# West Wales Fire Safety

# Fire Risk Assessment

**CWM Environmental Ltd**

**Nantycaws**

**Carmarthen**

**SA32 8BG**

# Table of Contents

## 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 contacted by Mr Wyn Morgan (Operations Director) to undertake a Fire Risk Assessment of new buildings at their depot in Nantycaws, near Carmarthen.

I, Fire Safety Consultant Mr Christopher Hughes BSc (Hons), MIFireE, of West Wales Fire Safety, met Mr Morgan, Mr Creamer and Miss Patterson, at the premises and duly carried out their request on the 16th July 2015.

| Date of Assessment | Name of Assessor (Print) | Signature of Assessor |
|---|---|---|
| 16th July 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 report focuses on two new builds the blue bag recycling building and the baled storage building/shed located in the recycling depot section of the site.

### The Blue Bag Building

The building measures 72m x 42m and 8m to the eaves of the pitched roof, it is of portal steel frame construction the walls are part insulated core panel (20%) and part coated steel box profile sheets (80%) the pitched roof is constructed of insulated core panels with integrated non openable sky-lights, interlocking reinforced concrete panels  5m x 1m x 150mm thick line the walls to a height of 6.5m in the blue bag reception area and the loose paper collecting area they prevent vehicular plant damaging the main walls of the building.

There are three work areas within the building firstly the waste reception area, blue recycling bags and loose products are dropped off in this area by numerous council and other commercial vehicles, the bags are then scooped up by a grab vehicle (Tele-handler) and dropped into the bag splitter that 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 and mechanically, plastic and metal items are collected below the processing line while loose paper is transported via conveyor belt to the final loose paper collection area. The individual materials are then either swept or grabbed by a grab vehicle (Tele-handler) and placed onto a large conveyor which transports the material to a large hopper above the baling machine, which crushers the material into tight bales and binds them with wire, the bales are then removed to an open sided storage area outside the building.

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 building is a new build, CWM Environmental is in consultation with the Local Building Control Authority and Fire Authority, the building has been designed to current Code of Practice, British Standard 9999 (BS9999) and has taken guidance from the waste industry document WASTE 28, “Reducing the risks at waste management sites”.

The building’s fire detection system is designed and installed to British Standard - BS5839: Part 1: 2013, at present there is no emergency lighting installed, however an Uninterrupted Power Supply (UPS) back-up power supply system is due to be installed which will operate on the loss of normal power, providing emergency lighting for escape purposes. A comprehensive CCTV system has been installed and is due for commissioning.

## The Baled Storage Building/Shed

The building is a single storey detached shed it is located adjacent and towards the rear of the blue bag building and rear of the recycling facility yard. In total it measures 54m x 6m it is made up of 9 bays, 8 of which are open fronted and are not physically separated the ninth bay measures 6m x 6m and is an enclosed unit, it has a large roller shutter door on the front and a standard access/egress door on the side, the unit houses a paper shredder.

The shed has a sloping roof it is 8m high at the open front and slopes back to the rear wall to a height of 6m. The building is constructed around a streel frame; the walls to a height of 3m are of reinforced concrete construction with the remainder of the walls and roof being of corrugated steel sheet construction.

Bales are collected from the end of the processing line in the blue bag building and transported the short distance to the shed by a tele-handler, where they are stored temporarily before being removed from site the large bales can be of paper, plastic or metal composition.

The end unit houses a paper shredder which is brought into use intermittently; a manual break glass call point and fire alarm sounder are provided in the unit which are linked into the site detection system, it also has emergency lighting; the systems are tested in line with the site testing regime.

## 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** |
| Newly Built Recycling Building and Bale Storage Shed. | Mr Creamer - Site Manager and<br>Miss Patterson – Health & Safety Officer |
| **Responsible Person** | Mr Gallagher (H&E Systems Manager) |
| **Responsible Person (Other)** | Mr Creamer and Miss Patterson |
| **Hours of Working** | Mon-Fri - 07.00-19.00hrs<br>Sat – 07.00-13.00hrs |
| **Number Employed** | 25 |
| **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 focus of this report is the new build blue bag recycling building and the storage shed located in the recycling depot section of the site.

The blue bag building measures 72m x 42m and 8m to the eaves of the pitched roof, it is of portal steel frame construction the walls are part insulated core panel (20%) and part coated steel box profile sheets (80%) the pitched roof is constructed of insulated core panels with approximately 50% of the internal walls lined with reinforced concrete panels for protection.

The storage shed measures 54m x 6m it is made up of 9 bays, 8 of which are open fronted and are not physically separated the ninth bay measures 6m x 6m and is an enclosed room, the shed has a sloping roof it is 8m high at the open front and slopes back to the rear wall to a height of 6m. The building is constructed around a streel frame; the walls to a height of 3m are of concrete construction with the remainder of the walls and roof being of corrugated steel sheet construction.

It is used for the temporary storage of bales before they are removed from site the large bails can be of paper, plastic or metal composition. The end enclosed bay/unit houses a paper shredder which is brought into use intermittently; a manual break glass call point and fire alarm sounder are provided in the unit which are linked into the site detection system, it also has emergency lighting; the systems are tested in line with the site testing regime.

There are three work areas within the blue bag building firstly the waste reception area where blue recycling bags and loose products are dropped off, a processing area with additional mezzanine level sorting is conducted by machinery and by hand and finally a collecting and baling area.

The building is a new build, CWM Environmental is in consultation with the Local Building Control Authority and Fire Authority, the building has been designed to current Code of Practice, British Standard 9999 (BS9999) and has taken guidance from the waste industry document WASTE 28, “Reducing the risks at waste management sites”.

The blue bag building has been occupied prior to the Local Building Control Authority signing off the building and there are a number of areas of non-compliance in Fire Safety Standards which the company are keen to rectify as soon as reasonably practicable. The aim of this document is to deal with the non-compliance and ensure a safe working environment for all persons legally allowed to be on the premises. The listed below highlights the main areas of concern, greater detail can be found in Section 5 (Fire Risk Assessment) and Actions to rectify the non-compliance in Section 9 (Action Plan)

- Means of Escape
- Fire Detection and Warning System
- Emergency Lighting

Provided all the works detailed in the Action Plan are completed to the required standard the Consultant would then be of the opinion that the building would meet the Local Building Control and Local Fire Authorities, Fire Safety Standards for life safety.

## 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<br><br>2. Ignition Sources (IS)<br><br>3. Oxygen | **Risk Evaluation:**<br>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**<br><br>Hazard<br>X<br>Risk<br>(Potential of Risk Occurring) |
|---|---|---|

| Potential Hazard | Location | Existing Controls | Risk Rating |
|---|---|---|---|
| Fuel: Blue recycling bags contents | Reception Area Blue Bag Building | No ignition sources in Area apart from Tele-handler | Normal |
| Fuel: Vehicle (Diesel Fuelled) | All Areas where Vehicles Work | Maintained, cleaned, parked outside at night | Normal |
| Fuel: Plastics, card board, paper, aerosol cans, old lighters etc. | Processing Area & Small Baler Shed | Cleaning schedule | High |
| Fuel: Large Processing Machinery | Processing Areas | New Machinery, Maintained, Cleaning Schedule | Normal |
| Fuel: Paper | Loose Paper Collection Area | No ignition sources in Area apart from Tele-handler | Normal |
| Fuel: Paper | Shredder Unit at end of Shed | Maintained, Cleaning schedule New machinery | High |
| Fuel: Stacks of Baled paper & plastic | Storage Shed & Yard Area | No ignition sources in Area apart from Tele-trucks | High |
| Fuel: Lubrication Grease | Processing Area | New machinery, Maintained, small amounts | Normal |
| Fuel: Dust | Blue Bag Building | Cleaning schedule | High |
| IS: Main Electricity supply and distribution cabinets | Blue Bag Building & Shredder Unit | New Installation | Normal |
| IS: Faulty Electrical Circuits (Sockets & Lighting) | Blue Bag Building & Shredder Unit | New Installation, part LED lighting | Normal |
| IS: Electrical fault to processing machinery or misuse. | Blue Bag Building & Shredder Unit | New Installation, Trained Staff | Normal |
| IS: Fault or overheating of conveyor motors | Blue Bag Building | New Installation, Cleaning Schedule | High |
| IS: Overheating of conveyor bearings/ rollers | Blue Bag Building | New Installation, Cleaning schedule | High |
| IS: Portable Electrical Equipment | Blue Bag Building & Shredder Unit | New Equipment, Trained Staff, PAT testing | Normal |
| IS: Vehicle Fire | All Areas where Vehicles Work | Maintained & Checked Daily | Normal |
| IS: Hot Vehicle Exhaust system | All Areas where Vehicles Work | Vehicles cleaned, parked away from flammable materials at night | Normal |
| IS: Friction from Conveyors | Blue Bag Building | Maintained, Cleaning schedule | High |
| IS: Friction from Baling Machine | Processing Area | Maintained, Cleaning schedule | High |
| IS: Pressurised cans or lighters exploding in baler | Processing Area | Two members of staff on fire watch | High |

### Availability of Oxygen or Fire Accelerants

Other than the oxygen in the air there are no other oxygen supplies or gas cylinders used or stored in either of the buildings. The blue bag building has two large roller shutter doors at one end and two towards the back on one side 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. The storage shed is open on one side and is continually affected by the elements.

Occasionally small aerosol cans and lighters pass through the processing lines and have been known to explode and catch fire when being crushed in the baler. As this has been identified when cans are being processed two suitably trained members of staff standby either side of the baler with extinguishers prepared to deal with any incidents immediately. For consideration - this may be an occasion where a localised suppression system similar to Fire Trace could be installed.

### 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 beam detectors (three) at roof level. 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 cover by automatic detection i.e. store room.
- 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.

During testing it has been identified that the required sound levels cannot be attained in the production area and there is a problem identifying the visual warning signal (a strobe) given their location and diffusion in daylight hours. Additional sounders and beacon warning lights will be required in the production area as detailed in the Action Plan.

Should the fire detection system actuate during working hours (07.00-18.30 hrs) the building must be evacuated immediately, in order to reduce the number of false alarms sent to the Local Fire Service during working hours a designated person on site would call 999. 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. Outside working hours the monitoring company “Red Care” when alerted would send an immediate call to the emergency services.

An additional automatic detector should be provided in the Paper Shredder Unit at the end of the Storage Shed.

## Means of Escape

At present the means of escape does not comply with the code of practice document used in the design (BS9999) of the building in the areas indicated (i) the number and location of the work force and provision of fixed vertical ladders, (ii) the use of open roller shutter doors as escape routes and (iii) following assessment of the work place it was identified that the available exit width at the end of the picking line at ground floor level was insufficient. The following solutions are offered with additional detail included in the Action Plan.

i. Remove two vertical fixed ladders from the end of the picking line at mezzanine work level and provide an extended walkway to an exit door to the outside of the building onto a landing area with an external stair leading down from this area. Additionally at the dead end condition at the start of the processing line extend the walkway to an exit door to the outside of the building onto a landing area with an external stair leading down from this area.
ii. Install an integrated exit door in each of the roller shutter doors either side of the baler.
iii. Install an additional exit door at the end of the picking line at ground floor level as identified during the work place assessment.

It is the opinion of the Consultant that the fixed vertical ladder leading down from the hopper feeding the baler can be utilised as a means of escape for that area as only one possibly two people would be in the area either for maintenance or for routine cleaning.

The means of escape from the Shredder Unit at the end of the Storage Shed is deemed satisfactory and so too is the remainder of the Shed as it has short travel distances and is open fronted.

## 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 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 the weekly cleaning schedule involves 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.

As the building is new this schedule is deemed sufficient, however a dust/debris assessment should be undertaken at regular intervals as part of the ongoing maintenance of keeping escape routes clear and reducing the build-up of flammable materials as the building ages, processes change, working hours change or amount of materials being processes increases or changes.

### Fire Exit and Escape Route Signage

The working areas on the mezzanine floor area will have a minimum of two escape routes afforded to them as the new exits are being installed a review of the escape signage should be undertaken and additional signage put in place as necessary.

## Fire Fighting Equipment

The number, type and location of fire extinguishers within the building is satisfactory, there is also a rolling programme to fit an automatic extinguishing system to each electrical cabinet (Fire Trace). 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, it is essential that an operating policy is draw-up as to where and in what circumstance these extinguishers are to be used and who is to use them. Once this is complete the necessary information and training should be given to the nominated members of staff.

## 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 with the CCTV in the new building due for commissioning. The main entrance barriers are secured outside of working hours prohibiting access to the site.

## 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 be confirmed and whether the supply could be increased in a fire situation; At present the location of the open water supply from the risk (New Buildings) complies with the current edition of Approved Document B – Fire Mains and Hydrants.

A review should be undertaken with regard to using the open water supplies on site for fire-fighting and how to deal with water run-off, including reusing it for fire-fighting operations.

## 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 and ready for use | YES | Adequate |
| Is fire-fighting equipment indicated by signage? | NO | Adequate |
| Is there an automatic fire detection and warning system? | YES | Mostly 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

As the building has been designed and constructed to a British Standard code of practice BS9999 the Consultant has continued with this 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 and shreds some of the material, 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 cans 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.

## Section 7 - Fire Safety Strategy

As stated previously in this document the building is constructed as a steel port frame build, with no fire resisting protection afforded to the frame, the walls are constructed of insulated core panels (20%) and coated steel box profile sheets (80%). By default approximately 50% the main steel structure and the box profile sheeting has a level of protection from the reinforced concrete panels installed to protect the walls against damage from vehicle collision.

Although the insulated core panels are afforded 60 minutes standard of fire protection they only cover 20% of the building and are attached to the steel rather than affording the steel protection they will provide fire protection for the two new external escapes. Given the fire behaviour of insulated core panels and taking into account that most of the building is covered with steel sheeting, 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. Introduce regular checks of machinery likely to overheat due to usage, 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 the normal distances above can be achieved in most cases additional exit will be required due to (i) vertical fixed ladders are not acceptable as a means of escape for more than 10 people (II) roller shutter doors are not acceptable as a means of escape door and (III) an additional door is required following assessment of operations and available exit width at end of picking lines on ground floor level. Details of the additional exit can be found in the Action Plan (Section 9).

Once the additional exits have been installed all exit routes will be well within the normal escape travel distance and the allowed variation as indicated above will not be necessary, however as the height of the ceiling 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 any unseen areas are covered by automatic detection.
- 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 additional exits:<br>i. Remove two vertical fixed ladders from the end of the picking line at the raised work level and provide an extended walkway to an exit door to the outside of the building onto a landing area with an external stair leading down from this area. Additionally at the dead end condition at the start of the processing line extend the walkway to an exit door to the outside of the building onto a landing area with an external stair leading down from this area.<br>ii. Install an integrated exit door in each of the roller shutter doors either side of the baler.<br>iii. Install an additional exit door at the end of the picking line at ground floor level as identified during the work place assessment. | Short Term | |
| Inadequate means of escape | The location of final exit doors and their method of operation should be indicated by signage. | 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 | Any steps along an escape route (internally or externally) should have the edge/nosing painted to distinguish the changes in level. | Medium Term | |
| Inadequate sound levels of fire alarm system | Provide additional fire alarm sounders in the processing area and carry out sound level test, during working hours. | Short Term | |
| Inadequate visual signal | Provide additional visual beacons as part of the fire detection system. Beacons should be located in the process area and testing area at approximately eye level or between 1.5m to 2m. | Short Term | |
| Inadequate Fire Alarm System | Provide Automatic detection in the following locations: - Paper Shredder Unit at end of Shed | Short Term | |
| Inadequate Fire Alarm System | Provide additional manual break glass call points adjacent to new fire exits | Short Term | |
| Inadequate Emergency Lighting system | Confirm with Local Building Control that planned Uninterrupted Power Supply (UPS) system can be utilised as an Emergency Lighting power supply | Short Term | |

| Hazard Identified | Action | Proposed Completion Time Frame | Actual Completion Date |
|---|---|---|---|
| Inadequate Emergency Lighting system | If UPS system is unacceptable, provide Emergency Lighting system within the Building | Medium Term (Dependant on above) | |
| Inadequate Emergency Lighting system | Provide Emergency Lighting along external escape routes. | Medium Term | |
| Large amount of bales stored in Storage Shed | Separate the amount of flammable materials (paper/plastic) in Storage Shed by installing fire breaks – concrete blocks or bales of metal cans | Medium Term | |
| Ignition Sources | Survey electrical cabinets and control equipment cabinets as they should comply with IP (protection) standard to prevent dust ingress. | Medium Term | |
| Ignition Sources | Install Fire Trace system in electrical distribution cabinets | Long Term | |
| Falling debris onto electrical motors and cabinets | Survey electrical motors and cabinets to ensure no debris collects on them. Where it does fit a cover or guard to provide protection. | Medium Term | |
| Openings in Insulated Core Panels | Any holes made in panels for the passage of utilities, doors, conveyors etc., should be sealed as recommended by the manufactures to prevent ingress of sparks or flame. | Medium Term | |
| Ignition sources due to over heating | Introduce electrical motor and bearings/rollers checks using Thermal Imaging Camera. Stacks of bales can also be checked for build-up of heat. | Medium Term | |
| Ignition source friction from process – Baling metal cans | Two members of staff to stand-by on fire watch.<br><br>Note: Consider localised suppression system similar to Fire Trace | Short Term and continually | |
| Management systems | Produce the following protocols / procedures: -<br>• Procedure for calling Fire Service during working hours (Reduce false alarms)<br>• Use of large 50l foam extinguishers<br>• Dust/Debris routine checks | Short Term | |
| Management systems | Produce an Emergency Plan to deal with a large fire situation. | Medium Term | |
| Management systems | Inform and train members of staff with regard to their individual responsibilities, following the completion of new protocols/procedures | 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.<br>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.<br>The actions people need to take in case of fire.<br>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'.<br>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.