

Fire Prevention Plan Fornax (North) Ltd

High Temperature Thermal Treatment Facility

On land off Heighington Lane, Merchant Park, Newton Aycliffe

March 2025



Olive Compliance Ltd

Planet House, Northumbrian Way, Killingworth, Newcastle upon Tyne, NE12 6EF

admin@olivecompliance.com

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DRAWINGS

Drawing 007 Site Layout Plan - L046 -ASA -30 -01.00 -D -A -003001 _ (S4 -C040- HNA-ASA-30-VS.00-D-A-3001_(S2-T01)_Proposed Site Layout Plan

Drawing 004 Site Receptor Plan

Drawing 005 External Plan Layout

Drawing 019 External Hydrant Plan

Drawing 008 22242-BGL-XX-XX-DR-C-00210 P03-Site Drainage Plan

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FORNAX 006A - WAREHOUSE - FIRE DETECTION AND PREVENTION REV3

APPENDICIES

- Annex 1 AF3691 Merchant Park Detailed Fire Strategy Report (Issue 01)
- Annex 2 Document Sprinkler Performance Specification-V2

Annex 3 – Emergency Plan

Issue and Revision Record

Revision

V0.1 (Draft)	13/08/2024	OCL	Produced for EA Approval (Permit Application)
V2	10 August 25	H	Amendment for the Layout plan and size of Q areas.

Date Originator Description of Changes

Site Contacts and Emergency Information

Name	Contact
Fire Service Emergency	999
Fire Service (Local)	0345 305 8383 or 999
Police Emergency	999
Police (Local)	101
Northumbrian Water	0800 328 7648
Environment Agency	0800 80 70 60
Durham County Council	03000 26 0000
Health and Safety Executive	0300 003 1747
Total Recycling Services	01325 464713



1. Introduction

Fornax (Northeast Ltd) – (Fornax) has instructed Olive Compliance Limited (OCL) to prepare an application for a Bespoke Environmental Permit Application for their site at Merchant Park, Newton Aycliffe, County Durham.

The application is for bespoke permit which will allow the installation to accept, store and treat (via high temperature incineration) waste clinical and hazardous wastes. The total quantity of waste that can be stored and subsequently treated at the site shall be no more than 10,500 tonnes per year.

This plan is designed specifically around site activities. Site operations will primarily be the acceptance and treatment of clinical waste and hazardous wastes fuel will be sourced from NHS and commercial and industrial sources.

This document is primarily to document the onsite control measures in place to reduce the risk of fire occurring and manage the risk of fire should it occur and any resulting environmental impacts.

1.1 Fire Prevention Plan

This FPP has been prepared in order to mirror the contents of the EA guidance for FPP to allow for ease of assessment and for users of this document to readily locate the specific information and on-site provisions relating to each particular topic.

1.1.1 Fire Prevention Objectives

This FPP identifies measures to be employed to reduce the likelihood of fires at the site. In addition, the plan identifies measures to be employed in the event of a fire in order to limit the damage caused to the environment or human health.

As such, and in accordance with EA guidance, the objectives of this FPP are to:

- minimise the likelihood of a fire happening
- aim for a fire to be extinguished within 4 hours
- minimise the spread of fire within the site and to neighbouring sites

1.1.2 Exclusions

The EA guidance for FPP states that the guidance does not apply to:

- hazardous wastes
- dangerous substances (i.e. those under Control of Major Accident Hazard Regulations)
- combustible liquids



2. Types of Combustible Wastes

Within the permit the below combustible waste types are received on the site are

- Clinical Wastes(Contaminated)
- Mixed wastes(Contaminated)
- Plastics (Contaminated)
- Cardboard/Paper (Contaminated)
- Metals (Contaminated)
- Wood (Contaminated)
- Rubber & Tubing (Contaminated)

Section 9 of this document details the associated storage arrangements.

Details of other combustible, non-waste materials on site are detailed within Section 7.10 and their locations are added to the site plan.



3. Use of this document

This FPP forms part of the environmental management system for the site. It is prepared for use as a standalone document, such that all staff can easily refer to any information or operational requirements that relate to the prevention of fire or the procedures that are in place in the event of a fire.

The existence and location of the FPP is notified to all staff and will be readily accessible, in both hard and electronic copy, at all times, including during an incident. The plan and associated emergency contacts and site plan are stored in the site weighbridge/office (Emergency Pack).

All visitors and contractors to site will be given a Site Induction and a copy of the Site Rules which they will sign to confirm their understanding. The Site Induction will ensure that visitors and contractors know what they must do to prevent a fire occurring and what to do during a fire if one breaks out. The locations of the Emergency Pack will also be confirmed.



4. Training

All staff will be trained on the contents and requirements of the FPP (suitable to their role), and site inductions will include a summary of the FPP and notices of its location. A record of any training including any refresher or Toolbox talk will be recorded and signed off by all staff.

All staff are provided with information and training on fire prevention, protection requirements and action to be taken in the event of fire. New members of staff are given information or training on:

Procedures and their personal responsibilities to prevent and protect against outbreaks of fire.

- What action to take if they discover a fire;
- How to raise the alarm, the location of manual call points, and the procedure for contacting the Fire and Rescue Service and the EA;
- What action to take immediately on hearing the fire alarm;
- The location and safe use of portable or other fire extinguishing equipment;
- The location of escape routes from their place of work including those routes not used regularly for normal access and egress;
- Their responsibility to direct or escort visitors and contractors in their charge to escape routes (and in the case of disabled persons to the nearest useable escape route or refuge);
- The importance of keeping closed all fire doors to limit the spread of fire, heat or smoke;
- How to safely isolate or shutdown plant or equipment, where appropriate;
- The importance of good housekeeping in preventing the outbreak of fire and limiting its effects.
- Fire safety and emergency information for visitors and contractors will be provided at reception where they are required to sign-in.

4.1 Document Testing and Review

Quarterly exercises will be carried out to test how well the fire prevention plan works.

Exercises will be planned to test specific aspects of the fire prevention plan throughout the year to ensure effectiveness.

Such tests may take the form of physical drills, toolbox talks or desk-based assessments as relevant to the element of this FPP that is under test. The nature of each test, the results, and appropriate actions (including where no action is required) will be maintained for inspection by the EA, on request.

This fire prevention plan will be kept under regular review with monthly external audits conducted on fire prevention measures on site and review of compliance with this document.

This document will be revised if where necessary for example if:

- there is reason to suspect it no longer meets the objectives of the guidance
- the site has had a fire or identify a near miss of a fire
- changes in site activities
- the environment the site operates in changes, for example if a school or residential development is built nearby
- The EA ask the company to revise it due to some concern over the risk posed by site operations

Any revised document will be sent to the EA for approval.



5. The Site

Site Activities

The application is for a bespoke permit which will allow the installation to accept, store and treat (via high temperature incineration) waste clinical and hazardous wastes. The total quantity of waste that can be stored and subsequently treated at the site shall be no more than 10,500 tonnes per year.

Site Plans

Site Layout

The site layout, is shown on FORNAX 006A - WAREHOUSE - FIRE DETECTION AND PREVENTION REV3 (Site layout). the layout of buildings

- all permanent ignition sources on site and show they are a minimum of 6m away from combustible and flammable waste
- any areas where the operator is treating or storing combustible waste or combustible non-waste material
- all separation distances
- access points around the site perimeter to assist firefighting
- hydrants and water supplies
- areas of natural and unmade ground
- storage areas with pile dimensions and fire walls, including wastes stored in a building or containers
- the location of fixed plant and mobile plant when not in use
- the location of spill kits
- the quarantine areas

5.1 Operational Hours

The site operates according to the hours stated below;

• 24 hrs 365 days per year

5.2 Site Location and Receptors

The site (centred at NGR NZ2670622077) is located at:

On land off Heighington Lane, Merchant Park, Newton Aycliffe DL5 6UG

The site is principally bounded as detailed in Table 1.



Table 1 – Site Setting

Boundary	Description
North	Agricultural Land/ Golf Course to Northeast, Deciduous Trees
East	Industrial/Commercial,
South	Industrial/commercial, Demons Beck
West	Agricultural Land, Deciduous Trees

The site location and environmental site setting is shown on Drawings 001 and 002 shows the Permit Boundary.







6. Site Receptors

The closest residential receptor, residential housing at Newfields is located approximately 350m to the southeast of the site.

Sensitive receptors identified within this document are shown on Drawing 004.

Table 2 below details the sensitive receptors, distance from the site and contact details.

Table 2 – Sensitive I	Recep	otors
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Receptor	Distance	Receptor Assessment	Advice
Little Cubs Day Nursery	660m	Due to the proximity of site, there is risk of impact from site activities.	Staff to contact the nursey 01325312288 to advise staff of any incidents that may have any impact.
UTC South Durham	611m	Due to the proximity of site, there is risk of impact from site activities.	Staff to contact the school 01325430250 to advise staff of any incidents that may have any impact.
Locomotion One Clay Target Shooting Club	340m	Due to the proximity of site, there is risk of impact from site activities.	Staff to contact the club 07760283151 to advise staff of any incidents that may have any impact.
Glow Church	680m	Due to the proximity of site, there is risk of impact from site activities.	Staff to contact the church 08454505871 to advise staff of any incidents that may have any impact.
Moordale Park	880m	Due to the proximity of site, there is risk of impact from site activities.	Await further instruction from Emergency Services.
A1 (M) – Transport Link	1.42km	Due to the proximity of site, there is a small risk of impact from site activities. In the event of fire, it could be difficult to drive in due to short-term poor visibility from smoke and damage to vehicles from ash, which could result in short-term commercial impact and traffic	Await further instruction from Emergency Services. Contact Highways Agency 0300 123 5000 Police 999
		disruption.	-

Hitachi Rail	200m	Due to the proximity of site, there is a risk of impact from site activities. Dust, Nosie, and Fire Controls in place to prevent impact to the neighbouring businesses.	Staff to contact 01325 621 6531 to advise staff of any incidents that may have any impact.
		Constant boundary monitoring of noise and dust also identifies any possible emissions from site to allow the site to cease activities and undertake any remedial action.	
Heighington, Train- Transport Links	425m	Due to the proximity of site, there is risk of impact from site activities. In the event of fire, it could be difficult to drive in due to short-term poor visibility from smoke and damage to trains from ash, which could result in short-term commercial impact to businesses that use the railway.	Await further instruction from Emergency Services. Contact Northern Railway 03457484950 Police 999
Durham Animal Feeds	Adjacent on West Boundary	Due to the proximity of site, there is risk of impact from site activities.	Staff to contact 01388720411 to advise staff of any incidents that may have any impact.
INEOS Golf Club	North East of site	Due to the proximity of site, there is risk of impact from site activities.	Staff to contact 07854054286 to advise staff of any incidents that may have any impact.

Other receptors

None of the following receptors have been identified within 1km of the proposed permit boundary.

- National Nature Reserves;
- World Heritage Sites;
- Registered Parks and Gardens;



- Area of Outstanding Natural Beauty;
- Woodland Trust Sites; and
- National Forest.

European/International Sites

Searches on the Multi Agency Geographical Information for the Countryside (MAGIC)¹ website confirm there are no Sites of Special Scientific Interest (SSSI), a special area of conservation (SAC), Marine Conservation Zone within 1km of the site.

None of the following receptors have been identified within 1km of the proposed permit boundary.

- National Nature Reserves;
- World Heritage Sites;
- Registered Parks and Gardens;
- Area of Outstanding Natural Beauty;
- Woodland Trust Sites; and
- National Forest.

Major Roads and Transport Links

The site is accessed from Millennium Way from the A167.

The A1 (M) runs approximately 2km southeast of the site.

There is a rail link that runs 430m east of site, with Northern Railway, Heighington train station being situated 425m northeast of site.

There are no motorways within 1km of the site boundary.

Water courses

The Demon's Beck is situated 115m south of site.

The River Skerne is situated 1.86km east of site.

Flood Risk

Checks made on the Environment Agency Flood risk website has identified that the site no risk of flooding.

Air Quality

Checks conducted on Defra's AQMA mapping system (<u>AQMAs interactive map (defra.gov.uk</u>) and Durham County Council Website has evidenced the site is not in an air quality management zone





Prevailing Wind Direction

Using the Willy Weather application², meteorological forecast information is available for over 45000 British locations. The available data includes Met Office weather radar, satellite images and synoptic charts. The application also provides current conditions and warnings.

Upon review of historic wind data, the prevailing wind directions are predominately south easterly in respect of the site.

Given the prevailing wind, the receptors that could principally be affected by fire at the site would be the rural areas situated directly to the west north westerly of the site and would not affect highlighted residential areas or sensitive receptors.



Image 2 – Wind Direction Average 5-year data - Aycliffe

Weather monitoring is assessed throughout the day and formally recorded daily, as part of the daily site checks.



² <u>Aycliffe Wind Forecast, Durham DL5 6 - WillyWeather</u> accessed September 2024.

7. Managing Common Causes of Fire

7.1 Arson/Security

The site has a number of security measures in place to limit the likelihood of arson or vandalism listed below.

- Site is situated within a secure gated area, that you must enter via the gate house to be vetted and receive ID to be able to access.
- 2.4m palisade security fencing;
- Lockable site palisade entrance gates (2.4m);
- CCTV is installed around the site with external monitoring by the Operator and external Security Company.
- Inspection and maintenance procedures;
- Visitor sign in system; and
- 24hr Security monitoring.

Access to the site is via one entrance/exit. The site does not share the entrance any other company.

Visitors to the site must sign in and out via the visitors register located in the site office.

The site security system CCTV cameras cover all external and internal operational areas on site. CCTV cameras cover all operational waste storage areas. The CCTV cameras trigger an alert to the Operator and nominated personnel when movement identified. Security staff can assess on site activity to either identify any false alarms or carry out further investigation.

During operating hours there is a member of senior management on site at all times.

Perimeter inspection is undertaken on a daily basis and any repairs temporarily made good by the end of the working day. Arrangements are made to have permanent repairs, if required, completed within one week. Any defects and repairs are recorded.

Thermal imaging camera in the building will pick up any unusual heat signatures and send a text notification to the nominated personnel in the event of a tigger breach of 50 degrees Celsius. See Annex 3 for camera specification.

Out of hours access can be gained via the steel gates. Only the Senior Management, Security Team and nominated Key Holders have keys to allow entry to site.

7.2 Plant and Equipment

Plant and equipment are maintained in accordance with the manufacturer's recommendations and recorded on daily check sheets.

Plant and equipment are operated in accordance with the manufacturer's instruction manuals.

Induction training and refresher training is provided, to all persons engaged at the site, in the safe operation of plant and equipment relevant to their role.

Inspection of plant and equipment is undertaken on a daily basis to check for faults and ensure appropriate safeguards are in place. Designated forms for the checking and defect records for all vehicles and plant are completed and forwarded to the Operator for checking and review.

Regular cleaning is conducted on all operation plant. This is recorded when completed on plant inspection forms.



At the end of the working day, plant and equipment are stored 6m away from stock/containers of combustible materials (See Drawing 003).

In the event of a failure or suspected fault with an item of plant or piece of equipment, the relevant persons ensure that the equipment is shut-off in a safe manner and not used until the equipment can be repaired or replaced. Defects are reported to senior site management for appropriate action to be taken.

7.3 Electrical Faults

The electrics on-site are certified by a suitably qualified electrician.

Regular safety checks and daily site inspections are recorded in the site diary. Periodic inspections will be undertaken by a suitably qualified electrician on an annual basis.

Any potential ignition sources from suspected electrical faults should be isolated and an electrician should be contacted immediately.

The inspection frequency will be based on recommendations from the electrician or where a potential risk is identified via the daily site inspections.

PAT testing of portable equipment will be checked on a yearly basis.

7.4 Discarded Smoking Materials

Smoking is not permitted on site. There is a designated area outside of the entrance/exit of site for site operatives to smoke. This area is over 6m from any waste storage or treatment activities.

7.5 Hot Works

The company operates a permit to work system. No hot works are not generally undertaken.

In the event hot works are required, they are only undertaken by staff who are trained, and by contractors who have the relevant permit to work.

Works must be completed within 2 hours of the working day.

A fire watch is provided continuously during the works, including breaks, and one hour after completion. Once works are complete, they will be signed off by the Operator or Nominated person.

7.6 Industrial Heaters

Industrial heaters will not be used on site.

7.7 Hot Exhausts

Vehicles are turned off when not in use.

Flammable/combustible materials are stored in designated areas away from frequent vehicle movements (as far as is reasonably practicable).

A fire watch of all on-site plant and equipment (including, if appropriate, transport vehicles) will be undertaken for at least 30 minutes following use and at the end of every working day.



7.8 Ignition Sources

Ignition sources will be kept at least 6m from any combustible waste stock/containers or other potential on-site fire hazards (e.g. diesel storage, oils, chemicals).

Ignition sources such as hot works, smoking, electrical equipment, plant and equipment, heaters and exhausts are detailed within the above sections.

Ignition sources may only be located less than 6m from a potential fire hazard where suitable fire walls/breaks are in place between the ignition source and the combustible material. The 6m buffer zones that will apply, in this respect, across the site are shown in Drawing 003.

A DSEAR assessment has been carried out for the facility and Designated Atex zones for Carbon room and ammonia room raw materials storage have been designated. Specific rated Atex equipment is provided in these areas and installed by a suitably qualified person and certified.

Friction and static electricity can be created by transportation of chemicals therefore a anti-static plate and anti static clips.

Waste sampling area is undertaken within purpose built booth situated within the waste reception area, which is Atex zone 1 rated.

Fork Lift Trucks will be rated in accordance with the ATEX classifications of the zones where they are operating.

7.9 Batteries

Batteries are not readily accepted but if they are received on site they will be stored segregated into specific types and quarantined and transferred off site for onward disposal.

7.10 Leaks and Spillages of Oils and Fuels

Spillages and leakages of fuels and oils (either from on-site vehicles or where such material is accepted in error) are prevented through maintenance in accordance with the manufacturer's recommendations as recorded in the Environment Management System.

COSHH assessments are carried out by the Operator to inform site staff of the risks of materials on site and control measures required when handling. These are kept in the site office.

Where a delivery vehicle (i.e. not under the control of Fornax) is found to be leaking, that vehicle will be refused entry to site.

Storage areas for fuels and liquids are not located within the permitted area. All refuelling and any repair work will be carried out in a dedicated workshop off site with maintenance products stored securely in this area outside of the permitted site.

Any spillage/leak of hazardous materials (including oils/fuels) at the site shall be treated as an emergency and immediate action taken to absorb or contain it using spill kits provided (See Drawing 003). The absorbent will be cleaned up as soon as possible and disposed of, as hazardous waste, by a suitably licensed contractor.

Spillage procedure within the site EMS supports the management, staff training and treatment of spillages. A nonconformance report is completed with the appropriate actions taken recorded.



7.11 Build-up of Loose Combustible Waste, Dust and Fluff

Staff are to remain vigilant for loose material, dust or fluff and should clean up such material on identification, placing such material in the correctly designated storage stockpile. Daily site inspections and general housekeeping of the site is also undertaken in order to minimise the potential for the build-up of such materials.

Plant, conveyers and equipment are checked daily and cleaned weekly to reduce the risk of trapped debris which reduces the risk fire.

Good housekeeping is practiced on site, keeping site equipment and surfaces clean and clear access free for plant and staff movement on site.

7.12 Reactions between Wastes

All wastes arriving onsite will be checked in accordance with the waste acceptance criteria to ensure no materials of unknown composition are accepted at the site.

Waste oils and fluids collected from vehicles only through repairs or general maintenance are to be stored separately within the designated tanks/vessels.

Unpermitted wastes will be quarantined within the defined quarantined area or within the designated chemical type storage area where it will be marked as "Quarantined" (for example flammable liquid must be kept in flammable liquid store) if necessary and stored over 6 metres away from any waste stock/containers.

Weste is

7.13 Deposited Hot Loads

All wastes are assessed both at the time of the receipt of an enquiry and as the material arrives at site.

On arrival, checks are made to ensure that no hot loads or smouldering materials are accepted by the site.

The quarantine area (fire prevention) will be used in the event that any hot load is received, in error, by the site.

Appropriate action will be taken, either the Fire Service contacted, or the waste will be allowed to cool, or a fire extinguisher used to dose a small fire or smouldering if safe to do so.

7.14 Neighbouring Activities

Checks made on the Public Register show that there is 3 permitted facilities regulated by the EA detailed below.

PREFERE RESINS UK LIMITED, Newton Aycliffe Industrial Park, Thermoset Resins EPR/XP3635ET, Heighington Lane, Aycliffe Industrial Park, County Durham, DL5 6UE 0.6km

H W MARTIN WASTE LIMITED, Heighington H W R C, Heighington Lane, Newton Aycliffe, County Durham, DL5 6AP, 0.7 km from the site.

DURHAM COUNTY COUNCIL, Heighington Lane Waste Transfer Station, Heighington Lane, Aycliffe, County Durham, 0.8 km from the site.

It is not felt any of the above activities pose any risk to the site based on their location and infrastructure.



8. Prevent Self-Combustion

8.1 Manage storage time

Robust stock pre-acceptance, acceptance, tracking and management systems are in place such that no delivery is accepted at the site that would result in an exceedance of the permitted storage and/or processing capacity. All deliveries to the site are scheduled in advance of arrival on site. As deliveries are scheduled, it enables the site to ensure that there is sufficient storage capacity available and to comply with stockpile capacities.

8.1.1 Site Activities

The Installation will comprise of an on-site Hight Temperature Incinerator and transfer operation.

8.2 Non-Conforming Waste

If the waste is not as described or as expected from acceptane checks or should the waste not conform with the waste transfer note or Consignment Note, the site chemist and site manager is informed. The site chemist will assess the waste and decide whether it can be accepted. The waste must either be rejected or given the appropriate waste description, EWC code with the paperwork updated.

If the waste is deemed unacceptable under the permit or due to contamination the waste must be quarantined prior to removal off site or reloaded immediately. A waste rejection note must be completed at this stage and the customer contacted.

The EMS details the waste acceptance, validation, and rejection procedures. The below procedures below cover the waste acceptance and rejection process.

- Waste Acceptance Procedure
- Waste Rejection Procedure
- Waste Rejection Record

8.3 Monitor and control temperature

EA guidance on FPP states that where on-site storage is proposed for longer than three months, additional measures will be required in respect of stockpile monitoring and control.

In respect of additional controls, the site will use CCTV cameras and purposefully designed monitoring systems to comply with the Fire Detection and Sprinkler System.

8.3.1 Routine Daily Monitoring

During the day waste containers are visually monitored during the acceptance procedure and as part of the daily checks by site staff. Stockpile management is listed within the Daily Check sheet with all stockpiles of containers/barrels checked to ensure compliance with the storage arrangements detailed within this document.

Site staff are trained to detect signs of fire and hotspots, container expension, with the management of any signs of fire or hotspots carried out under the direction of the site manager.

Staff are to be vigilant for any signs of visual smoke or smouldering of wastes during the working day and should notify the site manager should they detect signs of fire.



Daily weather conditions and temperatures are recorded by the Operator or Nominated Person daily. This is recorded on the Daily Check Sheet. In the event there is a prolonged period of warm weather, additional weather inspections will increase in frequency, every two hours, to ensure the constant monitoring of all stock/containers.

8.3.2 End of Day Monitoring

At the end of each shift a fire watch is conducted on waste storage areas, and site plant and equipment.

This is carried out 30 minutes prior to the end of each shift. Nominated staff will look for any evidence of smoke, heat or smouldering.

Should this be detected, the stockpile or container will be assessed by the Site Manager (or nominated person), whether to maintain visual monitoring or if the waste requires active fire measures such as water suppression. The use of fire extinguishers or water suppression would be implemented, or wastes can be placed into the designated fire quarantine area and separated to allow cooling. These checks are recorded and filed in the site office.

In the event of a fire, if safe to do so, the waste containers can be segregated from to reduce the fuel source. Unburnt material can be placed in the quarantine areas for the purpose of separation.

These end of shift checks are recorded. These checks cover a site walk around and site closure measures including waste storage area checks, plant and equipment storage, security measures and the shut off electrical equipment.

8.3.3 Reduce the exposed metal content and proportion of 'fines'

Fines are not produced on site.

8.3.4 Dealing with hot weather, heating from sunlight and monitoring temperature

During periods of warm weather, care will be taken to ensure that wastes do not increase in temperature resulting in combustion.

Wastes are kept cool inside the storage and treatment building stored on racking which allows for aeration.

Where it is felt that wastes may be subject to overheating, action will be taken to segregate wastes into the quarantine area to allow the waste to be inspected. This would be actioned in response to daily weather monitoring and visual daily inspections of stock/containers by the Operator (or trained nominated person).

Using the forklift, the container/s will be opened, and the waste spread and aerated. Visual inspection of the waste should continue. Once cooled the waste should be turned and returned into the appropriate container.

Monitoring is conducted by the Operator or a nominated trained member of staff. Any findings or responses to fire/smouldering are recorded in the site diary and made available in the site office for information.

8.4 Contingency

In the event of any delay to the removal of material from the site, the Operator will contact the relevant 'waste receiver' to determine the anticipated length of the delay. If deliveries to the site are scheduled, for before the delay to exports is resolved, that would result in an exceedance of the storage capacity, or if such a delay could cause a breach of the limits to the waste storage time on-site, the Operator will contact the EA immediately.

In addition, in the event of a contract failure with, or closure of, a waste receiver (and its operations) that could result in the storage of material on-site for a long period, the Operator will contact the EA immediately.



In the event there is a major breakdown that effects site processing plant or equipment, the Operator take proactive action, consider ceasing waste acceptance and determine the anticipated length of the delay.

The EA will be notified, discussions between the site and the EA regarding actions and timescales in relation to the recommencing of site operations.



9. Management of Waste

Wastes are received and stored in plastic euro bins or plastic drum/barrels as shown below.

Image 3 and 4 – Waste Storage Containers



Wastes are stored internally in rows with containers stacked 4 high as demonstrated in Image 5 below. (drawing ref FORNAX 006A - WAREHOUSE - FIRE DETECTION AND PREVENTION REV3 shows more) This allows for accessibility of waste streams and in the case of emergency.



Image 5 – Example of Storage Arrangements (Fornax)

9.1 Containers

FPP guidance states that sites storing waste in containers that can hold more than 1,100 litres, must be accessible so any fire inside it can be put out. In the event of a fire, these containers must be moved as soon as is reasonably practicable to prevent the fire spreading.



Drawing Fornax006A shows where containers will be located for the storage of incoming permitted waste post acceptance into the transfer building. This will allow for effective waste inspection upon receipt and identification of any hot loads or signs of fire/smoke.

The site will prioritise the treatment or off-site transfer of waste based on:

- its type
- age on arrival (if known)
- date of arrival
- duration of storage on site

In line with EA Guidance³ each incoming container is then electronically recorded (Barcoded) with the date, time and contents of the container, it is then stored in the Dirty Bin storage area in the relevant row. By electronically recording each container and its relevant waste type, the site can demonstrate the first-in, first-out principle and also identify and prioritise wastes with differing storage times scales daily through the digital tracker system.

Containers are stored in rows one on top of another on racking, these are stored at a maximum of 4 containers high so the rack can remain stable during a fire. There is a separation distance of 3.3m between rows.

9.1.1 Storage Times

There are different maximum storage times for containers storing different types of healthcare waste.

Containers storing the below wastes will be stored pre-treatment for no more than 14 days.

- infectious clinical waste
- offensive waste
- treated waste from alternative treatment plant (for example, autoclave floc)

Containers storing refrigerated anatomical waste will be stored for up to 14 days. The refrigerator unit is indicated on the site plan Appendix 1

Containers received with unrefrigerated anatomical wastes will be stored for up to 24 hours, or up to 72 hours if over a weekend.

Containers storing the below wastes will be stored for 6 months.

- cytotoxic and cytostatic drugs
- other medicines or drugs
- other chemicals or other wastes

Different healthcare wastes according to waste type and destination will be segregated into Euro bins in order to store waste types in separate storage areas or containers. This is to prevent physical contact or a leak from one contaminating another waste type or its packaging: The bins will then be stored within the racking system.

³ <u>Healthcare waste: appropriate measures for permitted facilities - Waste storage, segregation and handling appropriate measures - Guidance - GOV.UK (www.gov.uk)</u>

9.1.2 Storage Capacities

The site stores wastes in accordance with the below storage capacities.

Inbound bin storage area = 10.5m (l) x 8m (w) x 1.13m (h) = $106.79m^3$. This allows for the storage of 52 (770lt containers) stored at any one time. This area is classed as one stockpile.

Dirty Bin Storage area = 20m (I) x 40m (w) x 5m (h) = 4000 m^3 . This allows for the storage of approx. 1752 (770lt container) stored at any one time.

This area is made up of 15 rows (Stockpile 1-15) each measured at 10m (I) x 2.05m (w) x 5m (h) = 102.5m³.

Chemical waste storage is in accordance with HSG71 whereas specific waste streams are separated by at least 3m depending on chemical properties. The racking is designed to have purpose-built containment bunds to prevent the run of, of incompatible chemicals.



This site will not take class1 flammable or explosive hazardous or compressed gasses property codes.

Flammable liquids are separated using purpose built 90m fire resistance barriers from other chemicals. Flammable solids are also separated using 90m fire resistance barrier.

All storage is carefully managed to keep below COMAH thresholds.

Clinical Waste Type	EWC Code	Relevant HP Code(s)	H (Health Hazard)	P (Physical Hazard)	E (Environmenta I Hazard)	COMAH Lower- Tier Threshol d (tonnes)	Maximu m Storage for Fornax (tonnes)	Notes
Anatomical Waste (Human & Animal Tissue, Blood Products)	18 01 02 / 18 02 02	HP9 - Infectious	H310, H330	P235 (Keep cool)	E - N/A	200	<190	

Infectious Waste (General Clinical Waste, Bandages, Swabs, PPE)	18 01 03* / 18 02 03*	HP9 - Infectious	H311, H314	P233 (Keep container closed)	E - N/A	200	<190	
Sharps Waste (Needles, Syringes, Blades, Contaminated Glass)	18 01 01*	HP9 - Infectious, HP4 - Irritant	H301, H311	P280 (Wear gloves)	E - N/A	200	<190	
Cytotoxic & Cytostatic Waste (Chemotherap y Drugs, Cancer Treatment Waste)	18 01 08*	HP6 - Toxic, HP7 - Carcinogenic , HP10 - Toxic for Reproductio n	H341, H350, H360	P201 (Obtain special instructions before use)	E - N/A	5	5	This is based on H1 being Acute toxic, this will need to be on the inventor y system rules that we cant accept more than as part of toxic overall.
Pharmaceutica I Waste (Expired Medicines, Vaccine Waste, Liquid Drugs)	18 01 09 / 18 02 08	HP6 - Toxic	H301 <i>,</i> H370	P260 (Do not breathe dust/fumes)	E - N/A	50	<49	
Clinical Waste from Infectious Disease Trials (COVID, TB, Other Pathogens)	18 01 03*/1 8 02 03*	HP9 - Infectious	H311 <i>,</i> H330	P233 (Keep container closed)	E - N/A	200	<190	



Clinical Waste Contaminated with Chemicals (Lab Wastes, Solvents, Fixatives)	18 01 06 / 18 02 06	HP3 - Flammable, HP8 - Corrosive, HP14 - Ecotoxic	H314, H318	P210 (Keep away from heat)	E - H410 (Very toxic to aquatic life)	500	<450	
Clinical Waste with Heavy Metals (Dental Amalgam, Mercury Waste, X-ray Fixers & Developers)	18 01 10* / 18 02 07*	HP14 - Ecotoxic, HP6 - Toxic	H301, H400	P391 (Collect spillage)	E - H410 (Very toxic to aquatic life)	500	<450	

Category	DSC Ltd. Red Flag Codes	COMAH Lower-Tier Threshold (tons)	Relevant HP Code(s)	Example Hazardous Wastes	Maximum Storage to Stay Below COMAH (tons)	Notes	
Oxidising	EUH019, H240, H241, H250, H251, H252	50	HP2 - Oxidising	Peroxides, Nitrates, Bleach	<49		
Flammable Liquids	EUH018, H224, H225, H226, P210, P211, P243	2,500	HP3 - Flammable	Solvents, Paint Thinners	<2,450	Reference Comah Schedule 1 part2 34 flammable liquids	
Flammable Solids	H228, P283	500	HP3 - Flammable Solids	Sodium, Lithium, Contaminated Rags	<450		
Irritant / Harmful	H314, H318, H341, H351, H361, P305, P351	200	HP4 - Irritant / HP5 - Harmful	Acids, Alkalis, Lab Waste	<190		
Toxic (Acute & Chronic)	H301, H310, H330,	50	HP6 - Toxic	Pesticides, Pharmaceuticals	<49	This is based on H1 being Acute toxic, this will	
26							

	H370, H372, P310, P320					need to be on the inventory system rules that we cant accept more than as part of toxic overall.
Carcinogenic	H350, H351	50	HP7 - Carcinogenic	Cytotoxic Drugs, Medical Waste	<49	
Corrosive	H290, P406	500	HP8 - Corrosive	Sulfuric Acid, Caustic Soda	<450	
Infectious	EUH071, P402	200	HP9 - Infectious	Clinical Waste, Sharps	<190	
Toxic for Reproduction	H360, H362, P263	50	HP10 - Toxic for Reproduction	Industrial Chemicals	<49	
Mutagenic	H341 <i>,</i> H350	50	HP11 - Mutagenic	Research Chemicals	<49	
Releases Toxic Gas	EUH029, EUH031, EUH032, H280, H281, P231	50	HP12 - Releases Toxic Gas	Cyanides, Sulfides	<49	
Sensitising	H317, P280, P284	200	HP13 - Sensitising	Adhesives, Isocyanates	<190	
Ecotoxic	H400, H410, P391	500	HP14 - Ecotoxic	POPs, Heavy Metals	<450	
Potentially Hazardous Waste	EUH206, P420	200	HP15 - Waste Capable of Exhibiting Hazardous Properties	Industrial By- Products	<190	

9.2 External Storage

Oxidisers are kept within a purpose-built lockable fire rated COSHH compliant, internally bunded, chem store with internal bunding outside of the building with a 6m standoff from any buildings or structures.



9.3 Moving containers in a fire

Access to all barrels/containers storing wastes on-site will be maintained at all times to allow for the extinguishing of any fire within a skip/container or for its removal to the quarantine area (fire prevention) as soon as is reasonably practicable.

All bulk waste containers are stored in a way that allows safe and easy access for inspection at all times and minimises the need to remove others that may be blocking access. Safe access via inspection aisles are in place from each side of racked wastes. Each container is labelled clearly to ensure they are identifiable and legible.

Using the forklift, containers can be safely removed from racking systems for inspection or signs of smouldering/smoke.

In the event of a fire the use of onsite water suppression or fire extinguisher can be directed into any container and pulled away using site plant to isolate it into the appropriate quarantine area. During working hours this should take 5 minutes.

9.4 POP,s

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Incoming wastes may contain Persistent Organic Pollutants (POPs) within some of the clinical waste or chemical wastes received. Destruction will be achieved via high temperature incineration.

The customer will be asked to declare if POPS are present within the waste stream. POPS materials will be stored separately on the racking and labelled accordingly.



10. Prevention of the Spread of Fire

10.1 Separation Distances

All containers received in the inbound reception area of potentially combustible wastes are stored 6m from potential sources of ignition (i.e. on-site storage areas, treatment/processing operations, moving plant).

Each row in the dirty bin storage area has a separation of 3.3m between each row.

10.2 Fire Walls, Bays, Buildings

The site stores combustible wastes internally on racking as detailed in Section 9.

The waste transfer building is a steel framed structure with fire-resistant steel panels. The energy centre containing the kiln is compartmentalised within fire walls as detailed in section 10.3 below. The building is grouted and sealed to contain any fire water or spillages.

10.3 Fire walls construction standards

Fire walls will be installed within the buildings as required by the fire insurers and in accordance with Buildings Regulations. The location and specification for fire walls will be subject to detailed design of the Facility, and dependent on the layout to be further developed by the EPC Contractor. The indicative locations of the fire walls are presented in the site layout plan Fornax006A

Subject to the location of the process equipment, operational areas will be segregated into fire zones (the "Fire Zones"). In accordance with NFPA 850, certain specific Fire Zones such as the waste bunker and boiler hall will be separated from each other by fire barriers with a minimum of 2-hour fire resistance rating, spatial separation, or by other approved means. The specific Fire Zones to which this applies, and the means of separation, will be subject to agreement with the fire risk insurers.

As part of the detailed design process, a fire risk assessment will be undertaken for each Fire Zone to identify the appropriate fire detection and protection systems in association with appropriate civil work design principles to control:

- the risk of fire propagation;
- the spread of fumes and smoke;
- firewater flooding; and
- to maintain the integrity of dedicated fire partition walls in the event of fire.

The fire zoning will be subject to the approval of Fornax and the fire risk insurers.

The dividing wall between the waste reception hall and energy centre and all other walls will be suitably constructed in concrete, block work or a suitably rated cladding system up to roof level to form a continuous 2-hour fire rated barrier for the full width and height of the building structure. In addition, the base of the building will be constructed of reinforced concrete, and the whole structure will be designed as a water retaining structure.

The Wall separating the Warehouse and Offices is to be insulated to achieve a 'U' value of 0.26 W/m²K and to be 150mm Eurobond "Firemaster Wall Extra" composite rockwool fire panels (or similar/equal LPCB approved) taken full height to the underside of the mezzanine floors, and fire stopped to provide a minimum 1 hour fire resistance.

Steel column vertical supports are to be incorporated and intumescent painted to protect against fire to the same degree of protection as the wall. All fixed internal glazing integral with the compartment wall shall be deemed to comply to the same fire resistance standards as the compartment wall.



The wall separating the Warehouse and Energy Centre is to be 150mm Eurobond composite rockwool type panels (or similar/equal LPCB approved), taken full height to the underside of the Energy Centre roof, and fire stopped to provide a minimum 2-hour fire resistance. Steel column vertical and horizontal supports are to be incorporated and protected against fire to the same degree of protection as the wall with intumescent paint.

The structural design and construction of this dividing wall shall be such that the integrity of the fire barrier is maintained in the event of the collapse of the roof due to a fire in the energy centre.

The structure of the energy centre itself therefore will have adequate fire resistance.

All openings in fire barriers will be provided with fire doors, including fire dampers, penetration seals (fire stops), or other approved means having a fire protection rating consistent with the designated fire resistance rating of the barrier.

Windows in fire barriers (e.g. control rooms, observation windows, computer rooms, etc.) will be provided with appropriate fire protection to maintain the integrity of the fire barrier, e.g. by means of a fire shutter, automatic water curtain, window sprinkler system, etc. All cable trays or piping systems passing through fire barriers will be fitted with fire stops.

The fire resistance rating of the concrete walls and panels has been estimated using the 'Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies' (American Concrete Institute, ACI Standard 216.1-97). Table 2.1 of the ACI Standard is reproduced (converted to SI units) as per Table 6 below.

Concrete Aggregate Type	Minimum equivalent thickness for fire resistance rating (cm)				
	1-hour	1.5-hour	2-hour	3-hour	4-hour
Siliceous	8.9	10.9	12.7	15.7	17.8
Carbonate	8.1	10.2	11.7	14.5	16.8
Semi-lightweight	6.9	8.4	9.7	11.7	13.7
Lightweight	6.4	7.9	9.1	11.2	13.0

Table 6 Fire resistance of singular layer concrete walls, floors and roofs

The external cladding will be in accordance with the recommendations of the LPCB and designed to comply with wind loads calculated in accordance with BS.6399: Part 2:1997. The cladding will be Kingspan KS1000RW composite panels or similar/ equal LPCB approved.

The outer sheet coating will be Kingspan Spectrum from the standard Kingspan colour range or similar/equal LPBC approved.

10.3 Management of wastes stored in bays and containers

The site, stores wastes both internally as detailed in section 9 and 10. As previously stated, wastes are subject to constant inspection, electronically tracked and frequent stock rotation, ensuring waste are processed on a first in, first out policy.



11. Quarantine Area

11.1 Quarantine Area Location and size

The quarantine area is somewhere burning wastes can be moved to extinguish them. It can also be used for the storage of unburnt wastes into the quarantine area to isolate and prevent them catching fire if necessary.

Quarantine areas (fire prevention) are located 6m from the site boundary to prevent the risk of heat/fire spreading across the site boundary.

Fornax006A clearly defines the quarantine area, indicating the required minimum 6m separation buffer that will be maintained during a fire event. The Quarantine area measures $13.5mx 16m \times 2(h) = 432m3$.

The quarantine area (fire prevention) will during normal site operations will be kept clear.

The quarantine area (fire prevention) is large enough to hold 50% of the largest stockpile stored internally /or material can be stockpilled externally within the yard as the drainage can be isolated via a valve system.

The storage of flammable liquids are separately from other dangerous substances that may enhance the risk of fire or compromise the integrity of the container or cabinet/bin.

11.2 How to use the quarantine area if there is a fire

The quarantine area is located within the permitted area.

11.2.1 Procedure to remove material stored temporarily if there is a fire

If safe to do so nominate trained staff can separate any burning waste from the storage area into this area for active firefighting using the forklift.

If safe to do so staff can also move fire damaged waste after a fire into these areas to quarantine it from viable waste.

Access to all on-site skips/containers storing wastes will be maintained at all times to allow for the extinguishing of any fire within a skip/container or for its removal to the quarantine area (fire prevention) as soon as is reasonably practicable.

11.2.2 Waste Quarantine Area

In the event any unpermitted or contaminated waste requires quarantine this will be stored in a designated secured marked container or skip.



12. Detecting Fires

12.1 Detection systems in use

Identifying fires as quickly as possible makes the suppression of the fire easier and results in lesser damage to the environment and human health.

The below detection systems are in place on site.

12.2 CCTV

Onsite CCTV cameras provide visual monitoring during operational hours. The site is manned 24 hrs per day.

CCTV Installation provides a UHD fixed CCTV installation to cover the following areas:

- 1. Car park and entrance area
- 2. ANPR control for weighbridge, car park and site entrance/exit
- 3. HGV entrance area
- 4. Service Yard
- 5. Each end of the building to cover the entire rear of the building
- 6. Office/Reception main entrance (Internally and externally)
- 7. In-bound loading area
- 8. Out-bound loading area
- 9. Warehouse area
- 10. 1st floor mezzanine area
- 11. Hopper loading area (ground and first floor allow for 2no. cameras to each area)
- 12. Bin wash area
- 13. Plant room (item 78 of the EPC Interface Schedule)

A RJ45 data point connection will be in place to the network for connection to a SCADA central monitoring platform and for interfacing to the Incineration CCTV installation.

The site will maintain a rota of nominated staff who are able to attend site within 20 minutes in the event of an out of hours call.

All nominated personnel are trained in fire response, water suppression systems, this FPP and are fully trained plant operators and forklift trained personnel.

The design, installation and maintenance is covered by an appropriate third party certification scheme such as UKAS or meet an appropriate recognised standard such as a British Standard.

Senior management have remote access to CCTV cameras for active monitoring both during and out of hours.



12.3 Fire Alarms

A fire alarm system will be provided to the offices and warehouse of the fully automatic and fully addressable analogue type, all in accordance with the requirements of BS.5839 and the Building Control Officer/Appointed Fire Engineer. The equipment will incorporate a main recessed fire alarm panel located in the reception area, break glass manual contacts on all escapes to provide a complete system with zones being arranged to generally suit the Client's requirements. The fire alarm panel shall be coordinated with other devices in the reception to provide an approved uniform and symmetrical layout.

Sounders will be provided throughout the offices to accord with the standard. The system will be wired in red firetuf or equal cable extended in a concealed manner in the Main Offices.

Fire alarm interfaces shall be provided as follows:

- 1. Incineration control panel assume ground floor SCADA room;
- 2. Gas safety valve serving the incineration plant;
- 3. Sprinkler installation valve stations;
- 4. Ventilation plant (Office, Warehouse and MHE AHU's.
- 5. Warehouse Goods lifts nr 2 (to make it inoperable upon fire alarm activation)

The contractor to develop a cause effect chart to co-ordinate interface responses upon pre-alarm and full alarm condition.

Provide RJ45 data point/connection to allow a SCADA connection to a central monitoring platform.

See the AF3691 - Merchant Park - Detailed Fire Strategy Report (Issue 01) Appendix 1 for the full specification of cctv, fire controls and suppression systems.

12.4 Gas Detection

Fixed gas detection monitoring will be in place within the chemical storage area. The detection system is linked to the SCADA unit that will engage emergency shutdown of fixed ignition sources upon gas detection. And an automatic alarm will sound.

12.5 Waste Transfer Building

Within the transfer building there are CCTV cameras for visual fire and smoke detection.

Drawing Fornax006A details the locations, zoning and layout of the detection/extinguisher equipment on the plant.

12.6 Fire Alarm Tests and Drills

Tests and drills are an important mechanism to ensure that the site is prepared for a fire. As such:

- Fire drills take place six monthly to identify any weakness in the evacuation strategy on site; and
- Air horns are to be tested regularly in accordance with the manufacturer's recommendation.



13. Suppressing Fires

EA guidance states "If you store waste in a building, you must install a fire suppression system. This system should be proportionate to the nature and scale of waste management activities you carry out and the associated risks".

Due to the low level of combustible waste stored on site, combined with low storage times and the fact that each container is segregated, the risk of fire occurring is low. Taking into account end of day checks and robust security monitoring out of hours it is not proportionate to fit any of the above automated systems.

The site as the below equipment to suppress small fires or smouldering wastes on site:

13.1 Handheld Fire Extinguishers

Handheld firefighting equipment is provided in the building and will also be provided within mobile plant.

All FLT will be suitable for use within there working areas. For example - Pyroban Area 2 Cat 3 specification in flammable areas. These are fitted with the appropriate fire fighting equipment.

All mobile plant is rated appropriately for the correct fitted with 2kg dry powder fire extinguishers for fighting vehicle/equipment fires.

13.2 Mains Water Supply

The site is equipped with a mains water supply and a mains water connection is provided inside of the main workshop building.

The site is equipped with a standard 32mm mains water pipe supplying the site with mains water. A dedicated firefighting hose (50m) will be provided and maintained, allowing for water to be available and within reach of all waste storage locations in the event of a fire.

13.3 Fire Blankets

Large heavy precut blankets are used to smother smouldering wastes or use as a precaution in the event of warm, prolonged weather periods, to reduce the risk of fire occurring.

13.4 Training

All staff are fully trained in the use of the above firefighting equipment with regular toolbox talks and practical drill training. However, the company priorities the health and safety of all site staff, this equipment will not be used should a risk be posed to site staff.

The site has trained Fire Marshalls on site who are responsible for the management of persons and site activities in the event of a fire. Certification expires after 3 years then re-certification is required.

Regular training ensures that staff are prepared and can respond safely when a fire occurs on site with staff on a rota system to attend sit in the event of an emergency.

Out of hours, site plant is stored internally. This is for security purposes and allows for safe access of equipment in the event of a fire.

All fires on site must be treated as serious and must be reported to the site manager as soon as possible.

 In the event of an outbreak of fire will be regarded as an emergency and immediate action will be taken to extinguish the fire. No one should attempt to fight a fire unless they have received training in the use of fire extinguishers and then only if this can be done without risk.



- 2. If it is safe to do so, attempts should be made to extinguish a fire. This can be done by using site machinery to move any non-burnt material away from the smoulder or source of fire or using water, working from the edge of the fire inwards. Plant and machinery must never be driven into the centre of any fire; this will place both the driver and the machine in danger. If possible, extinguish the fire with a portable extinguisher or water.
- 3. Should the fire be successfully extinguished by this action, a check should be kept of the area to ensure that the fire does not re-ignite. The area should be vacated until it is obvious that there is no further danger of the fire restarting.
- 4. If the above action fails to extinguish the fire, prohibit all entry to the area, then summon emergency services immediately. Close the site to all members of the public. Any persons already on the site should leave. The Fire Service will be contacted to deal with major fire incidents. Site staff will not be deployed to deal with major fires.
- 5. Telephone the Fire and Rescue Service Dial 999. Give the exact details including the site address and telephone number.
- 6. Before the Fire and Rescue Service arrives, staff will:
- ensure operators of appropriate machinery are standing by in a safe location to help create fire breaks, under the direction of the FRS when they arrive
- Appoint a clearly identified person to liaise with the emergency services on site. They should identify themselves to the FRS as soon as they arrive
- ensure access routes are clear
- use pollution control equipment to block drains and/or divert fire water to a containment area and/or operate any pollution control facilities, such as drain closure valves/or penstocks where safe to do so
- 7. On arrival the FRS should be met by the identified responsible person who must provide them with a copy of the FPP and update them with relevant information that will assist them in dealing with a fire more effectively.

See the AF3691 - Merchant Park - Detailed Fire Strategy Report (Issue 01) Appendix 1 for the full specification of cctv, fire controls and suppression systems.


14. Firefighting techniques

The site must always have the resources available to fight a fire. These include:

- Plant to move waste around the site such as the forklift;
- Nominated staff (on-call for out of hours events);
- Available water supply;
- Fire Extinguisher and suppression systems; and
- Finances for the removal of fire damaged waste or water and any remediation costs.

In the event of a fire at the site, the class of fire will determine the action to be taken by the fire authorities.

The facility is to be provided with automatic start pumped water supplies complying with FM data sheets. The supplies consist of a single 100% capacity galvanised steel water storage tank feeding a single diesel driven fire pump, housed within an external pump room.

The following sizes are for guidance only at the pre-construction phase with the additional fire controls referenced below.

Sprinkler Tank Capacity

1 x Full Capacity – 10.850m Ø x 7.262m high = 600m3

Sprinkler Pump Capacity

1 x Diesel fire pump - Nominal Rating 2,500usgpm@133psi

Pump house

1 x GRP Enclosure - 7m x 6.5m x 3.5m high

Pump room to be internal enclosed room to house all mechanical equipment and valves including pump house general lighting, heating and ventilation.

The electrical installation shall be fed from a local distribution board within the pump house.

Ensure pump suction, tank infill and tank drain valve are trace heated and thermostatically controlled so that the system is maintained when the external air temperature is -15 degrees Celsius.

Provide valve stations in accordance with FM design codes.

A remote run/trip/alarm indicator panel, including all cabling, will be located within the office reception.

Control Valves

The site will have valve stations installed in accordance with FM Global requirements housed within the facility and as a minimum; Each valve station shall be fully compliant with the requirements of FM global and be provided with a flow switch to permit fire alarm signalling by others.

Hydrant Supply

A new hydrant supply in accordance with BS750 to serve the proposed warehouse and associated areas.



Warehouse Area Roof Sprinkler Installation

Main Roof – a single level of exposed wet pipe sprinkler protection throughout the warehouse area. The sprinkler design shall be based upon the following: -

- Roof Storage (Pendent K360 @ 1.4 bar 10 heads operating) FMDS 8-9 Table 10, Maximum Ceiling Height 7.5m, utilising FM approved K360 sprinklers @1.4bar – incorporating 950l/min hose stream allowance for 60-minute duration.
- A single level of exposed sprinkler protection matching density of system above to services, ductwork and plant >600mm wide, will be installed.

Warehouse Area Rack Sprinkler Installation

Racking – a single level of exposed wet pipe sprinkler protection throughout the racking at a maximum 9m from the floor level.

The sprinkler design shall be based upon the following:-

- Rack (Pendent K320 @ 2.1bar 6 heads operating) FMDS 8-9 2.3.6.6 alternate in-rack sprinkler designs incorporating 950l/min hose stream allowance for 60 minute duration.
- Racking to meet the definition of open frame racking

The contractor shall review the racking drawings and provide additional levels of protection, should it be required due to obstructions etc, and advise the main contractor if any baffle boards are required to achieve full compliance with the FM codes.

Warehouse Area Mezzanine Sprinkler Installation

Mezzanine Platform– provide a single level exposed wet pipe sprinkler protection to the underside of the mezzanine. The sprinkler design shall be based upon the following: -

- Mezzanine Storage (Upright K242 @ 1.5bar 12 heads operating) FMDS 8-9 Table 5, Maximum Ceiling Height 7.5m, utilising FM approved K240 sprinklers – incorporating 950l/min hose stream allowance for 60 minute duration.
- Provide a single level of exposed sprinkler protection matching density of system above to services, ductwork and plant >600mm wide, etc.

Energy Centre Sprinkler Installation

- Main Roof provide a single level exposed wet pipe sprinkler protection throughout the area. The sprinkler design shall be based upon the following: -
- Process area (Pendet K360 @ 2.8 bar 10 heads operating) FMDS 3-26 Table 3, Maximum Ceiling Height 18m, utilising FM approved K360 sprinklers – incorporating 950l/min hose stream allowance for 60 minute duration.
- Low piled Storage treat storage of plastic commodities up to 6 ft (1.8 m) high.
- Provide a single level of exposed sprinkler protection matching density of system above to services, ductwork and plant >1200mm wide, etc.
- The contractor shall undertake a study to ensure the correct head temperature rating is selected.

Offices, Rest Rooms

• Offices – installation of a dual level of concealed wet pipe sprinkler protection to the 2 storey Main Offices inclusive of ceiling voids.

The sprinkler design shall be based upon the following:-



• Offices - (HC1) design density – wet - 4.1mm/min over 186m2 - FMDS 3-26 Table 2, utilising FM approved K80 sprinklers.

Internal Bin Wash Area

• Internal Bin Wash area – provide a single level of exposed wet pipe sprinkler protection to the plant areas of the facility.

The sprinkler design shall be based upon the following:-

- Bin Wash Area (HC3) design density dry 12.0mm/min over 330m2 FMDS 3- 26 Table 2, utilising FM approved K160 sprinklers incorporating 1900l/min hose stream allowance for 60 minute duration.
- This is located under the mezzanine and shall be considered as part of the mezzanine design.

External Canopies (Where Applicable)

External Canopies – provide a single level of exposed wet pipe sprinkler protection to the plant areas of the facility.

The sprinkler design shall be based upon the following:-

- External Area (HC3) design density wet 12.0mm/min over 230m2 FMDS 3-26 Table 2, utilising FM approved K160 sprinklers incorporating 1900l/min hose stream allowance for 60 minute duration.
- Trace heating and lagging of the wet pipework
- Maximum height of this area is deemed to be 9m.

Incinerator Pits

Protection to be provided in accordance with Factory Mutual Data Sheets.

Fuel System

A bulk fuel tank above ground to supply the sprinkler pump of sufficient capacity for 3 no. days usage. The tank shall be supplied complete with fuel level indicator, fuel fill cap with breather and strainer, fuel feed and return lines to day tanks. Provide manual by-pass valve to solenoid valves located within the fuel lines.

Ensure the bulk fuel tank incorporates a bunded tank construction to comply with relevant British Standards and legislation.

Provide a remote external fill point cabinet adjacent to the fuel tank with interconnecting fuel transfer lines to the day fuel tank. Provide tank contents gauge, fuel full alarm and drip tray, linked to the BMS.

A day fuel tank shall be located adjacent to the sprinkler pump. Ensure the bulk fuel tank incorporates a bunded tank construction to comply with relevant British Standards and legislation.

Ensure fuel system complies with Environment Agency PPG2 and the Control of Pollution Storage (Oil Storage) (England) Regulations.

FM 200 Gas Suppression

A FM 200 gas suppression installation shall be provided to each SCADA and Comms room.

The gas suppression installation shall be fully inclusive of Control Panels, access control, c/w pressure relief damper and control panels detection, and all other associated equipment, required.

Document Sprinkler Performance Specification-V2 in Appendix 2 of this plan supports the above information.



14.1 Site information

To assist the authorities is managing a fire outbreak at the site, a copy of this FPP should be provided to the authorities as possible including the site layout plan and quantities and types of stored materials.

A copy of this document will be provided to the Security Company and a copy will be located outside of the office for the Emergency Services and site staff to access in an emergency.

14.2 Emergency Service Response

The local Fire and Rescue Service will assume full control for the approach to suppression/extinguishing of any fire once it is in attendance at the site.

The nearest fire station Central Avenue, Newton Aycliffe DL5 5QH, is located 2.5 miles from the site. The approximate response time is 7 minutes.

14.3 Onsite firefighting equipment

Fire extinguishers are situated around the site in key locations, they are also located inside the building for easy access, and next to the fuel storage areas.

All mobile plant is fitted with 2kg dry powder fire extinguishers for fighting vehicle/equipment fires.

Out of hours, site plant is stored internally. This is for security purposes and allows for safe access of equipment in the event of a fire (areas shown in Drawing Fornax006A).

All firefighting equipment will be kept in good condition, unobstructed, and be serviced at least once a year by a competent person.

A fire hose is fitted to apply water to any containers near to the main building, to cool smouldering wastes or cool

In addition, as discussed in Section 12 the quarantine area (fire prevention) will also be maintained and kept free of obstruction, to be used as either:

- An area for extinguishing burning materials;
- An area for the segregating of unburnt materials away from a fire



15. Water Supplies

15.1 On Site Supply

There is a dedicated tank on site containing 6000,000lts this provides water for the onsite fire water system supply. The operator will install an on site hydrant to provide water supply in accordance with *BS750*.



This can cool smouldering wastes or cool unburned material near this area if safe to access in the event of a fire.

If safe to do so, trained staff can separate unburned material from the fire using heavy plant using the forklift, or at the direction of FRS if used as an active firefighting measure.

15.2 External Supply

The EA guidance for FPP requires that, for a 300m³ stockpile, a total of 360,000 litres (360m³) of water would be required in order to extinguish the fire.

There are no active hydrants available outside of the site.



15.3 Water supply required

The sprinklers in the warehouse building are designed to deliver <u>K360@3.6bar</u>10 heads operating = $360x\sqrt{3.6 \times 10}$ = 6,830lt/min, therefore approximately a maximum of 410m3/h.

The building footprint is designed to hold a 2mm height has a storage capacity of $12m^3$. However, the facility drains via falls in the floor slab to the external service yard to the north, which is designed to contain the supply tank volume and additional supply provided by the fire rescue.

The external yard area is designed with a low point to allow for fire water containment within the areas of impermeable pavement and sealed drainage. The containment is enclosed with sealed kerb upstands and provides a capacity of at least 600m3.

The holding capacity of the site is over the 4 hr period of fire water generation would be 600 m3 which would be in excess of the actual amount that would be generated as the sprinkler/suppression systems are zoned and contained within compartmentalised fire walls. This would result in only active areas being used at a time of fire.

Fire Water Supply based on stockpiles

Maximum pile volume in cubic metres	Water supply needed in litres per minute Pile volumes x 6.67	Overall water supply needed over 3 hours in Litres Water supply x 180	Total water available on site in litres
106.79m ³	712.29lts	128,212lts	360,000 (hydrant supply)

Fire Service Liaison

Contact was made with the Durham Fire Service. They confirmed the below.

As far as meeting BS750, all fire hydrant installations will be carried out by Northumbrian Water. They would need to provide this confirmation, as well as water pressure etc once installed.



16. Managing Fire Water

All areas of the site benefit from concrete surfacing providing an impermeable surface. Areas of made ground are kerbed. This acts as a bund to prevent contaminated fire water entering this area which could cause pollution.

All handling and processing of waste will be carried out inside the processing building, and therefore, run-off from the building roof and yard area will be clean water. This can be managed via an attenuation pond, which will subsequently discharge at greenfield rates to the approved SUDS arrangements within the wider Merchant Park.

Roof water will be collected by gutters, rainwater pipes and a conventional drainage system and discharged into the pond. Run-off from the yard areas will be collected by gullies or drainage channels which will connect to a conventional drainage system. Water from this system will discharge into the pond via a bypass interceptor and silt traps.

Rollover bunds within the building access points (doorways) will ensure that any internal spillages do not escape the building, and that external runoff does not enter the building.

A volume of water would be retained at all times on site for firefighting within a firewater tank, and a penstock valve would be provided within the attenuation pond arrangements such that any dirty firefighting water can be retained safely for removal offsite for management as appropriate.

An indicative drainage scheme for management of internal liquid spills, and external runoff is presented within the site drainage plans.

Internal Drainage

All handling and processing of waste will be carried out inside the processing building. The inside of the building will be provided with a dedicated drainage system (including rollover bunds in doorways to ensure containment within the building of any spills) which has no connection to the external drainage arrangement.

The building which measures at 34m x 37m x 0.12m (h) can contain approximately 150,960 litres of fire water.

ENVA or other suitable wastewater company can provide an emergency response in the event contaminated water is to be removed off site to a suitably permitted facility.

Drainage Management

Regular maintenance of drainage system must be carried out to ensure the effectiveness of the above system. The interceptor will be checked on a monthly basis to check capacity and arrange clearance if necessary.

Drains and gulley's will be kept free of debris to prevent blockages which also would impact the effectiveness of the system.

The interceptor will be checked monthly to check capacity, and arrangements will be made for any clearance if necessary.



17. During and after an incident

The site has an Emergency Action Plan in place (See Annex 1).

On the discovery or suspicion of a fire:

- Activate the nearest fire alarm;
- Initiate evacuation of staff and visitors on site to the muster point and instruct delegated person(s) to conduct a rollcall to ensure all site users are accounted for;
- If trained and safe to do so, attempt to tackle the fire using one of the site's fire extinguishers or segregate smouldering/burning waste;
- Where attendance of the local Fire and Rescue Service is required, dial 999 to call the Fire Brigade;
- Staff will close the interceptor to prevent the release of any potential fire water;
- The Operator (or other responsible person) will make an assessment of the prevailing wind direction, contacting the critical receptors shown on Drawing 004 dependant on the receptors that may be affected;
- Operator contacts the EA on 0800 80 70 60.

17.1 Active fire fighting

If safe to do so staff may try to suppress a small fire using fire extinguishers or by using site plant to segregate and separate burning waste.

Fire extinguishers are located and maintained at the fire action points around the site and within the cabs of site plant/vehicles.

Instruction signs on the use of extinguishers and suitability of each type of extinguisher are kept adjacent to the extinguishers.

17.2 Visitors/Staff

On hearing the fire alarm:

- Leave the site quickly and calmly via the site's or office main entrance, closing all doors behind you;
- Report to the Operator/Fire Warden at the assembly point located outside of the main entrance;
- Do not take risks;
- Do not stop to collect personal belongings; and
- Do not re-enter the site for any reason unless authorised to do so.

Fire action notices are located and maintained at various points around the site to remind staff of the actions to be taken in the event of discovering a fire or hearing the fire alarm.

17.3 Receptors

Local receptors must be notified via telephone or verbally, if staff are able to attend local businesses or properties.

17.4 Deliveries to site

Contact will be made with customers to stop incoming waste collections for the next 24hrs or until site management have cleared the site as operational.



17.5 Making the site operational after a fire

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

17.5.1 After a small fire

A fire dealt with in-house using suitably trained staff and firefighting equipment located on site is classed as a small fire.

The fire will be recorded in the site diary and an Incident Record produced which will include the causes of the fire and methods used to manage the fire. An assessment will be carried out to determine whether further mitigation measures could have prevented the fire. Any outcomes to be implemented on-site will be incorporated within updates to this FPP, as required.

The incident and the results of the above assessment will be forwarded to the EA, with any updates to the FPP and the site's EMS made if required.

17.5.2 After a large fire

A fire that requires the presence of the Fire and Rescue Service is classed as a large fire.

If the site has been told to evacuate or cease operations by the EA and/or Fire and Rescue Service, site management and staff will wait until instructed that it is safe to re-enter the site and resume operations. The fire will be recorded in the site daily check sheet and an Incident Record Form with details of the cause of the fire and methods used to manage the fire. An assessment will be carried out to determine whether further mitigation measures could have prevented the fire. Any outcomes to be implemented on-site will be incorporated within updates to the FPP and the site's EMS as required.

Should damage be sufficient to prevent permitted operations at the site, the site will cease accepting waste and will divert deliveries to a suitably licensed facility, in accordance with the contingency planning provisions.

The Operator will liaise with the EA to determine a plan-of-action to recommence permitted operations at the site, and the timescales involved to achieve this.

17.6 Contaminated Fire Water

Total Recycling Services/ENVA or other suitably qualified contractor will provide support in an emergency. In the event contaminated water is to be removed offsite the company can provide an emergency response and remove any contaminated water to a suitably permitted disposal site.

17.7 Fire Damaged Waste

A visual assessment will be carried out by the Operator to determine whether the waste can continue to be stored on-site. Wherever possible, unburnt wastes will be separated from fire damaged containers. If waste containers have become mixed, then it is likely that the waste will be removed from the site for disposal.

Any fire damaged waste will be removed from the site within 24 - 48 hours to a suitably permitted facility.

Any quarantined waste, waiting for removal from site, is stored in the quarantine area to prevent the contamination of unburnt wastes on-site.

See the Site Emergency Plan (Appendix 3) of this plan.



18. Conclusion

This Fire Prevention Plan is considered to be a 'working' document that will be reviewed and updated annually or as required should any of the following occur:

- a fire on site;
- the results of any testing of this FPP indicate that changes are required;
- a change or review of legislation; or
- if the site is instructed to do so by the EA.

It will be the responsibility of the Operator or nominated person to maintain this Fire Prevention Plan and to ensure it is adhered to both to limit the risk of a fire occurring on-site and in the event of a fire on-site.

Any updates to this FPP, either as a result of specific incidents or identified during its testing/review, will be submitted to the EA for its approval prior to implementation of the proposed changes at the site.



Fire Prevention Plan

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DRAWINGS





-	NOTES DRAWING IS A SITE SCHEMATIC ANY ANOMALIES ON THIS DRAWING SH	OULD BE BROUGHT TO THE ATTENTION OF
-		
-	LEGEND - ALARM STRATEGY	LEGEND - SECURITY STRATEGY
	Smoke Detector	ACR Access Control Reader
	© Smoke Detector/Sounder	MI Access Control Magnetic Lock
	Heat Detector	
	(B* Heat Detector/Sounder	
	🄖 Smoke/Sounder/VAD	 Access Control Emergency Break Glass
	₩ Heat/Sounder/VAD	PSU Access Control Power Supply Unit
	O Hydrogen detector	VI Video Intercom
	Manual Call Point	DC Security System Door Contact
	□ Alarm Sounder	KP Security System Key Pad
	□ ≪ Sounder/Strobe	Security System PIR Sensor
		Security System internal Siren with Strobe
	Fire Alarm Panel	
NINE		PSU Security System Power Supply Unit
		ALARM Security System Alarm Panel
	Fire Alarm Interface	- Security System External Bell Box
	Void Delection Remote Indicator	Indoor CCTV Camera IP 2Mpix (Ultra Wide)
AND	^в Ream Transmitter/Receiver	
ſOR	Beam Reflector	
	■ Isolation Unit	Indoor CCTV Camera Mini Dome Fixed IP Mpix
	Disabled Alarm Over Door Indicator	4 Outdoor CCTV Camera Fixed IP Mpix
	Cisabled Alarm Pull Cord	
	ර PR Disabled Alarm Push to Reset	T ^o Dome 360 Camera
	DAP Disabled Alarm Panel	Outdoor Speed Dome Automatic Trace IP Mpix
	DRP Disabled Refuge Panel	MON CCTV Monitor
	Disabled Refuge Communication point	
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(S)*	Smoke Detector/Sounder	ML	Access Control Magnetic Lock
H	Heat Detector	PTE	Access Control Exit Button
⊕ [*]	Heat Detector/Sounder	۲	Access Control Emergency Break Glass
ゆ *み	Heat/Sounder/\/AD	PSU	Access Control Power Supply Unit
8	Hydrogen detector	VI	Video Intercom
۲	Manual Call Point	DC	Security System Door Contact
	Alarm Sounder	KD	Security System Key Pad
□«÷	Sounder/Strobe	, Kr	Security System PIR Sensor
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₽- PSU	Sounder/VAD	PSU	Security System Power Supply Unit
	Fire Alarm Interface	ALARM	Security System Alarm Panel
s	Void Detection	Щ-	Security System External Bell Box
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B V V	Beam Transmitter/Receiver	2	Indoor CCTV Camera IP Mpix
	Beam Reflector	3	Indoor CCTV Camera Mini Dome Fixed IP Mpi
	Isolation Unit		Outdoor CCTV Camera Fixed IP Mpix
	Disabled Alarm Over Door Indicator		
	Disabled Alarm Push to Reset		Dome 360 Camera
DAP	Disabled Alarm Panel		Outdoor Speed Dome Automatic Trace IP Mpix
DRP	Disabled Refuge Panel	MON	CCTV Monitor
DCP ASD	Disabled Refuge Communication point Aspirating Panel	NVR	CCTV NVR Recorder
		UPS] CCTV UPS
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APPENDICIES





Detailed Fire Safety Strategy Merchant Park

Registered Office: 30-32 Gildredge Road, Eastbourne, East Sussex, BN21 4SH T: 0203 9956 600 | 0121 8099 700 | E: enquiries@ashtonfire.com w: www.ashtonfire.com | Company Number: 12044770



Developed for: KAM Project Consultants Ltd

Newton Aycliffe

Issue 01 06 September 2023







Detailed Fire Safety Strategy

Merchant Park Newton Aycliffe

Project Reference: AF3691 Client: KAM Project Consultants Ltd

lssue	Date	Description	Author	Checked	Approval
Draft	13.04.2023	Draft issue for design team comment	GT	KW	GT
01	06.09.2023	Formal issue following design change	GT	KW	

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This report is subject to Ashton Fire's standard terms and conditions and is issued Commercial in Confidence.

GΤ George Tirkides MEng (Hons) AlFireE

KW Kieran Watson MEng (Hons) AlFireE

The checker has provided an internal review of the technical content of the report.

The approver confirms the report has received quality assurance in accordance with the principles of ISO 9001 and authorises external release of the document on behalf of Ashton Fire.



Senior Fire Engineer Senior Fire Engineer

EXECUTIVE SUMMARY

Ashton Fire have been commissioned by KAM Project Consultants Ltd to provide fire safety consultancy services for the new Merchant Park industrial development in Newton Aycliffe.

This document details the fire safety strategy design as developed for the scheme, intended to assist the design team in progressing their designs through to construction. Once finalised, this report should also be provided to the occupier and facilities management of the completed buildings, to assist with the ongoing management and maintenance of the facility. This report may be submitted for review by building control body.

This fire safety strategy has been developed to provide equivalent safety to that recommended within the life safety requirements with respect to fire under the Building Regulations 2010 (including amendments). This has been achieved through compliance with the recommendations for life safety through the application of the 2017 version of British Standard 9999 (BS 9999), in the first instance. The strategy has not been developed to include specific measures for the protection of property. However, features included for life safety will to some extent contribute to property protection and continuity of use following a fire.

Apart from where noted in this report, the design will be in accordance with the recommendations of BS 9999. To facilitate ease of review, the key fire safety challenges and / or variations from the fire safety guidance documents are identified in Summary Table 1, with the fire safety systems outlined in Summary Table 2.

The project consists the development of a new standalone industrial building to be primarily utilised for the incineration of waste. The fire strategy covers the use of the building as an incineration plant with ancillary uses supporting the main building function. Other functions, such as facility for the production of energy are outside the scope of this report.

As such, the facility shall include facilities for the collection, storage, and cleaning of waste bins and separate storage for empty bins using high rack storage. The incineration plant will be located on the north elevation of the building with internal stairs and access platforms all of which will be separated from the wider building using 120 minutes fire resisting construction. The building will also feature a mezzanine deck in the main floor area and a two-storey office / staff amenity unit on the south elevation served by a single internal stair. The building will generally rise a single storey with an internal ceiling height of 11.7m except for the incinerator room which has a height of 16.7m.

A simultaneous evacuation regime will be employed within the building, supported by an automatic detection and alarm system to a Category L2(M) standard. Escape from the building will be facilitated via final exits on the building perimeter, and open stairs from the mezzanine deck. The building will have a structural fire resistance of 60 minutes where required to support fire resisting walls and the office upper floor. However, the structure supporting the incinerator plant enclosure will be rated to 120 minutes fire resistance. The roof structure, which will support infrequent access for main maintenance, will not be fire-resisting.

The building will be fitted with an automatic sprinkler system designed and specified by a specialist contractor. As such, the sprinkler system will mitigate the risks of rapid fire growth presented by the high rack storage and will permit for the mezzanine deck structure to be unprotected where sprinkler heads are installed beneath the mezzanine. It is understood the sprinkler system will not extend into the incinerator room.

Firefighting operations will primarily be carried out via perimeter fire service vehicle access to the building. Due to the size of the building floorplate - 5,630m², site roads are to provide access to at least 15% of the building perimeter though the internal site roads provide access to three of the four building elevations. Hydrants are to be provided where these are within 90m of entry points into the building.

Summary Table 1 - Key fire safety strategy challenges

ltem	Description	Report Ref.
Building use	It is understood that the main use of the building is to function as an incineration plant for waste (primarily derived from medical facilities) and will accommodate a storage facility for bins to support this process, which will include high racking. The nature of the waste and high rack storage arrangements require that an automatic suppression system is installed within the storage areas and as such, an automatic sprinkler system will be installed within the building to mitigate the risk. This report does not consider further functional uses for the facility, such as steam production, energy generation, or insurer's requirements for property protection. However, it is acknowledged that various elements of the building will be designed with enhancements that will attribute themselves towards property protection.	2.1.3
Mezzanines	The main floor will include a large 790m ² steel frame mezzanine deck, rising a single level only at 6.2m above ground level. This will be used to store bins prior to being tipped into the incinerator, where low level storage will also be provided underneath. The mezzanine structure will not be provided with structural fire protection where it is considered that is acceptable given that this is low rising, used primarily for storage and thus supporting a low transient occupancy. The automatic sprinkler system installed within the building will also contribute to the reliability of the mezzanine structure. A maximum of 10 operatives are to be present on the mezzanine at any one time.	6.1

Summary Table 2 - Fire safety systems

ltem	Description	Report Ref.
Detection and alarm	Category L2 (M) system in the warehouse (BS 5839-1)	3.1
Automatic suppression A sprinkler system designed and specified by a specialist contr be fitted in all areas of the building (though assumed this may appropriate to be extended into the incinerator room). It is exp that this system will be in accordance with the minimum expect set out in BS EN 12845.		3.2
Automatic fire barriers	Fire shutters will be provided to close openings within fire resisting walls to the MHE repair/charge room, the materials store room opening into the energy centre (incineration plant), and incinerator room opening into the main floor and mezzanine.	3.3
Emergency lighting	Provide throughout occupied areas and escape routes.	3.5
Fire safety signage	Provided to indicate fire exits and escape routes.	3.7
Stand-by power	Should be provided for the suppression system, emergency lighting and signage, fire detection and alarm system and emergency voice communication systems.	3.8



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Α



INTRODUCTION 1.

General 1.1

- 1.1.1 Ashton Fire have been commissioned by KAM Project Consultants Ltd (henceforth referred to as 'KAM') to provide fire safety consultancy services for the Project Helios industrial development in Newton Aycliffe.
- 1.1.2 The scope of this report is for the use of the building as an incineration plant and the ancillary areas intended to support this function (waste incineration). Other functions, such as facility for the production of energy are outside the scope of this report.
- 1.1.3 This report documents the detailed fire strategy for the building to date and is intended to be submitted to the approving authorities for this project as part of the approvals submission package.
- 1.1.4 This strategy report may be used to support the end user of the buildings in the development of any fire safety management procedures and plans considered necessary to fulfil their responsibilities under the Regulatory Reform (Fire Safety) Order 2005 (FSO) and any other applicable fire safety legislation.
- 1.1.5 This document is not intended to portray detailed design information for fire safety systems or construction specifications. As a strategic document supporting and informing the wider design, it should be read in conjunction with the wider project design documentation.
- 1.1.6 It should be noted that any alternative design solutions proposed within this report are subject to agreement and eventual approval by the relevant authorities having jurisdiction (AHJs).

Legislation and basis of design 1.2

- 1.2.1 Fire safety in buildings is primarily governed by two pieces of legislation in the UK. The Building Regulations 2010, Part B, Fire Safety applies to building design, whilst for fire safety management in buildings, compliance with the Regulatory Reform (Fire Safety) Order 2005 (FSO) is required.
- 1.2.2 This strategy has been developed to meet the level of fire safety expected under the Building Regulations 2010 (as amended), namely:
 - B1 Means of warning and escape
 - B2 Internal fire spread (linings)
 - B3 Internal fire spread (structure)
 - B4 External fire spread
 - B5 Access and facilities for the fire and rescue service
- 1.2.3 The fire safety strategy has been developed to satisfy the requirements for fire safety as set out by the Building Regulations. The strategy has not been specifically developed to address property protection or insurer's requirements though, it is understood certain elements of design have been specified to a higher standard than that which is typically expected (such as the incinerator room enclosure and sprinkler system specification). Furthermore, the features that are included for life safety, as required by the Building Regulations 2010, will contribute in some extent to business and property protection.
- 1.2.4 In general, the fire safety strategy has been developed in-line with the guidance documented in BS 9999:2017 [1] and documents referenced therein. Fire engineering principles are employed to support alternative solutions where strict adherence to the codes would conflict with the wider aspirations for the scheme. Unless otherwise stated, it is expected that provisions will be provided according to recommendations of BS 9999 as appropriate.

- 1.2.5 Departures from the guidance documents are identified and alternative proposals (including associated analysis) are documented for facilitating review with the project's approvers. In accordance with the fire safety engineering principles detailed in the PD 7974 codes of practice, it is considered appropriate that all fire precautions are determined based on there being one seat of fire (i.e. accidental fires).
- 1.2.6 The strategy has been developed in cognisance of the Construction (Design and Management) Regulations 2015 (CDM 2015), which sets out what designers are required to consider to protect anyone involved in the construction or ongoing use of a project. A summary of management and maintenance issues are provided in Section 9.
- 1.2.7 This strategy does not provide a comprehensive assessment of site fire safety during the building works or the phasing of these works, though a designer's review of construction site fire safety issues is recommended to be conducted during technical design. The Fire Protection Association and the Health and Safety Executive (HSE) issue guidance on identifying and managing fire precautions during the works, which should be consulted by the contractor or their specialist advisor when developing their construction fire safety plan.

1.3 Reference information

1.3.1 This strategy is based on information provided by the design team to Ashton Fire as listed in Table 1. Additional contradictory information or subsequent design variations to the information listed in Table 1 may render the findings and recommendations of this report invalid.

Description	Reference	Rev.	Author		
Proposed site layout	21002-SK40	D	Ashton Smith Architects		
Proposed ground floor layout	21002-SK41	D			Architects
Proposed mezzanine layout	21002-SK42	D			
Proposed roof plan	21002-SK43	С			
Proposed sections (sheet 1 of 2)	21002-SK46	В			
Proposed sections (sheet 2 of 2)	21002-SK47	A			
Proposed elevations (sheet 1 of 2)	21002-SK44	В			
Proposed elevations (sheet 2 of 2)	21002-SK45	В			

Table 1 - Project documentation referenced



PROJECT OVERVIEW AND DESIGN BASIS 2.

Building description 2.1

Project Helios consists of a new industrial building set in Newton Aycliffe, England. The site is located 2.1.1 remotely from the surrounding built up areas and will be accessed via new roads linking to Heighington Lane. The wider site and access routes to the building are illustrated in Figure 1.



Figure 1 - Site layout and access to the building

- 2.1.2 The building will operate as an incineration plant for waste and as such, will contain an incineration room that is separated from the adjacent areas using full height compartment walls. To support this process, waste bins will be brought in via loading bays and stored on the main floor in high-racking. Thereafter, full bins will be emptied in the incinerator and subsequently washed and stored in a separate racking space until collected from another loading bay.
- 2.1.3 The scope of this report is for the primary use of the building as an incineration plant with ancillary uses for the storage of bins on high-racking and an office / amenity space. Other functions, such as facility for the production of energy are not considered in this report.
- 2.1.4 The building will have a total footprint of 5,630m² and will rise a single storey. Internally, the building is divided into three distinct spaces: the incineration room, an office/amenity space, and the wider floor area used for storage of the waste bins in high racking, washing of the bins, charging battery powered forklifts, and general circulation.
- The incineration room will contain the incinerator, associated plant equipment and stores (ammonia), 2.1.5 which will be separated from the wider building using 120 minutes fire resisting construction. The room is located adjacent to an external wall of the building and is provided with vehicle access for collecting ash. The full height of the incinerator room measured from the vehicle access level to ceiling level is 17.9m and is provided as a single volume. An 88m² platform is provided 5.2m above the ground level from where waste will also be tipped into the incinerator. The platform is accessed from an adjacent mezzanine deck located outside the incinerator compartment in the main floor area.

- 2.1.6 A staff office and amenity space is provided on the south elevation of the building which rises two storeys and which will house the main reception, offices, canteen, and changing rooms at the ground level, and additional office and meeting room space on the upper level. The top of the office is located at a height of 4.0m above ground level and is served by a single stair. The upper level floor reduces in areas and will include a mezzanine space open to the wider floor area provided with a fixed ladder accessing the ground level.
- 2.1.7 The main floor area of the building will consist of high racking for storing the bins brought into the facility which will have a top shelf of 9.7m above ground (~11.0m from ground floor to the top of the bin stored at the top shelf). The floor will also contain a washing facility for cleaning emptied bins to prepare them for collection, and a charging room for electric vehicles (such as forklifts) used to move bins within the building. A 790m² mezzanine deck is provided adjacent to the incinerator compartment, also comprising of bins stored at a single level to be manually tipped into the incinerator room, with bins also located beneath the mezzanine, stored in a single level configuration. The mezzanine deck is accessed via a protected stair discharging at ground level, and an open stair and fixed ladder connecting to the wider ground floor areas and subsequent final exits to outside.
- 2.1.8 The building will be provided with an automatic suppression system understood to be a sprinkler system designed and specified by others. The system will be installed throughout the building except within the incineration room where the activation of the sprinkler system may cause disruption to the running of the facility.
- 2.1.9 The building layout is shown the following figures.









Figure 3 - Mezzanine layouts

2.2 **Risk profiles**

- 2.2.1 In accordance with BS 9999, various fire safety provisions are determined based on the risk profile of the building. The risk profile is based on the occupancy characteristics and the fire growth rate.
- 2.2.2 It is expected that the building shall be occupied by permanent staff / personnel. Members of the public will not form part of the building occupancy. As such, the entire building will be assigned an occupancy characteristic of 'A - Awake and Familiar).
- 2.2.3 The main floor will primarily comprise of high-rack storage and processing areas such as changing points for electric vehicles (forklifts) and a washing room for bins. The high-racking storage having a height in excess of 9.7m promotes rapid growth for a fire that is deemed unacceptable in BS 9999 (known as '4 ultra fast fire growth'). To reduce the rate of fire growth a level that satisfies the expectations in BS 9999, an automatic suppression system will be installed throughout the building except for the incineration room. As such, the main floor is assigned a fire growth rate of '3- Fast'. It is understood that this will be an automatic sprinkler system designed and specified to meet the expectations in BS EN 12845 [4].
- The office and amenity space will be situated in a separate fire compartment to the wider building, and 2.2.4 will generally contain combustibles arranged akin to a typical office. A fire growth rate of '2 - Medium' is therefore adopted. Given the automatic suppression system will be extended to the office space, the fire growth rate is reduced by one level as permitted in Section 6.5 of BS 9999.
- 2.2.5 The incinerator room will contain industrial plant and equipment that will contribute to a fire growth rate of '3 - Fast'. The nature of the processes being carried out are considered to be high risk, but not warranting an 'ultra-fast' fire growth rate given the incinerator plant will be contained within robust construction and room will not contain high risk or racked storage configurations. The construction of the incinerator is expected to be robust to handle extreme temperatures and the sprinkler system will be extended to provide coverage within the incinerator room.

2.2.6 The fire growth rates assigned to each area are summarised in Table 2.

Table 2 - Summary of risk profiles in Unit A

A) Reduced by one level as per Section 2.2.3.			

B) The incinerator room will be provided with sprinklers, though due to the high risk associated with the processes being carried out in this area the A3 risk profile will not be further reduced for the purposes of this fire strategy.

2.3 Occupancy

- 2.3.1 The occupancy within the building has been estimated based on seating arrangements displayed on the architectural drawings, and floor factors for various occupancies recommended in Table 9 of BS 9999 (6m²/person for offices), and further supplemented using Table D.1 of ADB [5] (30m²/person for warehouse, production, and plant areas).
- 2.3.2 To avoid double counting, areas where the occupancy will be transient (WCs, showers, changing rooms, locker rooms, stores, the canteen) are not considered to be occupied at the same time as the other areas.
- 2.3.3 The maximum expected number of occupants of the building is summarised in Table 3. The maximum allowable occupancy in areas within the building will ultimately be limited by the available exit capacity (see Section 4 for further discussion).

Table 3 - Design occupancy

Area	Floor	Floor area (m²)	Floor factor (m²/person)	Occupancy (persons)
Main mezzanine	lain mezzanine Mezzanine 790 30		30	10 ^{A)}
Bin tipping (incinerator compartment)	Mezzanine	88	30	
Offices / meeting rooms (office compartment)	Mezzanine	Number of seats		47 ^{B)}
Plant deck (office compartment)	Mezzanine	155	30	6
Main floor	Ground	4235	30	142
MHE repair room	Ground	59	30	2
Energy centre (incinerator compartment)	Ground	614	30	21
Bin tipping (incinerator compartment)	Ground	170	30	6
SCADA / meeting (incinerator compartment)	/ meeting (incinerator compartment) Ground Number of seats		12	
Canteen (office compartment) Ground Number of seats		24		
Offices / reception (office compartment)	Ground	Number of s	seats	16
Lockers (office compartment)	Ground	56	2	28



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AF3691: Merchant Park - Detailed Fire Safety Strategy

Total	262 ^{C)}
A) Escape via ladders is limited to 10 persons.	
B) Maximum occupancy on the upper level of the office compartment limited to 60 persons due to single stair	
C) Total occupancy excluding areas of transient occupancy as per Section 2.3.2.	



FIRE SAFETY SYSTEMS 3.

Automatic detection and alarm systems 3.1

- 3.1.1 The wider building will assume an A3 risk profile and as such, are to be provided with a Category L2 automatic detection and alarm system, to be designed and installed in accordance with BS 5839-1 [6] by a specialist. These areas will have significant floor to ceiling heights (over 10m), where suitable means of detection, such as beam smoke detectors, should be considered.
- 3.1.2 Single storey rooms within these areas and having a lower ceiling height (<10m) may be provided with point smoke detectors (or heat detection if used in plant areas, kitchens, or the charging room or to limit the likelihood of false alarms). These rooms include the offices and amenity spaces, as well as stores.
- 3.1.3 Though the office and amenity space is assigned an A1 risk profile, it is recommended the Category L2 automatic detection and alarm system is extended to the office spaces too, with detection provided in the store rooms, kitchens (if applicable), locker rooms, comms rooms, reception, as well as to the escape routes.
- 3.1.4 Appropriate means of detection, such as a rate-of-rise heat detector or a multi-sensor detection system (i.e. heat and CO monitoring) shall be considered for the incinerator room.
- 3.1.5 Manual call points (MCPs) are to be provided throughout the building. These will be of Type A in accordance with BS EN 54-11 [7], which are required to be provided with a protective cover. These are to be provided at all storey exits and further located so that they are not more than 45m apart.
- 3.1.6 Visual beacons or alternative means of warning should be provided in rooms or spaces within the offices where the background sound level could be louder than the fire alarm, or where occupants with hearing impairments may be situated in isolation (e.g. plant rooms, showers and WCs).
- 3.1.7 To assist with escape during maintenance periods, sounders are to be provided on the roof.
- 3.1.8 To assist with escape from the cleaning room and charging room which are inner rooms to the main floor area, a fire alarm should be provided in these rooms.
- 3.1.9 A Category L5 system will be provided to activate the automatic fire barriers (shutters) that cover the openings in the materials store, MHE repair and charging rooms, and the incinerator room compartment openings into the main floor at ground floor level and the mezzanine. This will be a local detector head located within the room. This is not required where activation of the barriers will be via a fusible link.
- 3.1.10 The automatic detection and alarm system shall be designed, installed and maintained in accordance with BS 5839-1. The system provider will be required to submit the design certificate for the scheme to the approving authority prior to its installation.

3.2 Automatic suppression systems

- 3.2.1 The building will be protected with an automatic sprinkler system, given this is required to mitigate the rapid rate of fire growth associated with the high rack storage facilities to an acceptable level. As such, the sprinkler system will provide coverage throughout the building, including within the office areas and below the mezzanine levels.
- 3.2.2 The sprinkler system will be designed and installed in accordance with BS EN 12845, where the system will be specified by a specialist contractor to also consider any relevant insurer requirements.

3.3 Automatic fire barriers

- 3.3.1 The materials store opening into the energy centre (incineration room), and the MHE repair / charge room opening into the wider ground floor, will consist of openings provided with roller shutters. Both of these rooms are enclosed using fire resisting construction and thus will require fire resisting shutters to be fitted over the openings in order to complete the fire resisting enclosure.
- 3.3.2 The MHE repair / charge room will be enclosed using 30 minutes fire resisting construction. As such, a fire shutter achieving a fire resistance rating of 30 minutes (integrity and insulation) should be provided. Given the shutter is provided in lieu of a fire resisting wall / door, a 2m exclusion zone either side of the shutter should be maintained where no combustible items will be located.
- 3.3.3 The materials store is separated from the adjacent energy centre (incineration room) sing 120 minutes fire resisting construction, where an opening is provided connecting the two rooms. A fire shutter that achieves a fire resistance rating of 120 minutes (integrity and insulation) should be provided. However, if the enclosure around the energy centre arranged to include the materials store within the same fire compartment, the fire resisting separation between the energy centre and the materials store may be reduced to a 30 minutes rating and therefore, a 30 minutes fire shutter. The exclusion zone noted above will also apply to the material store.
- 3.3.4 A fire and smoke curtain will be provided at the openings to the incinerator plant room from the main floor (ground floor) and mezzanine level. The incinerator room compartment is enclosed using 120 minutes fire resisting construction, where the fire and smoke curtain will be specified to match that rating.
- 3.3.5 Automatic fire shutters should be designed and installed in accordance with BS 8524-1 and BS 8524-2. A summary of the expected performance specifications is provided in Table 4 (overleaf). These locations are also illustrated in the fire strategy markups provided in Appendix A.

Table 4 - Fire shutter specifications

Parameter	Specification					
	MHA repair / charge Ground floor bin tipping room		Incinerator room enclosure			
Fire resistance integrity (E)	30 minutes	120 minutes	120 minutes			
Fire resistance insulation (I)	30 minutes	120 minutes				
Smoke containment	None	Not more than 3m³/m/h				
Reaction to fire	Class B-s3, d2 or better					
Obstruction warning	Multi-beam detection covering the whole opening					
Activation	Activation of a local detector head or fusible link		Activation of a local detector head			
Retraction	Full retraction upon the alarm being reset					
Power supplies	Backup power supplies not required where gravity fail-safe is provide upon loss of primary power					



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Frequency of intended use Class C1 in accordance with BS EN 14600:2005 (cycle class)

Electromagnetic locking / hold-open devices 3.4

- 3.4.1 Where doors are provided with electromagnetic locking or hold-open devices, these devices are to operate (either release the door to close normally, or release the door to be opened) upon:
 - Activation of the detection and alarm system;
 - Failure of the power supply;
 - Operation of a hand operated switch located to the side of the door;
 - Malfunction.

3.5 Automatic doors

3.5.1 Turnstiles and automatic doors are to be in accordance with BS EN 16005 [11] and BS 7036-0 [12]. They should be arranged to fail safe in the open position, or be easily openable in an emergency.

Emergency lighting 3.6

- 3.6.1 Emergency lighting will be installed to provide temporary illumination in the event of failure of the primary power supplies to the normal lighting system. As part of the emergency lighting system, escape lighting will be provided to ensure the escape routes are illuminated at all material times. Adequate artificial lighting will be provided in all common escape routes and will be of a sufficient standard to enable persons to see to escape.
- 3.6.2 Emergency lighting will be installed in accordance with the recommendations of BS 5266 [13], BS EN 1838 [14] and BS EN 60598-2-22 [15].
- 3.6.3 Emergency lighting will illuminate all occupied areas, common evacuation routes (internal and external as necessary) and essential areas including plant areas. It will also illuminate a safe exit route including fire exits, fire alarm call points, changes in level or direction and fire-fighting equipment. Lighting to escape stairs should be on a separate circuit from that supplying any other part of the escape route.
- 3.6.4 Primary and emergency lighting will be required for any external escape routes that will not be lit by surrounding street lighting.
- 3.6.5 Discharge lighting installations may operate at voltages that are a hazard to firefighters. An exterior discharge lighting installation, or an interior discharge lighting installation operating unattended, operating at a voltage exceeding low voltage (as defined in Statutory Instrument number 1018, part of the Building Regulations), should be controlled by a firefighter's emergency switch, installed and situated in accordance with BS 7671 [16] and the requirements of the fire authority.

Fire safety signage 3.7

- 3.7.1 Fire safety signs will be installed where necessary to provide clear identification of fire precautions, fire equipment and means of escape in the event of fire. All parts of the development will be fitted with appropriate fire safety signage to comply with The Health and Safety (Signs and Signals) Regulations 1996, i.e. signage to be specified in according to BS ISO 3864-1 [17], BS 5499-4 [18] and BS 5499-10 [19].
- 3.7.2 The purpose of fire signs is to direct persons towards fire exits, or to provide specific information or warning about particular equipment, doors, rooms or procedures. They should be recognisable,

- 3.7.3 Fire notices should be permanently displayed in conspicuous positions throughout the buildings, including storey exits, and should be specific to it.
- 3.7.4 All fire doors, other than lift landing doors, will be marked with the appropriate fire safety sign conforming to BS 5499-1 (white on blue) 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'); or
 - held open by an automatic release mechanism ('AUTOMATIC FIRE DOOR KEEP CLEAR').
- 3.7.5 Any emergency securing device fitted to doors on escape routes are to be provided with instruction notices, adjacent to the device, indicating the method of operation.

Emergency (life-safety) power supply 3.8

- 3.8.1 All life-safety systems will be provided with robust power supplies in accordance with Figure 1 BS 8519 [20].
- 3.8.2 The following fire safety systems shall comply with their respective British Standards regarding secondary power supplies:
 - Emergency lighting and signage;
 - Automatic fire detection and alarm system;
 - Automatic fire barriers:
 - Emergency voice communication (EVC); and
 - Automatic suppression system (pumps).
- 3.8.3 Power cabling should meet the recommendations of BS 8519 and the relevant design standard for the specific system.
- 3.8.4 The emergency lighting / internally illuminated signage, fire alarm systems, and EVCs may utilise internal batteries to provide back-up power supply where appropriate. These batteries should be capable of a continuous stand-by supply in accordance with the relevant design standard and be fully rechargeable within a period of 24 hours.
- 3.8.5 The automatic fire barriers can utilise a gravity drop as opposed to connection to a secondary power supply.
- 3.8.6 There must be minimal delay in change over if the main power fails and it must occur automatically.



MEANS OF WARNING AND ESCAPE 4.

Building Regulations requirement B1:

"The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times."

4.1 Evacuation philosophy

4.1.1 The building shall operate a simultaneous evacuation philosophy where all areas of the building will receive the signal to evacuate upon detection of a fire. The simultaneous evacuation regime will be supported by the detection and alarm system provided in each building as detailed in Section 3.1.

Horizontal means of escape - General 4.2

- 4.2.1 To meet the recommendations of BS 9999, the maximum permitted travel distances throughout the building are to satisfy the acceptance limits summarised in Table 5, with the occupancy to be supported by exits of adequate capacity as summarised in Table 6.
- 4.2.2 BS 9999 permits relaxations of travel distance limits and required exit widths where the fire detection and alarm system provides a clear benefit to the fire strategy over the baseline expectation in BS 9999, or where ceiling heights are greater than 3 m. These relaxations are incorporated in the values shown in Table 5 and Table 6 as appropriate.
- 4.2.3 Doors will be provided in accordance with the exit width factors summarised in Table 6. However, all exits should achieve a clear width not less than 800mm, which is to be increased to 850mm where disabled occupants are expected to be present. Where doors provide an exit from the stair, the clear width of the exit should be at least as wide as the stair it serves. Further, in accordance with BS 9999 guidance, the capacity of exits less than 1050 mm shall be calculated by assuming the exit to be 500 mm wide.
- Where an area or room has an occupancy of greater than 60 people, at least two exits are to be provided, 4.2.4 where these swing in the direction of escape. Doors hung to swing against the flow of escaping occupants are to serve a maximum of 60 people, irrespective of the available clear exit width.
- 4.2.5 Only exits provided with suitable door fastening hardware are to be considered as fire escape exits from the buildings. The design and management of security within the buildings must be co-ordinated with the means of escape to ensure escape routes will be available during all periods of occupation.

Table 5 - Travel distances

Risk profile / area	Ceiling	Recommended maximum travel distances		
	height (m)	Single direction (m)	Multi-direction (m)	
A1 – office and amenity spaces ^{A)}	<3	30.0 (20.0)	74.7 (49.8)	
A3 - bin wash	>4, <5	19.8 (13.2)	49.5 (33.0)	
A3 - bin tipping (incinerator room)	>5, <6	20.7 (13.8)	51.7 (34.5)	
A3 - mezzanine decks	>7, <8	21.7 (14.5)	54.4 (36.3)	
A3 - main floor, incinerator room	>10	22.0 (14.7)	58.5 (39.0)	

Notes

A) Beneficial use of the automatic detection and alarm system is taken for the office areas where the travel distances are increased by an additional 15%.

Where the internal layouts are not known, BS 9999 recommends taking 2/3rd of the travel distance which is the figure given in brackets and should be the limit applied where potential layout arrangements are unknown.

Table 6 - Exit width capacities

Risk profile	Exit component	Minimum exit width per person
A1 – office and amenity spaces ^{A)}	Doors and escape routes	2.81 mm/person
A3 - bin wash	Doors and escape routes	4.14 mm/person
A3 - all other areas	Doors and escape routes	4.10 mm/person

Notes:

A) Beneficial use of the automatic detection and alarm system is taken for the office areas where the travel distances are increased by an additional 15%.

Capacity of door with a clear width less than 1050mm shall be assessed on the basis of: 'Door capacity' = 500mm/exit factor.

Exit widths are for clear widths measured in accordance with Figure 14 in BS9999 as per below:



Horizontal means of escape - Mezzanines 4.3

- 4.3.1 The main floor mezzanine sits over open storage space and adjacent to the incinerator plant room compartment. The mezzanine covers a total area of 790m² and will support additional low level storage, understood to be bins lined up to be emptied into the adjacent incinerator.
- 4.3.2 The mezzanine is accessed via a protected stair on the east elevation, and an open stair and fixed ladder leading to the main floor area. Escape from the mezzanine deck to the vertical circulation routes (stairs and ladder) is within the 54.4m travel distances limit, and within 58.5m to a final exit at ground floor thereafter where the full ceiling height afforded by the building is taken into account. Ladders used for escape are to conform with BS EN ISO 14122-4.
- 4.3.3 Due to reliance on escape via a fixed ladder, the combined occupancy in the two mezzanines shall not exceed 10 persons as per Section 14.3b) in BS 9999. See Figure 4.
- 4.3.4 A separate mezzanine is provided over the office and amenity spaces which is provided with alternative exits: one into the adjacent office compartment; and, another to the ground floor exits via a fixed ladder into the main floor area. The travel distances from the office mezzanine are within the limits given in Table 5. Escape via fixed ladders is considered suitable for up to 10 occupants where these are afforded access for maintenance purposes only as per Section 14.3 in BS 9999.



2 Effective clear width (door stop to door

4.3.5 A plant room is also provided on the mezzanine level within the incinerator compartment, provided with a single means of escape to the ground floor via a ladder. Escape to the ground floor is within the single directional travel distance limit of 22m in the incinerator compartment, after which alternative directions of escape become available. Onward escape to outside is within the multi-directional travel distance limit of 58.5m.



Figure 4 - Means of escape and travel distances from the mezzanine levels

Horizontal means of escape - Main floor 4.4

- The main floor area will contain high rack storage, access into the incinerator room and adjacent office 4.4.1 compartment, as well as ancillary rooms serving primary use of the building such as a bin wash area, storage, and an MHE repair and charging room.
- 4.4.2 Escape from the main floor will be to perimeter exits located on the north, east, and south elevations. A total of six exits are provided directly to outside, which are sufficient for up to 605 persons assuming a clear exit width of 850mm and after discounting one exit being blocked by a fire.
- 4.4.3 The exit capacity at ground floor is suitable to cater for all occupants within the building even after one exit is discounted. Furthermore, the exits are sited such that escape from all parts of the floor area are within the travel distance limits given in Table 5.
- The bin washroom and MHE repair / charging room are accessed directly from main floor area, and are 4.4.4 open to the wider floor but surrounded by railing. As such, these are not classified as an inner rooms risk but should be noted that the conditions for designing inner rooms in BS 9999 are achieved as follows:
 - The occupancy within the inner room will be less than 60 persons. All rooms are transient, but the maximum occupancy that can be accommodated in each is less than 60 thus meeting the above.

- Escape from each inner room should be only through one access room and within the travel distance limits set out in Table 5 where both these conditions are met for all inner rooms.
- The access room should not be a place of special fire hazard. This is defined as areas that are likely to contain flammable liquid stores, combustion plant, or other high hazard processes. Though these are not explicitly the case for each inner room, the wider areas are assigned an A3 risk profile and include areas containing high rack storage. However, the inner rooms are assessed under the same risk profile, contain a transient occupancy, and access rooms will be provided with an automatic suppression system which is considered to adequately mitigate this risk. Furthermore, both rooms have exits in close proximity but occupants escaping from within these rooms will also be provided with alternative options to escape in once in the main floor area.
- The inner rooms will be provided with a fire alarm sounder giving warning of a fire developing in the access rooms given the wider single-storey areas will be provided with a Category L2 detection and alarm system.
- Horizontal means of escape Energy centre (incinerator room) 4.5
- 4.5.1 It is understood that the incinerator room will primarily contain the incinerator plant and supporting processes. As such, occupants within this area will be limited to operatives in charge of tipping bins into the incinerator (at the ground and mezzanine levels), as well as maintenance personnel.
- 4.5.2 At the mezzanine level, a deck is provided from which bins can be manually transferred from the adjacent space and tipped into the incinerator. This area will be accessed from the adjacent main mezzanine deck and its circulation spaces (see Section 4.3). Escape to the main mezzanine storey exits within the travel distance limits outlined in Table 5.
- 4.5.3 Access stairs will also be provided at the ground floor level to allow maintenance staff to inspect the plant. However, these only provide closer access to the plant and do not lead to an occupiable space and are considered to only cater a transient occupancy for brief periods. At the ground floor level, a total of four exits are provided, two of which lead directly to outside and the other two lead into the adjacent fire compartment (the main floor).
- 4.5.4 As such, escape from the energy centre (incinerator room) is within the travel distance limits in Table 5, and where exits provided with a clear width of at least 800mm are also sufficient.
- 4.5.5 At the ground floor, a SCADA room and a meeting room will be provided which are accessed from the wider incinerator plant compartment. As such, these rooms are considered to be inner rooms given they are accessed from a room containing a fire load and as such, shall meet the following conditions in accordance with BS 9999:
 - The occupancy within each inner room will be less than 60 persons.
 - Escape from each inner room should be only through one access room and within the travel distance limits set out in Table 5 where both these conditions are met for all inner rooms (this will be to outside the incinerator compartment).
 - The access room should not be a place of special fire hazard. This is defined as areas that are likely • to contain flammable liquid stores, combustion plant, or other high hazard processes. Though these are not explicitly the case for each inner room, the wider areas are assigned an A3 risk profile. However, the incinerator compartment will be provided with an automatic suppression system which is considered to adequately mitigate this risk. Furthermore, both rooms have exits in close proximity but occupants escaping from within these rooms will also be provided with alternative options to escape to from the access room and once outside the incinerator compartment.



• The inner rooms will be provided with a fire alarm sounder giving warning of a fire developing in the access rooms given the wider single-storey areas will be provided with a Category L2 detection and alarm system.

Horizontal means of escape - Offices / amenity space 4.6

- 4.6.1 The main offices and amenity space are provided in a separate two-storey compartment within the building. This will be separated from the adjacent main floor by 60 minutes fire resisting construction and will be served by a single stair. The upper level steps back from the floor below to form a 150m² deck open to the main floor area that will be accessed only for maintenance purposes.
- 4.6.2 A single escape route, such as a single stair, is suitable to accommodate up to 60 persons. The first floor occupancy is less than this at 47, and thus considered appropriate. However, the 60 person occupant limit should be considered for any future expansion of the offices.
- 4.6.3 Escape to the single stair from the internal areas of the upper floor are within the travel distance limits given in Table 5. The mezzanine deck open to the main floor is provided with alternative exits into the office compartment, and to the main floor area exits via a fixed ladder. Fixed ladders are not typically considered a suitable means of escape unless solely used by maintenance personnel on an infrequent basis, and where these may serve only up to 10 persons. Ladders used for escape are to conform with BS EN ISO 14122-4.
- 4.6.4 All rooms on the upper floor are provided with a single exit, where each exit including the storey exit into the stair is to have a clear width of at least 800mm.
- 4.6.5 Given the single stair is centrally located, offices at the remote ends of the circulation space are at a dead-end to the storey exit. Where these exceed a distance of 4.5m, a protected corridor is provided as per Section 16.3.11.3 in BS 9999, where the corridor enclosure is to be constructed to achieve 30 minutes fire resistance and maintained as fire sterile.
- 4.6.6 On the upper level, a waiting room is located off a wider circulation route east of the stair, through which occupants in the board room, training room, and kitchenette will escape passed on route to the single stair. The route is not considered to present risks commensurate to a corridor given its width (>4m) and short length, it is considered that rooms escaping through the waiting area are in an inner room condition, where the conditions set out in Section 4.4.4 are met.
- 4.6.7 Escape from the MD office at the upper level is through a dead-end corridor located west of the single stair. As such, a protected corridor is provided from which the offices and meeting room are accessed. The protected corridor will be enclosed using 30 minutes fire resisting construction, FD30S fire doors, and will be free of any fire load or combustible furnishings.
- 4.6.8 At ground floor, the canteen and office rooms are provided with alternative exits directly to outside and through internal circulation routes leading to the main entrance lobby and access across the compartment wall into the adjacent main floor space. Locker rooms exit onto the circulation corridor, which is provide with alternative exits as noted above, as well as into the canteen where these routes are to be signed as exits.
- 4.6.9 All exits at ground floor are to have a clear width of at least 850mm. The final exit from the stair into the reception and adjacent main floor compartment are to have a clear width that is at least as wide as the stair (i.e. minimum 1,000mm).

4.7 Horizontal means of escape - Roof

- 4.7.1 The roof of the building will not support an occupancy. However, where it is intended to be provided with access for maintenance, suitable means of escape are to be provided.
- 4.7.2 The roof will be provided with a single built-in access route via a fixed ladder from the incinerator compartment. Where provided with a single exit, the maximum permitted travel distance is limited to 60m. However, escape from the furthest part of the roof is approximately 116m and is to be provided with an alternative means of escape to accommodate roof access for maintenance.
- 4.7.3 Access to the roof exit via the incinerator compartment is also along a route in close proximity to nonfire rated roof lights. Given the spacing between these and the escape route is less than 3m separation as suggested in BS 9999, an alternative exit also accommodates appropriate escape from the roof.
- 4.7.4 To mitigate risks of roof escape during maintenance access periods, temporary alternative means of escape shall be afforded during scheduled maintenance visits through the use of MEWPs or other similar means. The alternative exit is to be positioned such that both exits are not at risk of being simultaneously compromised by the roof lights in the event of a fire developing on the floor below (see figure below).
- 4.7.5 The building tenant will be responsible to develop procedures ensuring that alternative escape routes will be facilitated by MEWPs (or similar other means), and where the organisations which are responsible for carrying out maintenance operations should carry out a fire risk assessment beforehand.
- 4.7.6 Emergency action plans should consider providing alternative means of escape from the roof, where BS 9999 permits for travel distances of up to 200m to an exit.



Figure 5 - Escape from the roof (maintenance)



4.8 Vertical means of escape - Offices / amenity space

- 4.8.1 Escape from the upper floors shall be facilitated by a single protected stair. As a minimum, the stair is to have a clear width of 1,000mm.
- 4.8.2 The stair discharges into a furnished reception space at ground floor. Though this is not permitted for a single stair, this is mitigated through providing alternative options for escape at the base of the stair to the adjacent main floor compartment and corridor leading to the canteen exit.
- 4.8.3 As such, the base of the stair will be separated from all adjacent escape options using fire resisting construction. Given a small number of occupants (<60) will escape via the single stair, it is considered that this arrangement will not result in significant congestion within the stair.
- 4.8.4 Lobby protection is not typically expected for single stairs that only serve a single storey above ground, though Section 17.2.4 in BS 9999 recommends that a protected lobby is provided between a single stair and a place of higher fire risk (e.g. the main floor area housing high-racking). However, given an automatic sprinkler system will be fitted within the main floor space it is considered that the high fire risk is significantly reduced. In addition to this, a compartment wall is provided to separate between the stair and main floor, and high ceilings further reduce the likelihood of excessive temperature build-up near the stair door.
- 4.8.5 It should be noted that some building design guidance documents may require a greater clear width, such as Approved Document M [23] or Approved Document K [24], which may affect the calculated occupant capacities in the stair.
- 4.8.6 Handrails which do not intrude more than 100mm into the clear escape route width may be ignored when measuring the clear width of the stair. Where these intrude more than 100mm, the clear stair width will be measured as the distance between the handrails.

Means of escape of disabled persons 4.9

- 4.9.1 It is envisaged that most occupants will be able to escape to a place away from danger without assistance from trained fire wardens. However, there may be a certain proportion of building occupants, such as those who are non-ambulant disabled (e.g. wheelchair users), who will not be able to negotiate stairs from office floor, or at ground floor where there is a change in level without assistance. In these instances, an environment should be provided in which their safety can be assured for a given period of time (e.g. refuge areas) prior to being assisted to ultimate safety outside the building.
- 4.9.2 It should be noted that under the Regulatory Reform (Fire Safety) Order 2005, it is the duty of the responsible person along with their appointed safety assistants to assist everyone to a place of ultimate safety outside the buildings in the event of an emergency.
- 4.9.3 Though there are no lifts providing access to the upper floor of the offices, it is recommended that a disabled refuge space is provided within the stair (at least 900 x 1,400 mm). This will enable disabled occupants to wait in a place of safety while the majority of people escape before they make their way out of the buildings at their own pace with assistance.
- 4.9.4 Each refuge shall be provided with an emergency voice communication system (EVC). The system shall comply with BS 5839-9 and consist of a Type B outstation which communicate with a master station located near the building or the fire alarm panel.
- 4.9.5 Refuges should be located not to impede the movement of occupants onto stairways or escape routes, be clearly identified and provided with emergency voice communication between the refuges and management/security positions.

4.9.6 Any disabled member of staff should have a Personal Emergency Evacuation Plan (PEEP) and the procedures should be practised. A Generic Emergency Evacuation Plan (GEEP) will need to be written for members of the public who would need assistance to escape. Further information can be found in BS 8300-2 and the DCLG Publication "Fire Safety Risk Assessment Supplementary Guide - Means of Escape for Disabled People" [26].

4.10 Escape away from the building

- 4.10.1 Travel beyond the buildings final exits must be away from the building, towards a place of safety, and not be jeopardised by unprotected openings of the building. Exits that require occupants to escape adjacent to an external wall of the building are to be safeguarded using fire resisting construction.
- 4.10.2 Assembly areas are to be located such that they are located remotely from access routes for the fire and rescue service (FRS) and evacuation from the buildings can be achieved without exposure to a hazard from a building fire.
- 4.10.3 The selection of appropriate assembly zones outside the buildings is an operator-led exercise. Landscape design must ensure safe escape to and from the relevant locations, i.e. routes should be usable by all occupants, e.g. a need to cross grass may not be appropriate for all mobility aids.



INTERNAL FIRE SPREAD - LININGS 5.

Building Regulations requirement B2:

- "(1) To inhibit the spread of fire within the building, the internal lining shall:
 - Adequately resist the spread of flame over their surfaces; and a)
 - Have, if ignited, a rate of heat release or a rate of fire growth, which is reasonable in the b) circumstances.
- In this paragraph 'internal linings' mean the materials or products used in lining any partition, (2) wall, ceiling or other internal structure."

Internal wall and ceiling linings 5.1

- 5.1.1 During the development of a fire in a building, the choice of material for the lining of walls and ceilings can significantly affect the spread of fire and its rate of growth.
- 5.1.2 Restrictions are placed on the wall and ceiling lining materials within certain areas of buildings to limit the spread of fire and production of smoke in these areas.
- 5.1.3 It is particularly important that in circulation spaces, where the rapid spread of fire is most likely to prevent occupants from escaping, the surface linings are restricted, by making provision for them to have low rates of heat release and surface spread of flame.
- 5.1.4 All wall and ceiling linings within the buildings should meet the recommendations of Section 34 in BS 9999 when tested under the European Classification (in accordance with BS EN 13501-1 [28]) as summarized in Table 7 below.
- 5.1.5 The surface linings of walls and ceilings should generally conform to the classification recommended above for the appropriate location. However, parts of walls in rooms may be of a lower class but not lower than European Class D-s3, d2, provided that the floor area of those parts in any one room does not exceed half of the floor area of the room, subject to a maximum area of 60 m².

Location	Euro Class
Small rooms ≤30m²	D-s3, d2
Circulation spaces*-	B-s3, d2
Other rooms	C-s3, d2

Table 7 - Surface spread of flame requirements

Rooflights and thermoplastic materials 5.2

- 5.2.1 Any non-plastic rooflights are to meet the recommendations of Table 7.
- 5.2.2 Where thermoplastic materials are used in the buildings, these are to comply with the various recommendations provided in Section 34.1.2 in BS 9999.
- 5.2.3 Furthermore, Table 34 in BS 9999 suggests that in industrial type buildings, the total area of class D-s3, d2 (or TP(b)) rooflights should not exceed 20% of the area of the room below, and where these may be spaced 1.8m from each other. This is achieved by the rooflight arrangements given these have an aggregate area of approximately 280m², evenly distributed over the roof having an area of 6,220m².



INTERNAL FIRE SPREAD - STRUCTURE 6.

Building Regulations requirement B3:

- The building shall be designed and constructed so that, in the event of fire, its stability will be "(1) maintained for a reasonable period.
- A wall common to two or more buildings shall be designed and constructed so that it (2) adequately resists the spread of fire between those buildings. For the purposes of this sub paragraph a house in a terrace and a semi-detached house are each to be treated as a separate building.
- Where reasonably necessary to inhibit the spread of fire within the building, measures shall be (3) taken, to an extent appropriate to the size and intended use of the building, comprising either or both of the following:
 - (a) sub-division of the building with fire resisting construction;
 - installation of suitable automatic fire suppression systems. (b)
- The building shall be designed and constructed so that the unseen spread of fire and smoke (4) within concealed spaces in its structure and fabric is inhibited."

Structural fire resistance 6.1

- 6.1.1 The building consists of single storey industrial and warehouse spaces having an A3 risk profile (reduced from an A4 risk profile on the basis of a sprinkler system being installed within the building). The office compartment has a top floor height of 4.0m above ground level, and is assigned an A1 risk profile given this will be separated from the wider building and provided with sprinkler coverage.
- 6.1.2 Taking into consideration both the risk profile and the height of internal office accommodation within the wider single-storey unit, loadbearing elements of structure shall achieve a fire resistance rating of 60 minutes in order to meet Table 24 in BS 9999.
- 6.1.3 This rating of structural fire protection is considered suitable for the purposes of achieving the life safety goals of the Building Regulations 2010 (as amended). A higher standard of structural fire protection may be needed to meet insurer requirements, and to protect the structure providing fire separation between the energy centre (incineration room) and wider building. See Section 6.2.2.
- 6.1.4 The building contains a 790m² structurally independent mezzanine deck located 5.2m above ground. This deck will be utilised as a raised storage platform, with low level storage beneath too, and will be occupied by staff operating the bin tipping process within the incinerator room. Although the mezzanine deck is not considered to be equivalent to an occupied floor, supplementary guidance from within Approved Document B Volume 2 (ADB2) [ref] suggests there are cases where such structures may require protection. However, where the building is fitted with an automatic sprinkler system, Clause 7.7 in ADB2 suggests that structural fire protection to the mezzanine is not required subject to this only rising a single level above ground. As such, it is considered appropriate that no fire protection is afforded to the mezzanine structure.
- 6.1.5 Elements of structure that only support a roof do not require fire resistance (i.e. where the roof does not support heavy plant or is treated as an occupied floor). However, where the structure supporting the roof is also crucial to the stability of elements described in the sections above, this will also require to be protected to at least 60 minutes structural fire resistance.

Compartmentation and fire-resisting construction 6.2

- 6.2.1 The building will predominantly comprise a single storey facility but with a two storey (G+1) office located within the building. In accordance with Table 22 of BS 9999, the main offices and the secondary offices will be fully separated from the wider building areas using construction achieving a fire resistance rating of at least 60 minutes.
- 6.2.2 The energy centre (incineration plant) will be enclosed using fire resisting construction achieving a rating of at least 60 minutes. However, it is understood this will be enclosed using 120 minutes fire resisting construction.
- 6.2.3 An MHE charge / repair room, and materials store will be provided adjacent to the main floor area, and the energy centre respectively. These rooms are to be separated from each other, and the adjacent areas using at least 30 minutes fire resisting construction. Where these rooms share a wall with the energy centre (incineration room), the fire resistance rating of that wall should match that of the energy centre enclosure.
- 6.2.4 Protected stairs within the building are to be enclosed using at least 30 minutes fire resisting construction (one stair located on the mezzanine deck, and another located in the office compartment).
- 6.2.5 Within the office compartment, the single stair will discharge internally at ground floor. Diverse routes of escape will be provided from the base of the stair that will be separated using at least 30 minutes fire resisting construction.

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Part of Building	Minimum Fire to the relevant	Methods of Exposure		
	Loadbearing	Integrity	Insulation	
Structural elements	60	n/a	n/a	Exposed faces
Compartment wall to the energy centre	120	120	120	Each side separately
Compartment wall to the offices	60	60	60	Each side separately
Protected stairs	30	30	30	Each side separately
Service shafts in the offices	30	30	30	Each side separately
Protected corridors, lobbies	30	30	30	Each side separately
Kitchens, store rooms, comms	30	30	30	Each side separately
Plant rooms	60	60	60	Each side separately
Plant room housing life safety equipment	120	120	120	Each side separately
Cavity barriers	n/a	30	15	Each side separately



ements (in minutes)

- 6.2.7 Shutter assemblies provided in openings in fire resisting enclosures are to achieve a fire resistance rating that matches that of the wall (see Section 3.3).
- 6.2.8 The roof covering is to achieve a designation of $B_{ROOF}(t4)$ for at least 1.5m either side of the compartment wall, and set over a substrate or deck with a rating of at least class A2-s1, d0. Further discussion on roof covering designations and associated British Standards is provided in Section 7.2.
- 6.2.9 The fire resistance requirements for the building are summarised in Table 8. The fire resisting enclosures in the building are illustrated in the fire safety mark-ups produced for the scheme and provided in Appendix A.

6.3 Fire doors

6.3.1 Fire doors should be provided as summarised in Table 9, in accordance with the recommendations in Table 30 in BS 9999.

Position of Door	Tested to BS 476-22 [29] Tested to BS EN1634 [30]		
Enclosing a compartment wall	As per the wall it is fitted in		
Enclosing a protected escape route	As per the wall it is fitted in and with cold smoke seals		
Enclosing a protected stair	FD30S	E 30 S _a	
Enclosing a protected shaft / riser	FD 30	E 30	

Table 9 - Fire Doors

Notes:

The ratings shown above are for integrity only.

Smoke seals are indicated by the suffix 'S' (to BS 476-31 [31]) or Sa (to BS EN 1634-3 [32]) and are required in all doors which form the enclosure to protected escape routes.

All fire doors should be self-closing except for doors which are normally locked shut, such as to places of special fire hazard or service risers, which should also be provided with appropriate signage.

- 6.3.2 Doors on escape routes should not be fitted with locks, latch or bolt fastenings or should only be fitted with simple fastenings that can be readily operated (without the use of a key) from the side approached by occupants making an escape.
- 6.3.3 Doors should generally be hung to open in the direction of escape and should always do so where it is expected that the number of persons expected to use the door at the time of a fire is more than 60. In corridors having escape in each direction, doors are recommended to swing in both directions.
- 6.3.4 Vision panels should be provided where doors on escape routes sub-divide corridors, or where doors are hung to open in both directions.
- 6.3.5 Any fire doors fitted with hold-open devices should release on:
 - actuation of the fire alarm system;
 - manual operation or operation of a manual switch fitted in a suitable position, if necessary; or

- failure of the electricity supplies.
- 6.3.6 Where doors on escape routes need to be secured against unauthorised use by electrically powered access control measures when the buildings or part of the buildings are occupied, it should also be overridden from the side approached by occupants making an escape. Electrically powered doors should return to the unlocked position;
 - On operation of the detection and alarm system.
 - On loss of power or system error.
 - On activation of a manual door release unit (Type A) that is designed to BS EN 54-11 [7] and is positioned at side of the door that is approached by people making their escape. Where the door provides escape in either direction, a unit should be installed on both sides of the door.

6.4 Fire-stopping and penetrations through fire-resisting construction

- 6.4.1 Fire-stopping should be provided at the junction of fire-separating walls and external walls in order to maintain the fire resistance period of fire-separating walls, and thereby prevent a fire from travelling around the junction and into the neighbouring space. Penetrations through lines of fire-resisting separation should be fire-stopped using a system which will achieve the same fire resistance rating as the penetrated wall or floor.
- 6.4.2 All pipes, ductwork and services passing though fire-resisting separations should be either enclosed in fire-resisting construction (i.e. shaft) of matching fire resistance or provided with fire dampers of matching fire resistance. Certain small diameter pipes require only fire-stopping around the pipe, dependent on pipe material and the type of fire-resisting barrier penetrated. Further information is available in Table 31 of BS 9999.
- 6.4.3 In order to maintain the fire resistance of separating construction, any pipe or cable penetrations through lines of fire-resisting separation should be fire-stopped in accordance with one of the following methods set out by Section 32.5.14 in BS 9999, unless located within a protected shaft. Figure 6 is provided to assist in the interpretation of the above recommendations.
 - for pipes of any diameter, a proprietary seal which has been shown by test to meet the fire-resistance rating of the wall, floor, or cavity barrier for the penetration circumstance; or
 - for pipes with a restricted diameter, keeping the opening as small as possible and providing firestopping around the pipe. The nominal interior diameter of the pipe should not be more than the relevant dimensions given in Table 31 of BS9999.
- 6.4.4 Where a duct crosses fire-resisting construction protecting escape routes, dampers on fusible links are not sufficient. Either combined fire-and-smoke dampers activated upon smoke detection (ES-type dampers) are provided, or the duct should be fire-resisting / enclosed within fire-resisting construction.
- 6.4.5 Any gas supply pipe through a protected stair will be of a screwed-steel or all-welded steel construction, installed in accordance with the "Pipelines Safety Regulations 1996, SI 1996 No 825" and the "Gas Safety (Installation and use) Regulations 1998. SI 1998 No 2451".

6.5 Cavity barriers and concealed spaces

6.5.1 Cavity barriers are provided in order to prevent the rapid spread of unseen fire or smoke in voids, and to prevent the spread of fire around compartmentation via voids. Extensive internal concealed cavities (e.g. in external cavity walls, subd-dividing walls, roof voids or the void between suspended ceilings and the soffit of the floor above) generally require cavity barriers to sub-divide them, as illustrated in Figure 7.



- 6.5.2 All cavity barriers should have a fire resistance rating of at least 30 minutes for integrity (E) and 15 minutes for insulation (I). They should be provided as follows:
 - in general, cavity barriers should be at 20 m centres in cavities with exclusively Class C-s3, d2 linings or better. For other linings, the spacing between cavity barriers should be reduced to 10 m;
 - in voids below or above large rooms, cavity barriers may be at up to 40m centres in either direction, provided there are also cavity barriers provided along the lines of the enclosing walls / partitions of that room and the cavity linings are exclusively class B-s3, d2 or better; and
 - above walls enclosing protected escape routes, where the wall does not continue to the level of the soffit above.
- 6.5.3 Cavity barriers provided around openings within the external wall may be formed of:
 - steel at least 0.5mm thick or timber at least 38mm thick; or
 - polythene-sleeved mineral wool, or mineral wool slab under compression when installed cavity; or
 - calcium silicate, cement-based or gypsum-based boards at least 12mm thick.





Figure 7 - Cavity barrier and fire-stopping locations



-Compartment wall



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Figure 6 - Fire-stopping expectations

EXTERNAL FIRE SPREAD 7.

Building Regulations requirement B4:

- The external walls of the building shall adequately resist the spread of fire over the walls and "(1) from one building to another, having regard to the height, use and position of the building.
- The roof of the building shall adequately resist the spread of fire over the roof and from one (2) building to another, having regard to the use and position of the building."

7.1 External wall construction

- 7.1.1 In order to prevent the spread of flame across the surface of the buildings at a speed which may pose a threat to life, materials forming the external cladding to buildings are to meet the performance criteria given in BR 135 [33] for cladding systems using full scale test data from BS 8414-1 [34] or BS 8414-2 [35], or should meet the following recommendations:
 - The external surfaces of wall will meet the provisions given in Section 7.1.2;
 - Cavity barriers will be in accordance with Section 6.5;
 - For walls which are not subject to the maximum cavity barrier spacing (by virtue of their masonry construction), the surfaces of materials which face into cavities should also meet the provisions set in Section 7.1.2.
- 7.1.2 The building height measured to the mean roof level is 14.8m above ground level in the wider building, and up to 17.9m in the incinerator room. In accordance with Figure 47b of BS 9999, there is no specific rating for the external wall surfaces of the up to a height of 18m above ground level.
- 7.1.3 Whilst there are no specific provisions required for the external wall surfaces of the building up to a height of 18m above ground level, these should not be designed to promote the spread of fire.

7.2 **Roof coverings**

- 7.2.1 Roof coverings are recommended to be resistant to fire spread where either close enough to a boundary to be at risk of ignition from a fire in other buildings or where needed to avoid fire spread between compartments via the roof covering. These are summarised in Table 10 below.
- 7.2.2 The relevant test and classification standards for the external fire performance of roof systems are BS 476-3 [36] (National Class) or BS EN 13501-5 [37] (European Class).
- 7.2.3 Roof coverings refer to a construction that can consist of one or more layers of material but does not refer to the roof structure as a whole. summarises the separation distances from the boundary according to the type of roof coverings as described in Section 35.4 of BS 9999.

Table 10 - Limitations on roof coverings

Distance	National Class	AA, AB or AC	BA, BB or BC	CA, CB or CC
from relevant boundary	European Class	Broof(t4)	C _{ROOF} (t4)	D _{ROOF} (t4)
Less than 6m		\checkmark	×	×
At least 6m		\checkmark	\checkmark	×
At least 20m		\checkmark	\checkmark	\checkmark

Space separation and unprotected areas of the façade 7.3

- 7.3.1 Should a fire occur in a building, heat will radiate through non-fire resisting openings in the external walls. This incident heat flux to nearby buildings could result in the ignition of their surface materials. To reduce the likelihood of this occurrence, the Building Regulations 2010 place limits on the area of the external elevation with no fire resistance, as function of the distance to the relevant boundary. This area is known as the unprotected area. The distance of the building from adjacent buildings across or relevant boundaries, the use of the building and the compartment size are all factors in determining the acceptable degree of unprotected area for each elevation.
- 7.3.2 The relevant boundaries can be taken as being:
 - the site boundary;
 - a notional boundary created on the centreline of an adjacent road, river, or railway tracks; or
 - a notional boundary formed at the midpoint between the building and an existing adjacent building.
- 7.3.3 In accordance with BS9999 guidance, only small unprotected areas in an otherwise protected façade do not contribute to the extent of unprotected area. These are shown in Figure 8 summarising the following:
 - The maximum permitted size of openings in a protected wall is to be limited to $1 m^2$ where adjacent openings are separated from the each other by a compartment wall or floors, or by a separation distance of 4m in both vertical and horizontal planes.
 - Smaller openings, with an area of up to 0.1 m^2 are permitted to be spaced from each other as well as from larger openings (as noted above) by a separation distance of 1.5m in both vertical and horizontal planes, or otherwise by a compartment wall or floor.



Key

- Unrestricted
- External wall of shaft that is enclosed by a minimum of 60 min fire resistance from the 2 accommodation side

Figure 8 - Exclusion from unprotected area calculations





- 7.3.4 The relevant boundaries around the site are illustrated in Figure 9.
- 7.3.5 The building has various heights at different elevations, all of which are summarised in the table below on the most onerous measurement taken for each compartment relevant to its elevation. The energy centre (incinerator room), and offices are taken to be independent fire compartments for the purposes of this analysis. The full width of each elevation is also assessed on the assumption that these form the main floor compartment.
- 7.3.6 Given the building is fitted with an automatic sprinkler system, the reduced incident radiation flux values of 84 kW/m² are taken for the main floor area, and 42kW/m² for the office compartment. Conservatively assuming the energy centre (incinerator room) will not be provided with sprinkler coverage, a value for the incident radiation flux of 168 kW/m² is taken.
- 7.3.7 The results of the analysis are shown in Table 11.



Table 11 - External fire spread calculations

Elevation	Area	Radiation intensity (kW/m²)	Façade width (m)	Height (m)	Boundary distance (m)	Permitted % of unprotected area
North	Main floor (racking)	84	103.6	16.0	56.7	100
	Energy centre	168	46.9	17.9	56.7	100
East	Main floor (racking)	84	51.3	14.8	17.6	100
	Office / amenity	42	4.0	8.0	17.6	100
South	Main floor (racking)	84	103.6	14.8	23.0	100
	Office / amenity	42	50.7	8.0	23.0	100
West	Main floor (racking)	84	51.3	14.8	30.9	100

Figure 9 - Site boundaries



ACCESS AND FACILITIES FOR THE FIRE AND RESCUE SERVICE 8.

Building Regulations requirement B5:

- "(1) The building shall be designed and constructed so as to provide reasonable facilities to assist fire fighters in the protection of life.
- (2) Reasonable provision shall be made within the site of the building to enable fire appliances to gain access to the building."

Means of notifying the fire and rescue service 8.1

8.1.1 In the event of fire, the fire and rescue service (FRS) will be notified by a member of staff or the general public. The fire and rescue service will be met by a member of staff when they arrive on site.

Water supplies 8.2

- Hydrants will be required in the vicinity of the buildings to support firefighting operations. Where 8.2.1 existing hydrants are identified near the building, these should be within 90m from a building entry point as per BS 9999.
- 8.2.2 Where existing hydrants are further than 90m from the building entry points, new fire hydrants are expected to be provided in accordance with BS 9990 [39]. These should be part of a ring main system and sited so that they are within 90m of the building entry points. The location of existing hydrants in proximity to the scheme are to be confirmed.
- 8.2.3 Hydrants should be designed and installed in accordance with BS 9990 and should be capable of achieving a flow rate of 1,500 litres/minute. In addition to this, all hydrants should have signage in accordance with BS 3251. Hydrants should be sited at least 6m away from the building envelope.

Vehicle access to and around the site 8.3

- 8.3.1 The site will be accessed from a new road leading from Heighington Lane, north of the development, with subsequent access around the building via new internal site roads. Access to the building will be via internal site roads as illustrated in Figure 10.
- 8.3.2 The building will have a gross internal floor area of circa 6,250m², and top floor height of 4.0m above ground floor level (mezzanine level at 6.2m above ground floor). Table 19 in BS 9999 suggests that the building should be provided with fire service vehicle access to at least 15% of the building perimeter. This is achieved in excess, where internal site roads provide access to the entire east and north elevations of the building as indicated in Figure 10.
- 8.3.3 The vehicle access route should comply with the minimum specification indicated in Table 12 for a pump-type appliance. Fire and Rescue service appliances are not standardised, therefore vehicle access provision should be discussed and agreed with the local fire and rescue service to ensure their vehicle complies with the parameters listed in Table 12.

8.4 Access into and through the buildings

- 8.4.1 Access into the building will be through doors on the façades at each elevation of the building (see Figure 10). Access is also provided from the access route directly to the stairs serving the main offices at the north elevation, and office / amenity space at the east and south elevations.
- 8.4.2 BS 9999 recommends that fire service access into the building is via doors no less than 750mm in width. The buildings include numerous doors that are at least 750mm wide.

Table 12 - Typical firefighting appliance access requirements

M	linimum	access	route	specific	ation
---	---------	--------	-------	----------	-------

- Width between kerbs
- Width between gateways
- Turning circle between kerbs
- Turning circle between walls
- Clearance height

Carrying capacity



Figure 10 - Fire service vehicle site access

First-aid firefighting 8.5

- First-aid firefighting provisions should be assessed and provided as part of the fire risk assessment for 8.5.1 the buildings, including consideration for the day-to-day management of these provisions. Suitable firstaid firefighting provisions can help with the extinguishment of small fires, preventing these from growing into significant fires.
- 8.5.2 In general, fire points should be provided within general areas of the buildings and within specific areas presenting a significant fire ignition risk, such as plant or any kitchen areas. The fire risk assessment that should be undertaken upon occupation of the buildings may assist with the placement of suitable fire extinguishers.



Dimension
3.7 m
3.1 m
26.0 m
29.0 m
4.0 m
12.5 tonnes (TBC by local FRS)
- 8.5.3 The type and size of extinguisher(s) at each fire point will be chosen in accordance with the guidance given in BS 5306-8 [40], as summarised by Table 13 and the classification of fire fuel hazards summarised as follows:
 - Class A fires involving solid materials, usually of an organic nature (general hazards);
 - Class B fire involving liquid of liquifiable solids (such as liquid fuels, lubricants, paints, etc);
 - Class C fires involving gases;
 - Class D fires involving metals; and
 - Class F fires involving cooking media (vegetable or animal oils or fats).
- 8.5.4 For the general areas, each floor should have a fire extinguisher at a rate of approximately 1x fire point for every 200m² of floor area. These would generally be recommended to be located adjacent to storey exits. Fire points are recommended to consist of either a 9L water and 2L CO₂ extinguisher, or a single 6L AFFF Foam extinguisher where covering electrical devices which would not exceed the 35 kV (dielectric test) limitation.
- 8.5.5 Any plant rooms should be provided with extinguishers suitable for their risks. In general, it would be expected that CO2 extinguishers would be provided for electrical risks, where this may be for higher voltage equipment. Powder extinguishers should not be used within these confined spaces, where breathing in of the powder is harmful to the health of lungs.
- 8.5.6 Wet chemical extinguishers are typically provided for kitchens having a risk of oil based fires. Fire blankets should also be provided for extinguishing cooking fire within kitchen areas.

Medium	Colour code	Application	Do NOT use for		
Water	White	Class A fires	Liquid, electrical, metal or cooking fires		
Powder	Blue	Class A, B, or C fires	Metal or cooking fires		
Foam	Cream	Class A or B fires	Electrical*, metal or cooking fires		
CO2	Black	Class B fires	Metal or cooking fires		
Wet chemical	Yellow	Class A or F fires	Liquid, electrical or metal fires		
*AFFF Foam extinguishers may be used for electrical fires up to 35 kV (dielectric test) and where					

Table 13 - Fire extinguisher types and application guidance



9. FIRE SAFETY MANAGEMENT

9.1 Overview

- 9.1.1 Management procedures have a pivotal role to play in fire prevention, control and evacuation of occupants should a fire incident occur. This management is the responsibility of the responsible person, supported by the building fire safety design and handover of fire safety information. In all other areas, the Regulatory Reform (Fire Safety) Order 2005 (FSO) places legal obligations on management.
- 9.1.2 This section is intended to introduce the FSO, its obligations and provide initial guidance in fulfilling these duties. It is the responsibility of the landlords/ building management to ensure that all fire safety systems are tested and maintained to ensure their continuous effectiveness. Building management need to be aware of all fire safety features provided and their purpose.
- 9.1.3 It is important that management are aware of their responsibilities detailed in this document and agree that they are sufficiently capable of adequately performing them. Effective arrangements should be put in place to manage all aspects of fire safety in the premises and the details of those arrangements need to be recorded, e.g. within a fire safety management plan.
- 9.1.4 In accordance with BS 9999:2017, there are two management system levels. One of which should be implemented and are summarised in Table 14.

Level	Management	Robustness	Minimum assurance	Conformity
1	Enhanced	Best Practice	High level of assurance	Conformity with a management level such as BS 9997
2	Adequate	Good Practice	Adequate level of assurance	Conformity with requirements of legislation

Table 14 - Management levels

Regulatory Reform (Fire Safety) Order 2005 9.2

- 9.2.1 The Fire Safety Order came into effect in October 2006 and replaced over 70 pieces of fire safety law. The Order applies to all non-domestic premises in England and Wales, including the common parts of blocks of flats or houses in multiple occupation. The Order removed the legal status of fire certificates, which are no longer enforceable by the Fire Authorities. The 'responsible person' has a duty to make the premises safe and must undertake regular fire risk assessments. It is the responsible person who will be held accountable under the new legislation for any breaches in fire safety. It is expected that the buildings are managed and maintained to a standard in accordance with the expectations of the FSO.
- 9.2.2 In workplaces, the responsible person is the employer. In other cases, the owner or person in control of the premises is the responsible person, e.g. building management company.
- 9.2.3 Under the Order, the 'responsible person' must carry out a fire safety risk assessment and implement and maintain a fire management plan. The assessment should be kept under regular review and reassessed if the use of the buildings has been varied or a material alteration has been made. The significant findings must then be recorded, along with the measures taken to address the risks identified. A competent person should carry out the fire risk assessment.

Management responsibilities in support of the fire strategy 9.3

9.3.1 Management of fire safety must be integrated with all other management systems. If this management is lacking, then there is a danger that all the other areas such as security measures and alarm systems will be ineffective. To ensure there is no doubt as to where the responsibility for fire safety rests, and to enable consistency of approach, it is important that each establishment appoints a designated Fire Safety Manager. It may be possible to appoint a professional to take on this role but that will depend on the size of the premises, costs, etc.

- 9.3.2 The appointed person should have the necessary authority and powers of sanction to ensure that standards of fire safety are maintained. The main duties of the Fire Safety Manager include:
 - management to minimise the incidence of fire; e.g. good housekeeping and security;
 - producing an Emergency Fire Plan; •
 - being aware of all of the fire safety features provided and their purpose;
 - being aware of any particular risks on the premises (e.g. issues relating to hot work); •
 - being aware of their responsibilities towards disabled people;
 - attendance at the premises when members of the public are present, or the buildings are occupied. It is acceptable for a competent person other than the fire safety manager to be in attendance, provided that this person has been delegated in writing and that cover is not interrupted;
 - liaising with, and where necessary seek the advice of, the fire authority, the licensing authority and • other relevant enforcing authorities;
 - having powers to deal with individuals who sabotage or tamper with safety systems, who ignore any smoking policy or who block exits;
 - liaising with other fire safety managers in a multi-occupancy arrangement;
 - ensuring that tenants, concessionaires and caretakers are appropriately briefed;
 - ensuring that appropriate communication systems are in place to deal with any fire incident; •
 - checking the adequacy of fire-fighting equipment and ensuring its regular maintenance;
 - ensuring fire escape routes and fire exits are unobstructed and doors operate correctly;
 - ensuring that fire detection and protection systems are maintained, tested, with records kept; and
 - ensuring any close down procedures are followed.
- 9.3.3 Good housekeeping is to ensure that the effectiveness of the fire safety provisions are not adversely affected, including the adequate provision for the disposal of waste and / or rubbish. Maintenance procedures are to be enacted so that equipment will able to operate effectively. Maintenance staff will are to be trained in the importance of the fire safety systems and planned maintenance.
- 9.3.4 Suitable assembly points outside the buildings should be identified. These should be remote from the access routes used by the FRS.
- 9.3.5 Internal escape routes should generally have wall and ceiling linings achieving a Class B-s3, d2 surface spread of flame standard, apart from permitted exceptions noted in this report. These finishes must be maintained for the life of the buildings. Display features or items such as posters, artwork pieces, etc. may be included with appropriate consideration, justification and on-going control.
- 9.3.6 Maintenance access to the roof will be facilitated by a single built-in route from within the building where an alternative means of escape is required to be provided on any scheduled roof maintenance visits to the roof. This is to be provided by employing MEWPs (or other similar temporary means) during such times.



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	Tel: 014	23	52288	2 Fax:	014	23 565	104		
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Project Name: Merchant Park (Project Helios)					
Drawing Title: FIRE STRATEGY DRAWING					
Author:	GT	Date:	06.09.23		
Checked:	KW	Issue:	03		
Project Nun	nber:	AF 3691			
	Fire Res	sistance			
Doors					
		D	oors		
Rating (Minutes)	Walls	Do With Smoke Seals	oors Without Smoke Seals		
Rating (Minutes) 30	Walls	Do With Smoke Seals	oors Without Smoke Seals		
Rating (Minutes) 30 60	Walls	Do With Smoke Seals	Without Smoke Seals		
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Rating (Minutes) 30 60 90 120	Walls	U With Smoke Seals	Without Smoke Seals		
Rating (Minutes) 30 60 90 120	Walls	U With Smoke Seals	oors Without Smoke Seals		

developed in accordance with BS9999 for life safety. No insurer requirements are considered as confirmed by the client.

2. An automatic suppression system (sprinklers) will be provided as per BS EN 12845. It is understood the system will consist of overheard and in-rack sprinkler heads with the system to be designed by a specialist contractor.

3. The building is assigned an A3 risk profile considering the provision of an automatic suppression system.

4. The incinerator room will be separated from the wider floor area using 120 minutes fire resisting construction.

5. A Category L2 detection and alarm system is to be provided in the building (to escape routes, plant rooms, amenity spaces, charging rooms, etc.).

6. The structural fire resistance for the building should be 60minutes with the structure supporting the 120mins enclosure around the incinerator plant to match that rating. Where sprinklers are provided to the underside of the main mezzanine deck, structural fire protection is not required for the mezzanine level.

7. Fire service vehicle access should be provided to at least 15% of the building perimeter.

8. Fire hydrants should be provided in accordance with BS 9990 so that they are within 90m of entry points into the building.





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LOCATION PLAN



		SCALE 1:250		
7	70 LITRE WHEELIE BIN			
SK	U C-800			
Du bra	Invery Lead Time: 7 Working Days rable commercial wheelie bin made of high density and UV resist akes and four wheels. Fully compliant with noise reduction require • Overall size: 1300mm x 1260mm x 765mm • Volume: 770 Litres • Weight: 42.4kg • 200mm diameter wheels • Colour: Blue, Green, Grey, Red or Yellow	tant HDPE with two individual foot ements.		

bin 1)	max bin load: 30kg bin + 120kg max nunber of passengers: 1 door type: double, hinged doo protection: allow for tubular st Power Requirements: TBC Operation: Cabin operator pan 60 mins Fire compartmented s (integrity/insulation & load bea	loac rs, cc eel 'i el tud v	d = 150kg x 4no = 600kg + attendant @ o plour: Traffic Yellow RAL 1023. goal post' protection with toe guards, co wall construction) around Mezzanine Escape Stair	:100kg = 700kg blour: Traffic Yell	low RAL 1023.
ZZANIN APE STAI	E R 2		May be reduced to a 30 minute fire resistance rating.		
al)	Eurobin Bin and Pallet Number	S			
	Dirty/ Full Eurobin Floor Grids,	Goo	ds In -	53 no. (not	counted)
	Reject Eurobin Non-Standard E	10 no. (not	counted)		
	Wash Plant Dirty/ Empty Eurob	oin Fl	oor Grids -	114 no.	
	Dirty Full Non-Standard Eurobi	n Rad	cked Storage -	1,377 no.	
n wash	wash will largely be unmanned.		Grids -	261 no.	
e single	e directional travel distance			1,752	
ulti-dire ailable	allable.		n Racked Storage -	646 no.	
	Clean/ Empty Eurobin Floor Gr	ds, G	Goods Out -	308 no.	
	TOTAL CLEAN/ EMPTY EUROBI	NS -		954 no	
	GRAND TOTAL ALL EUROBINS -			2,706 no	
kable	Ammonia Powder Standard Ra	cked	Pallet Storage -	20 no.	
	TOTAL no. of PALLETS -			74 no.	

Goods Lifts 1 and 2: Lodige 'Escorta' Machine-room-less Goods Lift (with attendant) in a galvanised steel

paneled self supporting shaft and lift car.

max number of 770ltr Eurobins: 4no @ 1.3m (h) x 1.26m (d) x 0.76m (w)

Internal Car Size - 3m (d) x 2.8m (w)

Lift Height (between stops): 5.2m

Pit/ Floor Recess: 130mm

Number of Stops: 2

max load: 3000kg TBC

ASHTON FIRE					
Project Name: Merchant Park (Project Helios)					
Drawing Title: FIRE STRATEGY DRAWING					
Author:	GT	Date:	06.09.23		
Checked:	KW	Issue:	03		
Project Num	nber:	AF 3691			
	Fire Res	sistance			
Doors					
		D	oors		
Rating (Minutes)	Walls	D With Smoke Seals	oors Without Smoke Seals		
Rating (Minutes)	Walls	D With Smoke Seals	oors Without Smoke Seals		
Rating (Minutes) 30 60	Walls	D With Smoke Seals	oors Without Smoke Seals		
Rating (Minutes) 30 60 90	Walls	D With Smoke Seals	oors Without Smoke Seals		
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2. An automatic suppression system (sprinklers) will be provided as per BS EN 12845. It is understood the system will consist of overheard and in-rack sprinkler heads with the system to be designed by a specialist contractor.

3. The building is assigned an A3 risk profile considering the provision of an automatic suppression system.

4. The incinerator room will be separated from the wider floor area using 120 minutes fire resisting construction.

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7. Fire service vehicle access should be provided to at least 15% of the building perimeter.

8. Fire hydrants should be provided in accordance with BS 9990 so that they are within 90m of entry points into the building.





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Scale Bar 5.000.9 mm

SCALE 1:250

20m



770 LITRE WHEELIE BIN

SKU C-800 Delivery Lead Time: 7 Working Days

Durable commercial wheelie bin made of high density and UV resistant HDPE with two individual foot brakes and four wheels. Fully compliant with noise reduction requirements. Overall size: 1300mm x 1260mm x 765mm

- Volume: 770 Litres
- Weight: 42.4kg 200mm diameter wheels
- Colour: Blue, Green, Grey, Red or Yellow

MOE from the mezzanine deck

- Assumptions: - escape available in multiple directions
- min. ceiling height at mezz is 6.7m - min. ceiling height at GF is >10m.
- BS 9999 permits for the following travel distance limits: - escape from mezz to GF: 53.1m - escape from mezz to final exit: 58.5m
- Escape from the mezzanine deck is provided by a protected stair leading directly to outside, an open stair and a fixed ladder leading to the GF floor where travel distances are within the limits highlighted above.

nted stud wall constructio ou mins Fire compa (integrity/insulation & load bearing) around Mezzanine Escape Stair

MEZZANINE ESCAPE STAIR 2

May be reduced to a 30 minute fire resistance rating.

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ASHTON FIRE					
Project Name: Merchant Park (Project Helios)					
Drawing Title: FIRE STRATEGY DRAWING					
Author:	GT	Date:	06.09.23		
Checked:	KW	Issue:	03		
Project Num	nber:	AF 3691			
	Fire Res	sistance			
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developed in accordance with BS9999 for life safety. No insurer requirements are considered as confirmed by the client.

2. An automatic suppression system (sprinklers) will be provided as per BS EN 12845. It is understood the system will consist of overheard and in-rack sprinkler heads with the system to be designed by a specialist contractor.

3. The building is assigned an A3 risk profile considering the provision of an automatic suppression system.

4. The incinerator room will be separated from the wider floor area using 120 minutes fire resisting construction.

5. A Category L2 detection and alarm system is to be provided in the building (to escape routes, plant rooms, amenity spaces, charging rooms, etc.).

6. The structural fire resistance for the building should be 60minutes with the structure supporting the 120mins enclosure around the incinerator plant to match that rating. Where sprinklers are provided to the underside of the main mezzanine deck, structural fire protection is not required for the mezzanine level.

7. Fire service vehicle access should be provided to at least 15% of the building perimeter.

8. Fire hydrants should be provided in accordance with BS 9990 so that they are within 90m of entry points into the building.



LOCATION	PLA

Do not scale this drawing ashton smith to be notified of discrepancies in figured dimensions Contractors must check all dimensions from site This drawing is copyright and is for use on this site only This drawing is to be used solely for information as entitled For other information refer to the latest revision of any cross referenced drawing



AN

NOTES

----- ROOF FALL ARREST SYSTEM TO SPECIALIST DESIGN PHOTOVOLTAIC PANELS

ROOFLIGHTS TO THE NORTH AND EAST FACING ROOFS ONLY

CLIENT SIGNED OFF C 17.08.23 Washplant Flues Revised AA AA B 01.08.23 Washplant Flues Revised AA AA A 24.07.23 First Issue AA AA DRAWN CHECKED BY BY REV DATE DESCRIPTION REVISIONS

	ТНЕІ			CLIENT	
DRAWING TITLE PROPOS FORNAX	SED R	CLIFFE COOF PLAN -	S	FORNAX ENVIRONMENTAL SOLUTIONS	02
DRAWING NO. SK43	REVISION C	ISSUE DATE 23.06.23	DRAWN BY		21C
1:250	Vedere House, Tel: 01	2 Victoria Avenue, Harrogate, Nort 423 522882 Fax: 01423 565104 www.ashtonsmith.co.uk	th Yorkshire, HG1 1EL	ashtonsmith	JOB NO.

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commercial engineering at its best



Proposed Incineration Facility

Merchant Park, Newton Aycliffe

Sprinkler Performance Specification



Document	Validation
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Contract title:	Proposed Proposed Incineration Facility,Merchant Park, Newton Aycliffe.				Contract No: C1435
Document title:	Sprinkler Performance Specification			Doc/File ref: C1435-TCL-SPEC-S1	
Revision:	Date:	Filename:	C1435-TCL-SPEC-S1 (Sprinkler Performance Specification)		
T1	Jul 2023	Description:	Sprinkler Performance Specification		
			Prepared by:	Checked by:	Approved by:
		Name:	AR	RC	JB
		Signature:			
Revision:	Date:	Filename:			
T2	Aug 2023				
			Prepared by:	Checked by:	Approved by:
		Name:	AR	RC	JB
		Signature:			

Tate Consulting Leeds Office:

Suite 1b, 14 King Street, Leeds, LS1 2HL. +44 (0) 113 457 4491 <u>Belfast Office:</u> Suite 4, Belmont Office Park,232 240 Belmont Road, Belfast, BT4 2A W: <u>www.tateconsulting.eu</u>

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SECTION 0 - PROJECT PARTICULARS

100.010 THE PROJECT:

This specification covers the design, supply, installation, testing and commissioning general requirements for the mechanical, utility and general engineering services for the new incinerator facility.

The general engineering services requirements set out within this document should be read in conjunction with the main contract conditions issued by the Main Contractor.

100.020 THE EMPLOYER:

Refer to Contract Particulars

100.040 CONTRACT ADMINISTRATOR:

The term Contract Administrator (CA) is used throughout this specification and his duties will be carried out by the Engineer unless stated otherwise in the main contract conditions.

100.100 SERVICES CONSULTING ENGINEER:

Sprinkler Engineer;

Tate Consulting

Ray Cavanagh

Tel: +44 (0) 113 457 4491

email: ray.cavanagh@tateconsulting.uk

100.190 UTILITY SERVICE PROVIDERS:

The Vendor will undertake the following utility works, terminating within the site boundary;

Electricity Supply

IDNO (SSE Energy Solutions)

Provide a high voltage sub station within the site

Telephone Service: BT

Install 2No 90mm ducts.

Gas Supply

Fulcrum

Provide a MP gas supply.

Water

Supplier: Northumbrian Water

Provision of new-metered water supplies (Domestic and Fire).

300.000 TENDERING INSTRUCTIONS

300.010 GENERAL:

This section outlines the tendering procedures and requirements.

300.020 SCOPE:

These conditions are supplementary to those stated in the invitation to tender and on the Form of Tender and Agreement.

300.030 TENDER DOCUMENTS

The tender documents consist of the following:

• Refer to invitation to tender letter

300.050 CHECKING DOCUMENTS:

Check the tender documentation for obvious errors and omissions. Should any such errors or omissions be discovered inform the office issuing the documents immediately in writing in order that a correction may be issued before the date for submission of the tender.

300.070 PERIOD OF VALIDITY:

Tenders must remain open for consideration (unless previously withdrawn) for a period from the date fixed for submission of tenders of not less than 90 days.

The date for possession/commencement is as advised by the Main Contractor.

300.100 ACCEPTANCE OF TENDER:

The Employer and his representatives

- Offer no guarantee that the lowest, or any tender, will be recommended for acceptance or accepted.
- Will not be responsible for any cost incurred in the preparation of any tender.

300.130 SITE VISIT:

- Before tendering, ascertain the nature of the site, access thereto and all local conditions and restrictions likely to affect the execution of the Contract Works.
- No claims will be allowed after submission of a tender for lack of information or other reasons which could have been resolved by such a visit to the site.
- Arrangements for visiting the site must be made with prior agreement through: The Employer

300.140 RETURN OF DRAWINGS AND SPECIFICATIONS:

The completed tender documentation is to be returned to the office of issue.

300.150 ALTERATIONS TO TENDER DOCUMENTS:

No alterations or erasures to the text of any part of the tender documentation shall be permitted.

Any tender containing such alterations or erasures may be rejected.

300.160 TENDER ERRORS:

Errors in the priced subcontract specification will be dealt with in accordance with the Code of Procedure for Single Stage Selective Tendering 1996.

 In the event of a Tenderer discovering a genuine error in their tender after it has been deposited, attention in writing may be drawn to the error and an amendment submitted. The amendment may be accepted if deposited on or before the time fixed for receipt of tenders.

300.170 UNQUALIFIED TENDERS:

Other than as part of an alternative offer as described elsewhere, no account will be taken of any qualification or special conditions that a Tenderer may impose on their tender.

300.190 EXCLUSIONS:

If any part(s) of the Works cannot be tendered as defined in the tender documents, the CA must be informed as soon as possible, defining the relevant part(s) and stating the reasons for the inability to tender.

300.195 INTERPRETATION OF THE TENDER DOCUMENTATION:

Should there be any doubt about the precise meaning of any item for any reason whatsoever, the tenderer must inform the office of issue of the tender documents in writing in order that the correct meaning may be given.

310.000 TENDER SUBMISSION

310.010 GENERAL:

This section details the particular tender submission requirements.

310.020 RETURN OF TENDER:

- The tender documentation is to be returned to:
- Refer to the invitation to tender letter.

310.030 TENDER SUBMISSION DELIVERABLES:

To be compliant the tender submission must include the following deliverables as detailed elsewhere:

- A tender pricing schedule completed in full.
- Outline programme.
- Declaration of non-collusion

310.032 PROGRAMME:

Submit with the tender a programme indicating the sequence and timing of the principal parts of the works including periods for planning, design, procurement, installation and commissioning.

320.000 PRICING AND COSTS

320.010 GENERAL:

This section details particular requirements for the pricing of the tender documentation and cost procedures during the contract.

320.020 BASIS OF CONTRACT:

The contract shall be

• on a lump sum basis and accordingly shall not be subject to re-measurement.

320.030 TENDER PRICING DOCUMENT:

Alterations and qualifications to the specification must not be made without the written consent of the CA. Tenders containing such alterations or qualifications may be rejected.

320.035 SUBMISSION OF PRICED CONTRACT SPECIFICATION:

The priced contract specification must be submitted

• with the Tender.

320.040 SCHEDULE OF RATES:

A schedule of rates must be submitted

• Within one week's request, and prior to commencing on site.

320.050 ERRORS:

Errors in the priced subcontract specification will be dealt with in accordance with the Code of Procedure for Single Stage Selective Tendering 1996.

320.080 OVERTIME AND ALLOWANCES:

Include for all necessary overtime and other expenses in the contract price that may be necessary in order to complete the Works in compliance with the contract programme.

320.090 SUBMISSION OF FINAL ACCOUNT:

Submit a draft final account to the CA using the contract procedures for checking purposes together with all the necessary supporting documents.

320.100 INSTRUCTIONS AND VARIATIONS:

All instructions shall be issued in writing and confirmed in a similar manner.

Submit the cost of each variation showing the quantities and rates applicable for all materials, etc employed in accordance with the agreed contract schedule of rates. Submit to the CA

• Within 10 working days of the receipt of written instructions.

No work will be certified for payment until all the necessary information is provided.

320.110 DAYWORKS:

Where authority is given for work to be executed on a daywork basis, original vouchers giving the full particulars of hours worked, names of craftsmen and labourers, description of work executed and materials and plant used, must be forwarded to the CA.

Submit to the CA using contract procedures not later than the end of the week following that in which the work has been executed.

400.000 CONTRACT CONDITIONS

Refer to the Main Contract conditions

410.280 DEFECTS LIABILITY:

Liability for making good defects in the Works shall be for a period of 12 months (or as stated in the main contract conditions) from the date of issue of the certificate of practical completion for the installations.

 If it is necessary to replace or renew any portion of the contract works as part of liability for defects, the defects liability period in respect of that portion of the contract Works shall be extended.

410.310 SUPPLY OF COMPUTER HARDWARE AND SOFTWARE:

Obtain on behalf of the end user all appropriate licences, permissions, copyright waivers, rights of use and the like from the owners of the software rights. Ensure that the end user is properly registered with the software supplier for support and appropriate updating. Ensure that application software is written in compliance with BS 7649.

410.335 METHOD STATEMENTS:

Submit method statements to the CA prior to commencement of the contract works for the following work activities

-Each item of work

410.340 INSPECTION BEFORE CONCEALMENT:

Whenever work requiring inspection or testing is subsequently to be concealed give the following the notice to the CA so that inspections may be made or tests witnessed before concealment

• 7 working days' notice

410.350 EQUIPMENT GUARANTEES:

Plant and equipment guarantees shall commence at the date of practical completion and run for a minimum of 12 months after this date.

Any costs associated with this requirement shall be included in the contract price.

410.360 SITE MODIFICATIONS:

Site modifications to assemblies shall not be made without written approval of the CA.

Where site modifications to assemblies are authorised undertake in accordance with manufacturer's certified drawings and instructions.

Ensure that all modifications undertaken comply with the relevant standards and all test certification obtained.

410.370 DIMENSIONS:

Where installations are dependent upon site dimensions ensure that these are available before proceeding with the Works.

- Dimensions should not be scaled from drawings.
- Where dimensions are indicated on drawings check these on site, as appropriate, to ensure building construction tolerances and manufacturing tolerances can be accommodated.
- Equipment should not be ordered or manufactured using dimensions indicated on the Tender drawings.

430.000 QUALITY

430.020 WORKMANSHIP AND MATERIALS:

All materials, articles and workmanship shall be of the best quality and execution as detailed in the specification and drawings.

All equipment and materials to be installed shall be new unless otherwise indicated.

All equipment shall be installed in accordance with the manufacturer's written instructions and recommendations.

All materials considered by the CA to be unsound or not in accordance with the specification shall immediately be removed and properly replaced to the satisfaction of the CA at no additional cost. All work carried out imperfectly or with faulty materials must be immediately removed and properly replaced to the satisfaction of the CA at no additional cost.

430.030 DEFECTS:

Agree with the CA a system of recording defects that should include

- A reference to identify the defect
- Description of the defect
- Remedial works proposed
- Confirmation of defect clearance

500.000 ORGANISATION AND DESIGN MANAGEMENT

500.010 SITE STAFF:

Employ a competent project manager and supporting team dedicated full time to the project and not involved in the installation of the Works who shall have full authority to act in connection with the contract works.

500.030 DESIGN MANAGEMENT:

The design manager shall

• attend all design team meetings as required

Should any part of the design not meet the required standard of the CA then modify and reissue such work to the required standard at no additional cost or delay to the programme.

On completion of the contract design stage activities and prior to commencing the production information submit to the CA a statement of compliance that the design of the systems will meet the specification design and performance intent.

510.000 SUBMITTALS AND APPROVALS

510.010 GENERAL:

This section outlines the requirements and procedures for submittals to the CA.

510.020 SUBMITTALS:

Prior to any orders being placed the CA shall review all drawings and manufacturer's details.

510.051 PREPARATION OF DRAWINGS:

All drawings shall be prepared in Autodesk AutoCAD software.

510.060 REVIEW OF SUBMITTALS:

Submittals will be examined for

- compliance in principle with the design intent
- Such examination shall not relieve any responsibilities and obligations under the contract.

510.070 MISTAKES IN SUBMITTALS:

Examination and/or issue on a CA instruction of submittals shall not be deemed to remove any duties, obligations and responsibilities under the contract.

Be responsible for any error, discrepancy or omission in any submittal, presentation or drawing prepared or where others have prepared these for submittal.

The said indemnity shall be subject to the proviso that such error, discrepancy or omission is not due to any inaccurate data, drawing or information provided by the employer or by the CA on his behalf.

510.080 SAMPLES:

Provide free of charge samples of material and workmanship proposed to be used in the Works.

510.090 REVISIONS TO DRAWINGS:

Where revisions take place either under the authority of a CA instruction, or by written agreement with the CA or when revised architectural, structural or services information is issued, all drawings shall be modified accordingly and shall be re-issued for construction purposes subject to examination by the CA. The issue of revised drawings shall be in accordance with and with regard to the agreed programme for construction and where time is available re-issues shall be grouped together, as agreed with the CA.

520.000 OBLIGATIONS AND RESPONSIBILITIES

520.010 GENERAL:

- Complete the design development and undertake the detailed design.
- Undertake the responsibility for resolving final spatial co-ordination.
- Undertake specific detailed design.
- Co-ordination of the engineering services, with each other and with the building structure and fabric.
- Undertake all on-site co-ordination with all other trades, disciplines, manufacturers and suppliers.
- Provide the following drawings as defined elsewhere
 - Detailed design
 - Co-ordinated working
 - o Record
- Prepare such reports, calculations and details as required for submission to any appropriate authority including the co-ordination of such information by suppliers, specialists, etc needed to be included in any submission.

520.015 BUILDER'S WORK OBLIGATIONS AND RESPONSIBILITIES:

Provide final builders work details based on the installation and manufacturer's drawings to facilitate the installation of the works. Provide fully dimensioned drawings showing both size and position of builder's work making due reference to the structural engineering and architectural final dimensioned detailed drawings.

520.045 COMMISSIONING:

Undertake the testing, commissioning, regulation and setting to work of the Works.

Ensure that the commissioning requirements are compatible with any project restraints concerning sectional handover/ phasing.

Produce a detailed commissioning programme

Establish procedures with all parties to allow the demonstration of normal, emergency, shutdown and standby mode operation of plant and systems.

Prepare method statement

Provision of all necessary facilities to enable tests to be witnessed and inspections carried out including all necessary instruments and recorders to monitor systems during the commissioning and environmental proving period.

Produce record pro-forma documentation for review by the CA relating to the commissioning and testing of plant and systems

Ensure all certification is attained and witnessed as necessary for inclusion in the record documentation.

Record all plant and system settings.

Provide and submit a report for every test, demonstration, balance or commissioning activity witnessed, together with an engineering appraisal on the performance, either on or off-site.

Provide a final commissioning report, signed by a competent person, detailing the results of the commissioning and commenting on the performance of systems. The report to confirm that each installation is correctly tested and commissioned, achieves the specified performance and in accordance with CIBSE Code M.

Demonstrate that equipment is capable of the performance and method of operation specified. Demonstrate that the overall and complete systems perform correctly in the required manner and as intended by the specification.

520.050 HANDOVER:

Prepare log book(s) in accordance with the requirements of the specification and Building Regulations

• Use CIBSE TM 31 template.

Modify the record drawings as the works progress so that all alterations from the installation drawings are recorded as the work proceeds

Modify and update operating details to reflect commissioning results.

Record all water, gas and electricity meters on completion of the works.

Instruct the Employer's staff in the use, operation and maintenance of the installations.

Fully operate and maintain the installations in accordance with the Employer's normal occupational requirements prior to practical completion.

Prepare a schedule of all spare parts require for the works including recommendations of any others not stated in the specification.

Prepare a schedule of all tools require for the works including recommendations of any others not stated in the specification.

Supply and handover over:

- All tools.
- Spares
- Keys

530.000 LOCAL AUTHORITY REQUIREMENTS

530.010 GENERAL:

This section details the requirements for compliance with Local Authority By-laws.

530.020 STATUTORY AUTHORITY APPROVALS:

Make full and formal submissions to Building Control/District Surveyor at the earliest opportunity to ensure the approval of the Statutory Authorities for the proposed installation works.

Include for all fees and charges legally required under such Act of Parliament, Regulations or By-Laws in respect of the Works.

530.030 AUTHORITY NOTICES:

Documents requiring the Employer's signature shall be forwarded to the CA in time to meet the contract works programme in order for the necessary test and supply arrangements to be made.

No additional costs or extension to programme shall be allowed due to reconnections, revisits etc by supply authorities or failure to programme the works.

530.040 BYE-LAWS, NOTICES, ETC:

Observe and comply with the requirements of all Statutes and Bye-Laws.

Serve notices on the Authorities having control of the road surfaces before the same are broken up and likewise serve notices on the owners of sewers, drains, water, gas or other mains, electric cables, tramways and other services which may in any way be affected by the execution of the Works.

Inform all necessary parties when work necessitates such notices to be given.

540.000 HEALTH AND SAFETY

540.010 GENERAL:

Refer to the Main Contract Preliminaries for the requirements of safety, health and welfare.

540.020 CDM REGULATIONS:

The management of health and safety is to be undertaken in conformity with the requirements of The Construction (Design and Management) Regulations, and the corresponding Approved Code of Practice.

540.040 COSHH REGULATIONS:

Comply with The Control of Substances Hazardous to Health Regulations and The Control of Substances Hazardous to Health (Amendment) Regulations.

540.050 ASBESTOS:

No material or goods containing asbestos shall be incorporated in the contract works.

Be responsible for certifying at practical completion of any section of the contract works that no asbestos or asbestos related materials have been incorporated or by any sub-contractor employed.

540.060 RISKS TO HEALTH AND SAFETY:

Submit a statement with the tender describing any significant and unavoidable risks which may arise as a result of carrying out the contract works and the measures proposed to safeguard the health and safety of operatives and of any person who may be affected by the contract works.

550.000 BUILDING REGULATIONS REQUIREMENTS

550.010 GENERAL:

This section details the requirements for compliance with the Building Regulations.

550.020 BUILDING REGULATIONS APPROVALS:

Make full and formal submissions to Building Control/District Surveyor/Approved Inspector at the earliest opportunity to ensure the approval of the relevant Authorities for the proposed installation works.

Include for all fees and charges legally required under the Building Regulations in respect of the Works.

600.000 THE SITE

600.010 GENERAL:

This section outlines information on the site, refer to the Architects and Engineers site drawings and specifications for specific site information.

610.000 EXISTING SERVICES

610.010 GENERAL:

This section provides information on existing services.

610.020 EXISTING MAINS/SERVICES:

The contractor shall make new applications for utility records.

Be responsible for any damage entailed and make good any such damage to the satisfaction of the CA at no extra cost.

610.060 REMOVAL OF EXISTING SERVICES:

The approval of the CA shall be sought prior to the removal of any existing services.

610.070 SURVEY:

Ascertain the nature of the site and all local conditions and restrictions likely to affect the execution of the Works.

Before commencing work, carry out a survey and examination of the engineering services.

Examine all available drawings of the engineering services and report any discrepancies to the CA.

700.000 DESCRIPTION OF THE WORKS

700.010 GENERAL:

This section outlines the extent of the works and provides a description in a brief manner of the scope of each of the building services installations.

700.020 SCOPE OF WORKS:

The engineering services included in the Works and covered by this contract comprise:

- Mechanical, electrical and sprinkler services
- External Services
- Fit out to all areas

710.000 GENERAL DESIGN CRITERIA AND STANDARDS

710.010 GENERAL:

This section outlines the general design criteria and definitions applicable to the engineering services forming the contract Works.

710.130 ELECTROMAGNETIC COMPATIBILITY:

Ensure all equipment and systems are installed to provide electromagnetic compatibility within the system and with any other systems installed in the same area.

710.140 PRESSURE DIRECTIVE:

All pressure equipment and assemblies with a maximum allowable pressure greater than 0.5 bar shall comply with the European Community (EU) Pressure Equipment Directive (PED) 97/23/EC. Pressure equipment shall include vessels, piping, safety accessories and pressure accessories. Assemblies shall mean several pieces of pressure equipment assembled to form an integrated, functional whole.

Pressure equipment shall be marked as a minimum with:

- a) unique identification of the manufacturer
- b) unique identification of model and serial number
- c) the year of manufacture
- d) maximum/minimum allowable pressure limits
- e) CE marking

Provide a declaration of conformity for all pressure equipment.

Equipment must be:

a) Designed for adequate strength considering internal/external pressure, ambient and operational temperatures, static pressure and mass of contents in operating and test conditions, corrosion and erosion, fatigue, etc.

b) Provided with means to ensure safe handling and operation and of examination, draining and venting.

c) Provided with protection against exceeding the allowable limits of pressure.

d) Where necessary, pressure equipment must be designed and fitted with suitable accessories to meet damage-limitation requirements in the event of external fire.

Ensure all components or sub-assemblies in their finished assembly are used within their safe operating range and correctly installed and tested.

Ensure that adequate instructions are provided by the manufacture for the safe installation, testing and operation.

Instructions shall be provided to ensure for the safe maintenance and operation of the equipment when in operation.

Pressure equipment and assemblies below the specified pressure / volume thresholds must:

a) be safe.

b) be designed and manufactured according to sound engineering practice.

710.170 SOFTWARE:

Obtain on behalf of the end user all appropriate licenses, permissions, copyright waivers, rights of use and the like from the owners of the software rights. Ensure that the end user is properly registered with the software supplier for support and appropriate updating. Ensure that application software is written in compliance with BS 7649.

720.000 BUILDERS WORK

720.020 BUILDER'S WORK RESPONSIBILITIES:

Provide builder's work information, appropriate to the stage of design development. Revise, supplement and/or issue final information, drawings/details for the actual requirements of the contract works.

720.030 SCOPE OF BUILDER'S WORK:

All builder's work to be carried out by the Contractor

740.040 COMMISSIONING AND TESTING:

When the contract works or parts thereof are ready for testing and commissioning notify the CA in writing.

All necessary facilities shall be provided to enable tests to be witnessed and inspections carried out including all necessary instruments and recorders to monitor systems during commissioning system proving and environmental testing.

Prior to witnessing and inspection by the CA the contract works shall be fully tested, commissioned and be fully operational

Where portions of the work are required to be commissioned and tested separately, then upon final completion, demonstrate to the CA that all the several portions are capable of proper simultaneous operation in accordance with the requirements of the specification.

If testing demonstrates that the plant and equipment is not properly installed and/or not functioning correctly carry out such remedial measures and adjustments as may be necessary and repeat the commissioning and testing procedure to the satisfaction of the CA.

740.050 STATIC TESTING:

Progressive static testing shall include the following tests, but other tests may be required and witnessed:

- Insulation resistance
- Earth fault loop impedance
- Earth continuity
- Pressure testing of hydraulic systems

The CA shall be given the opportunity to witness all static tests.

Advance notice of the tests shall be given to the CA.

Timescale: days prior to test (no) 14 working days

740.060 PRE-COMMISSIONING CHECKS:

Ensure all pre-commissioning examinations and tests have been undertaken and that each system, including components, or item of equipment is complete and in a safe condition prior to start-up.

All necessary notices shall be displayed.

740.070 FUEL FOR TESTING:

Fuel for testing and operating the contract works shall be provided

If utility connections are not 'live' the Contractor to allow within the contract price and due allowance made within the tender.

740.080 SYSTEM DEMONSTRATION:

Subsequent to the completion of all testing and commissioning to the satisfaction of the CA and when directed operate the plant and demonstrate that the overall systems function correctly in accordance with the requirements of the specification.

740.110 TEST CERTIFICATES AND RECORDS:

Ensure that test certificates include:

- project title
- details and date of test
- instruments used, serial numbers, calibration dates
- signature of those witnessing test
- installers name
- specific location of the item in the contract works

740.160 ROTATING EQUIPMENT:

Immediately prior to practical completion adjust, ease and lubricate moving parts as necessary to ensure easy and efficient operation.

Ensure that temporary electrical supplies are provided to enable rotating plant items delivered and/or installed to be run at regular intervals to avoid damage or deterioration.

If temporary electrical supplies are not available ensure that rotating plant is hand-turned.

800.000 DRAWING DEFINITIONS

800.010 GENERAL:

This section defines each of the main drawing types and outlines the extent and content of drawn information.

800.020 THE TENDER DRAWINGS:

Drawings produced to enable those tendering to interpret the design and to submit a tender for executing all or any part of the Works as defined elsewhere.

The tender drawings are given in the appendix of the particular specification

800.040 DETAILED SCHEMATICS:

Line diagrams describing the interconnection of components in a system and showing the engineering principles.

800.050 DETAILED DESIGN DRAWING:

A drawing showing the intended locations of plant items and service routes in such detail as to indicate the design intent.

800.060 CO-ORDINATED WORKING DRAWINGS:

Drawings showing the inter-relationship of two or more engineering services and their relation to the structure and building fabric.

800.070 INSTALLATION DRAWING:

A drawing based on the detailed drawing or co-ordination drawing with the primary purpose of defining that information needed by the tradesman on site to install the works.

800.120 RECORD DRAWING:

Drawing showing the building and services installations as installed at the date of practical completion.

800.130 BUILDER'S WORK DETAILS:

Drawing to show requirements for building works necessary to facilitate the installation of the engineering services.

800.170 PLANTROOM SCHEDULES AND SCHEMATICS:

Provide good quality plant and switch room drawings, schedules, schematics and instructions and hang in the respective plant room or any other appropriate location or where directed by the CA.

810.000 RECORD DOCUMENTATION

810.010 STANDARDS:

Provide operating and maintenance manuals, system records and full documentation in accordance with the following standards

- BS 6701 Telecommunications equipment and telecommunications cabling.
- BS 7671 Requirements for electrical installations.(IEE Wiring regulations)
- BS EN 62305 Protection against lightning.
- BS 5839 Fire detection and fire alarm systems for buildings.
- BS 5266 Emergency lighting
- Building Regulations (Approved Document Part L2)

Comply with the requirements of the CDM Regulations in providing the appropriate input to the Construction Phase Plan and health and safety file for the contract works.

810.020 RECORD DOCUMENTS:

Provide:

- Record drawings and schedules.
- Plant room and switch room drawings, schedules and schematics.
- Operating and maintenance manuals.
- Ensure record documents clearly record the arrangements of the various sections of the Works as actually installed and identify and locate all component parts.

810.030 RECORD DRAWINGS AND SCHEDULES:

Prepare record drawings and schedules based on the As Installed Drawings maintained on site during the progress of the contract works.

810.040 PLANT ROOM AND SWITCH ROOM DRAWINGS, SCHEDULES AND SCHEMATICS:

Provide good quality plant and switch room drawings, schedules, schematics and instructions and hang in the respective plant room or any other appropriate location or where directed by the CA.

810.060 PRESENTATION OF THE OPERATING AND MAINTENANCE MANUALS:

Agree format and contents with the CA.

Provide the operating and maintenance manuals in the following form:

- Encase the manuals in A4 size, plastic-covered, loose leaf, four ring binders with hard covers, each indexed, divided and appropriately cover- titled. Fold drawings larger than A4 and include in the binder so that they may be unfolded without being detached from the rings.
- Electronic format stored on CD
- Provide a PDF version of all documents and drawings
- Provide a draft copy of the operating and maintenance manual to the CA for comment

Timescale:

Weeks before the contract completion date (no) 4

810.070 OPERATING AND MAINTENANCE MANUALS:

The operating and maintenance manuals must include:

- A full description of each of the systems installed, written to ensure that the Employer's staff fully understand the scope and facilities provided.
- A description of the mode of operation of all systems including services capacity and restrictions.
- Diagrammatic drawings of each system indicating principal items of plant, equipment, valves etc.
- Schedules (system by system) of plant, equipment, valves, etc., stating their locations, duties and performance figures. Each item must have a unique number cross-referenced to the record and diagrammatic drawings and schedules.
- The name, address and telephone number of the manufacturer of every item of plant and equipment together with catalogue list numbers.
- Manufacturer's technical literature for all items of plant and equipment, assembled specifically for the project, excluding irrelevant matter and including detailed drawings, electrical circuit details and operating and maintenance instructions.
- A copy of all test certificates, inspection and test Records, commissioning and performance test records including, but not limited to, electrical circuit tests, corrosion tests, type tests,

start and commissioning tests, for the installations and plant, equipment, valves, etc., used in the installations.

- A copy of all manufacturer's guarantees or warranties, together with maintenance agreements offered by subcontractors and manufacturers.
- Copies of insurance and inspecting Authority certificates and reports.
- Starting up, operating and shutting down instructions for all equipment and systems installed.
- Control sequences for all systems installed.
- Schedules of all fixed and variable equipment settings established during commissioning.
- Procedures for seasonal change-overs and/or precautions necessary for the care of apparatus subject to seasonal disuse.
- Detailed recommendations for the preventative maintenance frequency and procedures which should be adopted by the Employer to ensure the most efficient operation of the systems.
- Details of lubrication for lubricated items including schedules of lubricant type, frequency, etc.
- Details of regular tests to be carried out (e.g. water analysis for pseudomonas.)
- Details of procedures to maintain plant in safe working conditions.
- Details of the disposal requirements for all items in the works.
- A list of normal consumable items.
- A list of recommended spares to be kept in stock by the Employer, being those items subject to wear or deterioration and which may involve the Employer in extended deliveries when replacements are required at some future date.
- A list of any special tools needed for maintenance cross-referenced to the particular item for which required.
- Procedures for fault finding.
- Emergency procedures, including telephone numbers for emergency services.
- Hospital Operational Policy.
- Back-up copies of any system software.
- Documentation of the procedures for updating and/or modifying software operating systems and control programmes.
- Instructions for the creation of control procedure routines and graphic diagrams.
- Details of the software revision for all programs provided.
- Two back-up copies of all software items, as commissioned.
- Copies of relevant HSE/CIBSE/IET Guidance notes etc.
- Contractual and legal information including but not limited to
- details of local and public authority consents
- details of design team, consultants, installation contractors and associated subcontractors
- start date for installation, date of practical completion and expiry date for the defect's liability period
- details of warranties for plant and systems including expiry dates, addresses and telephone numbers.

900.000 COMPLETION AND HANDOVER

900.010 GENERAL:

This section details the requirements and procedures for completion and handover.

900.020 HANDOVER REQUIREMENTS:

As a pre-requisite to Practical Completion in respect of the contract works or part thereof, demonstrate to the satisfaction of the CA that:

- All the contract works are complete.
- With the exception of minor snags or limited defects as agreed with the CA that could be reasonably completed within an agreed programme without causing disruption to the Employer's use of the building or part thereof.
- All spares, keys, tools and other consumables as stated elsewhere have been supplied and handed over to the Employer.
- The instruction of the Employer's staff in the use and correct operation of the installation has been completed satisfactorily. In particular, safety devices and controls demonstration.
- All commissioning and testing completed
- A complete demonstration of the contract works with fully functional operational controls tested has been undertaken in the presence and to the satisfaction of the CA.
- All approved record documentation including record drawings, operation and maintenance manuals, etc is issued
- All information required for the health and safety file is issued to the satisfaction of the Planning Supervisor.
- The information shall include:
- A written description of plant operation.
- Control strategy/logic diagrams recording the final version of configuration software installed at handover.
- Details of system application software configuration.
- A description of user adjustable points.
- Commissioning record details.
- Detailed data sheets for all control components and equipment.
- Wiring circuit details including origin, route and destination of each cable.
- Comprehensive instructions for switching on, operation, switching off, isolation, fault finding and procedures for dealing with emergency conditions.
- Instructions for any precautionary measures necessary.
- Instructions for the routine operation of the control system including simple day-to-day guidance for those with limited technical skill.
- Instructions for servicing and system upkeep.
- A provision for update and modification.
- All necessary Statutory Authority approvals have been undertaken and written confirmation
 established
- Completion and issue of log books in accordance with Building Regulations.

900.030 READING OF METERS:

Record readings of all water, gas, and electricity meters immediately on completion of the Works and forward to the CA.

900.090 TRAINING OF EMPLOYER'S STAFF:

Prior to Practical Completion explain and demonstrate the purpose, function and operation of the installations including all items and procedures listed in the operation and maintenance manual

• to the Employer's maintenance staff.

900.100 MAINTENANCE:

At Practical completion the contractor shall include for providing an option of maintenance and attendance as follows;

• 12 month maintenance, including quarterly visits

900.1100 ENHANCED CAPITAL ALLOWANCES SCHEME:

1. The Employer intends to make a claim for Capital Allowances on all qualifying expenditure incurred on the works including, where applicable, a claim for Enhanced Capital Allowances (ECAs).

2 The Sprinkler contractor shall liaise with the Main Contractor and will provide in a timely manner all information reasonably requested by the Employer in order to make a claim for capital allowances and ECAs, including but not limited to:

2.1 A full schedule of assets/components installed as part of the mechanical and electrical works showing detailed descriptions of the following:

- Full Manufacturer's name
- Full make and model number
- Quantities of each asset installed (if multiple numbers)

2.2 A full clear cost and descriptive breakdown to the mechanical and electrical contract sums and all subsequent variations reconciling to the agreed final cost. The descriptions should tie in with the descriptions noted in clause 2.1.

3. Systems and equipment shall always whereever possible be selected from the Energy Technology Product List and be eligible for the Enhanced Capital Allowance Scheme (www.eca.gov.uk).

SECTION 1 DESCRIPTION OF WORKS

1.0 Introduction

This document is to provide the design strategy for the complete sprinkler services for the new facility at Merchant Park, Newton Aycliffe. It is intended to provide a general description of the services proposed for the above development and be the basis of the principles upon which the sprinkler design shall be based upon, and should be read in conjunction with all Architectural, Civil and Structural Engineering drawings and documents,

The works shall consist of the design, procurement, supply, delivery, offloading, storage, protection, cranage, erection, installation, setting to work, testing, commissioning and demonstration, and shall include the supply of all materials, plant, equipment, tools, labour and adequate resourcing, supervision and management necessary for the complete installation and operation of the complete sprinkler services installation in accordance with the insurers and employer's requirements, performance specifications and FM insurers requirements.

The building shall be designed, constructed and commissioned in compliance with Applicable British Standards, Appropriate Best Practice, Building Regulations, Planning Consent and the Employers Requirements.

This design performance brief and specification document is intended for general guidance only and no omissions from this document shall relieve the contractor from their obligations to carry out the complete installation of the works to provide fully functional sprinkler services installation.

Permanent access shall be provided for services at high level requiring maintenance access. Stepovers and suitable protection shall be provided to services installed at low level. All roof and other external penetrations shall be suitably weather-proofed, the sprinkler contractor shall fully coordinate all services to avoid any clashes.

Final access requirements for services in ceiling voids, etc shall be co-ordinated with the Architect's final ceiling plans, e.g. positioning of heads/valves above removable ceiling tiles, etc. Exposed service drops outside plant areas and risers shall be suitable boxed in or otherwise concealed; details to be agreed. Alarm panels and similar shall be flush mounted when on view; locations to be agreed in advance. All ancillary power and data supplies, controls connections, etc shall be provided (e.g. to valves and control panels etc) as necessary to achieve complete and operational systems and a fully functional building. The Contractor shall allow for providing services to suit the latest architectural plans and layouts.

Sprinkler systems shall be commissioned in accordance with current CIBSE Commissioning Codes, BSRIA Guidelines, British Standards, FM standards and Building Regulations, etc as applicable. The Contractor is to make due allowance for commissioning periods, responsibilities and requirements within the main construction programme.

The defects liability period shall be a period of twelve (12) months from the date of practical completion.

The contractor shall refer to the main contract and preliminaries documents. The contractor shall allow within his tender for working in conjunction with the production equipment installer (Bin washer) and racking contractors and agreeing a sequence of works, including testing and commissioning.

SECTION 2 DESIGN CRITERIA

2.1 General

The sprinkler contractor, referred to as "the contractor" throughout this specification shall design, supply, install, test, commission and put into continuous operation a sprinkler installation, "the works", to meet the requirements of all current FM data sheets for the commodity classification identified elsewhere within this specification.

Generally the sprinkler system shall be designed in accordance with FM. The system will be a Conventional wet installation and will comprise tanks, pumps, valves, sprinkler pipework and heads.

The system shall comprise of;

- Water systems 1No sprinkler tank; Pump house containing 1No pump (100% duty)
- Valves Control valve, Valve set located within the building
- Warehouse Protection- Wet Pipe installations (warehouse & mezzanine)
- Remaining areas Conventional wet installation
- Additional precautions for maintenance
- Interface ventilation plant with sprinkler activation via FIU to prevent temperature distortion at sprinkler head.
- Value station interface ventilation plant with sprinklers.

The installation shall consist of: -

- Sprinkler tank infill main
- Fire Main.
- 1 x 100% water holding tank
- One main diesel delivery fire pump in accordance with FM Global Standards.
- Sprinkler pump house with remote fuel transfer facility
- Warehouse roof level sprinklers
- Office void & false ceiling sprinklers
- Secondary protection to mezzanine floor, conveyors and all obstructions over 600mm
- In rack sprinkler protection systems as required
- 300 heads allowance for all obstructions greater than 600mm and incinerator pits.
- Do not locate sprinkler heads underneath skylights.
- FM 200 gas suppression installation c/w pressure relief damper and control panels to each SCADA and Comms room.
- Allow for insulation and trace heating to all externally exposed wet pipework.
- FM Standards Factory Mutual: DS 8-1 Commodity Classification Uncartoned Unexpanded Plastics (UUP).

2.2 Design Codes

The Sprinkler installation shall be designed, installed, tested and commissioned in strict accordance with the following design codes:

- The 2012 international building and fire codes with georgia amendments, 2010 FM 11, 2010 FM 13, 2011 FM 16, 2011 FM 409
- Building Regulations
- British Standards (BS)
- European Standards (EN)
- The current Edition of BS7671 IET Wiring Regulations (latest amendments)
- Institute of Refrigeration Best Practice Guides
- Local Water By-laws
- Health & Safety Requirements
- Manufacturers design, installation and commissioning recommendations

In addition to the above design codes, the contractor shall base his sprinkler tender on the following

- All current FM data sheets
- Insurers requirements

The sprinkler contractor (and his specialist sub-contractors) shall provide drawing(s) of their proposed installation in Autodesk REVIT to assist with co- ordination and demarcation of responsibilities, and shall liaise in all respects with the main contractor and the nominated lead co-ordinator throughout the Contract period.

The sprinkler contractor shall submit with this tender return documents a full description of his design philosophy/intent, together with sketch design drawings relevant to demonstrate these proposals.

SECTION 3 SPRINKLER SERVICES PERFORMANCE REQUIREMENTS

3.1 General

In addition to compliance with this specification, the contractor shall comply with any other specific contract conditions and programmes issued, under separate cover, by the main contractor.

The Contractor shall base his tender on the latest architects general arrangement layout drawings published by Ashton Smith and the latest racking layouts.

The sprinkler contractor shall observe the automation bin wash layout drawings and include for all necessary obstructions >600mm wide to comply with the relevant standards.

The sprinkler contractor shall make all the necessary allowances for additional roof sprinkler protection should the steel frame portal centres not be suitable for sprinkler spacing requirements.

Similarly, the sprinkler contractor shall make all the necessary allowances within his tender to accommodate wind bracing and purlin tie bars. Additional costs will not be entertained as a result of additional heads being required due to co-ordination with steel frame portal spacing, purlin tie bars or wind bracing steelwork.

Where rooflights are installed, the sprinkler contractor shall co-ordinate the design so that sprinkler heads do not sit directly under rooflights.

The sprinkler contractor shall base his tender on range pipes being fixed to purlin rails. Early coordination with the steelwork supplier could be advantageous for any holes that require drilling to allow the pass of range pipes. However, additional costs will not be entertained due to additional pipe bends etc. as a result of routing pipework over purlin rail or main steels.

The contractor shall liaise with the design team and all relevant contractors to ensure the requirements for the sprinkler installation are included and co-ordinated as required to complete the installation to the required standards.

The Contractor shall allow for all fixings, supports and bracketery necessary to support the installation from the primary steelwork and racking.

3.2 Technical Clarifications

The contractor shall ensure the sprinkler installation is designed and installed to accommodate the following criteria which are to be confirmed by the end-user and their fire insurers:

3.3 Design Code

The Contractor shall design, supply, install, test and commission a complete sprinkler and external fire hydrant installation to comply with the following standards:

- Sprinkler Installation
 - All current and relevant published FM Global Property Loss Prevention Data Sheets for the type of property and stored goods risk category identified within this specification.
 - o Factory Mutual: DS 2-0 Installation Guidelines for Sprinkler Systems
 - Factory Mutual: DS 3-0 Hydraulics
 - o Factory Mutual: DS 3-2 Water Tanks for Fire Protection
 - Factory Mutual: DS 3-7 Fire Protection Pumps
 - Factory Mutual: DS 3-26 Fire Protection Water Demand for Nonstorage Sprinklered Properties
 - Factory Mutual: DS 8-1 Commodity Classification
 - Factory Mutual: DS 8-9 Storage of Products
- External Fire Hydrant Installation
 - Hydrant system to: BS9990
 - Underground fire hydrants to: BS750
 - Pressure reducing valves incorporated for safe operation

3.4 Hazard & Commodity Classification

Use FM Global Loss Prevention Data Sheets DS 3-26, 8-1, 8-9:

- Offices HC1
- Dry Areas HC3
- Production Areas HC3
- Warehouse General Commodity Uncartoned Unexpanded Plastics (UUP) in accordance with 8-1 to all areas as advised.

3.5 Water Supplies

The facility is to be provided with automatic start pumped water supplies complying with FM data sheets. The supplies consist of a single 100% capacity galvanised steel water storage tank feeding a single diesel driven fire pump, housed within an external pump room.

The following sizes are for guidance only, and it is the contractors responsibility to determine the actual size.

Sprinkler Tank Capacity –	1 x Full Capacity – 10.850m Ø x 7.262m high = $600m^3$
Sprinkler Pump Capacty –	1 x Diesel fire pump - Nominal Rating 2,500usgpm@133psi
Pump house –	1 x GRP Enclosure - 7m x 6.5m x 3.5m high

Pump room to be internal enclosed room to house all mechanical equipment and valves. Inc. pump house general lighting, heating and ventilation. The electrical installation shall be fed from a local distribution board within the pump house, provided by others.

Ensure pump suction, tank infill and tank drain valve are trace heated and thermostatically controlled so that the system is maintained when the external air temperature is -15 degrees Celsius.

Provide valve stations in accordance with FM design codes.

The contractor shall provide a remote run/trip/alarm indicator panel, including all cabling, located within the office reception.

3.6 Control Valves

Provide valve stations in accordance with FM Global requirements housed within the facility and as a minimum; Each valve station shall be fully compliant with the requirements of FM global and be provided with a flow switch to permit fire alarm signalling by others.

3.7 Hydrant Supply

The contractor shall provide a new hydrant supply in accordance with BS750 to serve the proposed warehouse and associated areas.

3.8 Warehouse Area Roof Sprinkler Installation

- Main Roof provide a single level of exposed wet pipe sprinkler protection throughout the warehouse area. The sprinkler design shall be based upon the following:-
 - Roof Storage (Pendent K360 @ 1.4 bar 10 heads operating) FMDS 8-9 Table
 10, Maximum Ceiling Height 7.5m, utilising FM approved K360 sprinklers @1.4bar
 incorporating 950l/min hose stream allowance for 60 minute duration.
- Provide a single level of exposed sprinkler protection matching density of system above to services, ductwork and plant >600mm wide, etc.

3.9 Warehouse Area Rack Sprinkler Installation

- Racking provide a single level of exposed wet pipe sprinkler protection throughout the racking at a maximum 9m from the floor level. The sprinkler design shall be based upon the following:-
 - Rack (Pendent K320 @ 2.1bar 6 heads operating) FMDS 8-9 2.3.6.6 alternate in-rack sprinkler desgins – incorporating 950l/min hose stream allowance for 60 minute duration.
 - Racking to meet the definition of open frame racking
• The contractor shall review the racking drawings and provide additional levels of protection, should it be required due to obstructions etc, and advise the main contractor if any baffle boards are required to achieve full compliance with the FM codes.

3.10 Warehouse Area Mezzanine Sprinkler Installation

- Mezzanine Platform– provide a single level exposed wet pipe sprinkler protection to the underside of the mezzanine. The sprinkler design shall be based upon the following: -
 - Mezzanine Storage (Upright K242 @ 1.5bar 12 heads operating) FMDS 8-9 Table 5, Maximum Ceiling Height 7.5m, utilising FM approved K240 sprinklers – incorporating 950l/min hose stream allowance for 60 minute duration.
- Provide a single level of exposed sprinkler protection matching density of system above to services, ductwork and plant >600mm wide, etc.

3.11 Energy Centre Sprinkler Installation

- Main Roof provide a single level exposed wet pipe sprinkler protection throughout the area. The sprinkler design shall be based upon the following: -
 - Process area (Pendet K360 @ 2.8 bar 10 heads operating) FMDS 3-26 Table 3, Maximum Ceiling Height 18m, utilising FM approved K360 sprinklers – incorporating 950l/min hose stream allowance for 60 minute duration.
- Low piled Storage treat storage of plastic commodities up to 6 ft (1.8 m) high.
- Provide a single level of exposed sprinkler protection matching density of system above to services, ductwork and plant >1200mm wide, etc.
- The contractor shall undertake a study to ensure the correct head temperature rating is selected.

3.12 Offices, Rest Rooms etc.

- Offices provide a dual level of concealed wet pipe sprinkler protection to the 2 storey Main Offices inclusive of ceiling voids. The sprinkler design shall be based upon the following:-
 - Offices etc. (HC1) design density wet 4.1mm/min over 186m² FMDS 3-26 Table 2, utilising FM approved K80 sprinklers.

3.13 Internal Bin Wash Area

- Internal Bin Wash area provide a single level of exposed wet pipe sprinkler protection to the plant areas of the facility. The sprinkler design shall be based upon the following:-
 - Bin Wash Area (HC3) design density dry 12.0mm/min over 330m² FMDS 3-26 Table 2, utilising FM approved K160 sprinklers – incorporating 1900l/min hose stream allowance for 60 minute duration.
 - This is located under the mezzanine and shall be considered as part of the mezzanine design.

3.14 External Canopies (Where Applicable)

• External Canopies – provide a single level of exposed wet pipe sprinkler protection to the plant areas of the facility. The sprinkler design shall be based upon the following:-

- External Area (HC3) design density wet 12.0mm/min over 230m² FMDS 3-26 Table 2, utilising FM approved K160 sprinklers – incorporating 1900l/min hose stream allowance for 60 minute duration.
- Trace heating and lagging of the wet pipework
- Maximum height of this area is deemed to be 9m.

3.15 Incinetor Pits

o Protection to be provided in accordance with Factory Mutual Data Sheets.

3.16 Fuel System

The contractor shall provide a bulk fuel tank above ground to supply the sprinkler pump of sufficient capacity for 3 no. days usage. The tank shall be supplied complete with fuel level indicator, fuel fill cap with breather and strainer, fuel feed and return lines to day tanks. Provide manual by-pass valve to solenoid valves located within the fuel lines.

Ensure the bulk fuel tank incorporates a bunded tank construction to comply with relevant British Standards and legislation.

Provide a remote external fill point cabinet adjacent to the fuel tank with interconnecting fuel transfer lines to the day fuel tank. Provide tank contents gauge, fuel full alarm and drip tray, linked to the BMS.

A day fuel tank shall be located adjacent to the sprinkler pump. Ensure the bulk fuel tank incorporates a bunded tank construction to comply with relevant British Standards and legislation.

Ensure fuel system complies with Environment Agency PPG2 and the Control of Pollution Storage (Oil Storage)(England) Regulations

3.17 FM 200 Gas Suppression

A FM 200 gas suppression installation shall be provided to each SCADA and Comms room.

The gas suppression installation shall be fully inclusive of Control Panels, access control, c/w pressure relief damper and control panels detection, and all other associated equipment, required.

APPENDIX A – TENDER SUMMARY - SPRINKLER SERVICES

The following is a summary of the quoted figures as entered on the Form of Tender and must be completed by the tenderer at the time of tender and must be arithmetically correct.

The tender is intended to cover all work necessary including the supply, installation, testing and commissioning of all materials and labour of the sub contract in a workmanlike manner and is to be read in conjunction with the installation concept drawings and accompanying specification. Any details of items of work which are obviously or fairly intended and are usual or essential for the installation shall be deemed to be included, notwithstanding that they may not have been specifically referred to herein unless they are specifically stated as excluded in the Summary of Tender.

General conditions of contract and preliminaries.

The costs below shall include full compliance with preliminaries documentation and standards of workmanship as part of the engineering specification.

Items: -

		£
1.	Preliminaries	
2.	External services	
3.	Hydrant Supply	
4.	Sprinkler Pump	
5.	Sprinkler Tank	
6.	Sprinkler Pump House – Packaged (FM)	
7.	Valves	
8.	Controls	
9.	Pipework/Sprinklers-Roof Level	
10.	Pipework/Sprinklers-Inrack protection	
11.	Pipework/Sprinklers-Offices	
12.	FM 200 installation	
13.	300 Heads	
14.	Testing and commissioning	
15.	Operating and maintenance manuals and 'as installed' Drawings	
16.	Client training and handover	
	Sub Total	
	Add 1/39th for MCD	
	Tender Total	

Note:

The sub-contractor is required to submit a priced copy of the Tender Summary with this tender together with a priced copy of the Daywork Schedule.

A detailed schedule of rates shall be provided within 48 hours' notice to assist ratification of the tender. Should the sub-contractor be successful then these schedule of rates will used to value variations during the contract.

Signature of Contractor......Date......Date.....

For and on behalf of	
Telephone Number	Email

APPENDIX B – SCHEDULE OF DAYWORK RATES

Any work executed on a daywork basis shall be charged strictly in accordance with the 'Definition of Prime Cost of Daywork carried out under an Mechanical and Electrical Contract as issued by R.I.C.S.

1. Labour

The sub-contractor shall enter below the basic hourly rates of labour of the various categories at which rates he will be prepared to carry out work if instructed to do so on a daywork basis.

Basic Hourly Rate (specify)

Note, generally all variations will be valued on schedule of rates.

Category Technician Approved Electrician Approved Fitter Electrician Fitter Labourer 20 year old apprentice 19 year old apprentice 18 year old apprentice 17 year old apprentice 16 year old apprentice

Percentage addition to prime cost for overhead and profit as: -

- i) For work carried out during the Contract period add.....%
- ii) For work carried out during the defects liability period add.....%

APPENDIX C – SCHEDULE OF DRAWINGS

Drawing No:	Description:	Scale:
C1435-TCL-SP-100	WAREHOUSE GROUND & MEZZANINE SPRINKLER STRATEGY	1:200
C1435-TCL-SP-101	TYPICAL SECTIONS	NTS
C1435-TCL-CS-100	EXTERNAL SERVICES STRATEGY	1:300