



Taunton Depot

Transfer Station

1.7 Fire Prevention Plan

August 2024

recycling and recovery UK

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DOCUMENT DETAILS

Document title	Taunton Depot – Fire Prevention Plan
Version	3.0
Date	August 2024
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Distribution	SUEZ Environment Agency

DOCUMENT REVIEW HISTORY

Date	Version	Description
November 2020	1.0	Original Document
April 2021	1.1	Updated drawing references and drawings
November 2023	2.0	Review and update to account for residual waste storage. Added fire hydrant / hose reel location drawing
August 2024	3.0	Review and update for variation to integrate activities carried out under S1 and S2 exemption and to add storage of clinical waste.

CONTENTS

1	INTRODUCTION	1
2	RISK OF FIRE	2
2.1	Assessing the Risk of Fire	2
2.2	Combustible Materials on Site	2
2.3	Waste Storage and Hazardous Materials Storage	2
2.4	Cause of Fire	3
2.5	Impacts of a Fire	3
2.6	Sensitive Receptors	4
2.7	Wind Direction	6
3	PREVENTATIVE MEASURES	7
3.1	SUEZ Policies and Procedures	7
3.2	Controls to Manage Common Causes of Fire	7
3.3	Controls to Prevent Self-Combustion of Waste	10
4	DETECTION AND SUPPRESSION MEASURES	13
4.1	Fire Detection	13
4.2	Fire Suppression	14
4.3	Fire Fighting Techniques	14
4.4	Water Supply	15
4.5	Fire Water Management	15
4.6	Contingency Plan in the Event of a Fire	16
4.7	Out of hours Response	16
5	FIRE FIGHTING PROCEDURE	17

APPENDICES

Appendix A	Waste Storage Details
Appendix B	ACE Guidance

FIGURES

Figure 1	Site Location Plan	Ttn-LOC-1020-01a
Figure 2	Site Permit Boundary and Layout Plan	Ttn-PER-0324-01
Figure 3	Sensitive Receptor Location Plan	Ttn-REC-0324-01
Figure 4	CCTV Locations Drawing	Equipment Positions v4
Figure 5	Emergency Access – Fire Appliance Route	Ttn-PER-0920-03a
Figure 6	Drainage Plan	12243-0050
Figure 7	Private Fire Hydrants	B220-E005c

1 INTRODUCTION

- 1.1.1 This document details the Fire Prevention Plan (FPP) for Taunton Depot (the site) located at Walford Cross, Taunton, Somerset, TA2 8QP at National Grid Reference (NGR) ST 27722 27836. The site location and permit boundary are shown in Figure 1 and 2 respectively.
- 1.1.2 This document is written in support of the Environmental Permit (permit) to operate a transfer station with treatment with an annual tonnage of up to 75,000 tonnes. The facility primarily accepts municipal recyclates delivered by the municipal recycling collection vehicles run by SUEZ on behalf of Somerset Waste Partnership. Limited amounts of residual waste may also be accepted at certain times.
- 1.1.3 The document has been updated in support of a permit variation to integrate activities operated under S2 exemption, covering the external storage of WEEE, textiles, batteries and Tetra Pak. The variation also includes the addition of storage of limited clinical waste stream from kerbside collection.
- 1.1.4 Vehicles will be directed to the appropriate bay or storage area to deposit waste and recyclates. The transfer station contains separate tipping areas to enable the different recyclables to be deposited in separate covered bays.
- 1.1.5 A Fire Risk Assessment covering the operation is in place and is reviewed at regular intervals not exceeding 12 months. The Fire Risk Assessment is included within the SUEZ electronic risk assessment database.
- 1.1.6 An appropriate person will review this Fire Prevention Plan at regular intervals and on at least an annual basis, following any of the events below:
- Testing of the plan to ensure the plan works and staff understand the procedures to be undertaken to prevent a fire occurring and the procedure to be undertaken in the event of a fire;
 - an incident;
 - change in legislation or formal guidance;
 - prior to a change in activity on site.
- 1.1.7 In addition, the requirements of the Fire Prevention Plan will be communicated to site operational staff on at least an annual basis via toolbox talks. Yearly refresher toolbox talks will ensure that the requirements of the Fire Prevention Plan are reinforced.

2 RISK OF FIRE

2.1 Assessing the Risk of Fire

- 2.1.1 The risk assessment to identify potential events or failures that may lead to an environmental impact as a result of a waste related fire at site is included in the Environmental Risk Assessment and Accident Management Plan for the site. The risk assessment provides details of the following: the hazard, the pathways and receptors, the probability of occurrence, the consequences or impacts and the measures that will be taken to manage the risk, and an evaluation of the mitigated risk.
- 2.1.2 Further detail on the hazard, in terms of the materials received stored and/or treated on the site, the volumes of materials received, and the potential causes of fires are discussed further in this section of the Fire Prevention Plan. The sensitive receptors and the consequence of a fire on those receptors are also discussed below.

2.2 Combustible Materials on Site

- 2.2.1 The combustible materials which may be received and stored at the site include:
- Fibres (card/mixed paper/newspaper/pamphlets)
 - Mixed plastics
 - Textiles
 - Aerosols
 - Household batteries and small WEEE
 - Tetra Pak containers
 - Residual (black bag) waste

2.3 Waste Storage and Hazardous Materials Storage

- 2.3.1 Managing waste storage is a key factor, not only in preventing fires, but in mitigating the impact, should a fire break out.
- 2.3.2 Appendix A details the volume, storage time and storage method for each waste type at site.

Waste storage

- 2.3.3 The transfer station has been designed principally to receive, store and subsequently load for onward transport, household and similar other wastes from the local area. All wastes delivered and accepted to the site will be directed to specific areas on site for storage.
- 2.3.4 The majority of the non-hazardous combustible household and similar wastes accepted to the site will be directed to 1 of 10 enclosed bays on the site. The design capacity of the bays ensure adherence to current regulations, see Figure 2.
- 2.3.5 Specific non-combustible wastes identified either at acceptance, or within the bays indicated in 2.3.4 will be segregated and stored separately on site.
- 2.3.6 An indicative site layout plan showing the proposed location of the waste storage bays and/or areas are shown in Figure 2.

Hazardous materials storage

- 2.3.7 A bunded fuel storage tank is located on site close to the site entrance as indicated in Figure 2. The fuel storage tank will also be protected by an Armco barrier or other suitable protection.
- 2.3.8 Batteries will be stored in battery boxes that will contain any spillage of acid batteries.
- 2.3.9 Any hazardous waste delivered to the site that is not permitted by the permit will be segregated and consigned appropriately for disposal at a suitably permitted facility.

2.4 Cause of Fire

- 2.4.1 The potential causes of fire on the site have been considered and include the following:
- arson or vandalism
 - self-combustion of received and processed waste materials (e.g. chemical oxidation, microbial decomposition), although recent WISH data suggest that this takes far longer than the storage durations proposed in this document
 - plant or equipment failure
 - electrical faults
 - naked lights
 - discarded smoking materials
 - hot works, e.g. welding, cutting
 - hot exhausts
 - fuel deliveries and refuelling plant
 - build-up of dusts
 - damaged/exposed electrical cables
 - neighbouring sites activities
 - sparks from loading buckets
 - incompatible wastes
 - ignited materials received at the site
 - heat generated by friction on mobile plant
- 2.4.2 Any of the causes detailed above has the potential to ignite waste materials upon the site. The consequences of a fire are discussed below with mitigation measures detailed in a further section.

2.5 Impacts of a Fire

- 2.5.1 The effects of a fire may be both immediate and long term. The potential impacts of a fire have been considered and are summarized below:
- thermal radiation harming nearby properties and residents leading to fire spread
 - creation of hazardous waste by the fire and impacts of firefighting
 - explosions and projectiles harming sensitive receptors and spreading the fire to unaffected areas

- firewater run-off transporting pollutants to surface water and groundwater
- transport disruption resulting from road and rail closures
- nuisance from smoke, odour and particulates
- threat to life and property
- detriment of local amenity

2.5.2 The general management actions to mitigate the impact of a fire on sensitive receptors are detailed in Sections 3 and 4 of this Fire Prevention Plan.

2.6 Sensitive Receptors

2.6.1 Sensitive receptors within 1km of the site that may potentially be at risk from a fire have been identified within Table 1 and are shown in drawing in Figure 3.

Table 1 – Sensitive receptors

No.	Receptor	Category	Distance (m)	Direction from site
1	Walford Business Park	Commercial/ Industrial	0	North
2	Best Food Logistics	Commercial	30	North
3	Diverse Fine Foods	Commercial	65	North
4	Hello Bello Direct (Distribution)	Commercial	110	North
5	Somerset Vehicle Select	Commercial	190	Northeast
6	County Specialist Vehicles	Commercial	210	Northeast
7	Retro Resus	Commercial	180	North
8	Environments for Business	Commercial	180	North
9	Residential Properties off A361	Residential	160	North
10	Walford Farmhouse	Residential/ Agricultural	200	West
11	SmallCarsOnline.com car dealership	Commercial	190	Northwest
12	Home Farm	Commercial/ Agricultural	500	Northwest
13	Properties in Walford	Residential	600	Northwest
14	Farmhouse in Walford	Residential/ agricultural	690	Northwest
15	Properties off Adsborough Lane, Adsborough	Residential	940	North
16	Primrose Cottage	Residential	770	North

No.	Receptor	Category	Distance (m)	Direction from site
17	Durston Elms vehicle repair	Commercial	420	Northeast
18	Drakes Farm	Residential/ agricultural	500	Northeast
19	Businesses on Drake's Yard	Commercial	310	East
20	Old Vale Farm	Residential/ Agricultural	250	East
21	Creech Allotments	Allotments	90	South
22	K9 Park	Recreation	70	Southeast
23	Properties on Creech Heathfield Road	Residential	170	South
24	Properties in Creech Heathfield	Residential	300	South
25	Heathfield Farmhouse	Residential/ Agricultural	380	South
26	Theats Farm	Residential/ Agricultural	350	Southeast
27	Charlton Farm	Residential/ Agricultural	740	Southeast
28	Businesses on Castlefield Nursey	Commercial	860	South
29	Walford Lodge	Residential	850	West
30	Springfield House	Hotel	900	West
31	The Oaks	Residential	870	West
32	Property off Boome Lane	Residential	1000	Northwest
33	M5 Motorway	Infrastructure	30	Southeast
34	A38	Infrastructure	250	Northwest
35	A361	Infrastructure	240	North
36	Woodpasture and Parkland	Priority Habitat	280	Northwest
37	Deciduous Woodland	Priority Habitat	420	Northwest
38	Traditional orchard	Priority Habitat	400	Northwest
39	Deciduous woodland	Priority Habitat	550m	East
40	Deciduous woodland	Priority Habitat	830m	Southwest
41	Drain	Water Body	<50	South
42	Drain	Water Body	180	East

No.	Receptor	Category	Distance (m)	Direction from site
43	Secondary B Aquifer	Groundwater	0	N/A

2.7 Wind Direction

2.7.1 The data was obtained for Taunton. The prevailing wind direction is from the south west. A compass windrose from meteoblue.com, with the prevailing wind direction, is included in Figure 3.

3 PREVENTATIVE MEASURES

3.1 SUEZ Policies and Procedures

3.1.1 Section 3.8 of SUEZ Integrated Management System (IMS) relates to Emergency Preparedness and Response and will be followed in the event of a fire or explosion.

3.1.2 In addition to Section 3.8, the following policies and procedures, as detailed in the IMS, are also relevant:

- IMS 2.11 Accident Investigation and Reporting
- IMS 2.12 Site Inspection, Audit and Reporting
- IMS 2.13 Managing Non-Conformance, Corrective & Preventive Action
- IMS 2.14 Control of Records
- IMS 2.15 Audits
- IMS 3.1 Duty of Care
- IMS 3.6 Surface Water Management
- IMS 3.7 Oil and Fuel Storage

3.1.3 One of the principle objectives of the IMS is to ensure the efficient and safe operation of the site through the implementation of procedures that ensure defined staff roles and responsibilities supported by provision of appropriate training.

3.1.4 Key procedures that apply to all SUEZ sites include training all staff, contractors and visitors in correct health and safety and fire prevention procedures. The implementation of a regular maintenance and inspection programme for all areas of site and equipment to ensure good housekeeping and effective operation of machinery.

3.2 Controls to Manage Common Causes of Fire

Arson

3.2.1 Site security to prevent arson includes security fencing, locked gates and barrier control when the site is open. A CCTV monitoring system is installed in various strategic locations around the site as indicated on Figure 4.

Plant and equipment

3.2.2 Faults within a vehicle or item of plant have potential to cause fire so a regular plant and machinery preventative maintenance programme is in place to identify and remedy potential issues at an early stage.

3.2.3 All vehicles are stored at a safe distance (6m) from waste stockpiles when not in use.

3.2.4 Telehandlers are fitted with powder fire extinguishers, dust filters and high level exhausts.

3.2.5 Mobile plant will be maintained in accordance with SUEZ Policies and Procedures. This includes daily vehicle pre-use inspection checks, reporting of all defects to site management and regular clearing of detritus from around the machine. Each machine will be subject to regular service inspections in

accordance with manufacturer's recommendations which will include maintenance of the exhaust and weekly cleaning by the operator.

- 3.2.6 Plant and machinery will not be fitted with an infra-red detection system as it is not deemed as required due to the low risk. However the mobile plant on site will conform to the SUEZ essential safety requirements as outlined in Policies and Procedures. Policies and Procedures states loading shovels are to have a fire suppression system using a twin agent with engine isolation and in cab fire extinguisher. The loading bucket will have a composite cutting edge to reduce the risk of sparks.

Electrical Equipment

- 3.2.7 All portable items of electrical equipment are listed in a register and tested by a competent person at least annually. Items that cannot be shown to have been tested within the previous 12 months must not be connected to the electrical supply.
- 3.2.8 The fixed electrical installations are tested by a competent person at intervals of no more than three years, and any defects rectified as soon as reasonably practicable.
- 3.2.9 Electrical sockets must not be overloaded.

Discarded smoking materials

- 3.2.10 No wastes will be burned within the boundaries of the site.
- 3.2.11 Smoking on site is only permitted in the site designated smoking areas as shown on Figure 2.

Hot works

- 3.2.12 Contractors required to undertake hot works will be required to provide risk assessments and follow approved safe working procedures. Any hot works will be subject to the Permit to Work procedure and will be adequately supervised. In the event of hot works on site the initial fire watch will be undertaken two hours after hot works have been completed. Following the completion of hot works, the end of the day fire watch will pay particular attention to the area where hot works were undertaken.

Industrial heaters

- 3.2.13 No industrial heaters will be used on site.

Hot exhausts

- 3.2.14 A fire watch will be implemented at the end of the working day to reduce the risk of combustion as dust can settle onto hot exhaust and engine parts.

Ignition sources

- 3.2.15 Any sources of ignition including for example heating pipes, naked flames, light bulbs and spaces heaters will be kept 6 metres away from any combustible waste.

Leaks and spillages of oils and fuels

3.2.16 All machinery/equipment is subject to routine cleaning, servicing in line with manufacturers guidance and daily checks/defect reporting. The daily check includes identification of leaks, and where identified, is cleaned up according to spillage procedure as detailed in Section 3.8 of the SUEZ IMS.

Build-up of loose combustible waste, dust and fluff

3.2.17 Site cleaning regimes to reduce dust and litter will be directed through Standard Operating Procedures detailing the duration and frequency of cleaning activities, the equipment required to clean and visual aids depicting how areas should look following cleaning activity. In general, ongoing inspection and regular cleaning is undertaken on site by site staff to minimise the generation of dust and litter on site. Waste storage areas are cleaned regularly when they are emptied or as and when requested by the Site Manager.

3.2.18 Daily check sheets include a requirement for site staff to undertake visual dust qualitative monitoring; if perceived to be excessive the action causing the emission will be halted and remedial measures implemented.

Waste acceptance/reactions between wastes

3.2.19 Waste acceptance procedures will comply with the site permit and associated environmental legislation. Only waste types detailed in the permit (or exemption if applicable) will be accepted at the site.

3.2.20 The documentation accompanying the load shall be checked at the weighbridge, and shall include, but not be limited to the Carriers Certificate of Registration and Duty of Care Waste Transfer Note.

3.2.21 The information recorded in respect of each load as provided by the Waste Transfer Note will be:

- Ticket Number
- Vehicle Registration Number and Type
- Time and date (or date range) of transfer
- Waste description and quantities including all EWC codes
- Container type
- Where the transfer(s) took place
- Category of Transferor and Transferee (i.e. producer, WDA, registered carrier, permit holder, EPR etc)
- Names and addresses of all parties involved in the transfer and their roles (i.e. producer, carrier, disposer)
- Details of relevant permit/exemptions
- Signatures of all parties involved

3.2.22 Staff will carry out ongoing visual inspections of the wastes at the weighbridge where possible. All loads will be visually inspected on site as the waste is discharged or unloaded from the delivering vehicle.

3.2.23 Waste deposition will generally be undertaken by those delivering the waste. Site staff will direct and assist drivers as necessary.

- 3.2.24 Should any load, either upon entry to the site, or upon tipping, be discovered to contain waste types not permitted at the site or contain incompatible wastes the load will be rejected and removed from site by the delivering vehicle. A load rejection form will be completed in all cases and the customer informed.
- 3.2.25 If wastes not permitted by the site permit are discovered amongst a load after deposit, the waste will be isolated to prevent the processing of this waste.

Deposited hot loads

- 3.2.26 A quarantine area is available in the event that a hot or burning load is received on site. This area may also be used in the event of a fire on site.
- 3.2.27 If a hot load is discovered during delivery or deposit of the load, the waste will be isolated and placed in the quarantine area. The waste will be dealt with accordingly (e.g. dampened). The incident and time of discovery will be recorded in the site diary. The waste will be placed in a quarantine area until the fire is extinguished and then loaded into a suitable container. Arrangements will be made for the disposal of such wastes at a suitably permitted disposal facility as soon as practicably possible.

3.3 Controls to Prevent Self-Combustion of Waste

Waste storage procedures and waste piles sizes

- 3.3.1 Managing waste storage at the site is a key consideration in reducing the risk of fire. The waste types, storage detail, maximum volumes/stockpile size, storage duration and location on site are detailed in Appendix A.
- 3.3.2 Waste accepted at the site is inspected whilst being unloaded. Although an ongoing task throughout the day, at least twice daily checks will be made of waste in storage to identify any waste that has potential to cause a fire.
- 3.3.3 All waste entering the site will be logged in at the weighbridge, records will include weight, EWC codes, date and time. The Site Manager will be able to review the weighbridge reports to understand the materials that have been imported and exported from site.
- 3.3.4 Clear signage reinforces the safe storage of materials and use of ignition sources.
- 3.3.5 Storage of waste will be managed to minimise the volume of waste stored and limit the storage time as far as practicably possible.
- 3.3.6 Materials will be treated and removed from site in order of receipt and within 72 hours so as to reduce the risk of self-combustion. There will be capacity to tip in alternative empty bays whilst others are emptied to ensure a first in first out policy is maintained.
- 3.3.7 Regular working practice includes the emptying of a bay when the product pile reaches a marked height. SUEZ seek to remove the material off site as soon as possible. Bays will be marked showing the maximum waste storage limits levels. A 1m freeboard will be implemented at the top of each bay wall to prevent fire spreading over the bays. Waste will not be stored above the maximum height ensuring that the maximum stockpile sizes are not exceeded. In line with other similar facilities within the SUEZ portfolio, a visual "5S" system will be implemented on site using a marked priority system to

aid stock management and ensure compliance with the maximum storage time on site identified within Appendix A.

- 3.3.8 Stock rotation can be demonstrated via continuous operation of all bays and the implementation of the “5S” system.
- 3.3.9 Loose materials within bays are stored for a maximum of 72 hours. Bays will be completely emptied on a regular basis to allow cleaning to occur.
- 3.3.10 Some baled wastes in the bale storage area are on site for up to a month (unless there are exceptional market circumstances) but this is usually less during normal operating conditions.

Monitoring and controlling of temperature

- 3.3.11 Waste temperature monitoring at site is not proposed due to the short maximum residence time of the majority of waste type at the site of 72 hours. Some waste types are stored on site in containers between a month and 3 months due to the low level received at any one time.
- 3.3.12 Environment Agency guidance requires temperature monitoring to be in place if combustible waste is stored on site for longer than 3 months.

Waste bale storage

- 3.3.13 Appendix A details the maximum size of waste stockpiles, and volumes of various waste types.
- 3.3.14 Bales of flammable materials are stored within the building / covered area and are separated away from fixed plant by a minimum of 6m or by fire resistant walls.

Measures to prevent fire spread

- 3.3.15 All waste will be stored on an impermeable surface. The non-flammable nature of the impermeable surface will act as a firebreak, which should significantly reduce the risk of a fire spreading.
- 3.3.16 Access to any waste, should it ignite, will be from the front of the storage bays.
- 3.3.17 Combustible material (as identified above and within Appendix A) are stored within bays separated by pre-cast concrete walls. These will be constructed in line with BS EN 1992-1-2:2004. Part 5.4 of BS EN 1992-1-2:2002 which states that for a non-load bearing compartment wall to provide a 2 hours fire resistance the wall must be 120mm thick. The reinforced concrete walls will be approximately 180mm thick therefore they will provide in excess of 2 hours fire resistance.

Quarantine area

- 3.3.18 A quarantine area is retained at all times to allow burning material to be moved into this area (provided it is safe to do so) to extinguish and control fire spread. It is also used to move piles of non-burning material (adjacent to a fire) to prevent spread.
- 3.3.19 The location and size of the quarantine area is provided in Figure 5.

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- 3.3.20 As set out in EA guidance, the size of the quarantine area should be sufficient to accommodate 50% of the volume of the largest waste pile and provide a minimum separation distance of 6m on all sides to the nearest pile, building or site boundary.
 - 3.3.21 With reference to the pile size dimensions in Appendix A, it is considered that 180m³ will comprise the largest potentially flammable stockpile and therefore the quarantine area size is deemed suitable to accommodate 50% of this.
 - 3.3.22 In the event of a fire being detected on site, the material would be dealt with in the most appropriate manner, including either segregation of burning material into the quarantine area or the remaining non burning waste will be segregated to ensure the separation distance from the burning waste. The site has capability to move loose materials quickly.
 - 3.3.23 The quarantine area is located inside the site permit boundary with at least a 6-metre separation distance with the site office, the site perimeter and any combustible waste piles.
 - 3.3.24 To avoid confusion it will not be marked upon the ground but will be identified to site operatives at the beginning of each shift and emphasise will be made to the need of a 6m fire break from the nearest combustible waste. Site manager will also ensure that no materials is stored within this area and this will be fully communicated at the start of each shift and will be reinforced during yearly toolbox talks on Fire Prevention Plan.

4 DETECTION AND SUPPRESSION MEASURES

4.1 Fire Detection

Fire Alarm System

- 4.1.1 The site will be equipped with a fire detection and alarm control panel system that has been designed in general accordance with BS 5839-1: 2013. The fire detection system is connected to the appropriate number of sounders and beacons to notify site staff should the detection system trigger during operational hours. The fire detection system is also linked to a remote monitoring station who monitor the system out of hours and notify the local fire brigade and key SUEZ personnel in the event of a fire.
- 4.1.2 The Fire Alarm System will be regularly checked by the Technically Competent Manager (or other designated person) by a visual inspection of the Control Panel. Checks will be recorded in a Fire Log. Any fault must be reported immediately.
- 4.1.3 The Fire Alarm System will be tested weekly from a different alarm point – on the same day and time – or at a frequency in line with the manufacturer’s recommendations, by a designated person. This will be recorded in the Fire Log.
- 4.1.4 The Fire Alarm System will be inspected and maintained by the manufacturer every year in line with the service contract. Inspection and maintenance records will be kept in the Fire Log.
- 4.1.5 Fire Alarm points must be kept clear, visible and correctly labelled at all times.
- 4.1.6 The results of the alarm testing and servicing will be held in the Fire Logbook.

Fire Detection System

- 4.1.7 The fire detection and alarm system will meet the requirements of the applicable sections of the ACE Guidance document which is included within Appendix B.
- 4.1.8 A fire detection system will be installed in the building which houses the process equipment and also within the bays which contain potentially flammable materials in accordance with BS 5839 Part 1 and amendments to give level P1 coverage or equivalent coverage under NFPA 72 National Fire Alarm Code.
- 4.1.9 The fire detection system will be installed by a suitably accredited and certified contractor for the design, installation, commissioning, and handover, verification & maintenance of the fire detection and alarm systems in accordance with the requirements of: BS EN ISO 9001:2008, NSI FSQS 121, BAFE Scheme document SP 203 Part 1 and BS 5839 – 1:2017. This is a UKAS accredited scheme.
- 4.1.10 In particular the system will include the following:
- Suitable fire detection within the recycling bays and the building which houses the processing equipment.
 - Alarm system to have a suitable ‘dial out’ facility which connected to local fire brigade control or other monitoring station.
 - Manual call points located around the site as necessary.

- Additional fire detection to be provided as necessary throughout the welfare facility and the weighbridge office, integrated into the fire detection system.
- The main fire panel should be in a suitable location.
- A zone plan of the fire detection system shall be located above each panel.

4.1.11 In addition sounders strobes will be installed as necessary to alert staff of the fire alarm.

4.1.12 The Fire detection system will be backed up by batteries in the event of electrical failure.

4.2 Fire Suppression

Extinguishers/ firefighting equipment

4.2.1 Site staff will be trained in fire safety awareness and in the use of site firefighting equipment.

4.2.2 A mixture of 20 litre and 100 litre fire extinguishers are placed at key strategic locations around site as indicated on Figure 2. A check of the fire extinguishers (discharged/full, service in date etc) is part of the weekly site check. All fire extinguishers are subject to annual testing by an approved accredited supplier.

4.2.3 All fire extinguishers conform to British Standard EN 3 and sited in permanent fire points. The extinguishers are of a suitable size and weight for use by site staff.

4.2.4 If operations change a revised fire risk assessment will be undertaken and additional fire fighting measures will be implemented if necessary.

Fire hose reels and fire hydrants

4.2.5 There is one hydrant in the lane outside the site and two private hydrants on site. A number of fire hose reels are also located on site. The location of the private fire hydrants and hose reels are shown in Figure 7.

4.3 Fire Fighting Techniques

4.3.1 Managing waste storage is a key factor, not only in preventing fires, but in mitigating the impact, should a fire break out.

4.3.2 Providing access to the site in the event of a fire is a key consideration in containing a fire. Contact details in the event of an emergency are clearly displayed on site. A fire pack will be located in a box at the entrance of the site clearly marked for the Fire Rescue Service.

4.3.3 The emergency access routes to waste storage and quarantine area in the event of a fire are shown on Figure 5.

4.3.4 The firefighting procedure detailed in Section 5 must be adhered to if a fire should break out on site.

4.4 Water Supply

4.4.1 The water supply for fire fighting will primarily be provided from a combination of an existing public hydrant and two private hydrants. The Environment Agency Fire Prevention Plan requirements state for a 300m³ pile of waste 2,000 litres per minute are required for a minimum of 3 hours. This equates to a storage volume of 360m³. The site's maximum combustable waste volume will be 180m³. Therefore this equates to a flow rate of 1,200 litres per minute or 20 litres per second. As described previously this water supply will be provided by a combination of existing public and new private hydrants.

4.5 Fire Water Management

Fire water volume

- 4.5.1 The Environment Agency Fire Prevention Plan guidance indicates that a 300m³ of combustable material will require a water supply of at least 2000 litres a minute for a minimum of 3 hours.
- 4.5.2 All bays on site are constructed in such a way that concrete walls will be sufficient in acting as a thermal barrier to prevent fire from spreading. The maximum total volume of combustable wastes stored within the largest bays at the site will be 180m³
- 4.5.3 Based on the estimation above it is considered that the volume of water that would be required to manage the maximum total volume of materials contained within the largest bay would be 216m³ or a flow rate of 20 litres per second.
- 4.5.4 Based on the calculation above it is considered that the presence of onsite and external hydrants are capable of providing adequate volume of water.

Fire water management

- 4.5.5 The site benefits from an impermeable surface that will prevent infiltration of any spent firewater.
- 4.5.6 All areas of hardstanding, impermeable pavement and bays are visually inspected weekly to ensure continuing integrity and fitness for purpose. The inspection and any necessary maintenance subsequently required will be recorded.
- 4.5.7 Based on the largest stockpile of 180m³ of combustable materials, it is estimated that 216m³ of fire water would need to be retained in the worst-case scenario.
- 4.5.8 Fire Water will be retained on site. In the event of a fire a penstock valve will be closed, and water will be stored within the surface water attenuation tank. The drainage arrangements for the site are shown on Figure 6.
- 4.5.9 A Shutoff valve will be located before the water discharge outfall to the stream. In the event of a fire the manual shut off valve would be closed to ensure that contaminated fire water did not discharge to surface water. Fire water run off collected within the surface water drainage system will then be tankered off site for suitable disposal.

4.6 Contingency Plan in the Event of a Fire

4.6.1 In the event of a major fire, the emergency procedures will be followed which includes notifying the Fire Service and Environment Agency. A business continuity plan is in place as part of the contract and this includes contingency planning in the event of a major fire. In such an event, the following contingency action plan will be implemented:

- Remove all staff off site to a safe place.
- Depending upon the scale of the fire, operations on site will be suspended whilst the fire is extinguished.
- Close site and await further instruction from the authorities.
- During this period, SUEZ haulage team will be notified.
- Inform nearby residents and businesses. This will be done via SUEZ's communications team and in consultation with the local authority.
- Direct waste deliveries/ commercial customer to alternative facilities.
- Any burnt waste or material will be segregated and contained on site, either on site or within containers. This will then be assessed and disposed of to a suitably permitted facility. Any firewater produced as a result of fighting a fire would be contained on site. This would then be removed from site via tanker for subsequent processing at a suitably permitted facility.
- The site will be cleaned prior to operations recommencing.
- Operations will only recommence once the Fire Service have advised that it is safe to do so.
- Internal plant checks may also be required prior to recommencement of operations.
- Environment Agency will be notified of the restart of operation.

4.6.2 Fire damaged wastes will be disposed of at a suitably permitted facility.

4.7 Out of hours Response

4.7.1 A fire pack is located in a box at the entrance of the site, clearly marked for the Fire Rescue Service (FRS) to access in the event of attending site in the absence of personnel on site. The pack will contain

- Information relating to hazardous materials and their location
- Drainage plans and location of shut-off valves
- Contact details for key holders.

4.7.2 In the event of an out of hours fire when there was no SUEZ presence at site, the FRS would force their entry into the site and will gain access to the site via the normal site access route.

5 FIRE FIGHTING PROCEDURE

The following procedure must be adhered to if a fire should break out on the site.

ALL FIRES ON SITE MUST BE TREATED AS SERIOUS AND MUST BE REPORTED TO THE SITE SUPERVISOR AND/OR MANAGER AS SOON AS POSSIBLE.

- 5.1.1 It is considered unlikely that a fire will occur but if this should happen then any outbreak of fire will be regarded as an emergency and immediate action will be taken to extinguish the fire. No one should attempt to fight a fire unless they have received training in the use of fire extinguishers and then only if this can be done without risk.
- 5.1.2 If it is safe to do so, attempts should be made to extinguish a fire. This can be done by using site machinery to move any non-burnt material away from the smoulder or source of fire or using water, working from the edge of the fire inwards. Plant and machinery must never be driven into the centre of any fire; this will place both the driver and the machine in danger. If possible, extinguish the fire with a portable extinguisher or water.
- 5.1.3 Should the fire be successfully extinguished by this action, a check should be kept of the area to ensure that the fire does not re-ignite. The area should be vacated until it is obvious that there is no further danger of the fire restarting.
- 5.1.4 If the above action FAILS to extinguish the fire, prohibit all entry to the area, then summon emergency services immediately. Close the site to all members of the public. Any persons already on the site should leave. The Fire Service will be contacted to deal with major fire incidents. Site staff will not be deployed to deal with major fires.
- 5.1.5 Telephone the Fire and Rescue Service (FRS) – Dial **999**. Give the exact details including the site address and telephone number.
- 5.1.6 Before the Fire and Rescue Service arrives staff will:
 - ensure operators of appropriate machinery are standing by in a safe location to help create fire breaks, under the direction of the FRS when they arrive
 - Appoint a clearly identified person to liaise with the emergency services on site. They should identify themselves to the FRS as soon as they arrive
 - ensure access routes are clear
 - use pollution control equipment to block drains and/or divert firewater to a containment area and/or operate any pollution control facilities, such as drain closure valves/or penstocks where safe to do so
- 5.1.7 On arrival the FRS should be met by the identified responsible person who must update them with relevant information that will assist them in dealing with a fire more effectively.
- 5.1.8 The designated Assembly Point is in the car park facing the operations yard on the other side of the exit route. All persons must wait at the Assembly point for further instructions. A Fire Warden will ensure

that unauthorised persons do not enter the premises and that no one re-enters the site until given permission by a Fire Warden.

- 5.1.9 Upon the outbreak of fire, the receipt of waste at the site is to be suspended and not resumed until authorised by the Site Manager.
- 5.1.10 For a major fire that cannot be quickly extinguished, the Site Manager should notify the Environment Agency immediately by telephone on the incident hotline: 0800 80 70 60. The Agency must also then be informed in writing as soon as is practicable.
- 5.1.11 Communication with local businesses and residents identified in the sensitive receptor table (Table 1 Section 2.6) will be undertaken in the event of a fire to reduce any environmental damage and risks to human health associated with smoke and dust.
- 5.1.12 All incidents must be reported in the daybook and on SUEZ's Incident Reporting and Investigation System (IRIS). The Environment and Industrial Risk (EIR) Manager should be informed so that in turn, full details of the event can be reported to the Environment Agency.
- 5.1.13 Site operations will not be recommenced until deemed safe to do so by the Local Fire Authority and the Environment Agency.



Appendices



Appendix A – Waste Storage Details

Taunton Depot – Waste Storage Details

Waste Type	Form	Storage Detail	Quantity Stored at any One Time (Volume - Tonnes)	Maximum Storage Time on Site	Location within Site	Bay Dimensions and Approximate Volume of Waste Pile
Mixed plastics, ferrous and non-ferrous	Loose from Household	In 2 x separate bays with concrete surfacing and walls	2 x 180m ³ (2 x 12t)	48 hours or 72 hours over a bank holiday	Enclosed storage bay	Bay 1: 6m (W) x 10m (L) x 5m (H) (Minus 1m for max stockpile height and 75% capacity) Approximate stockpile volume 180m³ Bay 2: 6m (W) x 10m (L) x 5m (H) (Minus 1m for max stockpile height and 75% capacity) Approximate stockpile volume 180m³
Hard mixed paper	Loose from Household	In 2 x separate bays with concrete surfacing and walls	2 x 180m ³ (2 x 29t)	48 hours or 72 hours over a bank holiday	Enclosed storage bay	Bay 1: 6m (W) x 10m (L) x 5m (H) (Minus 1m for max stockpile height and 75% capacity) Approximate stockpile volume 180m³ Bay 2: 6m (W) x 10m (L) x 5m (H) (Minus 1m for max stockpile height and 75% capacity) Approximate stockpile volume 180m³
Paper (news and pamphlets)	Loose from Household	In 2 x separate bays with concrete surfacing and walls	2 x 180m ³ (2 x 100t)	3 – 5 days	Enclosed storage bay	Bay 1: 6m (W) x 10m (L) x 5m (H) (Minus 1m for max stockpile height and 75% capacity) Approximate stockpile volume 180m³ Bay 2: 6m (W) x 10m (L) x 5m (H) (Minus 1m for max stockpile height and 75% capacity) Approximate stockpile volume 180m³
(Non – combustible) Glass bottles and jars	Loose from Household	In 2 x separate bays with concrete surfacing and walls	2 x 180m ³ (2 x 100t)	48 hours or 72 hours over a bank holiday	Enclosed storage bay	Bay 1: 10m (W) x 12m (L) x 5m (H) (Minus 1m for max stockpile height 50% capacity) Approximate non-combustible stockpile volume 240m³ Bay 2: 8m (W) x 12m (L) x 5m (H) (Minus 1m for max stockpile height 50% capacity) Approximate non-combustible stockpile volume 240m³
Residual (black bag) waste	Bagged	In separate bay with concrete surfacing and walls	180m ³ (70t)	48 hours or 72 hours over a bank holiday	Enclosed storage bay	Bay: 6m (W) x 10m (L) x 5m (H) (Minus 1m for max stockpile height and 75% capacity) Approximate stockpile volume 180m³
Food waste	Loose from Household	In 6 x 20m ³ covered skips, which are also under cover	6 x 20m ³ (6 x 10t)	48 hours or 72 hours over a bank holiday	In designated covered bale storage area as shown on site plan	20m ³ covered metal skip
Household batteries	Loose from Household	Secure battery boxes	2t	1 month	External area as shown on site plan	Battery container
WEEE	Loose from Household	Metal container	5t	1 month	External area as shown on site plan	Metal container

Waste Type	Form	Storage Detail	Quantity Stored at any One Time (Volume - Tonnes)	Maximum Storage Time on Site	Location within Site	Bay Dimensions and Approximate Volume of Waste Pile
Textiles	Loose from Household	In 4 x 10m ³ textile banks	6t	3 – 5 days	External area as shown on site plan	10m ³ textile bank container
Clinical Waste (from kerbside collection only)	In containers from household	1 x 180 litre plastic lidded wheelie bins	<1t	Up to one month (although time will be less than this under normal operating conditions)	External area as shown on site plan	180 litre plastic lidded wheelie bins
Mixed plastics	Baled	In designated storage areas with concrete surfacing and separated from the processing plant	60t	One week (in exceptional market circumstances it may be stored for longer than this)	In designated covered bale storage area as shown on site plan	Baled waste in stockpiles – maximum 4m high, 20m width/length and in stockpiles of no more than 180m³ .
Non-ferrous	Baled	In designated storage areas with concrete surfacing and separated from the processing plant	66t	Up to one month (although time will be less than this under normal operating conditions)	In designated bale storage area as shown on site plan	Baled waste in stockpiles – maximum 4m high, 20m width/length and in stockpiles of no more than 180m³ .
Ferrous	Baled	In designated storage areas with concrete surfacing and separated from the processing plant	88t	Up to one month (although time will be less than this under normal operating conditions)	In designated bale storage area as shown on site plan	Baled waste in stockpiles – maximum 4m high, 20m width/length and in stockpiles of no more than 180m³ .
Cardboard	Baled	In designated storage areas with concrete surfacing and separated from the processing plant	75t	2 - 3 days (in exceptional market circumstances it may be stored for longer than this)	In designated bale storage area as shown on site plan	Baled waste in stockpiles – maximum 4m high, 20m width/length and in stockpiles of no more than 180m³ .



Appendix B – ACE Guidance



Document Control

Title	Waste Processing Plants - Fire Systems		
Originator	Jerry Douglas		
Reviewed Engineering	03 December 2013		
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Approved for release as EIB – Guidance Document on TRE	07 August 2015		
	Eldred R. W. Clark		
	07 August 2015		
References	See References below		
Revision History:			
Filename	Issue	Date	Comment
EIB_GD_Waste_Processing_Fire_10835_131203	1.0	26 March 2014	Issued
	1.1	11 May 2015	Draft second issue
	1.2	29 July 2015	Underwriter review
	1.3	07 August 2015	Engineering review
	2.0	09 August 2015	Issued
Distribution:	This document is current <u>only</u> to date and issue of download		
	Date:	Comment & Release Constraint:	
TRE	09 August 2015	Issued	
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Contents

1.0 Foreword	3
1.1 References	3
1.2 Previous Editions	3
1.3 NFPA and other Standards	3
1.4 Fire Products and Services	4
2.0 Construction	5
2.1 Materials of Construction	5
2.2 Designing for Dust	5
2.3 Fire Segregation	5
2.4 Penetrations and Openings in Fire Barriers	6
2.5 Steel Column Protection	6
2.6 Hot Load Areas	6
2.7 Drainage and Retention	6
3.0 Automatic Fire Detection	7
3.1 Internal Fire Detection	7
3.2 External Fire Detection	7
4.0 Fire Protection	8
4.1 Fire Protection Standards	8
4.2 Fire Water Supplies	9
4.3 Tipping Hall	9
4.4 MSW and RDF Bunkers	10
4.5 MSW / RDF Storage	11
4.6 Processing Building including MRF	12
4.7 Hydraulic Systems	14
4.8 Control Room	15
4.9 Electrical Rooms	15
4.11 Cable Spreading Room and Cable Tunnels	19
4.12 Diesel / Gas Engines	19
4.13 Cooling Towers	20
4.14 Fire Mains and Hydrants	20
4.15 Extinguishers	20
4.16 Fuel and Lubrication Oil Tanks	20
4.17 Smoke / Heat Venting	21
4.18 Interlocks	21
4.19 Vehicles	21
5.0 Appendices	22
5.1 Listed (<FM> Approved) Fire Resistant Fluid	22

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1.0 Foreword

These guidelines present ACE Group suggested requirements for property damage fire prevention for **Waste Processing Plants** (including Refuse Derived Fuel (RDF) production, Materials Recovery Facilities (MRF) and composting). The guidelines are generic and based on Best Engineering Practice. Health and Safety issues are not specifically addressed.

The recommendations contained in this document are intended for new installations. However, the recommendations contained in this document represent good industry practice, should be considered for existing installations and will be used as a basis for judging the fire protection standards for plants that ACE are asked to insure.

These guidelines should be used only in association with ACE and only in respect of a proposed or existing ACE insurance policy.

The term Energy from Waste (EfW) is taken to be synonymous with the term Waste to Energy (WtE).

Multiple ACE guidelines may apply to a project - Energy recovery equipment such as found in EfW or AD Plants, are not covered by this document.

- EfW Fire Systems are covered under EIB_GD_EfW_Fire_10439_131122
- Biomass fired plants are covered under EIB_GD_Biomass_Fire_10836_131201
- Anaerobic Digestion (AD) plant are covered under EIB_GD_AD_Fire_10839_131210

Any deviations from these guidelines should be discussed and agreed with ACE Technical Risks Underwriting and Engineering and should be documented. Any agreed deviations are not to be taken as a precedent on any other project – current or future.

Feedback, queries, comment or qualification in relation to these guidelines in respect of a proposed or existing ACE insurance policy should be addressed to jeremy.douglas@acegroup.com

1.1 References

The following documents have been referenced in the compilation of these guidelines:

- NFPA 2001, 850, 820, 750, 654, 214, 204, 92, 90A, 80A, 82, 80, 72, 70, 69, 68, 30, 24, 20, 15, 14, 13, 12, 11, 10
- BS 5306, 5839, Part 1, BS ISO 15004-1
- FM 7-98, 6-13, 6-4, 5-4, 1-10
- GAP 17.9

1.2 Previous Editions

These guidelines replace all previous editions of EIB_GD_WTE_Fire_Protection_040709 and EIB_RDF_&_Composting_Fire_Protection_Requirements_041118

1.3 NFPA and other Standards

Where NFPA or other standards are referred to, this should be taken to mean the edition current at the time of the signing of the construction contract for the plant concerned.



1.4 Fire Products and Services

All fire products and services should be Approved and supplied from Approved suppliers such as the UK Loss Prevention Certification Board's List (LPCB) of Approved Fire and Security Products and Services, <FM> or UL approved equipment. Companies having achieved the LPCB Quality systems certification or equivalent should carry out their design, manufacture and installation.

1.5 Gasifiers

Gasifiers to be treated as for boiler /furnaces.

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2.0 Construction

2.1 Materials of Construction

All construction materials should be non-combustible or of limited combustibility, including all building thermal insulation.

2.1.1 Composite Panels

Composite panels which are both LPCB and FM approved can be treated as being of limited combustibility.

2.2 Designing for Dust

Accumulation of combustible dust in enclosed buildings should be reduced by designing structural members such that their shape or method of installation minimises the surface area where dust can settle. Consideration should be given to installing structural members exterior to the enclosure.

Access should be provided to facilitate cleaning of all areas.

See also [Dust Suppression](#) below.

2.3 Fire Segregation

Fire areas should be separated from each other by fire barriers, spatial separation or other approved means.

Fire barriers separating fire areas should be a minimum of 2 hour fire resistance rating.

If a fire area is defined as a detached structure, it should be separated from other structures by a minimum of 15 m or a greater distance as defined in NFPA 80A *Recommended Practice for Protection of Buildings from Exterior Fire Exposures*.

Fire areas to be defined as:

- Indoor fuel receiving / tipping floor and MSW storage area (MSW Bunker)
- Indoor processed and unprocessed solid fuel storage (e.g. RDF and MSW storage other than in the Bunker or the fuel receiving / tipping floor)
- Processing area including Materials Recovery Facilities (MRF)
- Each Shredder of the hammer mill or flail mill type and associated dust collection equipment from every other shredder, and from other equipment
- Cable spreading room and cable tunnel
- Control Room, Computer Room, or combined Control / Computer
- Rooms with major concentrations of electrical equipment, such as switchgear room and relay room
- Battery rooms
- Maintenance shop
- Fire pumps
- Warehouses
- Emergency diesel generator
- Auxiliary boiler
- Indoor storage areas for flammable and combustible liquid tanks and containers from adjacent areas (this includes lubrication oil tanks unless integral with an engine) (day tanks for engines are not included) - see also [Fuel and Lubrication Oil Tanks](#) below
- External storage of RDF or MSW from plant and machinery - overhead power lines should be rerouted to prevent them from passing over any exterior fuel storage area



- Office buildings
- Telecommunication rooms

2.4 Penetrations and Openings in Fire Barriers

All openings in fire barriers should be provided with fire door assemblies, fire dampers, penetration seals (fire stops), or other approved means having a fire protection rating consistent with the designated fire resistance rating of the barrier. Windows in fire barriers (e.g., Control Rooms or Computer Rooms) should be provided with a fire shutter or automatic water curtain. See also under [Control Room](#).

2.5 Steel Column Protection

Any exposed steel columns located at the front of the fuel pits should be protected against structural damage caused by heat (fire). This protection could include concrete encasement, water spray, or other suitable alternatives and should extend from the base of the exposed column to the roof of the refuse pit enclosure. Care should be taken to protect fireproofing from mechanical damage. See also [Steel Column and Crane Rail Protection](#) below.

2.6 Hot Load Areas

Specific hot-load unloading areas should be designated and separated from other areas (preferably outdoors) so that loads containing smouldering or other suspect constituents can be segregated. Such areas should be properly monitored, and equipped to promptly extinguish incipient fires before recombining with other combustible material.

2.7 Drainage and Retention

Provisions should be made in all fire areas of the plant, for removal of all liquids directly to safe areas or for containment in the fire area without flooding of equipment and without endangering other areas. This includes transformer bays. See also [Transformer Bunding](#) below.

One or more of the following should accomplish drainage and prevention of equipment flooding:

- Floor drains
- Floor trenches
- Open doorways or other wall openings
- Curbs for containing or directing drainage
- Equipment pedestals
- Pits, sumps, and sump pumps

The provisions for drainage and any associated drainage facilities should be sized to accommodate all of the following:

- The spill of the largest single container of any flammable or combustible liquids in the area
- The maximum expected number of fire hose lines 1 890 lpm minimum operating for a minimum of 10 minutes
- The maximum design discharge of fixed fire suppression systems operating for a minimum of 10 minutes



3.0 Automatic Fire Detection

3.1 Internal Fire Detection

Fire detection should be installed in all buildings in accordance with BS 5839, Part 1 and amendments to give level P1 coverage or equivalent coverage under NFPA 72 *National Fire Alarm Code*.

P1 coverage under BS 5839, Part 1 basically means fire detection in all areas. In some areas of the plant, it may be difficult to fit fire detection which will provide meaningful coverage and not false alarm frequently. Such areas can be discussed on a case by case basis with the provision of sprinklers being pertinent here.

All fire alarms should signal to a permanently manned location - usually the Control Room and the Plant Main Desk, from where the fire service can be called.

NB The term “automatic fire detection” covers smoke, heat and flame detection – the type of detection chosen in any particular circumstance will depend on the conditions – dust, etc.

3.1.1 Thermal Imaging

An infrared thermal imaging camera system should form part of the automatic fire detection system for the Waste Bunker, either as a stand-alone system or associated with the automatic operation of the Waste Bunker fire water monitors. Sufficient thermal imaging cameras should be provided to cover all areas of the Bunker.

3.2 External Fire Detection

External fuel stores, and the like should be covered by video smoke detection systems, flame detection or other suitable means of raising the alarm in the event of fire.

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**4.0 Fire Protection****4.1 Fire Protection Standards****4.1.1 General**

Fire protection should be installed in accordance with National Fire Protection Association NFPA 850 *Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations*, in particular Chapter 9 Alternative Fuels.

4.1.2 Sprinkler Systems

Where fitted, sprinkler systems to comply with NFPA 13 *Standard for the Installation of Sprinkler Systems*.

4.1.3 Water Spray / Deluge Systems

Where fitted, water spray / deluge systems to comply with NFPA 15 *Standard for Water Spray Fixed Systems for Fire Protection*.

4.1.3.1 Alternative use of Deluge Systems

Water spray or foam-water spray / deluge systems may be used in lieu of Sprinkler Systems.

4.1.4 Foam-Water Sprinkler Systems and Foam-Water Spray Systems

Where fitted, foam-water sprinkler systems and foam-water spray systems to comply with NFPA 16 *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*.

4.1.5 Sprinkler / Spray Water Densities

Sprinkler / spray water densities and areas of coverage should be as specified in the NFPA standards above unless more stringent requirements are specified in the sections below.

4.1.6 Gaseous Fire Suppression Systems

Where fitted, gaseous fire suppression systems to comply with NFPA 12 *Standard on Carbon Dioxide Extinguishing Systems*, NFPA 2001 *Standard on Clean Agent Fire Extinguishing Systems* or BS ISO 15004-1 *Fixed firefighting systems. Gas extinguishing systems. Design, installation and maintenance*.

4.1.7 Water Mist Systems

Where fitted, water mist systems to comply with NFPA 750 *Standard on Water Mist Fire Protection Systems*.

4.1.8 Use of Alternative Systems (Equivalency)

Nothing in these guidelines is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by these guidelines.

Equivalency should be demonstrated following the methodology described in Chapter 4 of NFPA 850 and documented in the Fire Protection Design Basis document.



4.2 Fire Water Supplies

4.2.1 Flow and Duration

The firewater storage capacity should be capable of supplying for two hours all fixed fire suppression system demands that could reasonably be expected to operate simultaneously during a single event, in this context this is likely to be:

- Waste Bunker sprinklers
- Two Waste Bunker Water Cannons
- One Feed Hopper deluge system
- Control room window wetting deluge system
- Other demands e.g. any conveyor opening protection systems
- The hose stream demand of not less than 1 890 lpm (If the hydrant system does not take its water supply from the pumped fire water supply – the hose stream allowance is not required)

NB. No allowance is permitted for infill of water supply tanks during a fire situation in arriving at the water supply duration above

4.2.2 Breeching Connections

A breeching point (at least twin inlet) to enable the local Fire and Rescue services to connect a tender / hoses should be provided external to the pump house to feed water into the system downstream of the fire pumps.

4.2.3 Fire Pumps

Fire pumps should be provided, not be subject to a common failure, electrical or mechanical, and be of sufficient capacity to meet the fire flow requirements determined above under [Flow and Duration](#) with the largest pump out of service.

All fire pumps should be automatic starting and comply with NFPA 20 *Standard for the Installation of Stationary Pumps for Fire Protection*.

Common acceptable arrangements are:

- two independent 100% diesel engine driven pumps
- or
- one 100% electric motor driven and one 100% diesel engine driven pumps
- or
- one 50% electric motor driven and two 50% diesel engine driven pumps

4.2.4 Flow Testing Facilities

Full flow testing facilities should be provided for all the main fire pumps in order that the fire pump performance can be tested and demonstrated on a routine basis.

4.3 Tipping Hall

The Tipping Hall / Receiving Hall should be provided with automatic sprinkler protection throughout. Systems should be designed for a minimum of 10.2 mm/min over the most remote 279 m² (increase by 30% for dry pipe systems) of floor area with the protection area per sprinkler not to exceed 12.0 m². High temperature sprinklers 121°C to 149°C should be used.



Sprinklers to cover all areas under any conveyors and other obstructions to the overhead sprinklers in accordance with NFPA 13. This is in addition to the requirement for protection within the shredders.

Waste storage heights in excess of 6.1 m will require higher sprinkler design densities – as per NFPA 13 or the Tipping Hall should be treated as a Bunker and be fitted with fire water monitors as in [Fire Water Monitors \(Water Cannon\)](#) below. Use of Fire Water Monitors on loose MSW and the like can cause problems in that the waste is blown about.

4.4 MSW and RDF Bunkers

4.4.1 Bunker Sprinklers

MSW and RDF Bunkers should be provided with automatic sprinkler protection throughout to protect the entire roof area against structural damage. Systems should be designed for a minimum of 10.2 mm/min over the most remote 279 m² (increase by 30% for dry pipe systems) of floor area with the protection area per sprinkler not to exceed 12.0 m². High temperature sprinklers 121°C to 149°C should be used.

The roof level sprinkler system to include all of the Hopper Deck (grapple laydown areas, Hopper and spaces between).

Due to the distance between the bottom of the refuse pit and the sprinkler system, manual hoses and monitor nozzles should be considered as the primary means of fighting a MSW / RDF storage pit fire.

4.4.2 Bunker Fire Water Monitors (Water Cannon)

In addition to sprinkler protection, MSW and RDF Bunkers should be provided with automatic monitor nozzle protection (water cannon) designed to furnish a minimum of 946 lpm at 6.89 bar at the tip. Monitors should be located so as to allow for coverage of all pit areas with at least two (2) streams operating simultaneously. Due to frequency of use and potential for operator fire exposure, automatic oscillating monitor nozzles with manual override should be provided and the monitors should be capable of remote operation from the central Control Room.

Fire water monitors should not be installed in any area where they can affect the operation or maintenance of the refuse cranes and should be protected by steel frameworks to avoid damage from the waste grabs and should be protected by steel frameworks to avoid damage from the waste grabs.

Electrical cabling to the water monitors should be a minimum of 2 hour fire resistance rating and be protected from physical damage.

See also [Thermal Imaging](#) above.

4.4.3 Steel Column and Crane Rail Protection

Exposed vertical steel structures and crane rails in the Bunker should also be protected by an automatic water based system. Exposed steel column protection, where provided, should be designed in accordance with NFPA 15, should be laid out such that the discharge pattern washes the crane rails and can be connected to the overhead sprinkler system.



4.4.4 Hoppers

Waste feed hoppers either feeding conveyors, shredders, the furnace directly or waste compactors should have automatic deluge protection designed for a minimum of 8.1 mm/min over the entire Hopper, with the protection area per deluge head not to exceed 12.0 m². Manual activation of the Hopper deluge system should also be possible from the Control Room.

4.4.5 Shredders

Primary Shredders of the slow speed type and having an open top feed hopper that allows any explosion to vent upwards without causing extensive damage to the unit do not require explosion protection. However, if hammer mills or flail mills are used or if adequate explosion relief via the hopper is not possible, an explosion suppression system should be fitted. (See NFPA 69 *Standard on Explosion Prevention Systems*, and ASTM E 1248 *Standard Practice for Shredder Explosion Protection*.)

Hammer mill and flail mill type shredder enclosures should also be provided with automatic sprinkler or water spray protection. Systems should be designed for a minimum of 10.2 mm/min over the most remote 279 m² (increase by 30% for dry pipe systems) of floor area with the protection area per sprinkler not to exceed 9.3 m². Water spray protection should also be provided within the shredder housings at intake and discharge chutes and within vent shafts.

In addition to the requirement to fire segregate each hammer mill and flail mill type shredder from all other such shredders and from other equipment (as in [Fire Segregation](#) above), each such shredder and any associated dust collectors should be located within an enclosure of damage limiting construction.

All types of shredders, shredder enclosures, and openings into the enclosure should be designed so that, by a combination of venting and wall strength, they will resist a postulated worst credible case explosion. It is recommended that designers seek guidance from those having specialised experience in the analysis of such hazards, including specification and construction of explosion venting and shredder enclosures.

Electrical equipment located inside the shredder enclosure should be rated for use in both hazardous vapour and dust atmospheres in accordance with NFPA 70 *National Electrical Code* or equivalent.

Input and output conveyors from all Shredders should be protected as in [Conveyors](#) below.

4.5 MSW / RDF Storage

Any internal MSW / RDF storage area (i.e. as distinct from storage in the Bunkers) should be provided with automatic sprinkler protection throughout. This includes Walking Floor type storage. Systems should be designed for a 14.3 mm/min over the most remote 279 m² (increase by 30% for dry pipe systems) of floor area, with the protection area per sprinkler not to exceed 9.3 m². High-temperature sprinklers 121°C to 149°C should be used.

Storage heights in excess of 6.1 m will require higher design densities in accordance with NFPA 13.



4.6 Processing Building including MRF

4.6.1 Fire Protection System

4.6.1.1 Sprinkler Protection – General

Processing buildings should be provided with automatic sprinkler protection throughout. Systems should be designed for a minimum of 10.2 mm/min over the most remote 279 m² (increase by 30% for dry pipe systems) of floor area with the protection area per sprinkler not to exceed 12.0 m². Sprinklers to cover all areas under conveyors and other fixed obstructions over 1.2 m wide in accordance with NFPA 13. The width of groups of conveyors and other fixed obstructions should be considered together if the horizontal gap is less than 1.2 m.

4.6.1.2 Storage in Processing Area

Incidental storage of combustible material in the Processing Area should be covered by the overhead sprinklers at density appropriate for the materials stored.

4.6.2 Dust Suppression

The process should be designed to minimise the production of dust. Dust collected in a dust collection systems, baghouses, or cyclones should be discharged downstream of the collection system, as close to point of use or disposal as possible to avoid the same dust being repeatedly collected.

Portable or fixed pipe vacuum cleaners should be provided of a type approved for dust hazardous locations or low velocity water spray nozzles and hose. Cleaning methods such as vigorous sweeping of dust or blowing down with steam or compressed air should not be used since these methods can produce an explosive atmosphere.

Dust collectors should be located outside. For dust collection systems provided for handling combustible dusts, see NFPA 654 *Standard for the Prevention of Fire and Dust Explosions*.

Bag-type combustible dust collectors that are located inside buildings or structures should be protected with automatic sprinkler or water spray systems inside of the collectors.

The amount of firefighting water delivered to a dust collector can create structural support problems for the equipment itself and for the supporting structure or building.

The use of fire-fighting additives with water can be highly effective can typically result in less water being delivered into the dust collector due to the enhanced fire suppression properties of the agent, subsequently shortening the delivery period. A reduction in water can assist in minimising the potential weight issues.

Sprinklers for bag-type dust collectors should be designed for ordinary hazard systems. Sprinkler and water spray systems should be designed for a density of 8.1 mm/min over the projected plan area of the dust collector.

Protection inside dust collectors should include the clean air plenum and the bag section. If the hopper is shielded from water discharge, sprinklers also should be provided in the hopper section.

4.6.3 Explosion Protection

Units utilising equipment capable of producing explosive concentrations of gases or dusts should be provided with explosion venting or explosion suppression systems. (Refer to NFPA 68 *Guide for Venting of Deflagrations*; NFPA 69 *Standard on Explosion Prevention System* for further guidance.)



4.6.4 Odour Abatement and Ventilation

Odour Abatement Systems that include Biofilters should be fitted with high temperature alarms.

Biofilters should be located outside buildings and be of non-combustible construction including the fill.

4.6.4.1 Plastic Ducts

Plastic ducts, including listed fire-retardant types, should not be used for ventilating systems. Listed plastic fire-retardant ducts with appropriate fire protection are permitted to be used in areas with corrosive atmospheres.

Fire dampers (doors) compatible with the rating of the barrier should be provided at the duct penetrations in accordance with NFPA 90A, to the fire area unless the duct is protected throughout its length by a fire barrier equal to the rating required of fire barrier(s) penetrated.

Automatic sprinkler protection should be provided in plastic ducts over 300 mm in diameter whether ducts are located inside or outside buildings. Sprinklers should be spaced not more than 3.7 m apart in horizontal ducts and no more than 7.32 m apart in vertical ducts. Water supply should be adequate for a flow rate of 75.6 lpm per head.

4.6.5 Biological Treatment (Composting)

Aerobic Biological Treatment of MSW – Bio-drying / Bio-stabilisation, partial composting of the (usually) whole waste large open areas should be included in the sprinkler protected areas. Systems should be designed for a minimum of 10.2 mm/min over the most remote 279 m² (increase by 30% for dry pipe systems) of floor area with the protection area per sprinkler not to exceed 12.0 m²

Aerobic In-Vessel Composting used to either bio-stabilise the waste or process a segregated organic rich fraction does not normally require fire protection.

4.6.6 Conveyors

Conveyor Belt Material

Conveyor belts should be of material designed to resist ignition. U.S. Mine Safety and Health Administration and Canadian Bureau of Mines Standards for fire-retardant conveyor belt materials should be used as a guide.

Conveyor Sprinklers

Automatic water spray or sprinkler systems should be provided for conveyors carrying combustible materials. System coverage should include inside the enclosures of enclosed conveyors, transfer points (tail dust hoods and head chutes). Sprinklers should be designed for a minimum of 10.2 mm/min density over 186 m² of enclosed area or the most remote 30 m of conveyor structure up to 86 m²

Water spray systems should be used in enclosed conveyors that are inclined because of the greater potential for rapid fire spread. For water spray design criteria, see NFPA 15

If a sprinkler system is used to protect conveyors, particular care should be exercised in locating closed sprinkler heads so that they will be in the path of the heat produced by the fire and still be in a position to provide good coverage of all belt surfaces along the conveyor.



Conveyor width and other sprinkler obstructions should be considered in protection of the return belt and other floor level equipment in accordance with NFPA 13. Where sprinklers cannot provide adequate coverage due to obstructions, a water spray system using above and below belt nozzles should be used in place of a sprinkler system.

Conveyors can be considered protected by overhead building protection if not enclosed or hooded and not at an excessive height above the conveyors.

Conveyor Interlocks

It is vital that conveyors are tripped on detection of a fire on or near the conveyor in order to minimise the spread of fire in the material on the belt or the belt itself. To this end, conveyors should be tripped on detection of a fire in the building in which the conveyors are located – i.e. any fire alarm in the Process Building should shut down the conveyors. This is in addition to the interlocks referred to under [Interlocks](#) below.

4.6.7 Secondary Shredders

Damaging explosions are more common in the Secondary Shredders than the primary ones because the Primary Shredders are usually of fairly open construction, which allows the force of the explosion to dissipate rather than cause extensive damage to the unit.

Explosion and fire suppression should be as for [Primary Shredders](#) above.

4.6.8 Classifiers / Trommels

Classifiers / Trommels, such as rotating screens, should be provided with automatic water spray protection to prevent fire from propagating downstream through the screen. Systems should be designed for a minimum of 10.2 mm/min of the entire screen area with nozzles no more than 3.0 m on centre. Consideration should be given to avoiding physical damage from mobile equipment operation in the area and from the material being processed.

4.7 Hydraulic Systems

Hydraulic systems should use a listed Fire Resistant Fluid (FRF)¹

If FRF is not used, hydraulic equipment, reservoirs, coolers, and associated oil filled equipment should be provided with automatic sprinkler or water spray protection – this includes the hydraulic rams. Sprinklers or spray nozzles should be over oil containing equipment and for 6.1 m beyond in all directions. A density of 10.2 mm/min should be provided.

Exceptions: Where there is no normal presence of ignition sources within 6 m of any part of the hydraulic system during equipment operation. These include hot surfaces above the auto ignition temperature of the oil, open flames, or spark producing equipment.

Sprinklers may be omitted over a single small (<380 l total oil capacity) hydraulic system or multiple adjacent small systems, i.e., within 6 m of each other.

¹ There is an issue of compatibility of some FRF with some elastomers used in hydraulic systems seals – See [Listed \(<FM> Approved\) Fire Resistant Fluid](#) in Appendix



4.7.1 Hydraulic Systems – Fire Interlocks

For individual reservoirs containing more than 380 l of petroleum-based hydraulic oil, an automatically actuated means for shutting down the oil pump and shutting off flow from accumulators for hydraulic systems should be fitted. Automatic shutdown of hydraulic systems may be accomplished through the use of a sprinkler water flow switch; a thermally actuated fire detector / device rated at least 30°C above the highest anticipated operating environment temperature, located directly above the hydraulically operated equipment; or an oil reservoir liquid level switch electrically interlocked with the power supply to the oil pump. The oil reservoir liquid level switch arrangement should be used only where the hydraulic oil system release can be limited to 25 l or less.

4.8 Control Room

4.8.1 Control Room Window

The Control Room / Crane Cabin window normally forms part of a 2 hour fire rated wall.

In plants that do not have a requirement for operators to be able to see through the Control Window during a fire to operate cranes or other equipment, the fire rating of the window can be achieved by use of a fire shutter.

In plants where the control room operators are required to operate the cranes to dig out a possible fire, the control room window glazing should achieve its required period of fire resistance for both integrity and insulation. However, insulation rated glazing systems tend to become opaque at ~120°C as part of their intumescent properties - this would render the control room operators unable to operate the cranes.

To achieve the 2 hour fire resistance to the Control Room viewing window a glazing system designed to provide at least 60 minutes integrity should be used. The fire resistant glazing should be further protected by a water drenching curtain system mounted on the Bunker side of the glazing. The water drenching system should be automatically activated via the Bunker fire detection system or an independent fire detection system linked to a deluge valve. In addition, a manual initiation system should be installed in the Control Room.

The other walls of the Control Room should provide a 2 hour fire rated enclosure to protect the remaining parts of the Building from the possible spread of heat and fire from the Bunker / Tipping Hall.

4.8.2 Control Room Air Conditioning

Control Room air conditioning should provide a pressurised environment to preclude the entry of smoke in the event of a fire outside the Control Room.

4.9 Electrical Rooms

Total flooding gaseous fire extinguishing systems should be fitted in electrical / electronic rooms containing equipment that is of high value or is critical to plant operation such as, MCC rooms, DCS rack room, UPS and battery room, Crane Control Room (if not continuously manned). Coverage to include beneath raised floors and above false ceilings that contain cables. Individual equipment and in cabinet protection can be considered in lieu of total flooding systems.



4.10 Transformers

4.10.1 Transformer Type

All oil filled transformers and reactors should preferably be located outdoors. Dry type transformers are preferred for indoor installations. Less flammable liquid or non flammable fluid insulated transformers are preferred to oil filled transformers.

4.10.2 Transformer Fire Barriers (Indoor)

Oil insulated transformers of greater than 379 l oil capacity **installed indoors** should be separated from adjacent areas by fire barriers of 3 hour fire resistance rating.

Where transformers are protected by an automatic fire suppression system and **installed indoors**, the fire barrier fire resistance rating may be permitted to be reduced to 1 hour.

Transformers insulated with an approved less flammable liquid or non flammable fluid and **installed indoors** should be separated from adjacent areas by fire barriers of 1 hour fire resistance rating and do not require automatic fire suppression. (

Fixed Fire Protection

Oil filled transformers not meeting separation or fire barrier recommendations below should be protected with automatic water spray or foam-water spray systems.

Transformer protection should provide complete water spray impingement on all exposed exterior surfaces. The water should be applied at a net rate not less than 10.2 mm/m² of projected area of rectangular prism envelope for the transformer and its appurtenances, and not less than 6.1 mm/m² on the expected non absorbing ground surface area of exposure.

Water spray application should include the conservator tanks, pumps, etc.

Only to be used in association with ACE and only if specified in an ACE insurance policy



4.10.3 Transformer Fire Barriers (Outdoor)

Combustible Oil Insulated

Any **Outdoor oil-insulated** transformers containing 1 893 l or more of oil should be separated from each other and from adjacent structures by a 2 hour rated fire barrier or by spatial separation in accordance with [Table 4.10.3](#), below (basically for transformers with >18,925 l oil content, a 15 m clear line of site spacing between any oil filled transformer and any other structure or plant.)

Table 4.10.3 Outdoor Oil Insulated Transformer Separation Criteria

Transformer Oil Capacity	Minimum (Line-of-Sight) Separation without Firewall
1,893 l to 18,925 l	7.6 m
Over 18,925 l	15 m

Less Flammable Liquid Insulated

Any **outdoor** transformers utilising approved **less flammable liquid** containing 38,000 l or more of oil should be separated from each other and from adjacent structures by a 1 hour rated fire barrier or by spatial separation in accordance with [Table 4.10.4](#)

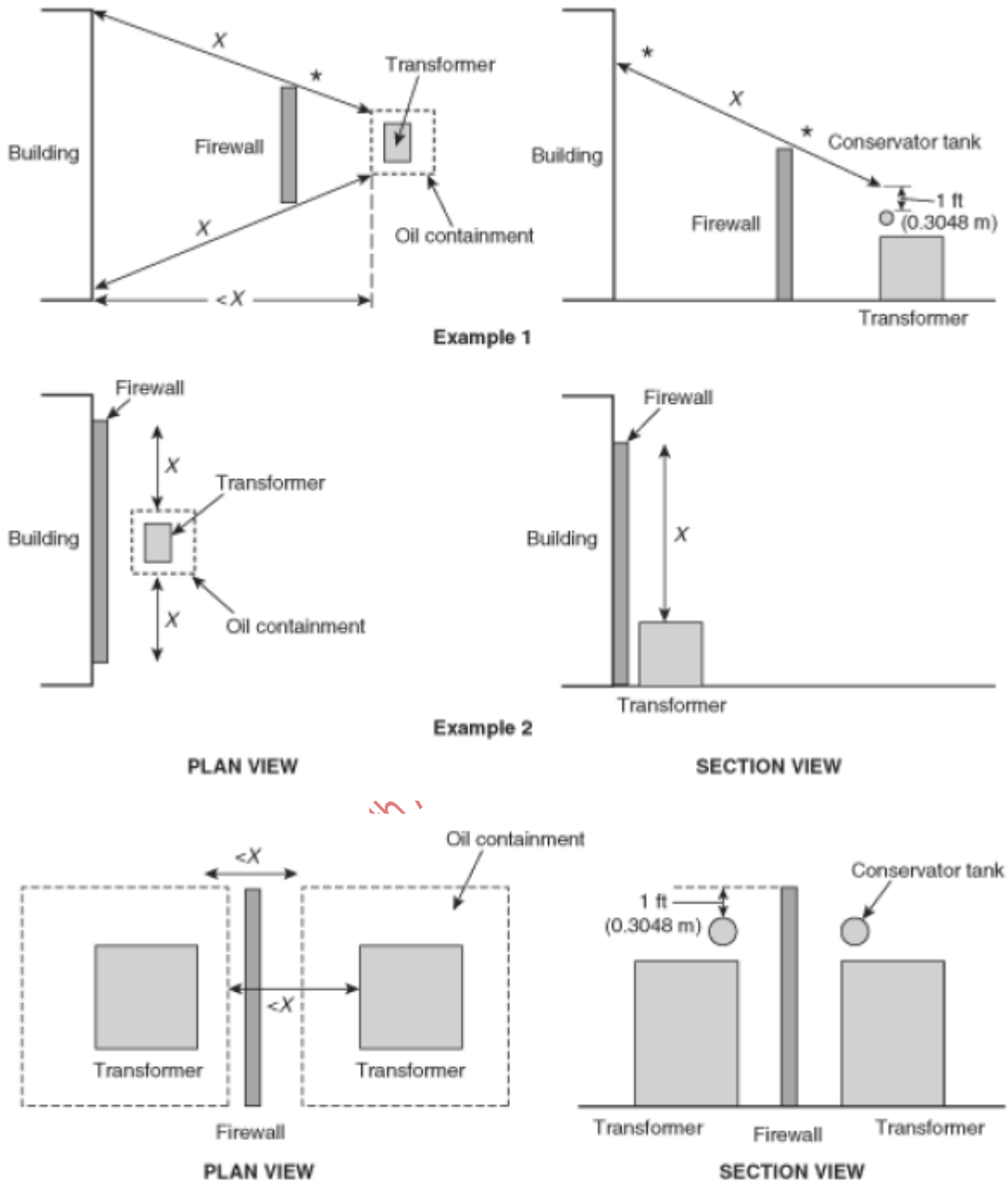
Table 4.10.4 Outdoor Less Flammable Liquid Insulated Transformer Separation Criteria

Transformer Less Flammable liquid Capacity	Minimum (Line-of-Sight) Separation without Firewall
Less than 38,000 l	1.5 m
Over 38,000 l	4.6 m

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Figure 4.10.4 Illustration of Oil-Insulated Transformer Separation Recommendations



X = Minimum separation distances from [Table 4.10.3](#) or [Table 4.10.4](#) above



Fire barriers between transformers should extend at least 0.31 m above the top of the transformer casing and oil conservator tank and at least 0.61 m beyond the width of the transformer and cooling radiators. Where a fire barrier is provided between structures and a transformer, it should extend vertically and horizontally as indicated in [Figure 4.10.4](#) above. Fire barriers should be designed to withstand the effects of exploding transformer bushings or lightning arrestors.

4.10.4 Transformer Bunding

Drainage facilities should be provided for outdoor oil insulated transformers, or the ground should be sloped such that oil spills will flow away from buildings, structures, and adjacent transformers. Unless drainage from oil spills is accommodated by sloping the ground around transformers away from structures or adjacent equipment, bund facilities sized to accommodate all of the following should be provided:

- 110% of the maximum transformer oil capacity
- The maximum expected number of fire hose lines 1,890 lpm minimum operating for a minimum of 10 minutes
- The maximum design discharge of fixed fire suppression systems operating for a minimum of 10 minutes

Open pit bunds should include one of the following forms of protection:

- (1) Automatic sprinkler or water spray protection for the pit area designed to a discharge density of (6 mm/min) over the area of the pit.
- (2) A 30 cm thick layer of rock located between steel grating at the top of the pit. The rock used should be 3.8 cm or larger washed and uniformly sized rock (size No. 2, ASTM D 448, *Standard Classification for Sizes of Aggregate for Road and Bridge Construction*)

For facilities consisting of more than one transformer unit that are not separated by a fire barrier provisions such as a sloped floor, curb, or trench drain should be provided on solid floors where the potential exists for an oil spill, such that oil released from an incident in one unit will not expose an adjacent unit.

4.11 Cable Spreading Room and Cable Tunnels

Cable spreading rooms and cable tunnels should be fitted with fire detection as per [Automatic Fire Detection](#) above.

Cable spreading rooms and cable tunnels that are long or otherwise difficult to access for firefighting should be protected with automatic sprinkler, water spray, or automatic gaseous extinguishing systems. Automatic sprinkler systems should be designed for a density of 12.2 mm/min 232 m² or the most remote 30 m of cable tunnels up to 232 m².

Definition of a Cable Tunnel - if one can walk down it, it is tunnel, otherwise it is a trench.

4.12 Diesel / Gas Engines

Emergency diesel / gas engine driven generators, and all other diesel / gas engines located within main plant structures, should be protected by automatic sprinkler, water spray, foam-water sprinkler, or gaseous type extinguishing systems. Sprinkler and water spray protection systems should be designed for 10.2 mm/min density over the fire area.



4.13 Cooling Towers

Cooling towers of combustible construction that are essential to continued plant operations should be protected by automatic sprinkler or water spray systems in accordance with NFPA 214 *Standard on Water Cooling Towers*.

4.14 Fire Mains and Hydrants

Yard mains and outdoor fire hydrants should be installed on the plant site. (See NFPA 24 *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, or BS 5306-0 *Fire extinguishing installations and equipment on premises. Guide for the selection of installed systems and other fire equipment*.)

External hydrant spacing should be a maximum of 100 m.

External hydrants should be located not less than 12.2 m from the buildings to be protected from physical damage from vehicles.

The supply mains should be looped around the main power block and should be of sufficient size to supply the flow requirements determined by NFPA 14 *Standard for the Installation of Standpipe, Private Hydrants, and Hose Systems*, to any point in the yard loop considering the most direct path to be out of service. Pipe sizes should be designed to encompass any anticipated expansion and future water demands.

4.14.1 Internal Hose Stations

Hose stations designed in accordance with NFPA 14 *Standard for the Installation of Standpipe, Private Hydrants, and Hose Systems, 2007 Edition*, should be located throughout fuel materials storage (tipping building), charging floor, firing floor, hydraulic area, and residue building. Due to the high frequency of use, the following points should be considered:

- (1) Location and physical protection so as to avoid potential damage due to traffic patterns
- (2) Size and number to be determined for unique plant geometry (e.g., push walls)
- (3) Ease of use, maintenance, and storage, such as through the use of continuous flow, non collapsible hose reels
- (4) Protection from freezing in unheated areas

4.15 Extinguishers

Extinguishers of suitable types should be installed in all parts of the facility to NFPA 10 *Standard for Portable Fire Extinguishers*, or BS 5306 Part 8: *Code of Practice for the Selection and Installation of portable fire extinguishers*.

4.16 Fuel and Lubrication Oil Tanks

Bulk oil tanks, should be banded to 110% of the maximum tank capacity. See also [Drainage](#) above.

External oil tanks should be located in accordance with NFPA 30 *Flammable and Combustible Liquids Code*.

External fuel oil handling and storage areas should be provided with hydrant protection. See above under [Fire Mains and Hydrants](#).



4.17 Smoke / Heat Venting

In most cases where smoke venting is provided, it is done to comply with local code. Smoke venting should be installed in the Tipping Hall, Refuse Bunker, Boiler House and Turbine Hall if it can be demonstrated that the system will be of benefit and that the design and operation of the smoke vents will not interfere with the operation of the sprinkler and other fire protection systems.

Where smoke venting is installed it should be in accordance with NFPA 204 *Standard for Smoke and Heat Venting*. Local manual operation should also be provided. Remote operation from the Control Room should be provided with provisions made to prevent premature operation, which can be accomplished using thermal interlocks or administrative controls.

Smoke and heat vents are not substitutes for normal ventilation systems unless designed for dual usage and should not be used to assist such systems for comfort ventilation.

Separate smoke management or ventilation systems are preferred; however, smoke venting can be integrated into normal ventilation systems using automatic or manually positioned dampers and motor speed control. (See NFPA 90A *Standard for the Installation of Air-Conditioning and Ventilating Systems*). Smoke venting also is permitted to be accomplished through the use of portable smoke ejectors. A smoke management system should be utilised to mitigate the effects of smoke and heat during the early stages of a fire.

4.18 Interlocks

The actuation of any fire suppression system should cause equipment it protects to shut down.

Under certain circumstances, continued running of equipment is desirable following detection of a fire - this should be allowed for in the interlock system design.

4.19 Vehicles

Diesel or petrol fuelled vehicles that operate in fuel storage areas, (yards, piles or Tipping Halls), should be equipped with fixed fire-extinguishing systems of a type approved for off-road vehicles.

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5.0 Appendices

5.1 Listed (<FM> Approved) Fire Resistant Fluid

Listed (<FM> Approved) Fire Resistant Fluids do exist with the following characteristics:

- Based on synthetic organic esters and additives to achieve hydraulic fluid performance
- Containing no water, mineral oil or phosphate ester
- Miscible and compatible with nearly all mineral oil type hydraulic fluids
- Properly maintained, has a useful life comparable to that of mineral oil fluids
- Offers the lubrication level of premium, anti-wear hydraulic oils
- Can be used with hydraulic components from all major manufacturers
- Compatible with some elastomers used on seals of hydraulic systems – see below
- Compatible with iron and steel alloys and most nonferrous metals and their alloys but is not compatible with lead, cadmium, zinc, and alloys containing high levels of these metals
- Systems previously using mineral oil types of fluids can be converted by draining and recharge - fire resistance is retained as long as at least 95% of the oil-based fluid is removed

5.1.1 Elastomer Compatibility of Synthetic FRFs

The table below contains the manufacturer's recommendations regarding the use of one of the Listed synthetic FRFs with commonly used elastomers.

Three categories of elastomer applications are listed:

- "Static" refers to trapped non-moving seals such as O-rings in valve subplates and rigid, low pressure hose connections
- "Mild-Dynamic" applications include accumulator bladders and hose linings where the hoses are exposed to high pressure and light flexing
- "Dynamic" refers to cylinder rod seals, pump shaft seals and constantly flexing hydraulic hose



Table 6.1.1 Elastomer Compatibility

<i>ISO 162 Designation</i>	<i>Description</i>	<i>Static</i>	<i>Mild- Dynamic</i>	<i>Dynamic</i>
NBR	Medium to high nitrile rubber (Buna N, >30% acrylonitrile)	C	C	C
NBR	Low nitrile rubber (Buna N, <30% acrylonitrile)	S	N	N
FPM	Fluoroelastomer (Viton®)	C	C	C
CR	Neoprene	S	S	S
IIR	Butyl rubber	S	N	N
EPDM	Ethylene propylene rubber	N	N	N
AU	Polyurethane	C	C	C
PTFE	Teflon®	C	C	C

C = Compatible

S = Satisfactory for short-term use, but replacement with a completely compatible elastomer is recommended at the earliest convenience

N = Not compatible

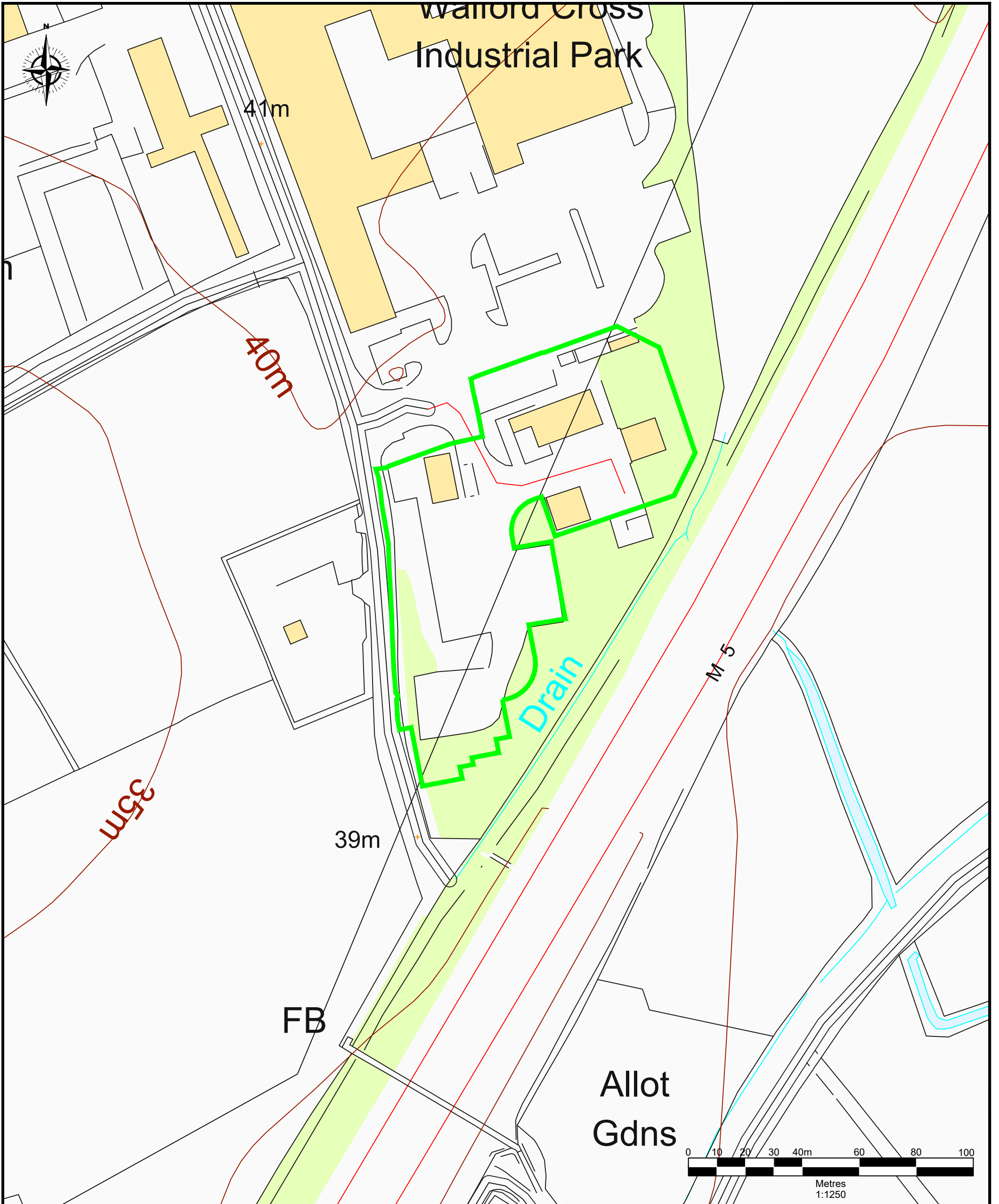
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Figures



Figure 1 – Site Location Plan



Notes

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— Site Location


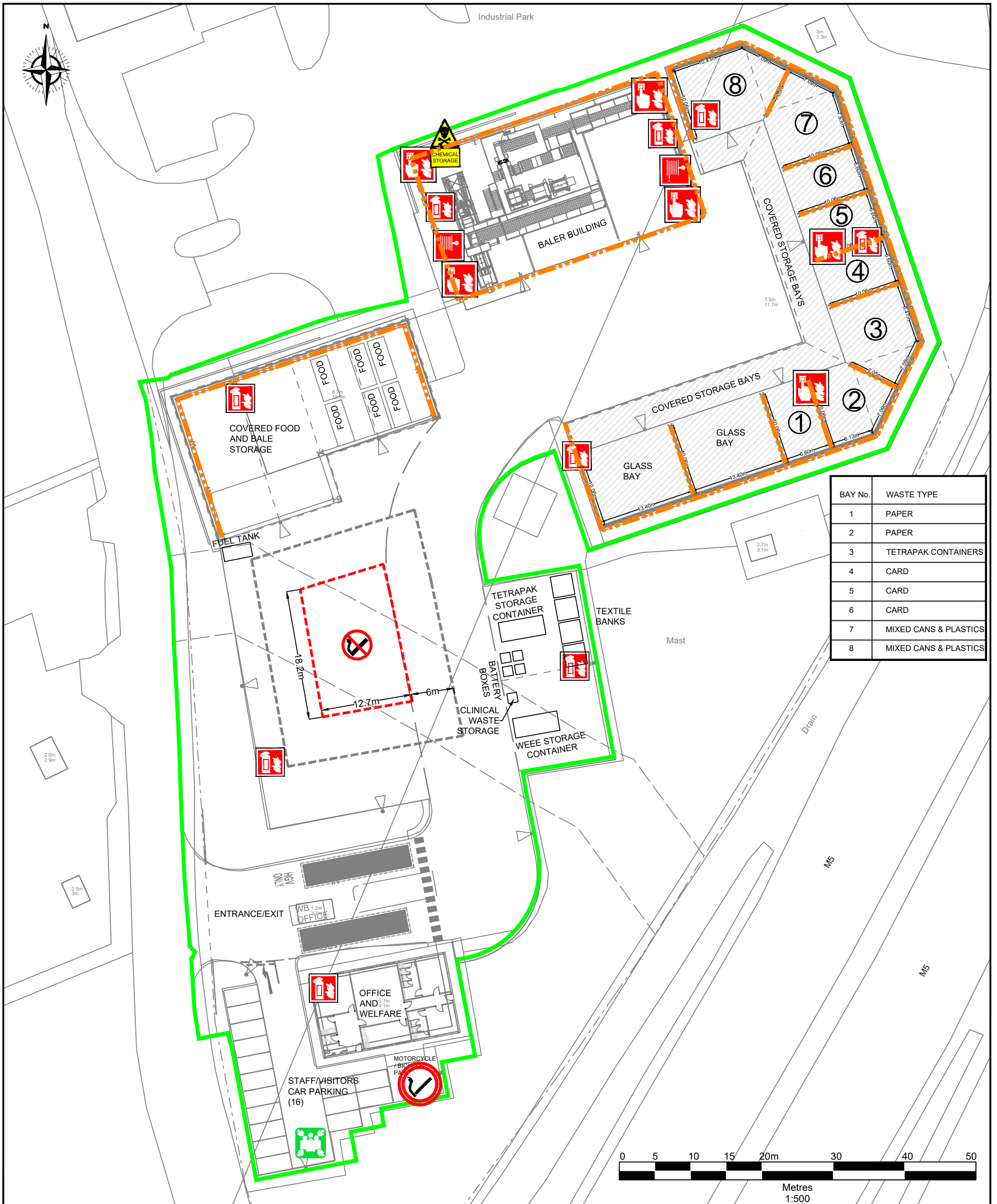
 <small>Darwen Resource Recovery Park, Lower Eccleshill Road, Darwen, BB3 0RP Tel: 01254 819700, Fax: 01254 819749, Email: richard.brissett@sita.co.uk</small>	Site	Taunton	Scale	1:1250 @ A3	Drawn by	RB	Rev	subject	date
	Title	Site Location Plan	Date	October 2020	Checked by	SW	A	Permit Boundary Amended	Apr 2021
			Drawing Ref	Ttn-LOC-1020-01a					



Figure 2 – Site Permit Boundary and Layout Plan



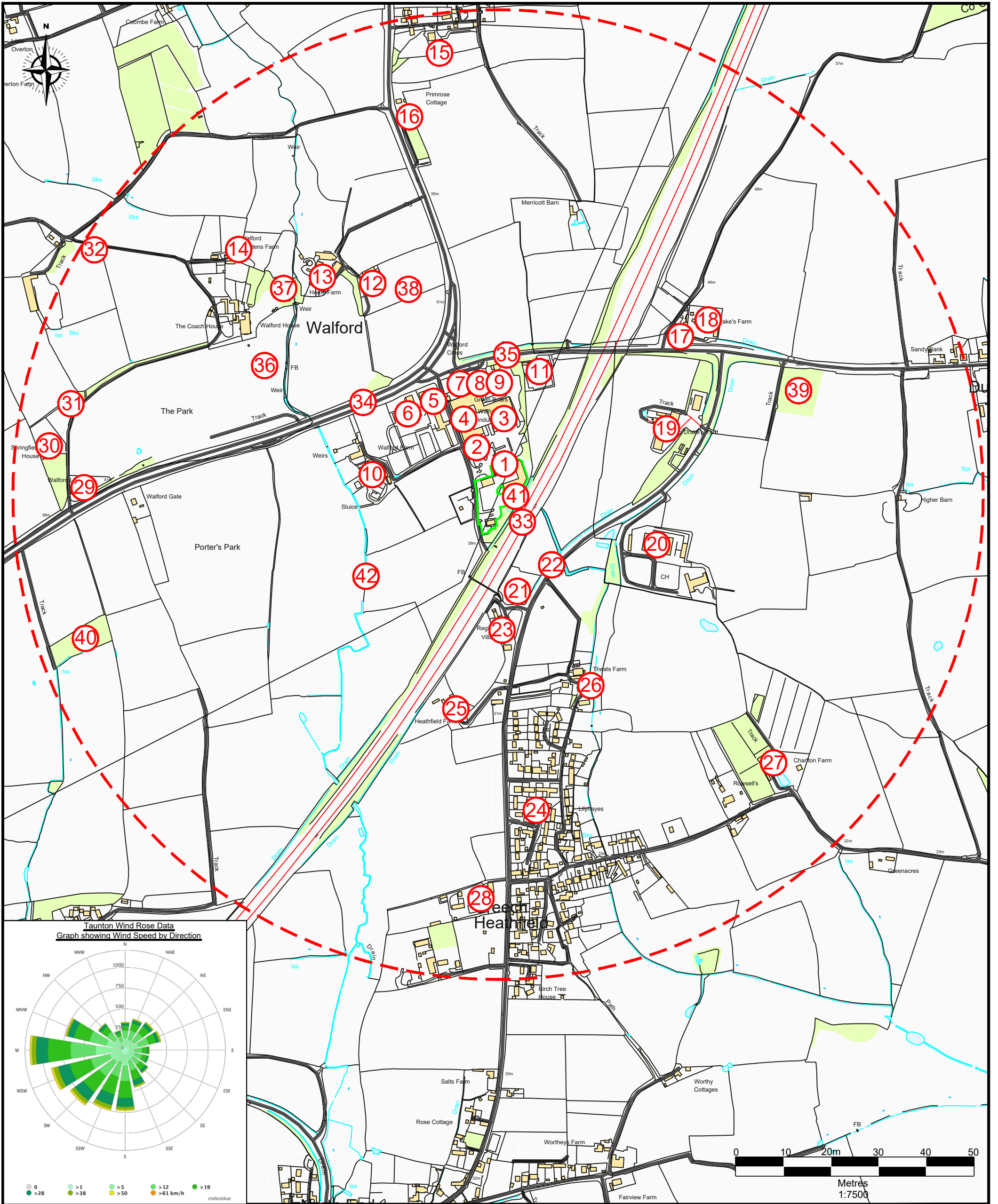
BAY No.	WASTE TYPE
1	PAPER
2	PAPER
3	TETRAPAK CONTAINERS
4	CARD
5	CARD
6	CARD
7	MIXED CANS & PLASTICS
8	MIXED CANS & PLASTICS

<p>Notes</p> <p>1. Reproduced from the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationary Office, Crown Copyright, Licence Number 100004910.</p>	<p>— Permit Boundary</p> <p>--- Quarantine Area</p> <p>--- Quarantine Area Offset</p> <p>--- Fire Walls</p> <p>⚠ Chemsafe Store</p>	<p>🧯 Fire Extinguisher</p> <p>🔥 Fire Hose</p> <p>📢 Alarm Call point</p> <p>👥 Assembly Point</p> <p>🚫 No Smoking Area</p> <p>🚫 Proposed Smoking Area</p>	<p>Scale: 1:500 @ A3</p> <p>Date: May 2024</p> <p>Drawing Ref: Ttn-PER-0524-01</p>	<p>Drawn by: JA</p> <p>Checked by: KH</p>	<p>Rev</p> <p>subject</p> <p>date</p>
					<p>Site: Taunton Depot</p> <p>Title: Permit Boundary Plan Site Layout</p>

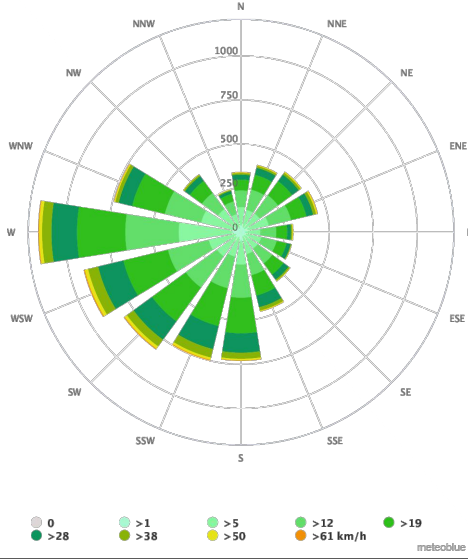




Figure 3 – Sensitive Receptor Location Plan



Taunton Wind Rose Data
Graph showing Wind Speed by Direction



Notes

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— Permit Boundary
- - - 1km Offset

① Receptors


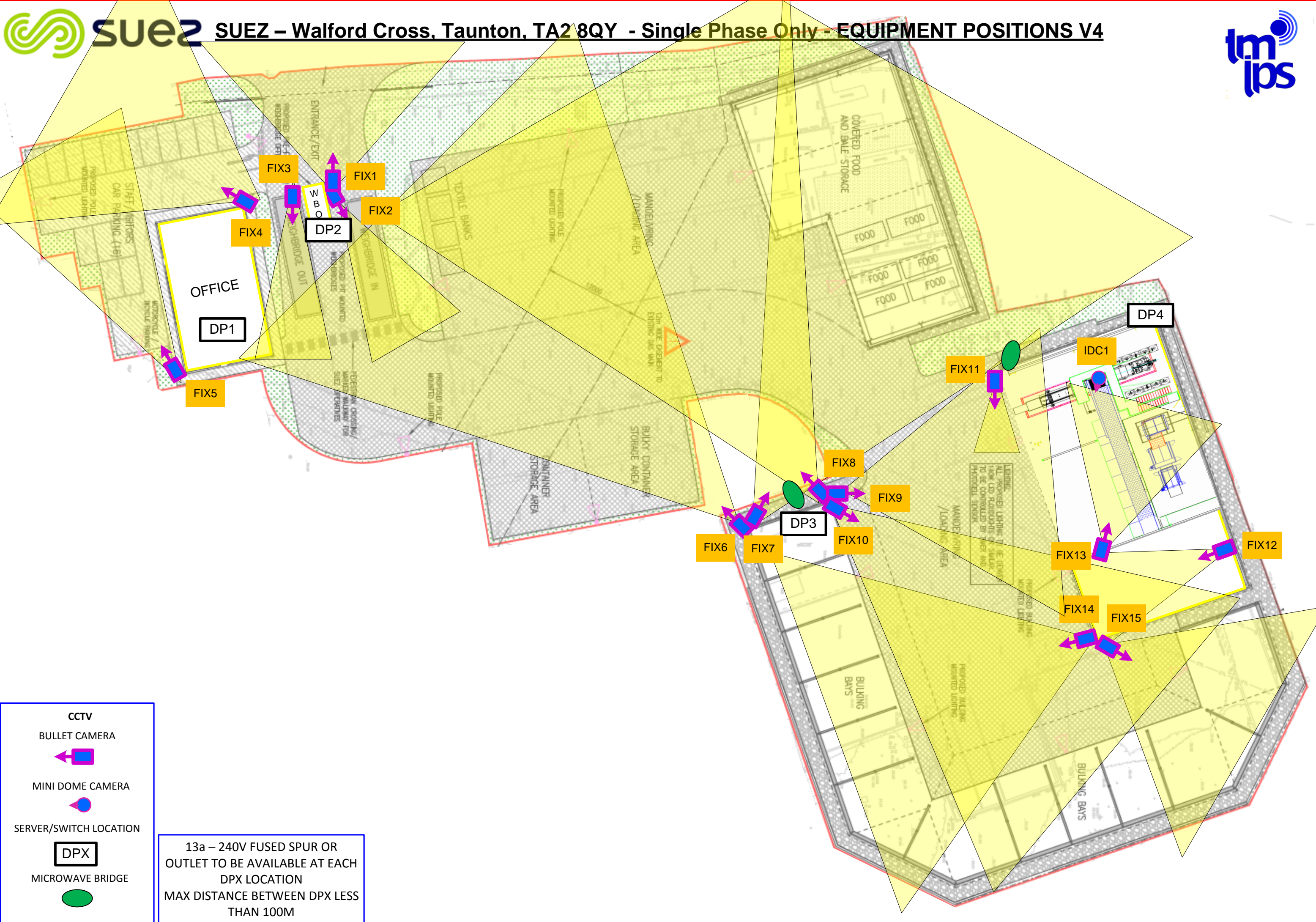
 <small>Darwen Resource Recovery Park, Lower Eccleshill Road, Darwen, BB3 0RP Tel: 01254 819700, Fax: 01254 819749, Email: richard.brissett@sita.co.uk</small>	Site	Taunton Depot	Scale	1:7,500 @ A3	Drawn by	JA	Rev	subject	date
	Title	Receptor Plan	Date	March 2024	Checked by	KH			
			Drawing Ref	Ttn-REC-0324-01					



Figure 4 – CCTV Locations



CCTV

- BULLET CAMERA
- MINI DOME CAMERA

SERVER/SWITCH LOCATION

-

DPX

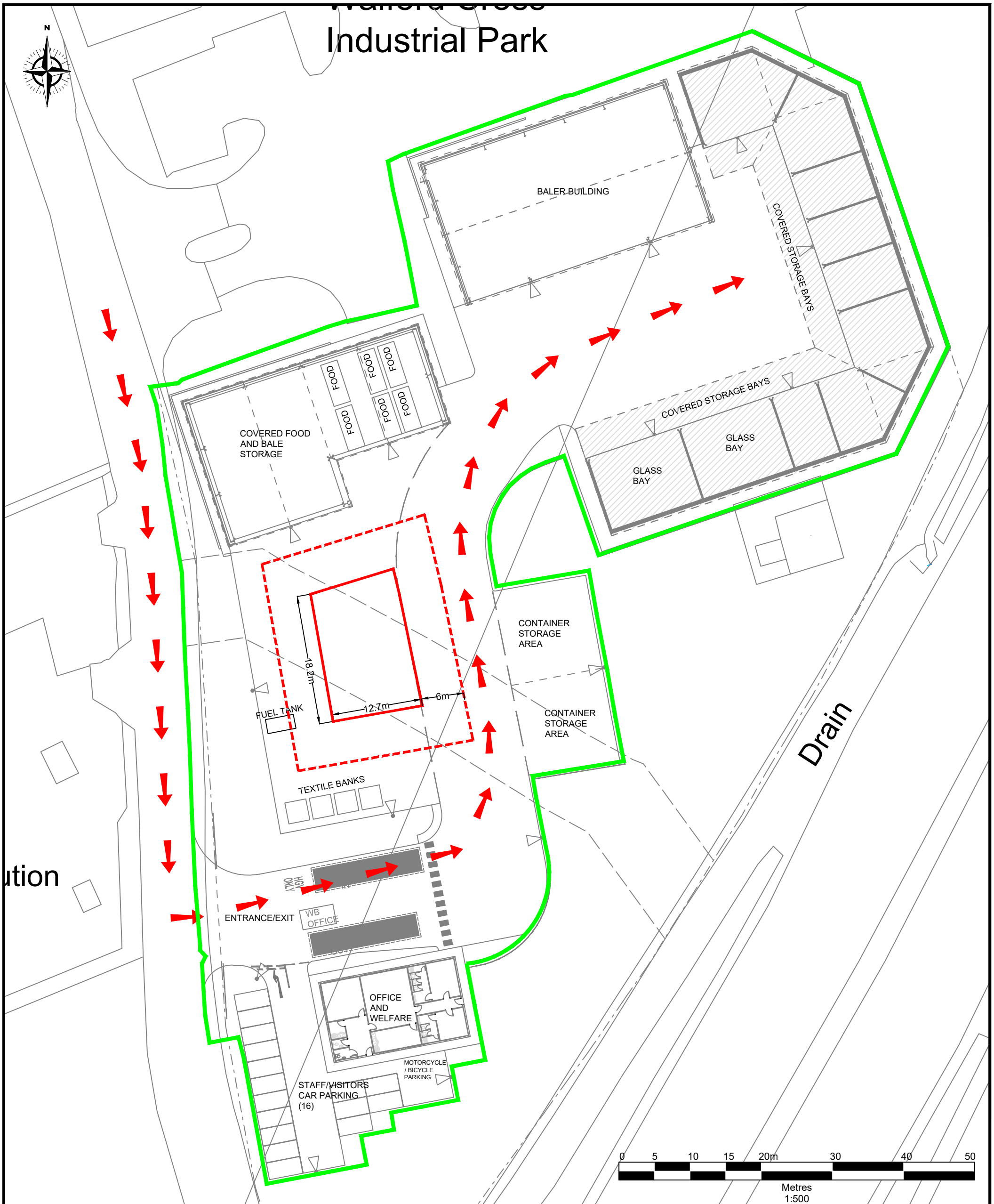
- MICROWAVE BRIDGE

13a – 240V FUSED SPUR OR
OUTLET TO BE AVAILABLE AT EACH
DPX LOCATION
MAX DISTANCE BETWEEN DPX LESS
THAN 100M



Figure 5 – Emergency Access - Fire Appliance Route

Industrial Park



ution

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- Permit Boundary
- Fire Appliance Route
- - - Quarantine Area
- - - Quarantine Area Offset



Site
 Taunton Depot

Title
 Fire Appliance Route

Scale
 1:500 @ A3

Date
 September 2020

Drawing Ref
 Ttn-PER-0920-03a

Drawn by
 RB

Checked by
 SW

Rev	subject	date
A	Permit Boundary Amended	Apr 2021



Figure 6 – Drainage Plan

Refer to Craddys drawing No. 12243-0060 for drainage diversions layout

Klargester NSFA100 full retention interceptor/separator (as per tender) drained area capacity = 5,560m³, drained area (including office/welfare roof and food & bale store roof) = 5,470m². Vent location as shown (TBC). Alarm to be installed at a suitable location within the baler shed.

9000l leachate storage tank, Ø1.422m x 6.290m length. Incoming invert level 35.200. Alarm to be installed at a suitable location within the baler shed.

Foul drainage channel - ACO Qmax 150. Drainage channel railing to be F900 ductile iron Q-guard.

ACO Qmax outlet chamber CL 38.500 IL 37.600

ACO Qmax outlet chamber CL 38.770 IL 37.870

Foul drainage channel within food and bale store - ACO Qmax 150. Drainage channel railing to be F900 ductile iron Q-guard.

ACO Qmax outlet chamber CL 38.110 IL 37.210

ACO Qmax 150 drainage channel. Drainage channel railing to be F900 ductile iron Q-guard

Ø175mm Orifice plate to outlet, proposed maximum discharge rates:
 - 1 in 1yr+40% : 35.4L/s (33% betterment)
 - 1 in 30yr+40% : 56.3L/s (43% betterment)
 - 1 in 100yr+40% : 66.0L/s (41% betterment)

Geocellular storage module attenuation tank - SDS Rigofill, with 4 No. Man access turrets. Tank to be wrapped with suitable impermeable membrane and vented to soft landscaping area. To provide min. 205.5m³ surface water attenuation storage volume @ 95% porosity - 10.4 x 16.0 x 1.3m depth. Invert level of tank 35.900.

EXISTING SERVICES: SHADED AREA DENOTES 4m EASEMENT TO EXISTING MEDIUM PRESSURE GAS MAIN. PROPOSED DRAIN BENEATH. HAND DIGGING WILL BE REQUIRED

EXISTING SERVICES: SHADED AREA DENOTES 12m EASEMENT TO EXISTING HIGH PRESSURE GAS MAIN. PROPOSED DRAIN PASSES APPROX. 50mm OVER COVER SLAB. HAND DIGGING WILL BE REQUIRED

"AS BUILT" DRAWINGS - REV AsB
 THIS DRAWING REPRESENTS FINAL CONSTRUCTION ISSUE INFORMATION. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DRAWINGS INCLUDING SPECIALIST SUBCONTRACTORS DRAWINGS

Package wastewater treatment plant (PWT/PT) to BS EN 12566 with integrated pump to suit 16 persons:
 - open industrial (without canteen)
 - 60lppd flow, 25gppd BOD, 5 ammonia
 - 0.96m³/day flow, 0.4kg/day BOD
 - Klargester BioDisc BB
 - with optional integrated pump (50mm MDPE rising main),
 - 1100mm incoming invert depth
 - CL 39.100 IL 38.000

KEY	
	Site boundary
	Existing surface water drain
	Existing drainage to be abandoned
	Proposed diversion drain (see drawing -0060)
	Proposed foul water drain
	Proposed clean surface water drain
	Proposed contaminated surface water drain
	Proposed rising main
	Proposed linear drainage channel with access
	Existing manhole
	Proposed PCC Type B manhole
	Proposed PPIC Type E inspection chamber
	Proposed geocellular attenuation tank
	Proposed road gully

C D M : SIGNIFICANT HAZARDS	
THE FOLLOWING HEALTH AND SAFETY HAZARDS ARE IDENTIFIED BY THE DESIGNER AS ABNORMAL IN PURSUANCE OF THE CURRENT CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS.	
RISKS DURING CONSTRUCTION:	
• DEEP EXCAVATIONS - Deep excavations should have adequate propping and shoring to ensure stability. Personnel working in excavations should be sufficiently protected from falling objects.	
• EXISTING SERVICES - Further to any existing services information available, contractor to undertake further surveys to locate any existing services prior to excavations. Refer to drawing No. B2005: UGX by Lewis Brown for existing information.	
• LIVE WATERCOURSE: The existing watercourse serves the area upstream of the existing site and is currently live and operatives must be aware of this during the construction of the headwall. Works on and around the watercourse to be carried out during dry and low level periods.	
OPERATION / MAINTENANCE RISKS:	
• MANHOLES/GULLIES/SILT TRAPS: Inspect manholes & silt traps for build up of silt and general debris (once a year, preferably in the spring after leaf fall in the autumn). If silt/debris is building up then clean with jetting / gully sucker & inspect pipe.	
• INTERCEPTOR: Refer to manufacturers recommendations.	
• LEACHATE STORAGE TANK: Refer to manufacturers recommendations.	
• PWT/PT & PUMP: Refer to manufacturers recommendations.	
RISKS DURING DEMOLITION / DECOMMISSIONING / DISMANTLING / ALTERATIONS:	
• No abnormal risks have been identified relating to this design element.	
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY COMPETENT & ADEQUATELY RESOURCED CONTRACTOR(S) WORKING TO SAFE SYSTEMS OF WORK.	

DRAINAGE NOTES
 DRAINAGE STANDARDS: All private drainage works shall be in accordance with Building Regulations Document Part H. All adoptable drainage works shall be in accordance with Sewerage Sector Guidance Appendix C : Design and Construction Guidance and statutory undertaker's requirements.
 MANHOLE COVER LEVELS: All manhole & inspection chamber cover levels are to be adjusted to suit the proposed finished surface levels. If the cover levels proposed in the drainage schedules vary from proposed surface level by more than 100mm, Contractor to notify Craddys.
 LAYING DRAINAGE: It is recommended that all drains be laid starting from the downstream connection to the existing network and working upstream to and through the new development.

DRAINAGE PIPE SIZES: All foul water drains to be 100mm diameter unless noted otherwise. All surface water drains to be 150mm U.N.O.
 ABOVE GROUND DRAINAGE: RWP/SVP drainage positions shown on Craddys drawings, upon which the below ground drainage is designed, are based upon the positions provided to us by the modular building supplier and these are to be set out on the modular building supplier's floor plans unless agreed otherwise. If above ground drainage positions change then Craddys will need to be informed of these changes in writing and the changes in position clearly noted or highlighted on a drawing, i.e. using revision clouds, with relevant CAD files provided to Craddys below ground drainage drawings to be updated. Note that should these changes occur following Craddys issue of Construction status drawings then there is a risk of the contractor undertaking abortive works.

IF YOU HAVE A QUERY CALL US
 SCALING FROM THIS DRAWING OR OBTAINING DIMENSIONS ELECTRONICALLY MAY NOT PROVIDE ACCURATE INFORMATION AND SHOULD BE AVOIDED. WORK ONLY FROM FIGURED DIMENSIONS.

REV	DESCRIPTION	DATE
AsB	AS BUILT ISSUE	JH 27.04.22
F	FOUL UPDATED AROUND LEACHATE TANK	RJH 27.04.21
E	LOADING AREA QMAX UPDATED TO SUIT LEVELS	RJH 14.04.21
D	CONSTRUCTION ISSUE - MINOR AMENDMENTS TO WELFARE FOUL AND WEIGHBRIDGE DRAINS	RJH 09.04.21
C	ATTENUATION TANK NOTATION UPDATED	RJH 10.03.21
B	LOCKDOWN VALVE ADDED TO Sw.20, DISCHARGE RATES NOTED	RJH 08.03.21
A	INFORMATION	WAH 03.03.21
REV	REVISION DETAILS	BY DATE

ASB	AS BUILT ISSUE	JH	27.04.22
F	FOUL UPDATED AROUND LEACHATE TANK	RJH	27.04.21
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C	ATTENUATION TANK NOTATION UPDATED	RJH	10.03.21
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CRADDYS
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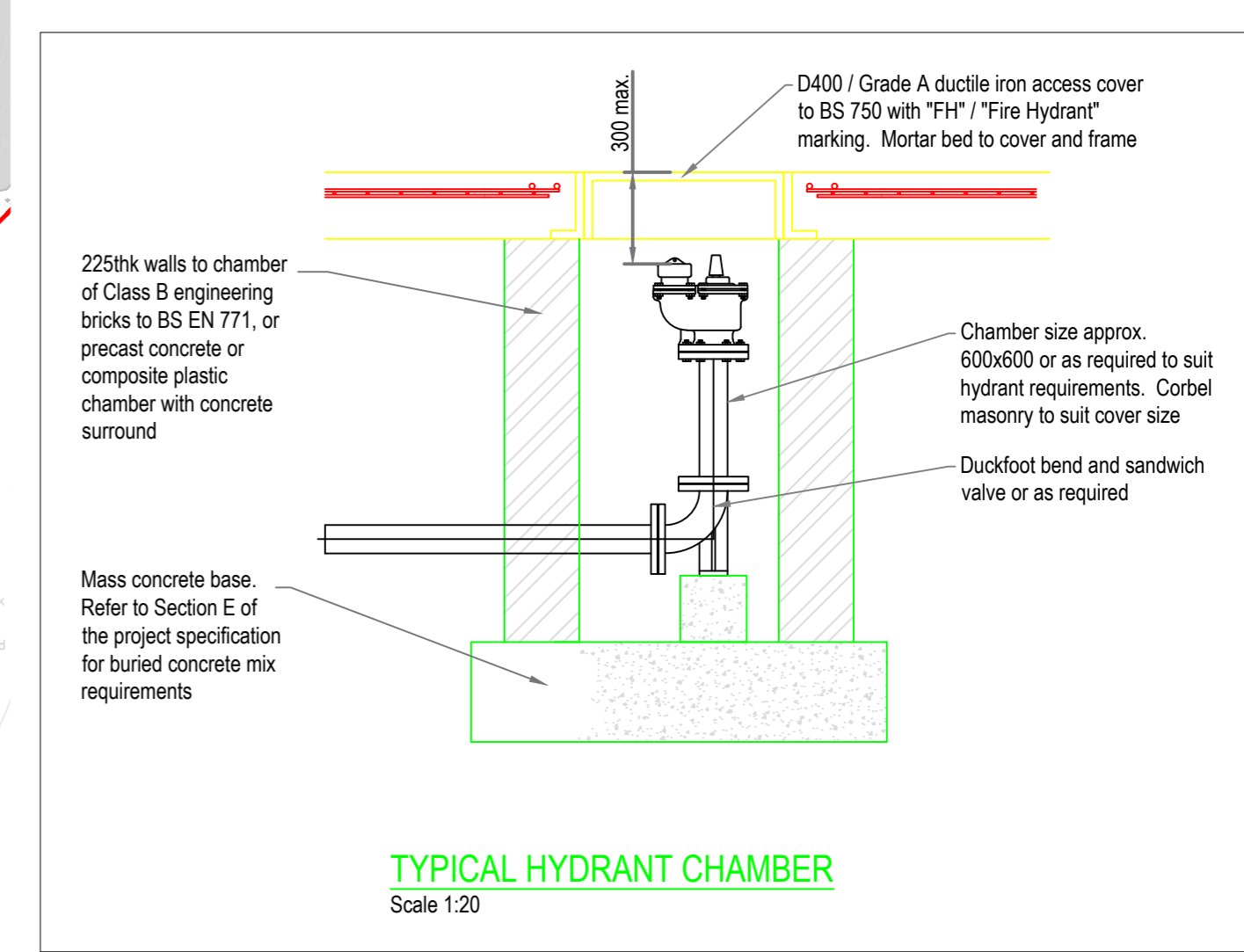
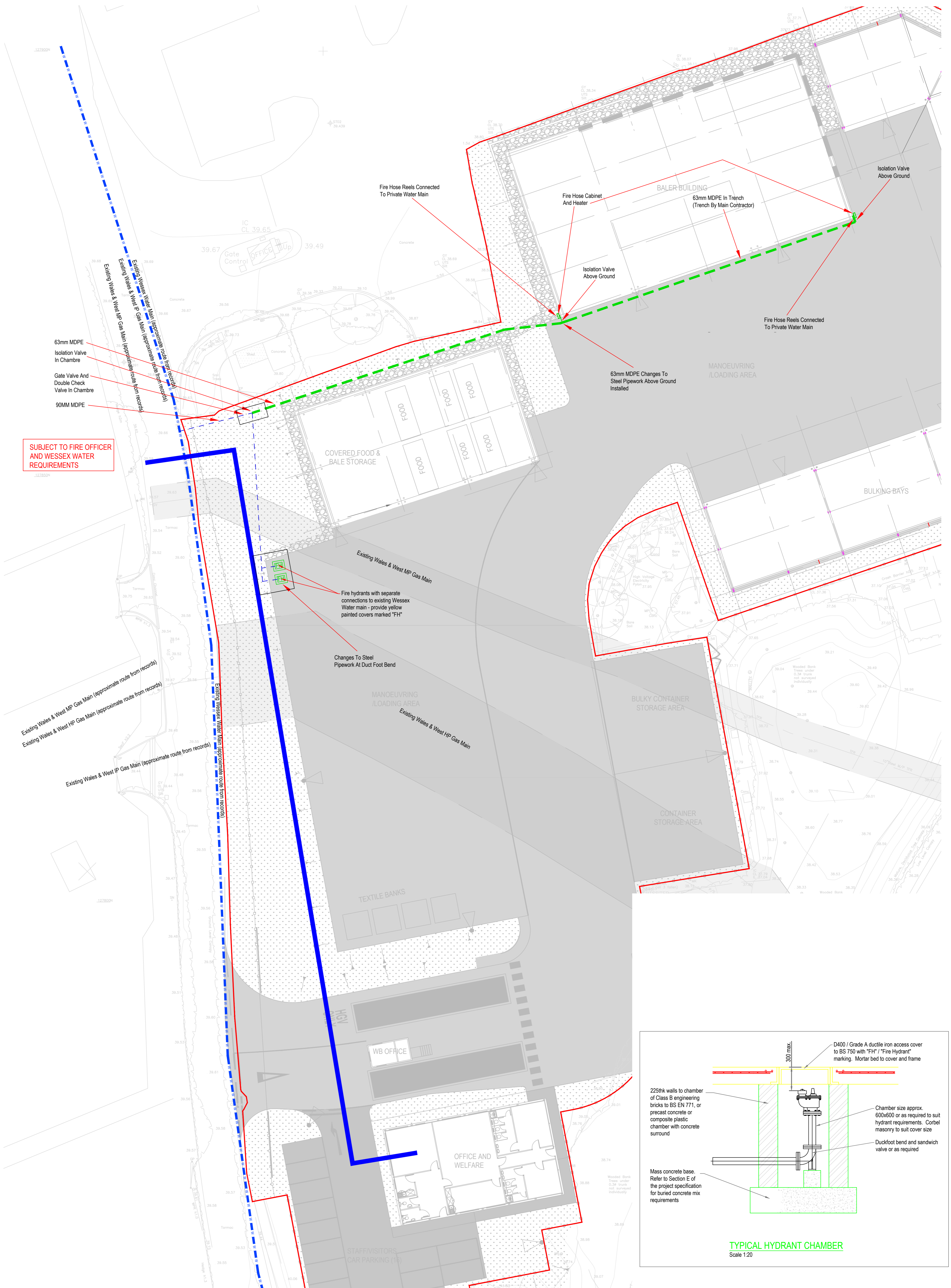
CLIENT
BRITANNIA CONSTRUCTION

STATUS
AS BUILT

PROJECT TITLE				
SUEZ WASTE TRANSFER STATION WALFORD CROSS TAUNTON				
DRAWING TITLE				
PROPOSED DRAINAGE LAYOUT				
SCALE AT A1	DRG SIZE	DRAWN	CHECKED	APPROVED
1:250	A1	WAH	RJH	CSD
JOB NO.	DRAWING NUMBER	STATUS		REV
12243	12243-0050	AS BUILT		AsB



Figure 7 – Private Fire Hydrants



Rev	Description	Date
A	PRELIMINARY ISSUE	AUG'21
B	PRELIMINARY ISSUE	AUG'21
C	PRELIMINARY ISSUE	SEPT'21

PRELIMINARY TENDER CONTRACT ISSUE	INFORMATION CONSTRUCTION AS FITTED
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Client BRITANNIA CONSTRUCTION
Project SUEZ WOLFORD CROSS TAUNTON

Title	Job No. B220	Dwg No. E005
Scale 1:200 A1	Drawn MAF	Checked KB
Date SEPT'21	A B C	

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