WEST WALES FIRE SAFETY

FIRE RISK ASSESSMENT

CWM Environmental Ltd

(Black Bag Recycling Building)

Nantycaws

Carmarthen

SA32 8BG

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Section 1 – Introduction

In order to ensure that CWM Environmental, complies with current Fire Safety Legislation i.e. The Regulatory Reform (Fire Safety) Order 2005, I was initially contacted by Mr Wyn Morgan (Operations Director) to undertake a Fire Risk Assessment of the Blue Bag Recycling building at their depot in Nantycaws, near Carmarthen. I have since been contacted by Miss Heather Patterson (Health & Safety Officer) to carry out the Fire Risk Assessments of the remainder of the site at Nantycaws.

I, Fire Safety Consultant Mr Christopher Hughes BSc (Hons), MIFireE, of West Wales Fire Safety, met Mr Creamer (Site Manager) and Miss Patterson, at the site to carried out their request commencing with the Black Bag recycling building.

Date of Assessment	Name of Assessor (Print)	Signature of Assessor
7th October 2015	Christopher Hughes	*C Hughes*

It is recommended that the Fire Risk Assessment be reviewed "Annually" or at such time when there is significant change in fabric of the premises, the work processes change or new ones are introduced and there is a change in the capabilities of staff members.

Date of Review	Name of Assessor (Print)	Signature of Assessor

I Christopher Hughes being a Competent, Specialist Fire Safety Consultant for West Wales Fire Safety confirm that this document, its findings and Action Plan are drawn up in good faith and to the best of the Consultants ability, subject to the Consultant being supplied with all the correct and relevant information it is a true reflection of the situation within the premises at the time of the Assessment.

Section 2 – Introduction to Premises

CWM Environmental manage a waste recycling site on the outskirt of the village of Nantycaws, just off the A48, five miles to the east of the market town of Carmarthen, the site has four main activity areas; Household Waste Recycling Facility (HWRC), a large landfill site, an In Vessel Compost (IVC) facility and two Material Recycling Facilities (MRF) (black and blue bags). This subject of this report is the black bag recycling building located in the recycling depot section of the site.

The building was constructed in 2013 it is "L" shaped and detached it measures 54m x 36m with a 18m x 12m side extension and its height is 8m to the eaves of the pitched roof, it is of portal steel frame construction the walls are part interlocking reinforced concrete panels 5m x 1m x 150mm thick x 2 rows (300mm thick) to a height of 3m to 4m and part insulated core panel which continues up to the pitched roof which is also constructed of insulated core panels with integrated non openable sky-lights, the front and rear of the building have a number of large roller shutter doors allowing for vehicular access.

There are three work areas within the building, firstly the ground floor which is used for the delivery of unprocessed waste (Black Bags) and collection of processed waste materials, secondly the mezzanine walkway working area is used for the processing of materials, the majority of which is conveyed to the end of the line and dropped onto the bailer feed conveyor which transports the material (into the third area), up to a feed hopper above the baler where it is baled into large square bales using wrapping/binding wire ready for removal to an external storage area.

The raised mezzanine processing area consists of a number of walkways and workstations adjacent to conveyor belts for hand picking and guarded machines for mechanical separation. The walkways are of non-slip steel construction, steel columns and beams support the mezzanine walkways with an open steel box frame work enclosing the mezzanine.

The process initially involves vehicles dropping off black bags in the reception area a grab vehicle (a high rise cab waste handler) picks up and drops the bags into the bag splitter machine it splits the bags before transferring the contents onto a conveyor which transports the material up to the mezzanine for processing, the materials are separated by hand in the pre-sort area before moving on (by conveyer) to the main sorting area where they are sorted by hand and mechanically. Some items (plastics and metals) are dropped to designated areas below the processing line while others continue to the end of the line where they are dropped onto the baler feed conveyer.

At present the baler is out of commission therefore the processed materials are dropped to the ground where they are picked up/grabbed by a grab vehicle (Tele-handler) and placed into a dumper lorry (HGV) in the loading bay for transport to land fill, this will continue until an extension to the building is constructed. There is also a small hand Trade Sorting area at ground floor level adjacent to the loading bay side of the building.

The building's fire detection system is designed and installed to British Standard - BS5839: Part 1: and Emergency Lighting to BS5266: Part 1. A comprehensive CCTV system is installed in the building.

Section 3 – Significant Findings

Company Name & Details	**Reason for Assessment**
CWM Environmental, Nantycaws,	Initial Fire Risk Assessment
Carmarthen, Carmarthenshire.	**Risk Assessor**
SA32 8BG	Christopher Hughes
Premises to be Assessed	**Assisted By**
Black Bag, Recycling Building.	Mr Creamer - Site Manager and Miss Patterson – Health & Safety Officer
Responsible Person	Mr Gallagher (H&E Systems Manager)
Responsible Person (Other)	Mr Creamer
Hours of Working	Mon-Fri - 07.00-19.00hrs Sat – 07.00-13.00hrs
Number Working in Area/Building	5 to 11 persons
Type of Business/Use	Waste Recycling

CWM Environmental manage a waste recycling site on the outskirt of the village of Nantycaws, Carmarthen, the site has four main activity areas; Household Waste Recycling Facility (HWRC), a large landfill site, an In Vessel Compost (IVC) facility and two Material Recycling Facilities (MRF) (black and blue bags). This subject of this report is the new build blue bag recycling building located in the recycling depot section of the site.

The building is "L" shaped and detached it measures 54m x 36m with a 18m x 12m side extension and its height is 8m to the eaves of the pitched roof, it is of portal steel frame construction the walls are part interlocking reinforced concrete panels 5m x 1m x 150mm thick x 2 rows (300mm thick) to a height of 3m to 4m and part insulated core panel continues up to the pitched roof which is also constructed of insulated core panels with integrated non openable sky-lights, the front and rear of the building have a number of large roller shutter doors allowing for vehicular access.

There are three work areas within the building, firstly the ground floor which is used for the delivery of unprocessed waste (Black Bags), the collection of processed waste materials and a small hand sorting area adjacent to the loading bay, secondly the mezzanine walkway working area is used for the processing of materials (pre-sort and main sort lines), the majority of which is conveyed to the end of the line and dropped onto the baler feed conveyor which transports the material (into the third area), up to a feed hopper above the baler where it is baled into large square bales using wrapping/binding wire ready for removal to an external storage area.

The raised mezzanine processing area consists of a number of walkways and workstations adjacent to conveyor belts for hand picking and guarded machines for mechanical separation. The walkways are of non-slip steel construction, steel columns and beams support the mezzanine walkways with an open steel box frame work enclosing the mezzanine.

At present the baling machine is out of commission therefore the processed materials are dropped to the ground where they are picked up/grabbed by a grab vehicle (Tele-handler) and placed into a dumper lorry (HGV) in the loading bay for transport to land fill, this will continue until an extension to the building is constructed.

The pre-sort line normally has 2 persons working on it but it does have work station for 4, the access/egress is via a metal stairs at one end of the line with two fixed vertical ladders at the opposite end, one either side of the line, they are required in order to achieve escape in two directions within the recommended travel distance.

The Consultant is satisfied that the vertical ladders are suitable for escape purposes in this case as the number of persons that would use them are low (2 to 4) they would be trained and familiar with their use and would be physically fit. However the route leading from the bottom of the ladders is inadequate as there are items of waste materials along the escape route and the route is too narrow and does not comply with the minimum recommended escape width. Therefore, a final exit door should be provided at ground floor level in the wall adjacent to the ladders, the provision of emergency lighting and exit signage will need to be reviewed with additional lighting units and signage provided as necessary.

Given the nature of the work in the building the occupiers follow daily and weekly cleaning routines to reduce the build-up of flammable materials and ensure escape routes are kept clear, as can reasonably be expected in this case.

The building's fire detection system is designed and installed to British Standard - BS5839: Part 1: and Emergency Lighting to BS5266: Part 1. A comprehensive CCTV system has been installed and is due for commissioning.

Following the installation of an additional exit door all areas in the building will have escape in two directions, early detection of fire combined with the height of the building as it will act as a smoke reservoir keeping the escape routes clear for longer, will increasing the "available safe escape time" (ASET) as detailed in BS9999. Therefore, although the Fire Growth Rating is 3 (Fast) the Consultant considers it highly unlikely that evacuation routes will become untenable before the occupants can safely evacuate the building.

Section 4 – Fire Safety Legislation

Regulatory Reform (Fire Safety) Order 2005

If you own, manage or operate a business you are referred to as the “Responsible Person” and you will need to comply with fire safety law. The principal law being the Regulatory Reform (Fire Safety) Order 2005 commonly known as the “Fire Safety Order" which applies across Wales and England it came into force on 1 October 2006.

The “Fire Safety Order” applies essentially to all workplaces, buildings and structures but not to individual private dwellings (e.g. individual flats in a block or family homes). It is your responsibility to make sure your workplace reaches the required standard and all “Relevant Persons” are safe from the effects of a fire and employees are provided with adequate fire safety training.

Adequate fire safety training would generally include:

- Induction training (general fire awareness)
- Periodic refresher training (or additional training where the level of fire risk increases as a result of changes)
- Training to support people in fulfilling their fire safety duties (e.g. responsible person)
- Training towards competence (fire risk assessment, fire warden, fire extinguisher)

Duty of Responsible Person

The “Fire Safety Order” places the emphasis on risk reduction and fire prevention. Under the Order, people responsible for commercial buildings i.e. the employer, owner, or any other person who has control of any part of the premises, are required to carry out a mandatory detailed fire risk assessment identifying the risks and hazards in the premises. The risk assessment must be recorded if you have a total of five or more employees or the premise requires a license. The responsible person for the premises is also required to:

- Consider who may be especially at risk.
- Eliminate or reduce the risk from fire as far as is reasonably practical and provide general fire precautions to deal with any risk.
- Take additional measures to ensure fire safety where flammable or explosive materials are used or stored.
- Create a plan to deal with any emergency and where necessary record any findings.
- Maintain general fire precautions, and facilities provided for use by fire-fighters.
- Inform their employees of any significant findings of the fire risk assessment that may affect them. And,
- Keep any findings of the risk assessment under review.

Section 5 – Fire Risk Assessment

Risk Assessment Process

A fire risk assessment is an organised and methodical look at a premises, the activities carried on there and the likelihood that a fire could start and cause harm to those in and around the premises.

Hazard Identification.

1. Identify potential hazards by focusing on any combustible materials and sources of ignition within the workplace as well as any unsafe acts (smoking) and any unsafe conditions that may assist a fire to spread more quickly.
2. Identify the persons most at risk with these hazards, paying special attention to those with any disabilities or those working in isolated areas.
3. Determine if existing controls in place are adequate or if more must be done to either reduce or eliminate the risks, also reviewing the provision of:
    - Means of detecting and giving warning in case of fire
    - Means of escape
    - Signage
    - Firefighting equipment

Fire Safety Management Check List

An additional questionnaire focuses on more specific aspects of fire safety, and indicates whether existing controls are adequate or if more must be done.

Action Plan

If any existing controls have been deemed inadequate from the hazard Identification exercise an Action Plan may be required to reduce the risks to a minimum or acceptable level.

Hazard Identification

1. Fuel 2. Ignition Sources (IS) 3. Oxygen	**Risk Evaluation:** When recording potential hazards, attempt to classify the risks as; **LOW** (minimal risk of fire), **NORMAL** (outbreak of fire likely to remain confined with warning system allowing persons to escape safely) or **HIGH** (where flammable or explosive materials are stored / used or where reaction times of individuals may be an issue).	**Risk Rating** Hazard X Risk (Potential of Risk Occurring)

Potential Hazard	Location	Existing Controls	Risk Rating
Fuel: Black recycling bags contents	Reception Area	No ignition sources in Area apart from Tele-handler	Normal
Fuel: Black recycling bags contents- plastics, card board, paper, aerosol cans, old lighters etc.	Splitter Machine	Extinguishing Equipment located close to machine, Trained Employees	High
Fuel: Vehicle (Diesel Fuelled)	Ground Floor Area	Maintained, cleaned, parked away from waste materials	Normal
Fuel: Delivery & Collection Vehicles (HGV)	Ground Floor Area & Loading Bay	Vehicles Maintained	High
Fuel: Plastics, card board, paper, aerosol cans, old lighters etc.	Processing Area	Cleaning schedule	High
Fuel: Large Processing Machinery	Processing Area	Maintained, Cleaning Schedule	Normal
Fuel: Large Rolls of Plastic Wrapping	Ground Floor near Loading Bay	No ignition sources in Area apart from Tele-handler	Normal
Fuel: Waste Paper	Collection Area under processing lines	No ignition sources in Area apart from Tele-handler	Normal
Fuel: Plastic bottles	Collection Area under processing lines	No ignition sources in Area apart from Tele-handler	Normal
Fuel: Stacks of Baled paper & plastic	Adjacent to Building in External Storage Area	No ignition sources in Area apart from Tele-trucks	Normal
Fuel: Baling Machine and Bales	Baling Area	Machine taken out of commission at present	Low
Fuel: Lubrication Grease	Processing Area	Maintained, small quantity	Normal
Fuel: Dust	Whole Premises	Cleaning schedule	High
Fuel: Household electrical equipment in plastic pallets	Adjacent to external escape route	No ignition sources in Area apart from Tele-truck and HGV's	Normal
IS: Main Electricity supply and distribution cabinets	Whole Building	Fire Trace System Installed in distribution cupboards	Low
IS: Faulty Electrical Circuits (Sockets & Lighting)	Whole Building	Tested, Maintained	Normal
IS: Electrical fault to processing machinery or misuse.	Processing Area & Splitter Unit	Maintained Equipment, Trained Staff	Normal

IS: Fault or overheating of conveyor motors or bearings or friction	Whole Premises	Cleaning Schedule, Thermal Image Camera Checks	Normal
IS: Overheating or ignition of materials during processing	Whole Premises	Extinguishing Equipment provided & Employees Trained	High
IS: Portable Electrical Equipment	Whole Premises	Trained Staff, PAT testing	Normal
IS: Grab Vehicle (Tele-handler) Fire	Whole Premises	Maintained & Checked Daily	Normal
IS: Delivery/Collection Vehicles Fire	Ground Floor area & Loading Bay	Extinguishing Equipment provided & Employees Trained	High

Availability of Oxygen or Fire Accelerants

Other than the oxygen in the air there are no other oxygen supplies or gas cylinders used in the building, empty cylinders (mostly Helium) are collected during the hand Trade Sorting of the waste at ground floor level which are stored in a large plastic pallet and removed from the area when the pallet is full. The building has four large roller shutter doors either side of the building and a loading bay at one end which allows for a significant air flow through the building, on windy days this could have the potential to accelerate the spread of a fire should one occur.

Persons at Risk

Persons identified at being at risk within the building are employees and contractors carrying out maintenance, no members of the general public are allowed on site.

Means of detection and giving warning in case of fire

As directed by BS9999 for a Risk Profile of A3 (see Section 6) the fire detection system installed in the building complies with the current British Standard, BS5839: Part 1: Category L2. The system includes three beam detectors at roof level. The processing machines are automatically isolated on actuation of the system.

In order to reduce the number of false alarms generated by a system of this type due to the dusty environment, the beam detectors are isolated during working hours; this seems to be a Waste Industry accepted practice. However, there are a number of caveats that need to be followed for this practice to be deemed as safe as reasonably practicable;

- The majority if not all of the working area within the building can be seen by members of staff.
- Any areas where fire can break out unseen must be covered by automatic detection; this may become more prevalent when the building is extended.
- The building must be staffed throughout the working day when the beams are isolated.
- If designated breaks are taken such as a lunch hour then the beams must be brought back on line.

Should the fire detection system actuate during working hours (07.00-19.00 hrs) the building must be evacuated immediately, in order to reduce the number of false alarms sent to the Local Fire Service, a designated person on site would call the Emergency Services. On actuation of the alarm the responsible person has 3 to 5 minutes to investigate and confirm if there is or is not a fire before an emergency call is sent from site, before implementing this management system it should be agreed with the Local Fire Service.

At Present outside working hours there are security personnel on site who patrol the buildings taking with them a Thermal Imaging Camera to check on the temperatures of stacked bales and loose piles of flammable materials the temperatures of which are recorded after each patrol.

Should the fire alarm actuate the Security person will investigate the identified location of the fire. They then have to inform "BT Red Care" whether there is a fire situation or not, a 3 to 5 minute delay/ investigation time slot should be built into this procedure to give the Security guard the time to fully investigate the situation and to avoid false alarms, the actual time frame can be agreed with the Local Authority Fire Service.

Means of Escape

The raised mezzanine processing area has two individual work areas a pre-sort line and main sort line the main sorting line normally has 4 persons working on it, but it does have work stations for up to 16 persons, there are two internal metal stairs for access/egress and one exit route to an external metal fire escape which offers the workers escape in two directions and is within recommended travel distances. The pre-sort line normally has 2 persons working on it but it does have work station for 4, there is one access/egress metal stairs at one end of the line with two fixed vertical ladders one either side of the line at the other end, they are required in order to achieve escape in two directions within the recommended travel distance.

The Consultant is satisfied that the vertical ladders are suitable for escape purposes in this case as the number of persons that would use them are low (2 to 4) they would be trained and familiar with their use and would be physically fit. However the route leading from the bottom of the ladders is inadequate as there are items of waste materials along the escape route and the route is too narrow and does not comply with the minimum recommended escape width. Therefore, a final exit door should be provided at ground floor level in the wall adjacent to the ladders, the provision of emergency lighting and exit signage will need to be reviewed with additional lighting units and signage provided as necessary.

Housekeeping

By the very nature of the work involved in the processing of waste materials it is unavoidable that an amount of clutter is produced, debris gathers in any dead space between machinery and also falls from the mezzanine working area down onto ground floor. Dust is also produced which again gathers in dead areas and on top of machinery, lighting gantries, girders etc.

It is essential that the type of flammable materials produced in processing (small and easily ignitable) are kept to a minimum and away from any sources of heat or ignition and all means of escape routes maintained clear whenever the building is occupied.

At present a daily and weekly cleaning routines are followed with the weekly routine involving clearing the dead areas between and under the machines and conveyor belts and vacuuming the whole of the mezzanine floor, areas below the processing line and all areas that can be accessed where dust could gather. Given the process involved a dust/debris assessment should be undertaken at regular intervals as part of the ongoing maintenance to ensure escape routes are kept clear and to minimise the build-up of flammable/ explosive materials.

The process lines have electric motors located adjacent to the lines at gangway/floor level, during processing materials fall down and cover the motors, therefore the motors should be cleared several times during the working day or they should be guarded to prevent this occurring. The area around the bottom of the fixed vertical ladders used for escape purposes should be maintained clear during working hours.

Fire Exit and Escape Route Signage

As detailed above additional signage will be required for the new exit, external signage may also be required i.e. "Fire Door – Keep Clear". The illuminated exit sign above the exit door adjacent to the hand Trade Sorting area near the loading bay cannot be seen as it is located in a recessed position it should be relocated so that it is visible from all areas on the ground floor.

Fire Fighting Equipment

The number, type and location of fire extinguishers within the building is satisfactory, and an automatic extinguishing system (Fire Trace) is fitted to each electrical cabinet. Fire fighting equipment is kept in large red fire boxes at designated locations, it is the opinion of the Consultant that no additional extinguisher signage is required as staff numbers are relatively low, all employees and maintenance workers are made aware of the location of the equipment, staff are informed/trained to identify types of extinguisher and how to use them if required to do so.

The occupiers have 2 x 50 litre foam extinguishers on trolleys which are intended for use on larger fires, an operating policy has been draw-up as to where and in what circumstance these extinguishers are to be used and who is to use them. As the baling machine was out of commission at the time of the Risk Assessment the extinguisher covering this area could be relocated to provide cover in another identified risk area.

Arson

The location of the site off the A48 does not lend itself to an attack of arson and none have been recorded at this site in the past. No members of the public are allowed on site, contractors are signed in and given induction training with any other visitors also being signed in and accompanied, there is CCTV installed on the whole site and within the building. The main entrance barriers are secured outside of working hours prohibiting access to the site.

Spontaneous Combustion

Spontaneous combustion can be a problem in this industry given the type of materials involved, their condition and method of transport and storage (large piles of materials and compacted bales), close storage of large amounts of materials adding to the risk of the build-up of heat. In this case a Thermal Imaging Camera is being used to monitor the heat levels within the materials, large 50 litre extinguishers are located near to risk areas, a Policy has been drawn-up on their use and staff have been trained in how to use the extinguishers.

Water Supplies

Given the location of the site and the risk should a fire start it essential that water is available for fire-fighting operations, the pressure and flow of the mains water supply should have been confirmed following the Blue Bag building fire risk assessment? A review is underway with regard to using the available open water supplies on site, including reusing water run-off.

Fire Safety Management Check List

Checklist		Existing Controls
Policies & Procedures	Answer YES/NO/NA	Adequate/ Mostly Adequate/ Inadequate
Is there an annual maintenance contract for the Fire Safety Systems (Fire Alarm, Emergency Lighting) & Fire Extinguishers	YES	Adequate
Is the mains electrical supply and circuits tested every 5 years	YES	Adequate
Is portable electrical equipment tested in line with manufactures recommendations	YES	Adequate
Is equipment properly maintained and inspected as per manufacturer specifications?	YES	Adequate
Do you have a visitor control system acknowledging any contractors in the building at all times?	YES	Adequate
Do you use Permits to Work for outside contractors?	YES	Adequate
Is the smoking policy strictly enforced?	YES	Adequate
Have adequate measures been taken to protect against arson?	YES	Adequate
Training & Testing	Answer YES/NO/NA	Adequate/ Mostly Adequate/ Inadequate
Have employees received Fire Safety/Awareness training	YES	Adequate
Do all employees know their own responsibilities should a fire break out?	YES	Adequate
Have employees been trained in the use of fire extinguishers and basic fire protection?	YES Fire Marshals	Adequate
Is the fire alarm tested weekly?	YES	Adequate
Is the fire detection system monitored outside working hours?	YES	Adequate
Is a fire drill conducted at least once per year?	YES	Adequate
Are fire safety checks and staff training recorded in a log book? (daily, weekly, monthly etc.)	YES	Adequate
Are systems in place to deal with any faults or near misses discovered during testing of equipment or procedures?	YES	Adequate
Fire Extinguishers & Other Systems	Answer YES/NO/NA	Adequate/ Mostly Adequate/ Inadequate
Do you have the correct type, correct size and sufficient number of fire extinguishers throughout the workplace	YES	Adequate
Are all fire extinguishers properly placed in position with secure mountings?	YES	Adequate
Have all fire extinguishers been inspected/serviced within the last 12 months	YES	Adequate
Is fire-fighting equipment indicated by signage?	NO	Adequate
Is there an automatic fire detection and warning system?	YES	Adequate
Is there an automatic sprinkler system installed?	NO	
Are internal fire doors identified accordingly and kept closed?	NA	
Are fire action notices displayed prominently throughout the workplace?	YES	Adequate

Section 6 - Risk Profile of Premises

The building was constructed in 2013 and has been signed off by the Local Building Authority as fit for purpose the Consultant has utilised British Standard code of practice BS9999 guidnace document in order to draw-up the Fire Safety and Evacuation Strategies for the building.

Occupancy Characteristics
BS9999 indicates that the occupancy characteristic would be “A” for employees and on occasion maintenance contractors who have under gone Induction training before being allowed on site i.e. occupants who are “awake and familiar with the building”.

Fire Growth Rate (FGR)
Much of the material being delivered to the building is flammable (cardboard, paper, plastic etc.) it is delivered in plastic bags several tonnes at a time with several hundred tonnes being present within the building at any one time. The process itself sorts the materials, the nature of the work produces high volumes of dust and debris, which adds to the high fire loading, the materials would readily ignite should an ignition source become available due to a fault or work process, there may also be some hidden risks/accelerants within the recycled materials such as aerosols or lighters. Taking these factors into consideration it is the opinion of the Consultant that this would give the building a Fire Growth Rating of 3 (Fast).

Risk Profile
The occupancy characteristics and fire growth rate would therefore provide us with a Risk Profile of A3.

Fire Safety Management Level (FSML)
Given the outcome of the Risk Profile associated with occupancy and the nature of the work within the building it would seem appropriate to introduce Fire Safety Management Level 1 as detailed in BS9999 Section 4.

Escape travel Distance
BS9999 states that normal escape travel distance for risk profile A3 is 18m single direction and 45m for two directions of travel.

Section 7 - Fire Safety Strategy

As stated previously the building is of portal steel frame construction the walls are part interlocking reinforced concrete panels 5m x 1m x 150mm thick x 2 rows (300mm thickness) to a height of 3m to 4m and part insulated core panel which continues up to the pitched roof which is also constructed of insulated core panels with integrated non openable sky-lights, the front and rear of the building have a number of large roller shutter doors allowing for vehicular access.

The lower half of the walls are of concrete construction and will afford the steel frame a good standard of fire resistance the top half however has the insulated core panels fixed to the outside face of the columns so therefore there is no fire protection to the steel frame. Given the fire behaviour of insulated core panels and taking into account there is no fire protection afforded to the steel above the concrete panels, it is unlikely that the Local Fire Service will undertake fire-fighting within the building.

Many Local Authority, Fire Services operational procedures will only allow for defensive fire-fighting[(i)] where the stability of the structure cannot be guaranteed. It is therefore essential that early warning of fire and a safe well-practiced evacuation of the building is achieved.

The Fire Safety Strategy provides a frame work for ensuring the safe evacuation of the building by employees and those legally allowed to be on the premises.

1. Provide early warning of fire by maintain a comprehensive fire detection and warning system.
2. Provide sufficient escape routes.
3. Maintain escape routes clear and sign posted at all material times.
4. Reduce build-up of flammable materials (debris and dust) by comprehensive cleaning scheduled.
5. Maintain production line machinery in line with manufactures recommendations.
6. Maintain regular checks of machinery likely to overheat due to usage and piles/stacks of flammable materials, using Thermal Imaging Camera.
7. Provide and maintain an adequate emergency lighting system.
8. Provide sufficient and correct type of fire extinguishers for the risk.
9. Maintain all fire safety equipment to manufactures recommendations.
10. Provide necessary training for employees in line with personal fire safety roles and responsibilities and carryout Fire Drills.
11. Record testing of equipment and training in a log book
12. Review Fire Safety Strategy and Fire Risk Assessment at regular intervals following any material changes to the building or processes undertaken there in.

Note: (i) Defensive Fire Fighting.
A primarily exterior form of fighting a fire often used when fire fighting from within a structure is not feasible due to dangers from direct flame, heat, structural collapse or the presence of hazardous materials. Often structures which are fully involved are attacked defensively with the main goal being the protection of nearby exposures. This form of attack is far less effective than an Offensive Fire Fighting from within a structure/building.

Section 8 - Evacuation Strategy

BS9999 states that normal escape travel distance for risk profile A3 is 18m single direction and 45m for two directions of travel. The guide allows variations in standard measurements for additional fire protection measures. In this case the increased ceiling height allows variations in travel distance, door width, corridor width and stair width if necessary. As the ceiling height of the premise is 8m to the eaves, an additional 24% can be added to the travel distance, equalling 22m single direction or 56m in two directions.

Whereas all areas have escape in two directions within the allowed travel distance there is an issue with the escape route from the bottom of the vertical fixed ladders, once this short fall is remedied the escape route will comply with recommended guidance. Details of the additional exit can be found in the Action Plan (Section 9).

As the height of the building will act as a smoke reservoir it will keep the escape route clear for longer, increasing the “available safe escape time” (ASET) as detailed in BS9999. Therefore, although the Fire Growth Rating is 3 (Fast) the Consultant considers it highly unlikely that evacuation routes will become untenable before the occupants can safely evacuate the building.

In order to maintain this and taking the Risk Profile of the premises into account the following evacuation strategy should be implemented: -

- Provide early detection and warning of fire: this is highly likely when beam detectors are isolated during work hours as building is open plan.
- Ensure warning signal both audio and visual is appropriate to the risk.
- Provide safe clear evacuation routes in two directions where possible and as recommended by guidance document.
- Provide and maintain signage and emergency lighting as necessary
- In event of the fire alarm sounding full evacuation of the building is to take place (Including adjacent building)
- To reduce false alarms a management protocol is to be drawn-up and agreed with the Local Fire Service
- Fire detection system is to be monitored outside working hours (Red Care)
- Inform employees of their fire safety responsibilities and carryout evacuation drills.
- Train employees in regard to their individual roles and use of extinguishing equipment as necessary.

Section 9 – Action Plan

The Action Plan is aimed at reducing to acceptable levels the risks identified within the previous sections.
The Proposed Completion time frames should be calculated from the time the client/responsible person receives the completed Fire Risk Assessment document.
The Actual Completion Date Box should be dated and signed off on completion of the Action.

Hazard Identified	Action	Proposed Completion Time Frame	Actual Completion Date
Inadequate means of escape	Provide an additional exit adjacent to the bottom or the vertical ladders	Short Term	
Inadequate means of escape	The threshold area over which final exit doors open should be level with internal floor.	Short Term	
Inadequate means of escape	Provide additional Emergency Lighting & Signage as necessary in location of new exit door	Short Term	
Inadequate means of escape	Clear & maintain clear the area around the bottom of the fixed vertical ladders	ASAP	
Inadequate position of exit sign	Relocate exit sign over door adjacent to ground floor hand Trade Sorting area.	Short Term	
Inadequate Fire Alarm System	Provide additional manual break glass call point adjacent to new fire exit	Medium Term	
Possible inadequate external emergency lighting	Review provision of emergency lighting (EL) on external evacuation routes. Provide EL units as necessary	Medium Term	
Openings in Insulated Core Panels around cross-building conveyors	Seal openings (Edges of panels) as recommended by the manufactures to prevent ingress of sparks or flame.	Medium Term	
Falling debris onto electrical motors and cabinets	Survey electrical motors and cabinets to ensure no debris collects on them. Where it does review cleaning schedule and/or fit a cover /guard to provide protection.	Medium Term	
Time frame for calling Emergency Service	Review Fire Service call out Policy/Procedures - Agree allowable time delay/investigation time with Local Fire Service (3 to 5mins) in order to reduce false alarms. Implement and inform employees.	Medium Term	

The time frames are indicated as Short, Medium or Long Term this does not necessarily represent the importance of the Action but takes cognisance of the time it would take to arrange the completion of the individual tasks. Some actions will rely on preceding actions being confirmed or completed before they can be dealt with, the time frames are suggested as guidance for the responsible person.
Short Term = 1 Month / Medium Term = 1 to 3 Months / Long Term = 3 to 6 Months

Appendix A – Definitions

Term	Definition
Access Room	A room through which the only escape route from an inner room passes.
Alternative Escape Route	Escape routes sufficiently separated by either direction and space, or by fire-resisting construction to ensure that one is still available irrespective of the location of a fire.
As Low As Reasonably Practicable	Is a concept where risks should continue to be reduced until you reach a point where the cost and effort to reduce the risk further would be grossly disproportionate to the benefit achieved
Automatic fire detection system	A means of automatically detecting the products of a fire and sending a signal to a fire warning system. (see "Fire Warning System"
Competent person	A person with enough training and experience or knowledge and other qualities to enable them properly to assist in undertaking the preventive and protective measures.
Combustible Material	A substance that can be burned.
Enforcing Authority	The fire and rescue authority or any other authority specified in Article 25 of the Regulatory Reform (Fire Safety) Order 2005.1
Escape route	Route forming that part of the means of escape from any point
False Alarm	A fire signal, usually from a fire warning system, resulting from a cause other than fire.
Final Exit	An exit from a building where people can continue to disperse in safety and where they are no longer at danger from fire and/or smoke.
Fire door	A door or shutter, together with its frame and furniture, provided for the passage of people, air or goods which, when closed is intended to restrict the passage of fire and/or smoke to a predictable level of performance.
Fire resistance	The ability of a component or construction of a building to satisfy, for a stated period of time, some or all of the appropriate criteria of relevant standards. (Generally described as 30 minutes fire resisting or 60 minutes fire-resisting.) See BS EN 1363-1,46 BS 476-733 and associated standards for further information.
Fire Safety Strategy	A number of planned and co-ordinated arrangements designed to reduce the risk of fire and to ensure the safety of people if there is a fire.
Fire Warning	A means of alerting people to the existence of a fire. (See automatic fire detection system.)
Flammable material	Easily ignited and capable of burning rapidly.

Term	Definition
Material change	An alteration to the premises, process or service which significantly affects the level of risk to people from fire in those premises.
Means of escape	Route(s) provided to ensure safe egress from the premises or other locations to a place of total safety.
Premises	Any place, such as a building and the immediate land bounded by any enclosure of it, any tent, moveable or temporary structure or any installation or workplace.
Protected Route	An escape route which is adequately protected from the rest of the building by fire-resisting construction.
Responsible Person	The person ultimately responsible for fire safety as defined in the Regulatory Reform (Fire Safety) Order 2005.1
Relevant Person	Any person lawfully on the premises and any person in the immediate vicinity, but does not include firefighters carrying out firefighting duties.
Risk Reduction Plan	A number of planned and co-ordinated arrangements designed to reduce the risk of fire and to ensure the safety of people if there is a fire.
Self-closing Device	A device that is capable of closing the door from any angle and against any latch fitted to the door.
Significant Finding	A feature of the premises, from which the fire hazards and persons at risk are identified. The actions you have taken or will take to remove or reduce the chance of a fire occurring or the spread of fire and smoke. The actions people need to take in case of fire. The necessary information, instruction and training needed and how it will be given
Travel Distance	The actual distance to be travelled by a person from any point within the floor area to the nearest storey exit or final exit, having regard to the layout of walls, partitions and fixings.
Where Necessary	The Order requires that fire precautions (such as firefighting equipment, fire detection and warning, and emergency routes and (exits) should be provided (and maintained) 'where necessary'. What this means is that the fire precautions you must provide (and maintain) are those which are needed to reasonably protect relevant persons from risks to them in case of fire. This will be determined by the findings of your risk assessment including the preventative measures you have or will have taken. In practice, it is very unlikely, that a properly conducted fire risk assessment, which takes into account all the matters relevant for the safety of persons in case of fire, will conclude that no fire precautions (including maintenance) are necessary.

Appendix B – Risk Rating Matrix

	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
Hazard ↑	1	1	2	3	4	5
Risk →	0	1	2	3	4	5

Yellow – Low / Green – Normal / Red – High

	Hazard	Risk
1	Slight Injury	Unlikely to Occur
2	Significant Injury	Possibly Occur
3	Slight Threat to Life	Moderate chance of occurring
4	Moderate Threat to Life	Likely to Occur
5	Significant Threat to Life	Highly Likely to Occur

Risk Rating is calculated by multiplying the hazard against the risk e.g. taking a hazard of 4, which is classified as moderate threat to life, and multiplying this against a risk of it occurring score of 2, which is classified as a Possibly occur, would give you and overall risk rating of 8, which would be risk rated as Normal.

High risk equals 15 to 25.
High Risks activities should cease immediately until further control measures to mitigate the risk are introduced.

Medium risk equals 5 to 12.
A Normal risk rating may be acceptable in most work places; however, this not to suggest that person should become complacent to the risks and efforts should be made where necessary to reduce the risk further by the introduction of additional control measures where possible.

Low risk equals 1 to 4.
Low Risks are largely acceptable, subject to reviews periodically, or after significant change etc.

Appendix C – Testing of Fire Safety Systems

Equipment	Period	Action
Fire detection and fire warning systems including self-contained smoke alarms and manually operated devices.	Weekly	Check all systems for state of repair and operation. Repair or replace defective units. Test operation of systems, by manually operated a break glass call point. Rotate call point(s) tested each week, number each call point for ease of recording test.
	Annually	Full check and test of system by competent service engineer. Clean self-contained smoke alarms and change batteries.
Emergency Lighting equipment including self-contained units and torches.	Weekly	Visually check units for damage ensure small LED light is lit.
	Monthly	Check all system, operate test switch or isolate electricity supply.
	Annually	Full check and test of systems and units by competent service engineer.
Fire-fighting equipment including hose reels.	Weekly	Check all extinguishers are in correct location, if they are showing signs of wear and are operational.
	Annually	Full check and test by competent service engineer.
Fire Exit Doors	Weekly	Check operation of release mechanism, check door opens fully and check for any obstructions.