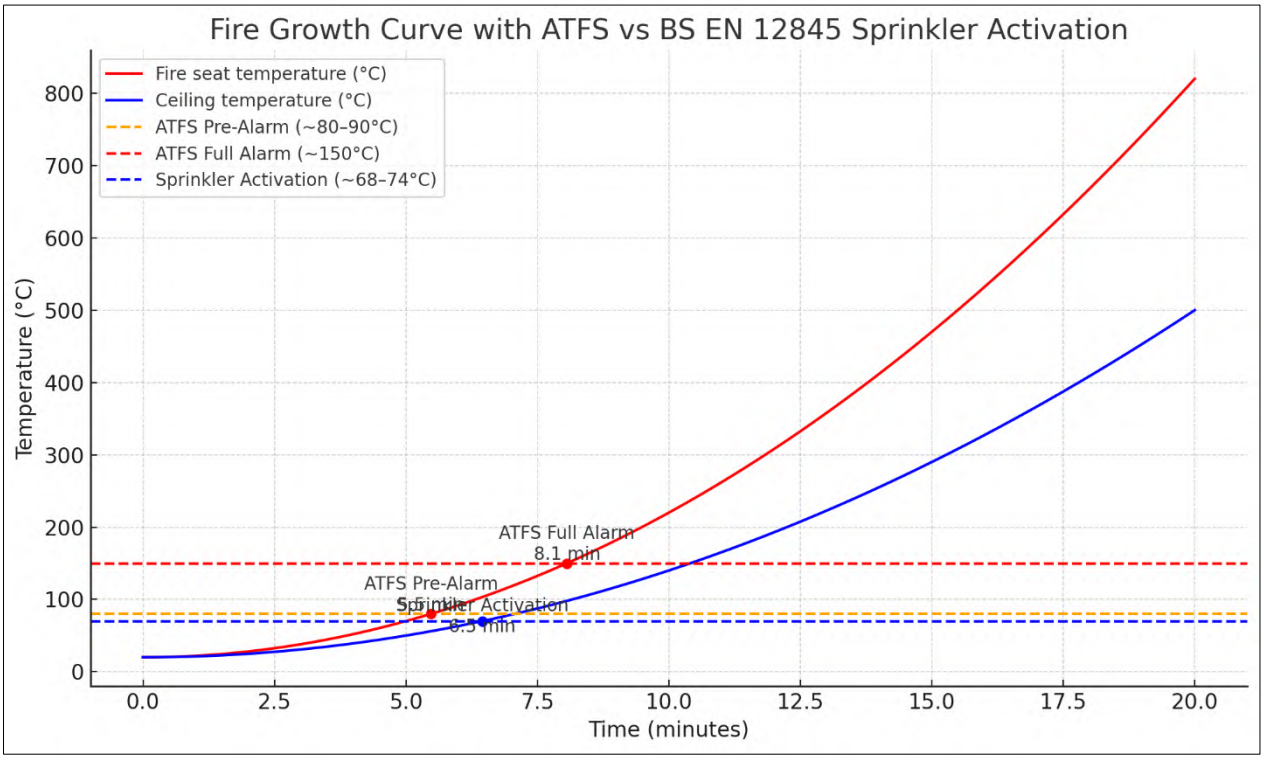
The Enviroo facility employs the PYROsmart® infrared thermographic detection system, an advanced AI-enabled solution designed for early identification of hotspots within waste and plastics processing environments. The system continuously scans designated zones using 5mm pixel resolution thermography to detect temperature anomalies from as little as 1°C above ambient up to 699°C.

When a localised hotspot is detected, the system initiates a two-stage alarm process:

- Pre-Alarm at 80–90°C, notifying site personnel via email and text alerts, as well as triggering the monitored fire alarm panel. Operators can remotely access the system to visually confirm or dismiss the anomaly.
- Full Alarm at 150°C, automatically escalating to suppression mode.

The cameras are programmed through AI to avoid false alarms from normal operations (e.g. plant equipment, forklifts). The system provides real-time panoramic thermal and video imaging, with operator access via control terminals on site or remote login (TeamViewer-based). Fault monitoring is embedded, with alerts sent to both Helios Fire Systems engineers and client staff. This approach enables detection of deep-seated or concealed fires well before flame emergence, particularly critical for polymer bales, battery contamination, and process heat risks.

Figure 1: Helios ATFS Detection Comparison



By contrast, a BS EN 12845 sprinkler installation relies on the thermal activation of individual sprinkler bulbs or fusible links, typically calibrated to 68–74°C (ordinary hazard), but activation only occurs once ambient air near the ceiling reaches that threshold.

In high-bay, ventilated, or open industrial environments, this delay can be significant: fire growth must develop enough plume energy to raise ceiling temperatures to the operating point of a head. For smouldering plastics, concealed hotspots, or lithium contamination, sprinklers may not operate until the fire is well established.

In summary, the ATFS offers a quicker and more intelligent form of detection than BS 12845 systems, with the ability to discriminate between normal operational heat sources and genuine fire precursors, and to initiate targeted suppression before flames emerge. Sprinklers remain a proven life safety system under prescriptive codes, but their activation inherently lags behind the early warning capability of the PYROsmart platform.

This system is not intended to serve as a compensatory measure for any life safety design requirements within the scheme. Its inclusion within the fire strategy is solely to demonstrate its contribution to enhancing the overall fire safety provisions.

4.1 Horizontal Evacuation

Travel Distance

Process and Warehouse
For a Process & Warehouse area with risk profile A3 and a 12m ceiling, BS 9999 Table 11 gives baseline travel distances of 18m (single direction) and 45m (multiple directions).

Applying a 30% management/geometry variation yields 23.4m and 58.5m respectively; however, Table 15 caps the single-direction increase at 22m for this scenario, while the multiple-direction result 58.5m remains below the 60m cap. With no enhanced fire alarm/detection, the final allowable limits are therefore 22m one-way and 58.5m with choice of direction.

Risk Profile: A3
Ceiling Height (m): 12
Enhanced fire alarm and detection system provided: No
Total Variation (%): 30%
Max. single direction travel distance before accounting for variation - Table 11 of BS 9999(m): 18
Max. multiple direction travel distance before accounting for variation - Table 11 of BS 9999(m): 45
Max. allowable variation for single direction travel distance - Table 15 of BS 9999(m): 22
Max. allowable variation for multiple direction travel distance - Table 15 of BS 9999(m): 60
Max. single direction travel distance after accounting for variation(m): 22.0
Max. multiple direction travel distance after accounting for variation(m): 58.5

Office
For an Office with risk profile A2 and ceiling height >3m, BS 9999 Table 11 sets baseline travel distances of 22m (single direction) and 55m (multiple directions).

With 0% variation and no enhanced fire alarm/detection, these values remain unchanged and are well within the Table 15 caps (26m and 75m). The final allowable limits are therefore 22m one-way and 55m with a choice of direction.

Risk Profile: A2
Ceiling Height (m): >3
Enhanced fire alarm and detection system provided: No
Total Variation (%): 0%
Max. single direction travel distance before accounting for variation - Table 11 of BS 9999(m): 22
Max. multiple direction travel distance before accounting for variation - Table 11 of BS 9999(m): 55
Max. allowable variation for single direction travel distance - Table 15 of BS 9999(m): 26
Max. allowable variation for multiple direction travel distance - Table 15 of BS 9999(m): 75
Max. single direction travel distance after accounting for variation(m): 22.0
Max. multiple direction travel distance after accounting for variation(m): 55.0

With an 800mm-wide exit, and applying BS 9999 guidance for an A3 risk profile (awake and familiar occupants, fast fire growth), the occupancy capacity is recalculated using the standard flow rate of 80 persons per metre per minute.

Calculation:

- 800mm = 0.8 metres
- 0.8 × 80 = 64 persons per minute per exit
- With two exits, total evacuation capacity = 64 × 2 = 128 persons per minute

Assuming travel distances are within the requirements for normal hazard industrial settings with two escape routes, and that both exits are accessible from all relevant areas, the building can safely accommodate up to 128 occupants under standard conditions. This figure reflects the discounting rule, where one exit is assumed unavailable during a fire scenario, and the remaining exit must support full evacuation.

Figure 1: Travel Distance Measurements for Goods In/Storage

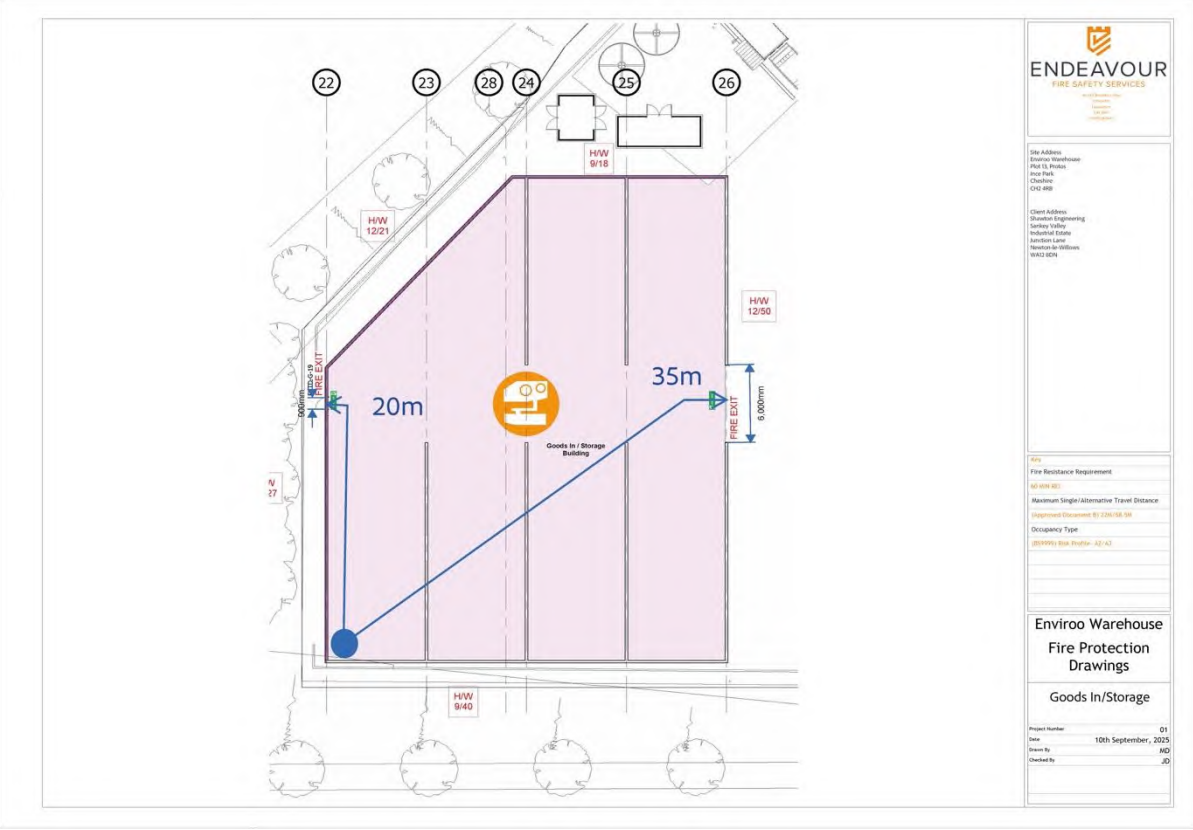


Figure 2: Travel Distance Measurements for Process Floor

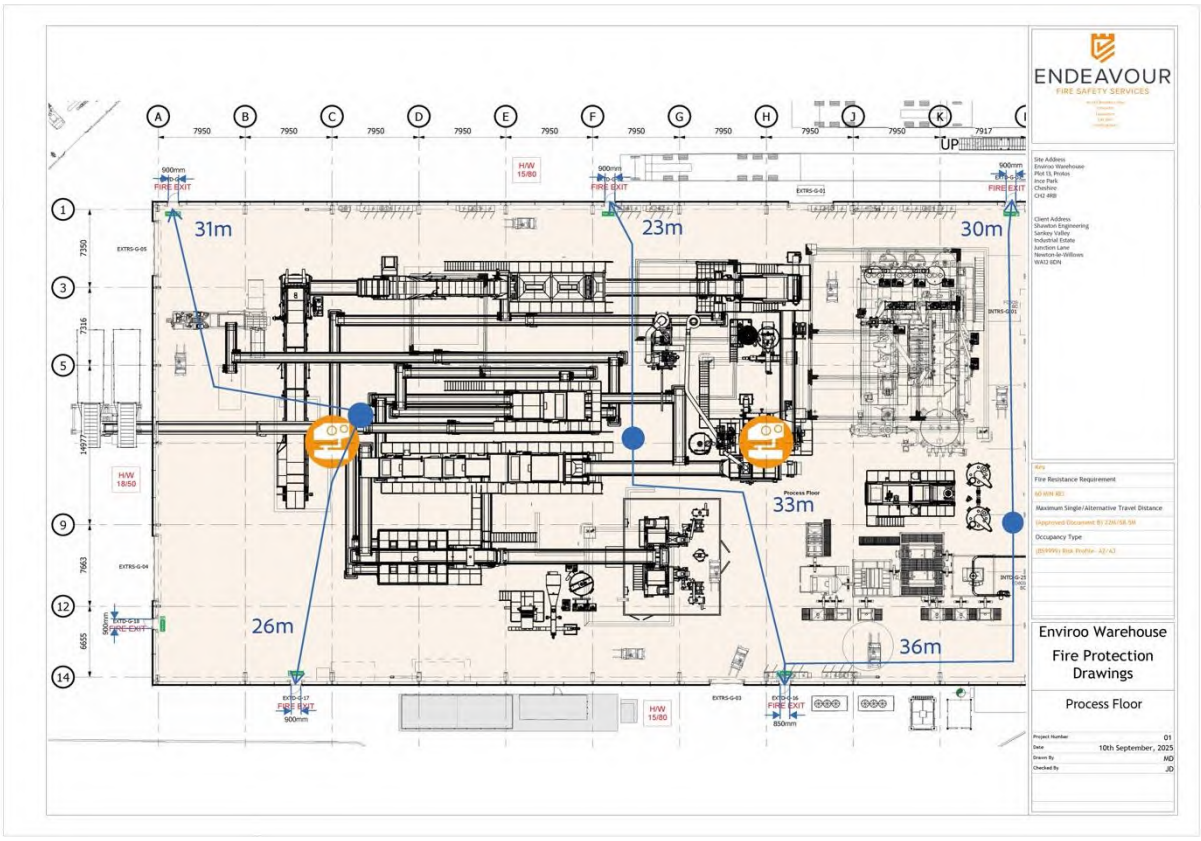


Figure 3: Travel Distance Measurements for Office Space

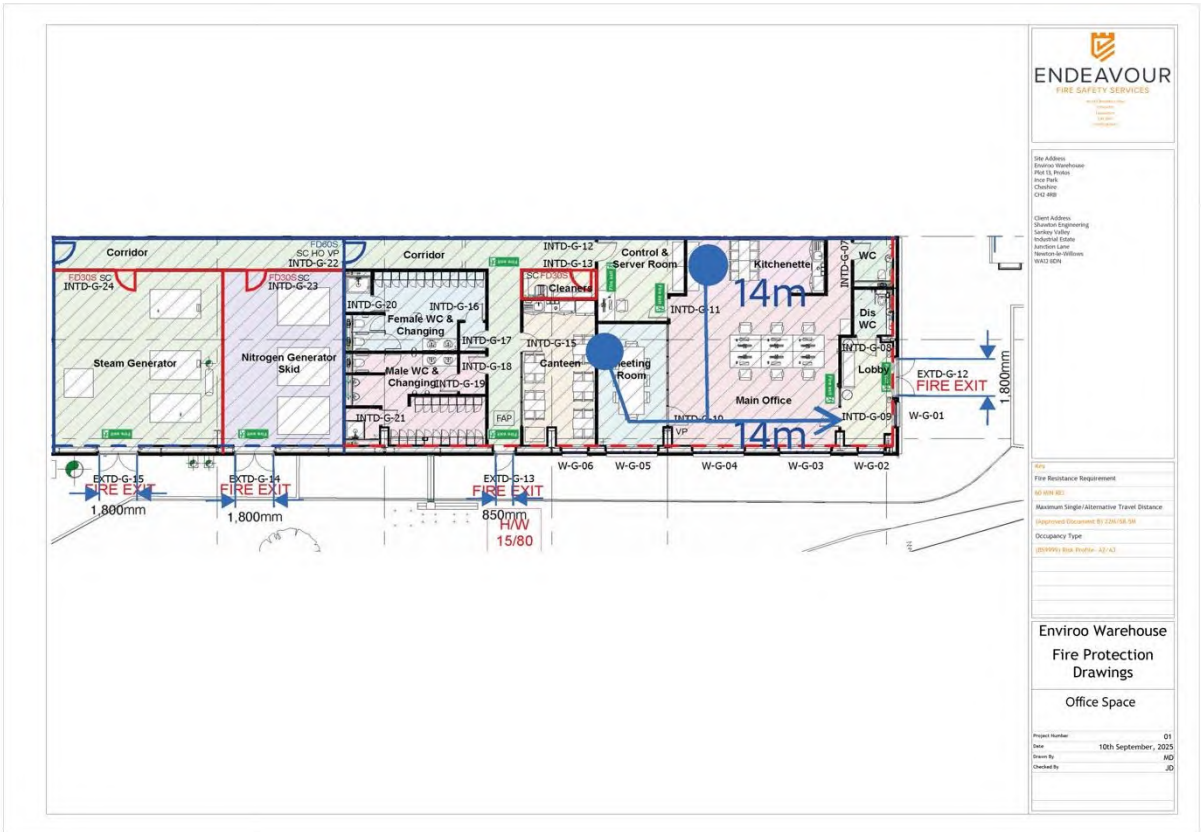
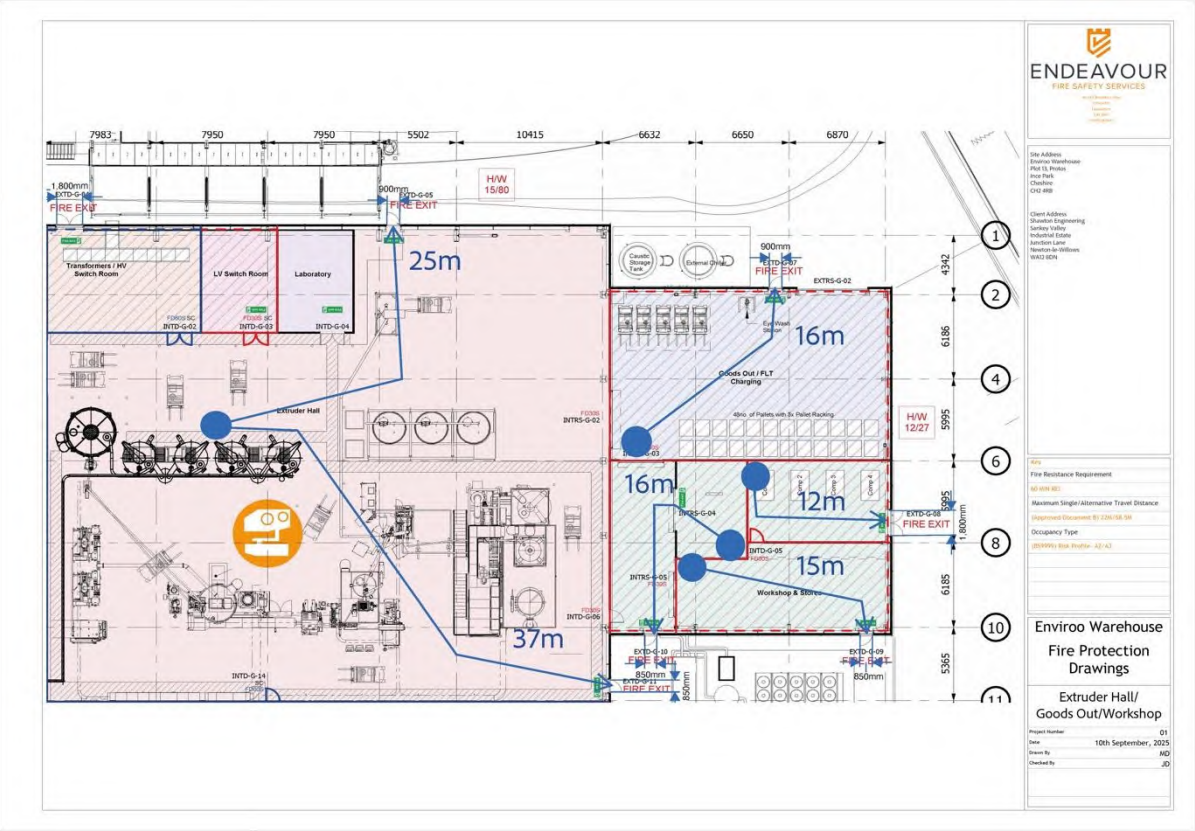


Figure 4: Travel Distance Measurements for Extruder Hall/Goods Out/Workshop



In the process building, the accepted design principle is that ground floor travel distances should not exceed approximately 37metres in any direction, with an additional allowance of around 20metres permitted only where access to equipment is required via gantries, vertical ladders, or similar arrangements.

It is important to note that this extended distance applies exclusively to operational and maintenance access for means of escape. All final exits from the units must therefore be positioned and sized to ensure that compliant escape distances are achieved within the 37metre ground floor limit, as no further compensatory measures are permissible under the guidance. This distinction safeguards against over-reliance on process access routes and ensures that life safety is maintained through clearly defined escape routes designed for occupants rather than operational convenience.

Doors on Escape Routes

Fire doors on escape routes in industrial buildings serve to contain fire and smoke, protecting evacuation paths and allowing occupants to escape safely. They support compartmentation, slowing fire spread between zones, and are designed to withstand fire for a set period (typically 30 or 60 minutes). This delay provides critical time for evacuation and emergency response, especially in high-risk environments with combustible materials or complex layouts.

When the building is occupied, all electrically powered locking mechanisms are to return to the unlocked position on operation of the fire detection and alarm system or loss of power. All doors are to be provided with a manual door release unit complying with BS EN 54-11 on the side approached by people making their escape.

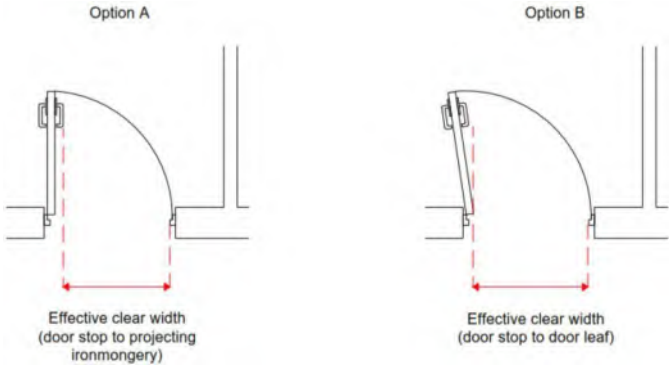
Where access to the means of escape is provided via a room, it should be ensured that appropriate measures are in place which would allow for the access doors to be open without the need for a key. Doors should either failsafe open or, be provided with a break glass unit, or other appropriate system.

Doors on escape routes should:

- Be hung to open not less than 90 degrees.
- Should be sufficiently recessed to prevent its swing from encroaching on the required egress route of the escape route or stair.
- Provided with vision panels if they are provided to sub-divide corridors or where doors are hung to swing in both ways.
- Only fitted with locks or fastenings which are readily operated, without the use of a key and without having to manipulate more than one mechanism.

Door widths are to be a minimum of 750mm, unless specified otherwise within the report. All doors in the building should be measured in accordance with Figure 5.

Figure 5: How to Measure Door Widths



Emergency Lighting

The escape lighting should be sited to provide an appropriate luminance near each exit door and where it is necessary to emphasise potential danger or safety equipment. The following bullet points indicate some of the critical areas in both offices/warehouses:

- All escape routes (final exit doors, escape corridors, staircases)
- Staircases and changes in level (internal stairs, ramps)
- High-risk areas (areas containing hazardous material or machinery, zones with no natural light, electrical rooms)
- Fire safety equipment locations (call points, fire extinguishers and safety signs)
- Large open spaces (large storage areas, open plan office rooms)
- Assembly points (if enclosed)
- Toilets

Emergency lighting must provide at least 1lux along escape routes and remain on for a minimum of 3 hours after the event of a power failure.

Emergency Escape Signage

The key locations where space signage (such as fire exit signs, directional signs, and hazard warnings) should be placed is in the same places as emergency lighting.

Signage is provided to identify the primary escape route from each location within the building. To achieve this, the following principles have been adopted:

- At least one escape route or doorway leading to an escape route should be visible from any place within every room or enclosure.
- Where direct sight of the escape route is obstructed, additional signage to be considered.
- Escape route signage is to take precedence over all other signs.
- All changes of direction in corridor, stairways and open spaces forming part of an escape route will be marked with intermediate signs. Each intermediate door or junction will also be similarly signed.
- Signs are not to be fixed to doors or sited where they are obscured by open doors.

Escape route signs are to be sited conspicuously within the normal field of vision. The following principles, which will assist the evacuating occupants to predict the location of successive signs, should be applied:

- Signs above doors or open spaces should be mounted between 2m and 2.5m from floor level, measured to the base of the sign and be sited as close to the centre line of the escape route as practicable.
- Signs sited on walls should be mounted between 1.7m and 2m from floor level to the base of the sign.
- Signs should be sited at the same height throughout the escape route, so far as is reasonably practicable.

5.0 Internal Fire Spread (Linings & Structure)

Linings

The choice of materials for walls and ceilings can significantly affect the spread of a fire and its rate of growth, even though they are not likely to be the materials first ignited. It is particularly important in circulation spaces where the rapid spread of fire is most likely to prevent occupants from escaping. The surface linings are restricted by limiting the surface spread of flames and minimising maximum heat release rates.

All surface finishes are to achieve the classifications in Table 3 when tested under the national classifications in accordance with BS 476 or the European classifications in accordance with BS EN 13501-1.

Table 2: Classification of Internal Linings

Location	National Class	European Class
Rooms not more than 30m² in the non-residential areas i.e. store rooms	3	D-s3, d2
Other rooms including garages	1	C-s3, d2
Escape routes, stairs	0	B-s3, d2

Parts of walls in rooms may be of a poorer performance than specified in Table 2 (but not less than Class 3 Class D-s3, d2), provided the total area of those parts in any one room does not exceed on half of the floor area of the room, subject to a maximum of 20m² in residential accommodation and 60m² in non-residential accommodation.

Structural Requirements

Elements of structure are defined as follows:

- A member forming part of the structural frame of a building or any beam or column.
- A load bearing wall or load bearing part of a wall.
- A floor.
- A gallery.
- An external wall structure supporting fire protected elements for the prevention of external fire spread and a compartment wall.

The following are excluded from the definition of elements of structure:

- A structure that only supports a roof, unless:
  - The roof performs the function of a floor such as parking vehicles or as a means of escape; or
  - The structure is essential for the stability of a wall which needs to have fire resistance.
- The lowest floor of the building.
- Where an element of structure forms part of more than one building or compartment, that element should be constructed to the standard of the greater of the relevant provisions.
- Where one element of structure supports, carries or gives stability to another, the fire resistance of the supporting element should be no less than the minimum period of fire resistance for the other element (whether that other element is load-bearing or not).

Compartmentation and fire-resisting construction

The spread of fire within a building can be restricted by sub-dividing the building into compartments separated from one another by walls and/or floors of fire resisting construction. This is to restrict rapid fire spread which could trap occupants of the building and to reduce the risk of fires becomes large.

BS 9999 – Special Fire Hazard Zones: Fire Resistance Requirements

Under BS 9999:2017, areas classified as special fire hazards due to elevated fire load, ignition risk, or operational criticality and must be subject to enhanced fire protection measures. The following elements are considered high-risk and require specific fire resistance ratings:

High Voltage (HV) Switchroom

- Required Rating: 60 minutes REI
- Rationale: HV switchrooms present significant ignition and arc flash risks. A 60-minute rating ensures containment of fire and protection of adjacent critical infrastructure, allowing sufficient time for evacuation and fire service intervention.

Low Voltage (LV) Switchroom

- Required Rating: 30 minutes REI
- Rationale: While LV systems carry lower energy loads, they still pose substantial fire risk due to cable density and potential overload. A 30-minute rating supports compartmentation and limits fire spread into circulation or escape routes.

Forklift Truck (FLT) Charging Area

- Required Rating: 30 minutes REI
- Rationale: Battery charging stations—especially for lithium-ion or lead-acid systems—are prone to thermal runaway and electrical faults. A 30-minute compartment rating mitigates risk to adjacent occupancies and supports business continuity.

Roof Construction – Adjacent Building Considerations
Where adjacent buildings are located within 6 metres, the roof over any special fire hazard zone must be constructed to:

- Resist Radiant Heat Transfer: Prevent ignition of nearby structures due to thermal radiation
- Limit Flame Spread: Comply with external fire exposure classification BROOF(t4) under BS EN 13501-5
- Maintain Compartment Integrity: Match the fire resistance of supporting walls if forming part of a compartment boundary

Table 3: Compartmentation Summary Standard

Floor/wall location	Fire Rating (minutes)	European Standard (minutes)
Structural frame, beam or column (Exposed Faces)	60	REI 60
Compartment Floors / Walls	60	REI 60
Between Warehouse and Office Areas	60	REI 60
High-risk Areas (flammable storage/plant rooms)	30	REI 30
High Voltage (HV) Switchroom	60	REI 60

Table 4: Fire Door Summary

Door Location	Fire Resistance National	Self-Closing Device Required
Doors in Compartment Walls (Profile Change)	FD60s	Yes
Hazard rooms	FD30s	Yes
High Voltage (HV) Switchroom	FD60s	Yes
Protected Stair Doors	FD30s	Yes

Suppression System

As detailed in section 4, the Enviroo plant will be fitted with an Automatic Targeted Firefighting System (ATFS), controlled by the PYROsmart thermographic detection platform, provides a fundamentally different approach to fire initiation when compared with a BS EN 12845-compliant sprinkler installation. Sprinklers rely on the thermal operation of individual bulbs or fusible links, typically rated at 68–74 °C for ordinary hazard. Activation is therefore dependent on fire plume development, ceiling height, ventilation, and thermal lag; in large industrial halls, this can delay initiation until the fire is well established.

By contrast, PYROsmart continuously scans all monitored zones in real time, identifying temperature anomalies as small as 1 °C above ambient. Pre-Alarms are triggered at 80–90 °C, and Full Alarms escalate at 150 °C. Crucially, this detection can occur at the fire seat or within deep-seated waste bales long before surface flames develop or ceiling gas layers reach sprinkler activation thresholds. This provides an advanced early-warning capability and ensures that targeted suppression can begin far earlier than under BS EN 12845.

BS EN 12845 prescribes water-based sprinkler protection to defined hazard categories, delivered via arrays of fixed sprinkler heads with design densities and durations determined by occupancy classification. This approach ensures broad area coverage and a high level of reliability, but suppression only begins after sprinkler heads operate, which is inherently reactive and water-demand intensive.

The ATFS suppression system employs robotic turret cannons capable of discharging 1,500 L/min at 12–14 bar with a wetting agent additive. Using coordinate data from the detection system, cannons target hotspots with an accuracy of 0.5m from up to 50m distance. This allows suppression to be applied precisely to the source of ignition immediately upon Full Alarm, with minimal delay following initial detection. Once extinguishment is confirmed, flow ceases automatically, conserving water and avoiding unnecessary collateral damage.

In practical terms, this means that the ATFS achieves both earlier detection and earlier suppression than a conventional BS EN 12845 sprinkler system, particularly for concealed, smouldering, or bale-related fire risks.

While the ATFS is not a BS EN 12845 sprinkler system and cannot be deemed equivalent for prescriptive compliance, its early detection and rapid, targeted suppression provide a credible engineered enhancement.

Within this strategy, suppression is included not to satisfy life safety requirements, but to demonstrate how enhanced provision contributes to:

- Limiting external flame spread,
- Controlling the potential design fire size, and
- Supporting property protection and business continuity.

Protection of Openings and Fire Stopping

To ensure all fire separating elements are effective, every joint or imperfection of fit, or opening to allow services to pass through the element, suitable fire protection is to be provided by sealing or fire stopping so that the fire resistance of the element is not impaired.

Fire Stopping

All openings for pipes, ducts, conduits or cables that pass through and/or any joints between fire separating elements should be appropriately fire stopped with consideration for any potential thermal movement of pipes and ducts.

Where non-rigid materials are adopted or unsupported spans exceeding 100mm are adopted, the fire stopping material to be reinforced with materials of limited combustibility.

It is proposed that all service inlet positions will enter over the fire doors to each compartment, to assist fire stopping.

Openings of Pipes

Where services pass through a fire separating element, the following three fire stopping measures will need to be considered to evaluate the most appropriate fire protection measure.

Method 1 - *Proprietary Seals*
Provide a proprietary sealing system e.g. intumescent collar which has been tested to maintain the fire resistance of the wall, floor or cavity barrier for a pipe of any diameter.

Method 2 – *Pipes with a restricted diameter*
On the provision that the type and internal diameter dimension satisfies the requirements in Table 6 fire stopping such as cement mortar or intumescent mastic may be used around the pipe.

Method 3 - *Sleeving*
A pipe of lead, aluminium alloy, fibre cement or uPVC, with a maximum nominal internal diameter of 160mm, may be used with a sleeving of non-combustible pipes. The specification for non-combustible and uPVC are given in Table 5.

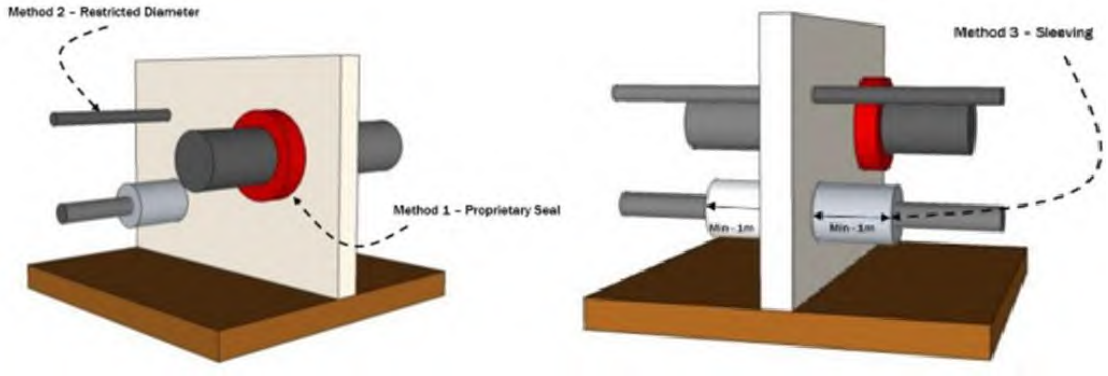
Table 5: Maximum nominal internal diameter of pipes passing through a compartment wall/floor

Situation	Pipe material and maximum nominal internal diameter		
	Non-combustible material[1]	Lead, aluminium, aluminium alloy, uPVC[2], fibre cement	Any other material
Structure enclosing a protected shaft which is not a stairway or a lift shaft.	160	110	40
Compartment wall or compartment floor.	160	160 (stack pipe)[3] 110 (branch pipe)[3]	40
Any other situation	160	40	40

Note 1: Any non-combustible material (such as iron, copper or steel) which, if exposed to a temperature of 800 degrees, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe.

Note 2: uPVC pipes complying with BS 4514 and uPVC pipes complying with BS5255.

Note 3: These diameters are only in relation to pipes forming part of an above ground drainage system and enclosed in Method 3. In other cases, the maximum diameters against situation 3 apply.



Building Services

The routing of building services through the common residential corridor introduces a fire risk in the space and it is recommended against this where possible. However, where the routing of services though the corridor is unavoidable, the services should be run in separating construction or in a secured fire-resisting method. There are two options available in this regard:

a) Construct a fire resisting ceiling that achieves 30 minutes fire resistance as required by the location of the riser with all services being above the ceiling line & risers in the corridor; or

b) Control the fire load in the ceiling and riser space through the specification and selection of low-risk materials. This approach will require a fire risk assessment and agreement from Building Control; and should include but not limited to the following aspects as a minimum:

- Minimising the number of electrical connections within the residential corridor
- Correctly sized cables and follow up with comprehensive on-site testing and inspection
- The surfaces of materials exposed to the corridor (i.e. ceiling void) will be of Class 0 (National Class) or Class B-s3, d2 or better (European Class)
- The materials within the corridor (inclusive of any insulation) will be of limited combustibility (National Class) or Class A2-s1, d0 or better (European Class)
- The services to be located within the corridor ceiling void will be of low fire risk
- Any electrical cabling will be laid in metal trays or metal conduit
- Access panels into ceiling voids to be secured (this can be by releasing devices or screw fixings to close)
- Any material or equipment located within the common corridor which have not been fire tested will

have been fire risk assessed to demonstrate its low-risk items in terms of ignition, combustibility and flammability by the system designer and system manufacturer

- Methods of cable support should be non-combustible (such as cable clips, cable ties or trunking)

Cavity Barriers

Concealed spaces or cavities in the construction of a building provide a route for smoke and flame spread. This is particularly in the voids above and below the construction of a building e.g. walls, floors, ceilings, roofs, around the windows, and compartment walls. The provision of cavity barriers within the voids is intended to restrict the spread of smoke and flames.

Cavity barriers should also be provided at the junction between any external cavity wall and a compartment wall or floor around openings (doors, windows etc.) in external cavity walls. Cavity barriers should also be provided above all corridors sub-divisions.

Fire resistant cavity barriers are to be installed in cavity spaces exceeding 20m in any direction. The cavity barriers will offer a minimum of 30 minutes fire resistance integrity and 15 minutes fire resistance insulation (European Standard E30 & EI15). See table 6 for a summary of cavity barrier locations.

Table 6: Maximum Dimensions of Cavities

Location of Cavity	Class of surface/ product exposed in cavity		Maximum dimensions in any direction (m)
	National	European	
Between roof and ceiling	Any	Any	20
Any other cavity	Class 0 or 1	Class A1 Class A2-s1, d0 Class B-s3, d2 Class C -s3, d2	20
	Not Class 0 or 1	None of the above classes	10

Construction and Fixing of Cavity Barriers

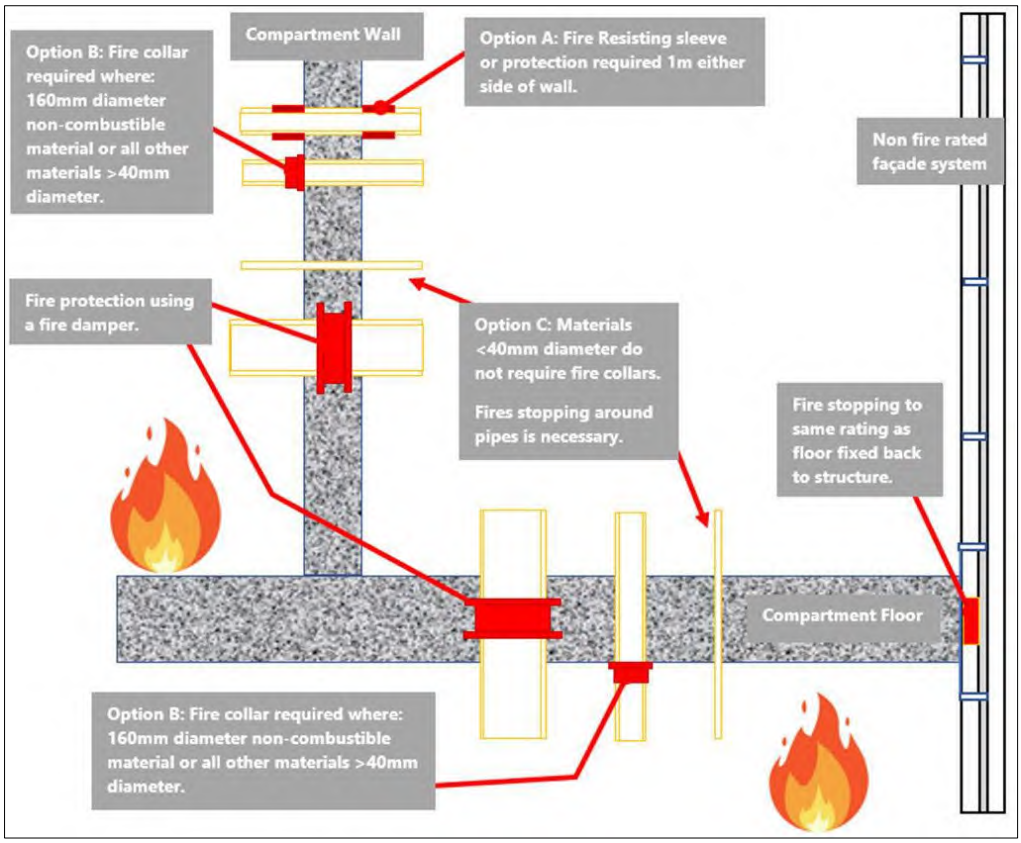
Cavity barriers should be constructed to provide 30min fire resistance (E30 EI15 when exposed from each side separately). The cavity barriers should be tightly fitted to a ridged construction and mechanically fixed in position. Cavity barriers should also be fitted so that their performance is unlikely to be made ineffective by movement of the building due to subsidence, temperature change etc. failure of their fixings, material or construction they abut or collapse of any services penetrating them.

Cavity barriers in a stud wall or partition or provided around openings may be constructed from:

- Steel at least 0.5mm thick;
- Timber at least 38mm thick;
- Polythene-sleeved mineral wool, or mineral wool slab, in either case under compression when installed in the cavity; or
- Calcium silicate, cement-based or gypsum-based boards at least 12mm thick.

It should be noted that cavity barriers provided around openings may be formed by the window or door frame if the frame is constructed of steel or timber of the minimum thickness above. Any openings in a cavity barrier should be limited to those for:

- 30-minute fire rated doors;
- The passage of pipes which meet the provisions set out in this report;
- The passage of cables or conduits;
- Openings or ducts (unless fire rated) fitted with a suitable automatic fire damper where they pass through the cavity barrier.



6.0 External Fire Spread

The fundamental requirements of B4 which will need to be met are:

- The external walls are to be constructed so that the risk of ignition from an external source and the spread of fire over their surfaces, is restricted, by making provision for them to have low rates of heat release.
- The amount of unprotected area in the facade is restricted to limit the amount of thermal radiation that can pass through the wall, taking the distance between the wall and the boundary into account; and
- The roof is to be constructed so that the risk of spread of flame and/or fire penetration from an extreme fire source is restricted.

Space separation and unprotected façade areas

Should a fire occur in a building, heat will radiate through non-fire resisting openings in the external walls. This heat can be enough to set fire to neighbouring buildings. In order to reduce the chance of this occurring, the Building Regulations place limits on the area of the external elevation with no fire resistance or protection.

This area is known as the unprotected area. The distance of the building from other buildings, the use of the building and the compartment size are all factors in determining the acceptable degree of unprotected area for each elevation.

The space separation of the building from its relevant boundaries has needs to be assessed in relation to the preventing external fire spread. This is achieved by limiting the area of non-fire rated elements of the façade where the separation is less than the minimum requirement within BR 187 – External fire spread building separation and boundary distances.

Using the calculation process outlined in BR 187 a preliminary analysis of the distance between the building and the adjacent site boundaries has been carried out. Based on this preliminary analysis, the protected areas to external façades should be in accordance with Table 7.

Table 7: Unprotected Area Assessment

Elevation	Actual Distance to Boundary	Allowable Distance to Boundary	%Allowable unprotected Area
Process – North	30m	35.1m	100%
Process – East	27.5m	35.3m	100%
Process – South	30m	39.5m	100%
Process – West	25.5m	26.3m	100%
Storage – North	12m	9.4m	50%
Storage – East	18.5m	186.5m	100%
Storage – South	14.5m	39.5m	100%
Storage – West	15.5m	11.8m	50%
Storage – Northwest	14m	7m	20%

It is considered that there are adequate provisions to protect the external flame spread from the storage unit by accepting the performance of the Helios ATFS. The baseline boundary separation requirements in Approved Document B and BRE Report 187 are derived from assumptions regarding the potential design fire size in an unsuppressed building. These distances ensure that radiant heat flux from a fully developed fire does not present an unacceptable risk of ignition or flame spread to neighbouring buildings.

In the case of the Enviroo facility, reliance solely on these conservative assumptions would result in extensive boundary protection measures. However, the provision of the PYROsmart early detection system combined with the Automatic Targeted Firefighting System (ATFS) fundamentally alters the expected fire growth profile.

With early detection and rapid suppression, the effective design fire size for external radiation assessment is significantly reduced compared to the unsuppressed scenario assumed in boundary separation calculations. This lower design fire size directly reduces the predicted thermal radiation intensity at the boundary line.

Accordingly, it is reasonable to apply a reduced radiation footprint in the boundary assessment, supporting a case for 100% protected area treatment. This recognises that the likelihood of a fully developed fire reaching boundary-impacting proportions is substantially mitigated by the engineered measures in place.

This rationale aligns with performance-based design principles, rather than defaulting to conservative prescriptive distances, the boundary protection strategy reflects the actual risk profile achieved through enhanced detection and suppression provision.

Combustibility of external walls

In relation to buildings of any height or use, consideration should be given to the choice of materials (including their extent and arrangement) used for the external wall, or attachments to the wall (e.g. balconies, etc.), to reduce the risk of fire spread over the wall.

In a commercial building with a storey 18m or less in height (when measured from the lowest adjacent side of the building to the upper floor surface of the topmost storey, excluding any floors consisting exclusively of plant), any insulation product, filler material (not including gaskets, sealants and similar) etc, used in the construction of an external wall should be of **Class B-s3, d2 or better**.

7.0 Access and Facilities for the Fire and Rescue Service

Overview

In the event of fire, the fire and rescue service will be notified by a building occupant or member of the public. A means of automatically notifying the fire and rescue service, could be provided to address automatic detection in common areas or for out-of-hours fires in non-residential areas.

Access into and around the building

Access to the site should be designed in such a way that the Fire Service can easily access the site upon a fire situation within the building. Provisions should be made at the design stage to ensure any new build scheme is provided with adequate and sufficient means for the Fire Service to enter the site.

Access into the buildings will be provided via the protected stairs. The fire and rescue service will then proceed via the normal circulation and escape routes, provided with natural smoke ventilation to protect the stairs from smoke ingress. External access requirements to the building have been highlighted in Table 8.

Table 8: Fire Appliance Access Route Specification

Appliance Type	Minimum width of road between kerbs (m)	Minimum width of gateways (m)	Minimum turning circle between kerbs (m)	Minimum turning circle between walls (m)	Minimum clearance height (m)	Minimum carrying capacity (tonnes)
High Reach	3.7	3.1	16.8	19.2	4.0	12.5

Note: This table is subject to agreement with the fire service as some fire services have appliances of greater weight

Fire Hydrants

In accordance with BS 9999:2017, Clause 22.4 – Access and Facilities for the Fire Service, fire hydrants should be located within 90–100m of the building footprint to ensure effective fire service intervention. Survey has verified that two existing fire hydrants are positioned at measured distances of approximately 96m and 105m from the site.

Figure 6: Surrounding Hydrant Measurements

Both are within the 110m maximum recommended distance to the principal entrances, as recognised in BS 9999 and supporting guidance (BS 9990:2015 – Non-automatic fire-fighting systems and equipment). This provision demonstrates compliance with the access and facilities requirements of Approved Document B5 and BS 9999, ensuring that adequate hydrant supplies are available to support fire service operations on site.

Life-safety power supplies

Fire protection systems designed to operate in a fire require enhanced provisions to ensure a secure supply is available. Specific recommendations are detailed within BS 9999 Section 38.2.3, but the main aspects are detailed below.

Secondary Power Supply
To reduce the risk of the loss of the electrical supply to critical fire safety systems a secondary power system is required to maintain a continuous power supply during a fire condition. The mechanical and electrical engineer will determine the most efficient means to achieve the secondary power requirements. The secondary power supplies will be provided to the following:

- Smoke Control systems.
- Sprinkler Suppression System.

Where secondary power supplies are recommended, these should have a primary supply taken from a public supply and a secondary supply from either:

- An alternative utility supply from another substation
- A generator
- An uninterruptible power supply (UPS)
- Batteries

8.0 Fire Safety Management

Regulatory Reform (Fire Safety) Order

The Regulatory Reform (Fire Safety) Order (RRO) came into force on 1st October 2006. The Order consolidates nearly all previous fire safety legislation revoking the Fire Precautions Act 1971 and the Workplace Regulations 1992. The Order places a general duty of fire safety care on employees. Occupiers and/or owners of the business to provide and maintain adequate fire precautions.
The legislation is supported by requiring a fire risk assessment (FRA) and fire safety management plan (FSMP).

The FRA is to be undertaken of the required business by a designed 'Responsible Person' who is liable to the legislation. This process looks to:

- Identify potential fire hazards.
- Evaluate the risk from hazards.
- Identify who would be at risk.
- Identify an adequate level of fire precautions to compensate for the risk.

The FRA is to be fully documented if the building has an occupancy of 5 or more persons.

The FSMP details the arrangements to implement, control, monitor and review fire safety standards and to ensure those standards are maintained. The plan describes the arrangements for effectively managing fire safety to prevent a fire from occurring and in the event of a fire, to protect people and property.

Both the FRA and FSMP documentation should have been completed before occupation of the building.

9.0 Appendices

Appendix A – Plan Drawings

Appendix A – Plan drawings

Appendix A – Plan Drawings

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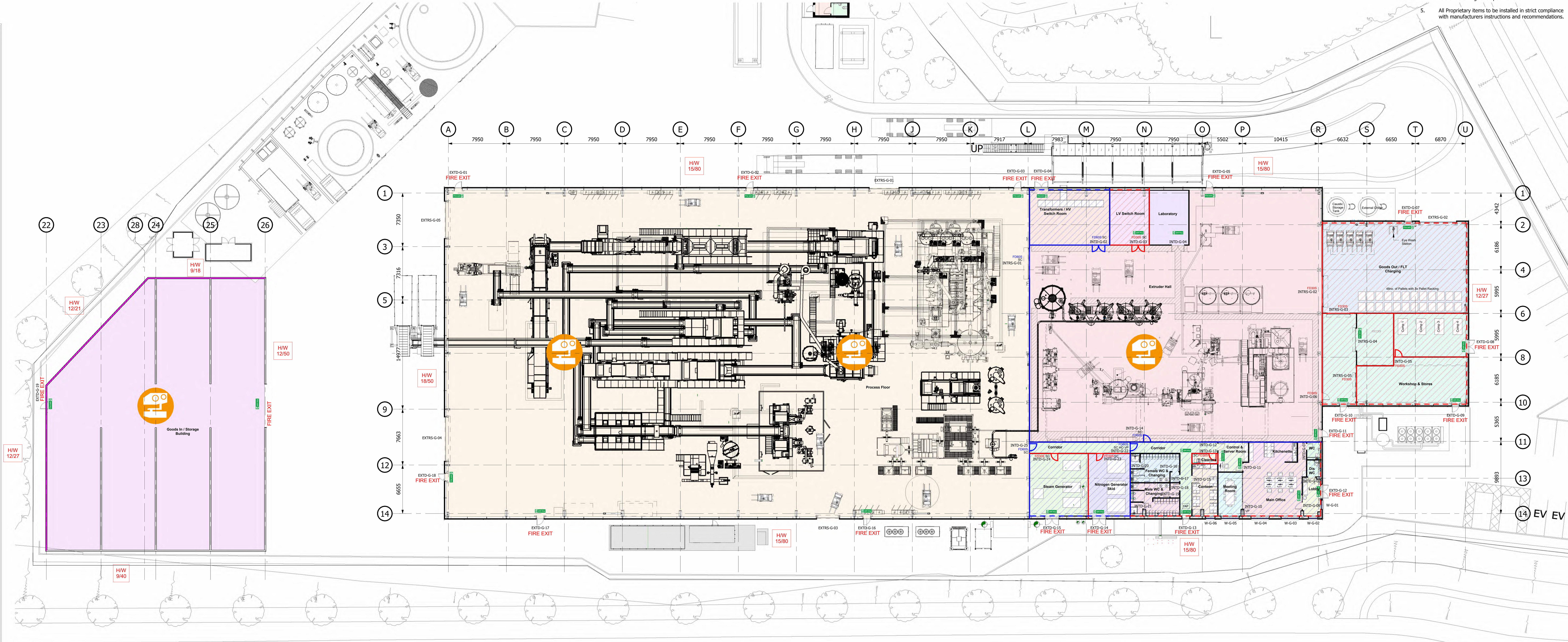
1m SCALE 1:200



KEY - FIRE SAFETY

30 MINUTES FIRE RESISTING CONSTRUCTION

60 MINUTES FIRE RESISTING CONSTRUCTION

30 MINUTES FIRE RESISTING CONSTRUCTION TO INTERNAL LEAF AND CEILING

DESIGNED TO EITHER PROTECT EXTERNAL ESCAPE ROUTES OR PROTECT AGAINST INTERNAL FIRE SPREAD TO 'PLACES OF SPECIAL FIRE HAZARD' WHERE NON-CLASS A1 INSULATING CORE PANELS WOULD OTHERWISE

[FIRE RESISTANCE CONFIRMED ON PHONECALL BY BUILDING CONTROL ON 22.07.2025; DETAILED DESIGN BY SPECIALIST SUB-CONTRACTOR]

60 MINUTES FIRE RESISTING CONSTRUCTION TO INTERNAL LEAF

DESIGNED TO PROTECT AGAINST INTERNAL FIRE SPREAD TO 'PLACES OF SPECIAL FIRE HAZARD' WHERE NON-CLASS A1 INSULATING CORE PANELS WOULD OTHERWISE BE EXPOSED INTERNALLY

[DETAILED DESIGN BY SPECIALIST SUB-CONTRACTOR]

BR187 ASSESSMENT NOTES A REQUIREMENT FOR 60 MINUTES FIRE RESISTING CONSTRUCTION TO THE AREA DETAILED WITHIN THE NOTES BELOW

[FIRE CONSULTANT TO CONFIRM WITH BUILDING CONTROL WHETHER THE HELIOS SUPPRESSION SYSTEM MAY BE CONSIDERED FOR EXTERNAL FIRE SPREAD; PLEASE REFER TO ENDEAVOUR GROUP'S REPORT FOR DETAILS]

H/W 9/18 — HEIGHT/WIDTH OF 'ENCLOSING RECTANGLE' OF ELEVATION

USED TO CALCULATE PERMITTED UNPROTECTED AREA CALCULATIONS AS STATED WITHIN THE NOTES BELOW, ALL IN CONJUNCTION WITH THE GUIDANCE PROVIDED IN BR 187.

FD30S — 30 MINUTES FIRE AND SMOKE RESISTING DOOR WHEN TESTED TO BS 476-22

FD60S — 60 MINUTES FIRE AND SMOKE RESISTING DOOR WHEN TESTED TO BS 476-22

VP — VISION PANEL TO DOOR

SC — SELF-CLOSING DEVICE TO DOOR

SC HO — HEAVY DUTY 'HOLD OPEN' DOOR CLOSING DEVICE LINKED TO THE FIRE ALARM; MECHANISM CONNECTED AND FITTED WITH AUTOMATIC RELEASE

FAP — MAIN FIRE ALARM PANEL (LOCATION TBC)

14.5M / 14.5M — ONE AND TWO-WAY TRAVEL DISTANCES (NOT SHOWN)

[TRAVEL DISTANCES (INCLUDING PROVISION FOR MEANS OF ESCAPE FROM INTERNAL PLANT/EQUIPMENT) TO BE CONFIRMED BY FIRE CONSULTANT; PLEASE REFER TO ENDEAVOUR GROUP'S REPORT FOR DETAILS]

HELIOS AUTOMATIC TARGETED FIRE SUPPRESSION (ATFS) CANNON LOCATION (LOCATIONS TBC). NO ACCREDITATION UNDER BRITISH STANDARDS AND THEREFORE HAS NOT BEEN TAKEN INTO CONSIDERATION AS A COMPENSATORY FEATURE FOR LIFE SAFETY PURPOSES UNDER BUILDING REGULATIONS FOR THIS FIRE STRATEGY

Fire exit — RIGID PLASTIC FIRE EXIT SIGNS WITH RUNNING MAN

NOTES:

FIRE RISK ASSESSOR TO CONFIRM FINAL FIRE SIGNAGE LOCATIONS ALL. NON-ILLUMINATED SIGNS TO BE USED WHERE LUX LEVEL IS GREATER THAN 100 LUX. ILLUMINATED SIGNS TO BE USED WHERE LUX LEVEL IS FEWER THAN 100 LUX; M&E CONSULTANT TO CONFIRM TYPE. ALL FIRE SIGNAGE TO BE IN ACCORDANCE WITH BS ISO 3864-1:2011 AND BS 5499-1:2014

AUTOMATIC FIRE DETECTION TO BE INSTALLED WITHIN VOIDS GREATER THAN 800MM DEEP.

THE STRUCTURE THAT ONLY SUPPORTS THE ROOF WOULD BE EXCLUDED AS 'ELEMENTS OF STRUCTURE' (WHEN REFERENCING TABLES B1 AND B2 OF THE APPROVED DOCUMENT B VOLUME 2) OR 'STRUCTURAL FRAME' (WITHIN THE NOTES BELOW), UNLESS THE STRUCTURE IS ESSENTIAL FOR THE STABILITY OF A WALL/CEILING THAT NEEDS TO BE FIRE RESISTING. WHERE ONE ELEMENT OF STRUCTURE SUPPORTS OR STABILISES ANOTHER ELEMENT OF STRUCTURE, THE SUPPORTING ELEMENT SHOULD HAVE NO LESS FIRE RESISTANCE THAN THE OTHER ELEMENT ALL IN ACCORDANCE WITH TABLES B1 AND B2 OF THE APPROVED DOCUMENT B VOLUME 2.

[THE EXTENT OF FIRE PROTECTION TO THE STEEL FRAME AND ASSOCIATED MEMBERS IS TO BE DETERMINED BY CAUNTON ENGINEERING, AS THE STEELWORK DESIGNER, AND SUBSEQUENTLY CONFIRMED BY SHAWTON ENGINEERING LTD, AS THE PRINCIPAL CONTRACTOR.]

Notes

1. If in doubt, ask the Project Lead.
2. Do not scale this drawing.
3. All dimensions are in millimetres unless stated otherwise.
4. This drawing is to be read in conjunction with all other relevant drawings and specifications.
5. All Proprietary items to be installed in strict compliance with manufacturers instructions and recommendations.

GA - Proposed Fire Strategy

1 : 200

APPROVED DOCUMENT B VOLUME 2

TO BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL DRAWINGS, SCHEDULE, SPECIFICATIONS AND BUILDING REGULATION NOTES IN ADDITION TO THE FIRE CONSULTANT'S REPORT BYENDEAVOUR GROUP.

PURPOSE GROUPS

IT IS APPROPRIATE TO ASSIGN THE BUILDING UNDER ITS OWN PURPOSE GROUP, RATHER THAN ASSIGN EACH DIFFERENT USE ITS OWN PURPOSE GROUP, AS THE ANCILLARY USE(S) RELATE TO AN AREA THAT IS LESS THAN ONE-FIFTH OF THE TOTAL FLOOR AREA OF THE BUILDING.

THEREFORE, THE FOLLOWING PURPOSE GROUPS ARE APPROPRIATE TO THE TWO BUILDINGS:
PROCESS BUILDING: 5 INDUSTRIAL
STORAGE BUILDING: 7A STORAGE

THE FOLLOWING PURPOSE GROUPS ARE REFERRED TO AS ANCILLARY USES TO THE PROCESS BUILDING:
3 OFFICE
7A STORAGE
[ON 28.08.2025, ENDEAVOUR GROUP, AS FIRE CONSULTANT, PROVIDED PURPOSE GROUP CLASSIFICATIONS IN ACCORDANCE WITH BS:9999 TO ALIGN WITH THEIR ASSESSMENT OF TRAVEL DISTANCES TO THIS AREA; PLEASE REFER TO ENDEAVOUR GROUP'S REPORT FOR DETAILS]

FIRE DETECTION AND ALARM SYSTEMS

DETAILED DESIGN OF FIRE DETECTION AND ALARM SYSTEM BY M&E CONSULTANT; TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2.
[DETAILED DESIGN BY M&E CONSULTANT TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

DESIGN FOR HORIZONTAL ESCAPE

IN INDUSTRIAL AND STORAGE BUILDINGS, THE APPROPRIATE TRAVEL DISTANCE DEPENDS ON THE LEVEL OF FIRE HAZARD ASSOCIATED WITH THE PROCESSES AND MATERIALS BEING USED.
[ON 01.08.2025, FICHTNER, AS CLIENT 'S AGENT, CONFIRMED THE CHEMICALS AND VOLUMES TO BE STORED ON SITE IN DOCUMENT 'FIC-FICH-BGE-EL-Z-00001 '. ON 28.08.2025, ENDEAVOUR GROUP, AS FIRE CONSULTANT, DETAILED MITIGATING FACTORS WHICH WOULD SUPPORT A 'NORMAL ' HAZARD CLASSIFICATION. ON 29.08.2025, ENVIROO AND FITCHNER, AS CLIENT AND AGENT, CONFIRMED THAT THESE MITIGATING FACTORS ARE APPLICABLE AND THEREFORE A 'NORMAL ' HAZARD CLASSIFICATION WAS AGREED AS APPROPRIATE]

MAXIMUM TRAVEL DISTANCES WITH REFERENCE TO TABLE 2.1 OF THE APPROVED DOCUMENT B VOLUME 2:

INDUSTRIAL & STORAGE:	22.0M SINGLE DIRECTION
[NORMAL HAZARD]	58.5M MORE THAN ONE DIRECTION
OFFICE:	22.0M SINGLE DIRECTION
	55.0M MORE THAN ONE DIRECTION

[ON 28.08.2025, ENDEAVOUR GROUP, AS FIRE CONSULTANT, CALCULATED THE ABOVE TRAVEL DISTANCES IN ACCORDANCE WITH GUIDANCE SET-OUT IN BS:9999; PLEASE REFER TO ENDEAVOUR GROUP'S REPORT FOR DETAILS]

PLACE OF SPECIAL FIRE HAZARD:	9M SINGLE DIRECTION
	18M MORE THAN ONE DIRECTION
ROOF TOP PLANT ESCAPE ROUTE:	60M SINGLE DIRECTION
	100M MORE THAN ONE DIRECTION

ANY ESCAPE ROUTES THAT ARE FOR MAINTENANCE PURPOSES TO INTERNAL AND EXTERNAL ROOF PLANT/EQUIPMENT, AND EXCEED THE ABOVE TRAVEL DISTANCES, SHOULD ALLOW FOR APPROPRIATE METHOD STATEMENTS TO ENSURE SAFE ESCAPE IN THE EVENT OF AN EMERGENCY.

LV SWITCH ROOM, LABORATORY, CANTEEN, CONTROL & SERVER ROOM AND MEETING ROOMS ARE ALL INNER ROOM SCENARIOS IN ACCORDANCE WITH PARAGRAPH 2.11 OF APPROVED DOCUMENT B VOLUME 2 AS, THE INNER ROOM IS NOT ENTERED DIRECTLY FROM THE ACCESS ROOM.
[ON 28.08.2025, ENDEAVOUR GROUP, AS FIRE CONSULTANT, ASSESSED THAT THE ABOVE WERE ACCEPTABLE GIVEN THAT THEY ADHERE TO ALL OTHER REQUIREMENTS INCLUDING TRAVEL DISTANCES AND ALTERNATIVE MEANS OF ESCAPE (WITH EXCEPTION OF FULLY GLAZED MEETING ROOM); PLEASE REFER TO ENDEAVOUR GROUP'S REPORT FOR DETAILS]
[DETAILED DESIGN OF AUTOMATIC FIRE DETECTION AND ALARM SYSTEM BY M&E CONSULTANT TO CONSIDER INNER ROOMS TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

THE BUILDING HAS MORE THAN THREE ESCAPE ROUTES/EXITS, THEREFORE THERE IS SCOPE FOR A MAXIMUM NUMBER OF OCCUPANTS FROM A ROOM OR STOREY, WITH REFERENCE TO TABLE 2.2 OF APPROVED DOCUMENT B VOLUME 2 AS FOLLOWS:

SCOPE FOR A MAXIMUM NUMBER OF PEOPLE
TO BUILDING WITH MORE THAN 3NO. EXITS: MORE THAN 600 PEOPLE

THIS MAXIMUM NUMBER OF PEOPLE IS RESTRICTED HOWEVER BY THE MINIMUM WIDTH OF ESCAPE ROUTES AND EXITS WITHIN THE BUILDING TO THE FOLLOWING, WITH REFERENCE TO TABLE 2.3 OF APPROVED DOCUMENT B VOLUME 2:

MAXIMUM NUMBER OF PEOPLE WITH
MINIMUM WIDTH OF 750MM: 60 PERSONS
[ON 18.07.2025, FICHTNER, AS CLIENT'S AGENT, CONFIRMED THE MAXIMUM OPERATIONAL CAPACITY OF THE BUILDING WILL BE 18 PEOPLE.]

DEAD-END CORRIDORS SERVING AS PART OF THE MEANS OF ESCAPE SHOULD BE CLASSIFIED AS PROTECTED CORRIDORS. THESE CORRIDORS SHOULD BE SUBDIVIDED WITH FIRE DOORSETS FITTED WITH SELF-CLOSING DEVICES EVERY 12M MINIMUM.
[ON 28.08.2025, ENDEAVOUR GROUP, AS FIRE CONSULTANT, CONFIRMED THAT THE TWO PREVIOUSLY SHOWN PROTECTED CORRIDORS TO THE WELFARE AREA COULD BE OMITTED DUE TO RE-CALCULATED TRAVEL DISTANCES IN ACCORDANCE WITH BS:9999 AND THE OMISSION AS THIS AS AN ESCAPE ROUTE FROM MAIN INDUSTRIAL AREAS; PLEASE REFER TO ENDEAVOUR GROUP'S REPORT FOR DETAILS]

GENERAL PROVISIONS

THE MINIMUM FIRE RESISTANCE TEST CRITERIA OF EACH BUILDING ELEMENT* ARE SET OUT BELOW WITH REFERENCE TO APPENDIX B WHERE STANDARDS OF PERFORMANCE ARE SUMMARISED IN TABLES B1 AND B2 OF THE APPROVED DOCUMENT B VOLUME 2:

STRUCTURAL FRAME:	60 MINS (EXPOSED SURFACES) *[WHERE STRUCTURE IS ESSENTIAL FOR THE STABILITY OF A FIRE RESISTING WALL; REFER TO FIRE STRATEGY FLOOR PLAN]*
FLOORS:	60 MINS (FROM UNDERSIDE) *[DESIGN FOR VERTICAL ESCAPE IN ABEYANCE PENDING VARIATION]*
ROOF (ANY PART FORMING AN ESCAPE ROUTE):	30 MINS (FROM UNDERSIDE)
EXTERNAL WALLS (ANY PART A MIN. OF 1M FROM THE BOUNDARY):	60 MINS (FROM INSIDE) *[WHERE PERMITTED UNPROTECTED AREAS OF ELEVATIONS ARE EXCEEDED WHEN CALCULATED USING THE 'ENCLOSING RECTANGLES' METHOD AS DETAILED WITHIN BRE 187; REFER TO FIRE STRATEGY FLOOR PLAN]*
EXTERNAL WALLS (ANY PART BESIDE AN EXTERNAL ESCAPE ROUTE):	30 MINS (FROM INSIDE)
COMPARTMENT WALLS:	60 MINS (EACH SIDE SEPARATELY) *[ON 30.06.2025, ENVIROO, AS CLIENT, CONFIRMED THE THIS WAS ALSO ACCEPTABLE FOR INSURANCE PURPOSES]*
PROTECTED STAIRWAY:	30 MINS (EACH SIDE SEPARATELY) *[DESIGN FOR VERTICAL ESCAPE IN ABEYANCE PENDING VARIATION]*
PROTECTED CORRIDOR:	30 MINS (EACH SIDE SEPARATELY)
SUBDIVISION OF CORRIDOR:	30 MINS (EACH SIDE SEPARATELY)
CONSTRUCTION THAT ENCLOSES PLACES OF SPECIAL FIRE HAZARD	30 MINS (EACH SIDE SEPARATELY)
CAVITY BARRIER:	30 MINS (EACH SIDE SEPARATELY)
CEILING	30 MINS (FROM UNDERSIDE)

*THE ABOVE ASSESSMENT FOR EACH ELEMENT HAS BEEN MADE ON THE UNDERSTANDING THAT THE BUILDING IS WITHOUT A SPRINKLER SYSTEM

THE MINIMUM FIRE RESISTANCE TEST CRITERIA FOR FIRE DOORS ARE SET OUT BELOW WITH REFERENCE TO APPENDIX C AND STANDARDS OF PERFORMANCE ARE SUMMARISED IN TABLE C1 OF THE APPROVED DOCUMENT B:

IN A COMPARTMENT WALL:	SAME AS THE WALL IN WHICH IT IS FITTED WITH RESTRICTED SMOKE LEAKAGE
FORMING PART OF THE ENCLOSURE TO A PROTECTED STAIRWAY:	FD 30 S
FORMING PART OF THE ENCLOSURE TO A PROTECTED CORRIDOR:	FD 30 S
SUB-DIVIDING CORRIDORS CONNECTING ALTERNATIVE EXITS:	FD 20 S
FORMING PART OF THE ENCLOSURE TO A PLACE OF SPECIAL FIRE HAZARD:	FD 30

PLEASE REFER TO GA PLANS FOR LOCATIONS OF FIRE DOORS AND FIRE RESISTING CONSTRUCTION.

IN GENERAL, DOORS ON ESCAPE ROUTES SHOULD EITHER NOT BE FITTED WITH LOCK, LATCH OR BOLT FASTENINGS, OR THEY SHOULD BE FITTED WITH SIMPLE FASTENINGS THAT CAN BE READILY OPERATED FROM THE SIDE APPROACHED BY PEOPLE MAKING AN ESCAPE.

ROLLING SHUTTERS SHOULD BE CAPABLE OF MANUAL OPENING AND CLOSING FOR FIREFIGHTING PURPOSES (SEE SECTION 17). ROLLING SHUTTERS ACROSS A MEANS OF ESCAPE SHOULD ONLY BE RELEASED BY A HEAT SENSOR, SUCH AS A FUSIBLE LINK OR ELECTRIC HEAT DETECTOR, IN THE IMMEDIATE VICINITY OF THE DOOR. UNLESS A SHUTTER IS ALSO INTENDED TO PARTIALLY DESCEND AS PART OF A BOUNDARY TO A SMOKE RESERVOIR, SHUTTERS ACROSS A MEANS OF ESCAPE SHOULD NOT BE CLOSED BY SMOKE DETECTORS OR A FIRE ALARM SYSTEM. REFER TO M&E CONSULTANT'S DRAWINGS AND DOCUMENTATION FOR DETAILS ON THE SECURITY MECHANISM OVERRIDE FOR DOORS OPERATED BY CODE OR COMBINATION KEYPAD, SWIPE OR PROXIMITY CARD, BIOMETRIC DATA, ETC.
[DETAILED DESIGN OF ELECTRONIC EMERGENCY OVERRIDES BY ROLLER SHUTTER DOOR SUB-CONTRACTOR TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

ALL ELECTRICALLY POWERED LOCKS SHOULD RETURN TO THE UNLOCKED POSITIONS UNDER THE FOLLOWING SITUATIONS: OPERATION OF FIRE ALARM SYSTEM; ON LOSS OF POWER OR SYSTEM ERROR; IF THE SECURITY MECHANISM OVERRIDE IS ACTIVATED.

SOME FINAL EXIT DOORS FEATURE SECURITY LOCK THAT ARE USED ONLY WHEN THE BUILDING IS EMPTY. SUCH LOCKS MAY BE APPROPRIATE, BUT MANAGEMENT PROCEDURES MUST EMPHASISE THEIR SAFE USE.

ALL FIRE DOORS SHOULD BE MARKED WITH APPROPRIATE FIRE SAFETY SIGN COMPLYING WITH BS 5499-5:2002 ACCORDING TO WHETHER THE DOOR IS: TO BE KEPT CLOSED WHEN NOT IN USE (FIRE DOOR KEEP SHUT); TO BE KEPT LOCKED WHEN NOT IN USE (FIRE DOOR KEEP LOCKED SHUT); OR HELD OPEN BY AUTOMATIC RELEASE MECHANISM OR FREE SWING DEVICE (AUTOMATIC FIRE DOOR KEEP CLEAR).

HARDWARE USED ON FIRE DOORS TO COMPLY WITH GUIDANCE PROVIDED IN APPROVED DOCUMENT B VOL 2 AND BY THE HARDWARE FOR FIRE AND ESCAPE DOORS PUBLISHED BY THE BUILDER'S HARDWARE INDUSTRY FEDERATION AND GUILD OF ARCHITECTURAL IRONMONGERS.

DOORS ARE GENERALLY HUNG TO OPEN IN THE DIRECTION OF ESCAPE WHEREVER REASONABLY PRACTICABLE. WHERE THIS IS NOT THE CASE, IT IS EXPECTED THAT LESS THAN 60 PERSONS MIGHT USE THE DOOR IN THE EVENT OF A FIRE.

DOORS SHOULD CONTAIN VISION PANELS WHERE THEY ON ESCAPE ROUTES AND DIVIDE CORRIDORS.

ESCAPE ROUTES ARE TO HAVE A MINIMUM CLEAR HEADROOM OF 2M. ESCAPE ROUTE FLOOR FINISHES SHOULD MINIMISE THEIR SLIPPERINESS WHEN WET. THE WIDTH OF A FINAL EXIT SHOULD BE AT LEAST THE SAME AS THE MINIMUM REQUIRED WIDTH OF THE ESCAPE ROUTE IT SERVES. THE BUILDING SHOULD PROVIDE DIRECT ACCESS TO A STREET OR OPEN SPACE VIA A WELL-DEFINED AND SUITABLY GUARDED ROUTE, ALLOWING PEOPLE TO QUICKLY EVACUATE THE AREA IN ACCORDANCE WITH SAFETY REQUIREMENTS.

REFER TO M&E CONSULTANT'S DRAWINGS AND DOCUMENTATION FOR DETAILS ON THE EMERGENCY LIGHTING. ALL ESCAPE ROUTES SHOULD HAVE ADEQUATE ARTIFICIAL LIGHTING. IF THE MAINS ELECTRICITY POWER SUPPLY FAILS, ESCAPE LIGHTING SHOULD ILLUMINATE THE ROUTES LISTED TABLE 5.1 OF THE APPROVED DOCUMENT B VOL.2. ESCAPE LIGHTING SHOULD CONFORM TO BS 5266-1.
[DETAILED DESIGN OF EMERGENCY LIGHTING BY M&E CONSULTANT TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

REFER TO M&E CONSULTANT'S DRAWINGS AND DOCUMENTATION FOR DETAILS ON THE EXIT SIGNS. EVERY DOORWAY OR OTHER EXIT PROVIDING ACCESS TO A MEANS OF ESCAPE, OTHER THAN EXITS IN ORDINARY USE (E.G. MAIN ENTRANCES), SHOULD BE DISTINCTIVELY AND CONSPICUOUSLY MARKED BY AN EXIT SIGN IN ACCORDANCE WITH BS ISO 3864-1 AND BS 5499-4.
[DETAILED DESIGN OF EXIT SIGNS BY M&E CONSULTANT TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

ASSEMBLY POINT LOCATED AT THE TIME OF THIS ISSUE IS TO THE SERVICE YARD, WITH FINAL LOCATIONS TO BE CONFIRMED BY CLIENT/FIRE RISK ASSESSOR.
[CLIENT/FIRE RISK ASSESSOR TO CONFIRM FINAL LOCATIONS OF ASSEMBLY POINTS]

CLASSIFICATION OF LININGS:

THE SURFACE LININGS OF WALLS AND CEILINGS SHOULD MEET THE CLASSIFICATIONS IN TABLE 6.1 OF THE APPROVED DOCUMENT B VOL. 2:

SMALL ROOMS OF MAXIMUM INTERNAL FLOOR AREA OF 30M2	D-S3, D2
OTHER ROOMS AND CIRCULATION SPACES WITHIN A DWELLING	C-S3, D2
OTHER CIRCULATION SPACES (COMMON AREAS)	B-S3, D2

THE NEED FOR CAVITY BARRIERS IN CONCEALED FLOOR OR ROOF SPACES CAN BE REDUCED BY INSTALLING A FIRE RESISTING CEILING (MINIMUM EI 30) BELOW THE CAVITY, COMPLYING WITH DIAGRAM 9.3 OF THE APPROVED DOCUMENT B VOL. 2.

WHERE INSULATING CORE PANELS ARE USED INTERNALLY IN HIGH FIRE RISK AREAS, SUCH AS KITCHENS, PLACES OF SPECIAL FIRE HAZARD, OR IN PROXIMITY TO WHERE HOT WORKS OCCUR, ONLY CLASS A1 CORED PANELS SHOULD BE USED.
[ON 28.08.2025, ENDEAVOUR GROUP, AS FIRE CONSULTANT, DETAILED 'PLACES OF SPECIAL FIRE HAZARD ' AS BEING TRANSFORMERS/HV SWITCH ROOM, LV SWITCH ROOM, GOODS OUT/FORKLIFT TRUCK CHARGING, WORKSHOP AND STORES, STEAM GENERATOR, NITROGEN GENERATOR SKID CLEANER'S STORE. ON 29.08.2025, ENVIROO AND FITCHNER, AS CLIENT AND AGENT, CONFIRMED THAT THIS ASSESSMENT WAS ACCURATE AND THAT THE KITCHENETTE AND CANTEEN DO NOT CONTAIN COOKING FACILITIES AND SO ARE NOT 'PLACES OF SPECIAL FIRE HAZARD ']
[DETAILED DESIGN OF FIRE RESISTANT ENCLOSURES TO THESE AREAS BY SPECIALIST SUB-CONTRACTOR TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

LOADBEARING ELEMENTS OF STRUCTURE

ELEMENTS OF STRUCTURE SUCH AS STRUCTURAL FRAMES, BEAMS, COLUMNS, LOADBEARING WALLS SHOULD HAVE, AS A MINIMUM, THE FIRE RESISTANCE GIVEN IN APPENDIX B, TABLE B1 OF THE APPROVED DOCUMENT B VOL. 2. APPENDIX B INCLUDES PROVISIONS TO ENSURE THAT WHERE ONE ELEMENT OF STRUCTURE SUPPORTS OR STABILISES ANOTHER ELEMENT OF STRUCTURE, THE SUPPORTING ELEMENT HAS NO LESS FIRE RESISTANCE THAN THE OTHER ELEMENT.

ANY STRUCTURAL ELEMENTS THAT ARE ESSENTIAL FOR THE STABILITY OF AN EXTERNAL OR COMPARTMENT WALL THAT NEEDS TO BE FIRE RESISTING (E.G. TO ACHIEVE COMPARTMENTATION OR FOR THE PURPOSES OF PREVENTING FIRE SPREAD BETWEEN BUILDINGS), WOULD NOT BE EXCLUDED FROM THE DEFINITION OF ELEMENT OF STRUCTURE UNDER SECTION 7.3 OF THE APPROVED DOCUMENT B VOL. 2, AND WILL REQUIRE FIRE RESISTANCE AS STATED IN TABLES B1 AND B2 OF THE APPROVED DOCUMENT B VOLUME 2 (SEE PREVIOUS NOTES).
[RELEVANT ELEMENTS OF STRUCTURE AS HIGHLIGHTED ABOVE, TO BE DETERMINED BY CAUNTON ENGINEERING, AS THE STEELWORK DESIGNER, AND SUBSEQUENTLY CONFIRMED BY SHAWTON ENGINEERING LTD, AS THE PRINCIPAL CONTRACTOR. DETAILED DESIGN OF INTUMESCENT PAINT TO THESE AREAS BY SPECIALIST SUB-CONTRACTOR TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

COMPARTMENTATION

PARTS OF A BUILDING OCCUPIED MAINLY FOR DIFFERENT PURPOSES SHOULD BE SEPARATED FROM ONE ANOTHER BY COMPARTMENT WALLS AND/OR COMPARTMENT FLOORS. COMPARTMENTATION IS NOT NEEDED IF ONE OF THE DIFFERENT PURPOSES IS ANCILLARY TO THE OTHER. FIRE RESISTANCE SHOULD BE CONTINUOUS AT THE JOIN BETWEEN ELEMENTS FORMING A COMPARTMENT, AND ANY OPENINGS BETWEEN TWO COMPARTMENTS SHOULD NOT REDUCE THE FIRE RESISTANCE.

ALL COMPARTMENT WALLS AND COMPARTMENT FLOORS SHOULD ACHIEVE: A COMPLETE BARRIER TO FIRE BETWEEN THE COMPARTMENTS THEY SEPARATE AND HAVE THE APPROPRIATE FIRE RESISTANCE, AS GIVEN IN APPENDIX B, TABLE B3 AND B4 OF THE APPROVED DOCUMENT B VOL. 2.

ALL WALLS COMMON TO TWO OR MORE BUILDINGS SHOULD RUN THE FULL HEIGHT OF THE BUILDING IN A CONTINUOUS VERTICAL PLANE AND BE CONTINUED THROUGH ANY ROOF SPACE TO THE UNDERSIDE OF THE ROOF.

TIMBER BEAMS, JOISTS, PURLINS AND RAFTERS MAY BE BUILT INTO OR CARRIED THROUGH A MASONRY OR CONCRETE COMPARTMENT WALL IF THE OPENINGS FOR THEM ARE AS SMALL AS PRACTICABLE AND FIRE-STOPPED. IF TRUSSED RAFTERS BRIDGE THE WALL, FAILURE OF THE TRUSS DUE TO A FIRE IN ONE COMPARTMENT SHOULD NOT CAUSE FAILURE OF THE TRUSS IN ANOTHER COMPARTMENT.

WHERE SERVICES COULD PROVIDE A SOURCE OF IGNITION, THE RISK OF FIRE DEVELOPING AND SPREADING INTO ADJACENT COMPARTMENTS SHOULD BE CONTROLLED.

AT THE JUNCTION WITH ANOTHER COMPARTMENT WALL OR AN EXTERNAL WALL, THE FIRE RESISTANCE OF THE COMPARTMENTATION SHOULD BE MAINTAINED. FIRE-STOPPING THAT MEETS THE PROVISIONS IN PARAGRAPHS 10.24 TO 10.29 OF THE APPROVED DOCUMENT B VOL. 2 SHOULD BE PROVIDED.

A COMPARTMENT WALL SHOULD MEET THE UNDERSIDE OF THE ROOF COVERING OR DECK, WITH FIRE-STOPPING TO MAINTAIN THE CONTINUITY OF FIRE RESISTANCE AND BE CONTINUED ACROSS ANY EAVES.

TO REDUCE THE RISK OF FIRE SPREADING OVER THE ROOF FROM ONE COMPARTMENT TO ANOTHER, A 1500MM WIDE ZONE OF THE ROOF, EITHER SIDE OF THE WALL, SHOULD HAVE A COVERING CLASSIFIED AS BROOF(T4), ON A SUBSTRATE OR DECK OF A MATERIAL RATED CLASS A2-S3, D2 OR BETTER, AS SET OUT IN DIAGRAM 8.2A OF APPROVED DOCUMENT B VOL. 2.

DOUBLE-SKINNED INSULATED ROOF SHEETING SHOULD INCORPORATE A BAND OF MATERIAL RATED CLASS A2-S3, D2 OR BETTER, A MINIMUM OF 300MM IN WIDTH, CENTRED OVER THE WALL.

OPENINGS IN COMPARTMENT WALLS OR FLOORS SHOULD BE RESTRICTED TO ESSENTIAL SERVICES ONLY, INCLUDING FIRE DOORSETS INSTALLED IN LINE WITH APPENDIX C, SERVICE ELEMENTS SUCH AS PIPES, VENTILATION DUCTS, CABLES, AND CHIMNEYS COMPLYING WITH SECTION 10, REFUSE CHUTES OF CLASS A1 CONSTRUCTION, ATRIA DESIGNED IN ACCORDANCE WITH ANNEXES B AND C OF BS 9999, AND PROTECTED SHAFTS THAT MEET THE RELEVANT REQUIREMENTS.

CAVITIES

IF THE FIRE-RESISTING CONSTRUCTION OF A PROTECTED ESCAPE ROUTE DOES NOT EXTEND TO FULL STOREY HEIGHT OR TO THE UNDERSIDE OF THE ROOF AT THE TOP STOREY, ADDITIONAL FIRE PRECAUTIONS ARE REQUIRED. IN SUCH CASES, CAVITIES ABOVE OR BELOW MUST BE FITTED WITH CAVITY BARRIERS OR, IF ABOVE, ENCLOSED BENEATH BY A FIRE-RESISTING CEILING WITH A MINIMUM EI 30 RATING.
[DETAILED DESIGN OF FIRE RESISTING ENCLOSURES BY SPECIALIST SUBCONTRACTOR TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

PROTECTION OF OPENINGS AND FIRE-STOPPING

THE PERFORMANCE OF A FIRE-SEPARATING ELEMENT SHOULD NOT BE IMPAIRED. EVERY JOINT, IMPERFECT FIT AND OPENING FOR SERVICES SHOULD BE SEALED WITH FIRE RESISTING PRODUCTS TO MAINTAIN THE FIRE RESISTANCE OF THAT BUILDING ELEMENT IN STRICT ACCORDANCE WITH SECTION 10 OF THE APPROVED DOCUMENT B VOL.2.
[DETAILED DESIGN OF FIRE STOPPING OF M&E BY SPECIALIST SUBCONTRACTOR AND IN CONJUNCTION WITH M&E CONSULTANT TO COMPLY WITH APPROVED DOCUMENT B VOLUME 2]

RESISTING FIRE SPREAD OVER EXTERNAL WALLS

AS THE BUILDINGS ARE LESS THAN 18M AND DESIGNED TO BE MORE THAN 1000MM FROM THE RELEVANT BOUNDARY, THERE ARE NO PROVISIONS REQUIRED FOR REACTION TO FIRE PERFORMANCE OF EXTERNAL SURFACES OF WALLS WHEN REFERENCING TABLE 12.1 OF APPROVED DOCUMENT B VOLUME 2.

RESISTING FIRE SPREAD FROM ONE BUILDING TO ANOTHER

THE BUILDINGS ARE OPERATED BY THE SAME ORGANISATION AND DO NOT FALL WITHIN THE SPECIFIED PURPOSE GROUPS 1, 2 OR 5, SO THE NOTIONAL BOUNDARY REQUIREMENT DOES NOT NECESSARILY APPLY AS THE RELEVANT BOUNDARY WHEN REFERENCING SECTION 13 OF APPROVED DOCUMENT B VOLUME 2.

PARTS OF AN EXTERNAL WALL WITH LESS FIRE RESISTANCE THAN THE APPROPRIATE AMOUNT GIVEN IN APPENDIX B, TABLE B2, OF APPROVED DOCUMENT B VOLUME 2. ARE CLASSIFIED AS UNPROTECTED AREAS FOR THE PURPOSES OF THIS EXERCISE.

THE PROPOSED EXTERNAL SURFACES ARE CLASSIFIED AS CLASS B-S1,D0 OR BETTER, WHICH EXCEEDS THE MINIMUM REQUIREMENT OF CLASS B-S3,D2 AS OUTLINED IN PARAGRAPH 13.7 OF APPROVED DOCUMENT B, VOLUME 2. THEREFORE, THE REGULATION IS SATISFIED, AND NO PART OF THE EXTERNAL WALL SURFACE IS CONSIDERED AN UNPROTECTED AREA, ASSUMING THE FIRE RESISTANCE IS ACHIEVED (SEE ABOVE).

AS THE EXTERNAL WALL OF THE GOODS-IN/STORAGE BUILDING CANNOT BE WHOLLY UNPROTECTED, THE RAFTER MEMBERS OF THE FRAME, AS WELL AS THE COLUMN MEMBERS, NEED TO BE FIRE PROTECTED IN ACCORDANCE WITH THE DESIGN METHOD AS SET OUT IN SCI PUBLICATION P313.

THE TWO SIMPLE METHODS FOR CALCULATING THE ACCEPTABLE AMOUNT OF UNPROTECTED AREA IN AN EXTERNAL WALL WHEN REFERENCING SECTION 13 OF APPROVED DOCUMENT B VOLUME 2, ARE NOT ACCEPTABLE FOR A BUILDING WHICH EXCEEDS 10M IN HEIGHT AND FOR INDUSTRIAL USE. BRE 187 HAS THEREFORE BEEN USED AS SUGGESTED IN PARAGRAPH 13.17 OF APPROVED DOCUMENT B VOLUME 2 TO CALCULATE THE PERMITTED UNPROTECTED AREAS AS FOLLOWS:

PROCESS BUILDING

NORTH ELEVATION:	30.0M/25.5M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
100% PERMITTED UNPROTECTED BASED ON	[1]35.1M FROM RELEVANT BOUNDARY *[[1]BASED ON THE PRINCIPLES OF THE ADVICE OBTAINED FROM BUILDING CONTROL, THE DISTANCE FROM THE CENTRE OF MARSH LANE TO THE NORTHERN PERIMETER OF THE SITE HAS BEEN TAKEN AS THE RELEVANT BOUNDARY, SINCE DEVELOPMENT WITHIN THE INTERVENING CULVERT IS CONSIDERED IMPROBABLE]*
EAST ELEVATION:	27.5M/15.5M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
100% PERMITTED UNPROTECTED BASED ON	35.3M/19.5M FROM RELEVANT BOUNDARY
SOUTH ELEVATION:	30.0M/25.5M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
100% PERMITTED UNPROTECTED BASED ON	[2]39.5M FROM RELEVANT BOUNDARY *[[2]ON 07.07.2025, SIMON THOMAS OF SOCOTEC BUILDING CONTROL CONFIRMED THAT A DISTANCE OF APPROXIMATELY 40M, MEASURED TO THE CENTRE OF THE ROAD (ACROSS THE BRIDLEWAY AND THE LAND TO THE SOUTH), WOULD BE ACCEPTABLE]*
WEST ELEVATION:	25.5M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
100% PERMITTED UNPROTECTED BASED ON	[3]26.3M FROM RELEVANT BOUNDARY *[[3]ON 07.07.2025, SIMON THOMAS OF SOCOTEC BUILDING CONTROL CONFIRMED THAT, AS THE BUILDINGS ARE OPERATED BY THE SAME ORGANISATION, NO NOTIONAL BOUNDARY APPLIES AND THE DISTANCE HAS THEREFORE BEEN MEASURED TO THE SITE BOUNDARY.]*

STORAGE BUILDING

NORTH ELEVATION:	12.0M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
[4]50% PERMITTED UNPROTECTED BASED ON	9.4M FROM RELEVANT BOUNDARY 60 MINS FIRE RESISTANCE REQUIRED TO 50% OF EXTERNAL WALLS AND ALL SUPPORTING ELEMENTS OF STRUCTURE *[[4]FIRE CONSULTANT TO CONFIRM WITH BUILDING CONTROL WHETHER THE HELIOS SUPPRESSION SYSTEM MAY BE CONSIDERED FOR EXTERNAL FIRE SPREAD; PLEASE REFER TO ENDEAVOUR GROUP'S REPORT]*
EAST ELEVATION:	18.5M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
100% PERMITTED UNPROTECTED BASED ON	[5]186.5M FROM RELEVANT BOUNDARY *[[5]ON 07.07.2025, SIMON THOMAS OF SOCOTEC BUILDING CONTROL CONFIRMED THAT, AS THE BUILDINGS ARE OPERATED BY THE SAME ORGANISATION, NO NOTIONAL BOUNDARY APPLIES AND THE DISTANCE HAS THEREFORE BEEN MEASURED TO THE SITE BOUNDARY.]*
SOUTH ELEVATION:	14.5M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
100% PERMITTED UNPROTECTED BASED ON	[6]39.5M FROM RELEVANT BOUNDARY *[[6]ON 07.07.2025, SIMON THOMAS OF SOCOTEC BUILDING CONTROL CONFIRMED THAT A DISTANCE OF APPROXIMATELY 40M, MEASURED TO THE CENTRE OF THE ROAD (ACROSS THE BRIDLEWAY AND THE LAND TO THE SOUTH), WOULD BE ACCEPTABLE]*
WEST ELEVATION:	15.5M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
[7]50% PERMITTED UNPROTECTED BASED ON	11.8M FROM RELEVANT BOUNDARY 60 MINS FIRE RESISTANCE REQUIRED TO 50% OF EXTERNAL WALLS AND ALL SUPPORTING ELEMENTS OF STRUCTURE *[[7]FIRE CONSULTANT TO CONFIRM WITH BUILDING CONTROL WHETHER THE HELIOS SUPPRESSION SYSTEM MAY BE CONSIDERED FOR EXTERNAL FIRE SPREAD; PLEASE REFER TO ENDEAVOUR GROUP'S REPORT]*
NORTHWEST ELEVATION:	14.0M INTERPOLATED DISTANCE FROM BOUNDARY REQUIRED FOR WHOLE FAÇADE TO BE UNPROTECTED
[8]20% PERMITTED UNPROTECTED BASED ON	7.0M FROM RELEVANT BOUNDARY 60 MINS FIRE RESISTANCE REQUIRED TO 80% EXTERNAL WALLS AND ALL SUPPORTING ELEMENTS OF STRUCTURE *[[8]FIRE CONSULTANT TO CONFIRM WITH BUILDING CONTROL WHETHER THE HELIOS SUPPRESSION SYSTEM MAY BE CONSIDERED FOR EXTERNAL FIRE SPREAD; PLEASE REFER TO ENDEAVOUR GROUP'S REPORT]*

[ON 30.06.2025, ENVIROO, AS CLIENT, CONFIRMED THERE ARE NO ADDITIONAL FIRE PROTECTION REQUIREMENTS FOR INSURANCE PURPOSES IN TERMS OF RESISTING FIRE SPREAD FROM ONE BUILDING TO ANOTHER]

IT WOULD APPEAR FROM OUR CALCULATIONS THAT SEVERAL UNPROTECTED AREAS AS NOTED ABOVE EXCEED THE PERMITTED UNPROTECTED AREAS CALCULATED USING THE 'ENCLOSING RECTANGLES' METHOD AS DETAILED WITHIN BRE 187. OUR RECOMMENDATION WOULD THEREFORE BE TO INSTALL 60 MINUTE FIRE RESISTING CLADDING TO THESE ELEVATIONS; NOTE THAT ANY STRUCTURAL ELEMENTS THAT ARE ESSENTIAL FOR THE STABILITY OF THIS EXTERNAL WALL CLADDING WILL ALSO NEED TO ACHIEVE 60 MINUTES FIRE RESISTANCE AS STATED IN TABLES B1 AND B2 OF THE APPROVED DOCUMENT B VOLUME 2 (SEE PREVIOUS NOTES).

RESISTING FIRE SPREAD OVER ROOF COVERINGS

THE LIMITATIONS ON THE ROOF COVERING, WITH REFERENCE TO TABLE 14.1 OF THE APPROVED DOCUMENT B VOL.2, IS BROOF(T4) AS ALL ROOF COVERINGS ON THIS BUILDING ARE LESS THAN 6M FROM ANY POINT ON A RELEVANT BOUNDARY. BROOF(T4) UNDER BS EN 13501-5 CLASSIFICATION'S TRANSPOSITION TO BS 476-3 CLASSIFICATION IS AA, AB, OR AC.

ACCESS AND FACILITIES FOR THE FIRE SERVICE

EVERY ELEVATION TO WHICH VEHICLE ACCESS IS PROVIDED HAS SUITABLE DOOR(S), NOT LESS THAN 750MM WIDE, GIVING ACCESS TO THE INTERIOR OF THE BUILDING.

EACH BUILDING REQUIRES ACCESS TO A FIRE HYDRANT AND SHOULD BE CLEARLY INDICATED BY A PLATE, FIXED NEARBY IN A CONSPICUOUS POSITION, IN ACCORDANCE WITH BS 3251.
[DETAILED DESIGN AND PROVISION OF FIRE HYDRANTS AND/OR TANKS TO THE SITE TO BE CONFIRMED BY M&E CONSULTANT/SPECIALIST SUB-CONTRACTOR TO COMPLY WITH APPROVED DOCUMENT B VOLUME 1 AND IN STRICT ACCORDANCE WITH THE LOCAL FIRE AUTHORITIES' REQUIREMENTS]

Rev	Amendments	Rev'd By	Date
P04	Revised in Accordance with Fire Consultant Comments and BS:9999	JW	01.09.25
P03	Revised In Accordance with Plan Check Report	JW	20.08.25
P02	Issued for Information	JW	09.07.25
P01	First issue for information	JW	23.06.25

Client: enviroo

Project: Enviroo - Plastic Recycling Centre Ellesmere Port

Title: GA - Proposed Fire Strategy

Project / Originator / Functional Breakdown / Spatial Breakdown / Form / Discipline / Number
250064 -WDK- 01 -XX- D - A - 14000

Internal Project Reference: 250064

Suitability | Suitable For: S2 - Suitable for Information

Scale: A0 @ 1:200 — Created: 21.05.25 — Revision: P04

Project Lead: J.B — Drawn: JW — Checked: CP — Reviewed: JB — Approved for Issue: JB

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Appendix B – Fire Detection and Suppression System Specifications

Helios Fire Systems Ltd
Suite 2.09 Blackbox
Beech Lane
Wilmslow
Cheshire
SK9 5ER

Project: Enviroo Ellesmere port plastics recycling site fire protection
Helios Fire Systems A.T.F.S. automatic targeted fire suppression system prepared to be controlled by PYROsmart early warning fire detection IR camera system for temperature surveillance and fire protection. 4no active zones in the container protecting main wash and extrusion plant plus main bale storage building.

Extinguishing Areas: 4 zone extinguishing areas as set out in the design plan.
Pump System: Standby and Duty 3 phase pumps
Flow Rate: 1500L/min
Extinguishing time: 1 hours (Single turret use)
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.
Helios A.T.F.S. Fully automatic turret firefighting system

4	**0010**	**Helios ATFS Turret (***1500 L/min @ 12 bar)*
		Technical Data: ▪ Body: corrosion resistant light alloy, RAL3000 paint covering, maintenance free deep groove ball bearings for rotation and vertical movement. ▪ Drive: direct current electric motors, worm drive ▪ Rotation (Auto): Max 359° ▪ Elevation: -120° to +80° ▪ Flange Connection: DN50, Vertical. ▪ Operating Power: 24 VDC ▪ Nozzle type: O stream nozzle for water, non-air aspirated foam and CAFS ▪ Nozzle Setting: 1900 L/min at 14 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. ▪ Weight: 15Kg ▪ Dimensions: (LxWxH) 510 x 210 x 302 mm
4	**0020**	**Flange for Helios ATFS turret DN50 / DN100**
4	**0030**	**Mounting console for Helios ATFS Turret**
		▪ 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
4	**0040**	**Control Distribution for Helios ATFS Turret**
		▪ 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
4	**0045**	**Joystick remote control for 1 ATFS turret**
		▪ The remote control is in a housing close to each camera system for quick access. ▪ Clear arrangement of control elements as a result of the arrangement maloperation has to 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 ▪ Cable Length: 10m 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
4	**111**	**Control distributor for joystick remote control for 1 ATFS 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 ▪ 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.
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 6m ▪ Dead weight: 5 Tonnes ▪ Payload on the crane hook 5 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 angles 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 incl 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.
1	**0070**	**Foam Agent Tank 500L**

		▪ **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
2	**0080**	**UPA Booster pump 3 phase electric 80 amp**
		Booster pump including control junction box and onsite implementing. ▪ Power: 1500L/min ▪ Pressure: 12 bars Technical details in combination with the water tank must be checked before start of assembly. Pump is designed to be capable of activating two turrets at a time
4	**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
1	**0110**	**Pressure maintaining pump**
		Use ▪ 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.
1	**0120**	**Wetting agent concentrate 1000 L Container (Novacold)**

		▪ Additive to be used at max 1% to volume of water. ▪ Internal approvals EN1568 Part 3 ▪ Freezing point -15°
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.
1	**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
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
1	**0160**	**Extinguishing system control center**
		▪ Control unit for pump ▪ For 4 extinguishing zones ▪ Including approx 40 control inputs and 20 control outputs ▪ including all couplings and ring buss modules ▪ 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.
130	**0175**	**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

80	**0179**	**Piping DN25 complete, RAL3000**
		▪ Welded threaded steel pipe, RAL 3000 coated on the outside. ▪ Including shipping mounting parts fitted and materials ▪ System: conventional threaded screw connections
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.
1	**200**	**Approval**
1	**210**	**Startup and commissioning**
1	**220**	**Project Management**
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.
1	**235**	**Documentation**
		System documentation
1	**200**	**Services not included**
		▪ Works outside of normal working hours (Overtime) ▪ Construction of walls or ceilings and any opening of brick ▪ Required scaffold or lifting platforms ▪ Execution of any electrical supply to the system ▪ Welding and mounting of possibly needed special constructions ▪ Earthing and lighting protection works ▪ clarification of issues with the authority's insurance fire departments
		Delivery
		Transport to be charged at cost prior to delivery (Cost to be confirmed and agreed)

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 ATFS system. All cabling/wiring between sub distribution container, central control room, CIE and the system components is to be installed within the costs as detailed herein this quotation.
Installation:	Installation of the ATFS system will take place once all cabling and pipe bridge work is completed.
Commissioning and test operation:	Once the mounting has been completed, we will commission the system and prepare it for test operation. The commissioning operation will run for 4 weeks. For this, DSL or UMTS remote access is required. **Commissioning Detail:** ▪ Test camera view configuration ▪ Cable from camera position to ATFS network box ▪ Run System diagnostics. ▪ Programme Turrets to understand location to cameras ▪ Calibrate and laser line up the Primary fire pump to ensure balance and levels

	▪ Calibrate Hekatron system to ensure all sensors zones and detection loops are working perfectly and mark up each zone accordingly ▪ Individually set up each camera to scan designated areas as per preliminary plans and ensure optimum detection and positioning for ATFS turret system ▪ Test run each camera for operation and detection including hot spot tests and alarms ensuring ATFS Turret system hits exact defined target area ▪ Once individual dry tests have been completed a full system run will be started with all cameras reporting data and displayed in the office and full system extinguish is initiated. ▪ Ensure turret system is discharging at the correct rate of 12bar pressure and flow tests are confirmed at 1500 L/min ▪ Test firefighting additive pump system to ensure optimum and correct % dosing ▪ Pressure test all pipe work ▪ Test run all pipeline to ensure no leaks and all mechanical joints are sound ▪ Calibrate internal Inbal valves to ensure all hold pressure and leave the outlet pipeline dry ▪ Label up all equipment within the technical container to ensure any error codes match the corresponding equipment. ▪ Check and test the return loop system from tank to pump to ensure full operation without discharging into the detection zones ▪ Switch all zones to maintenance to ensure non-activation of extinguishing system ▪ Dry test each zone to ensure PYROsmart system ids sending correct co-ordinates ▪ 2no Wet test for each zone to ensure correct direction and flows. ▪ Audible and visual test carried out to ensure site is aware of potential activation ▪ 2 days of spot checks and random heat source test including false alarms and heat test throughout the site with accurate suppression being targeted with each alert. ▪ 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 and ensuring turrets target detected zones as per defined by site requirements and plans set out in the preliminary planning document. ▪ Training on the system will begin once all systems have been set up and shaken down. Training should take no more than 2 day to complete. A separate training plan will be provided this is within the costs of the system quoted herein
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 ATFS system. All cabling/wiring between sub distribution container, central control room, CIE and the system components is to be installed within costs quoted herein. This project is fully turnkey with no additional costs being charged for unless pre-agreed with the client before additional works are undertaken. These additional works may be working outside of normal working hours or weekend work as detailed in quote above.
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 2no 80amp, 1no 32amp 3-phase power supplies 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 included herein. Power supply and water tank to tank need to be supplied by client
Shipment:	Transport to be charged at cost prior to delivery (Cost to be confirmed and agreed)
Delivery time:	approx. 14 weeks from technically and commercially settled order

Validity:	30 days from date of proposal
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 Helios Fire Systems until payment is fully effected. Warranty: The warranty period is 12 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 automatic camera and suppression systems

Yours Sincerely

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PYROsmart®- Quotation A-P10899-1
Indoor waste storage and processing area for Enviroo Ellesmere Port.
PYROsmart® infrared based early warning fire detection system for monitoring temperature anomalies.
Title 10: PYROsmart® early warning fire detection for Plastics storage, washing and extruding process.
PYROsmart® early warning fire detection system

10.01	**4**	**PYROsmart® Basic 320 (***76.800 IR pixel, auto focus)*
		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	**4**	**Video** (*integrated fast lens video zoom camera)*
		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	**4**	**Scan:** *(Intelligent high-performance drive for pan-/tilt head to monitor large areas)*
		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	**4**	**abiroVISION® Panorama (server license)**
		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.
10.05	**4**	**PYROcal® option** *(integrated automatic calibration to guarantee accurate measuring.*

		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	**4**	**PYROsmart® junction box fibre optics**
		▪ 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	**4**	**PYROsmart® mounting model 1**	
			▪ material: galvanized steel ▪ made to specification ▪ model may differ from picture and vary according to required mounting angle

PYROsmart® network / supply center
NVZ-II

10.09	**2**	**Control cabinet NVZ -III**
		Stainless steel control cabinet; measurements approx. 800 x 600 x 220 mm mounted with the following top hat rail modules: ▪ equipped for 2 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
10.10	**2**	**Internal power-supply unit for control cabinet NVZ -II UPS**
		▪ 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	**4**	**NVZ- optical converter -option**
		▪ 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**	**Signaling and remote maintenance module (mobile network)**
		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	**4**	**PYROsmart® - *EXTING-pro*** Extinguishing software package for precise control of water turrets
		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	**2**	**Active extinguishing control for control cabinet**
		▪ Control of 1 water turret ▪ addition to control cabinet ▪ industrial PC with extended temperature range, top hat rail mounting ▪ Can bus compatible ▪ SMARTbox control

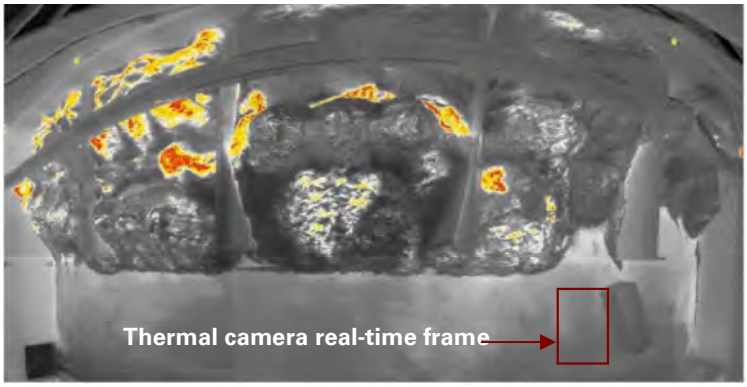
Title 30: Operating equipment and software features

Software packages

30.1	**1**	**Software package PS-Terminal® "Basis "**
		Basic version of the abiroVISION® - early warning fire detection software, for stationary PYROsmart® systems. ▪ **Easy operation** via **s**tandard 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**	**abiroVISION® PanoramaView option**
		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**	**Standard operation terminal**
		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 10Pro license ▪ set up charge for standard PS-Terminal software ▪ 2-year warranty

Title 40: Additional equipment, spare parts

40.4	**1**	**Drawings and documentation**
		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**	**Commissioning of the system on site**
		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	**25**	**Installation of full camera system**
		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.

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, re-commissioning 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	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.

Terms and conditions

Shipment	ex works, exclusive of customs charges
Delivery time	approx. 14 weeks from technically and commercially settled order
Validity	1 months from date of issue

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 Fire 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.