

Fire prevention plan template

Plan version: v1

Date of plan: July 2020

Site details

Site name: 3R Technology UK Ltd

Site address: Unit 21-22 Roman Way, Longridge Road, Preston, PR2 5BB

Operator name: 3R Technology UK Ltd

Who this plan is for

- All 3R staff
- Contractors working on site
- Local Fire Service
- EA staff

Issue	Date	Comments	Author	Approved by
1.0	29/07/20	Version 1 for submission to EA with Permit application	360 Environmental	Y. Wang

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Site overview

The 3R site consists of an open span warehouse of approximately 3,500m² with offices attached opening to the rear onto a 2600 m² yard bordered by 2m high palisade fencing and gates. The site is fully concreted and in good order throughout. The site sits within a large industrial area with the nearest residential housing some 310m from the building. Within 500m of the site there are at least 6 waste and recycling businesses. The M6 slip road is 1.3 miles away with excellent estate roads providing quick and easy access to the site.

3R current operate a plastics waste export business under T4 and S2 exemptions. A recent EA CAR gave the site a good report.

The company intends to operate a WEEE plastic separation business to meet the demands of the new POPs classification on WEEE waste. Purpose built equipment will be installed to carry out density separation to produce a number of recyclable streams from mixed WEEE shredder output that is likely to be classified as hazardous. This will principally be POPs-free plastic but will also include other materials removed from the feedstock including metals, paper, batteries etc. The heavy POPs waste will be disposed of through incineration.

Types of combustible materials

Combustible waste

Waste materials:

- Input - WEEE plastic shred from AATFs
- Output – sorted heavy/light plastic
- Output – residual metal/paper
- Output – wash sludge

Using this fire prevention plan

Where the plan is kept and how staff know how to use it

The Plan will be kept in four locations:

- Inside the rear access shutter doors.
- By the entrance from the offices to the warehouse.
- In the main office.

- Inside the front entrance to the offices.

All staff will be trained on the FPP requirements and be required to read through it. A record will be kept to show who has read it and been trained on it and the date. There will be annual re-training that will also be recorded.

Testing the plan and staff training

As above, every member of staff will undergo training on initial application of the plan and then annually.

A fire practice will be undertaken every year. This will involve a notional fire occurring in an input waste pile and will require staff to go through the process of warning, risk assessment, removal to quarantine area and suppression.

Records will be kept of all training and fire practices.

Fire prevention plan contents

Activities at the site

The site will be carrying out plastic separation from WEEE AATFs. Specialist equipment will be installed to separate the heavy and light fractions of WEEE plastic to enable the light fraction to then be recycled whilst the heavy – POPs – fraction is destroyed through incineration. The site has an capacity of potentially, 25,000 tonnes per year, but the initial annual throughput is expected to be approximately 6000 tonnes. The maximum material stored on site at any one time will be approximately 200 tonnes.

The separation process will be a self-contained purpose built plant in extensive use in other countries.

Site plan

The FPP site plan – 3RTech_04 – is attached at Appendix 4.

Plan of sensitive receptors near the site

The sensitive receptor plan – 3RTech_08_RECP – is attached at Appendix 8. This has considered all receptors from the FPP Guidance list but due to the largely industrial area in which the site operates, there are only those highlighted that are present within 1km.

- schools, hospitals, nursing and care homes, residential areas, workplaces
- protected habitats, watercourses, groundwater, boreholes, wells and springs supplying water for human consumption
- roads, railways, bus stations, pylons (on or immediately adjacent to the site only), utilities, airports

Manage common causes of fire

Arson

The site is fully secured with palisade fencing and a palisade gate and manual barrier into the yard. The whole area is covered by CCTV with remote access out of hours. In addition, we will install thermal imaging CCTV to cover internal waste piles. CCTV cameras are shown on the site plan 3RTech_04 at Appendix 4.

The thermal cameras will have a temperature alert system that will provide a mobile phone warning to the appropriate staff.

The CCTV system will be tested daily to ensure all cameras are fully functional and will also be part of the annual qualified electrician test. This will include a heat source tests for the thermal CCTV. Any failures of equipment will see immediate repair or replacement.

Plant and equipment

The planned equipment for the processing of WEEE plastic is shown in Appendix 5.

The plant is a combination of automation and hand sortation and consists of conveyor belts, granulators, trommels, flotation chambers, air classification equipment and picking belts. It is purpose built for the task of sorting mixed WEEE shredder output into its constituent parts and the processing the WEEE plastic into POPs and non-POPs.

There will also be the following additional equipment on site for managing waste:

- Vehicle weighbridge
- Fork lift
- Bucket loader

Fuel and oils for the plant and equipment will be stored in a sealed container along the party wall as shown in Appendix 4.

Electrical faults including damaged or exposed electrical cables

Electrics certification

The WEEE processing equipment will be installed by the manufacturers and along with all other equipment, will be fully tested and certified by a qualified electrician prior to commencement of operations.

Electrical equipment maintenance arrangements

All equipment will be subject to annual testing and certification by a qualified electrician.

All equipment will undergo full maintenance according to the manufacturer's instructions.

The WEEE equipment is in the process of manufacture and the maintenance schedule will be added to this fire plan as Appendix 10.

Records will be kept electronically of all maintenance and testing.

Discarded smoking materials

Smoking on site policies

There is no smoking allowed anywhere in the building or the rear yard. There is a designated smoking area by the access gate into the car park at the front of the building and another near the yard access gate. Both are at least 20m from any waste area.

Hot works safe working practices

There will be no hot works on site as part of the waste operations. Where hot works may be required for equipment maintenance and repairs, there will be a hot works procedure and a fire attendant present during the hot work and afterwards for a period of 1 hour with an appropriate fire extinguisher.

Use of industrial heaters

The building contains a heating system that negates the need for any separate industrial heaters.

Hot exhausts and engine parts

Fire watch procedures

The thermal imaging camera warning system will be monitored at all times during operational hours by office staff and on the automated warning app on staff mobiles. This will detect any flare up that may be caused by hot exhaust and engine parts.

There will be a designated fire watch operator for each shift who will be responsible for monitoring equipment generally and for ensuring that procedures are applied should there be any sign of excessive heating of engine parts and exhausts. All mobile plant operators will also be trained to ensure that they have full awareness of the signs that might lead to fires being caused by engine heat.

There will be a regular inspection routine for fluff build up and leaks of oil or fuel on mobile plant. These will take place before the start of each shift and then 4 hours of operation although operators will be instructed to continually look out for fluff build up in the exhaust area.

Ignition sources

There will not be any ignition sources on site other than equipment or mobile plant failure. Smoking is forbidden in the building, there will be no hot works other than under the conditions specified above and there will be no industrial heaters.

Build-up of loose combustible waste, dust and fluff

Mobile plant will be inspected and cleaned of dust and fluff by the operator before the start of each shift with the person inspecting completing an entry on a record sheet. This will be to identify and remove any waste, dust and fluff. Operators will also be required to apply a continual visual check process, especially in parts of the plant where it is known that these build up. The inspection will also include a check on engine leaks, which if identified, will lead to the plant being removed from service until rectified.

Reactions between wastes

We do not expect there to be any reactions between waste types. The waste received will be the processed output from authorised WEEE treatment facilities and will be inert and primarily non-hazardous. The Small Mixed WEEE shredder stream will arrive in loose or in bulk bags after an extensive shredding process that should remove any risk of battery shorting or reaction. However, it is recognised that there is still some residual risk and it is expected that this will be mitigated by the monitoring and fire suppression measure applied – thermal CCTV, fire extinguishers and sand buckets. There will be a designated quarantine area for the WEEE Waste in the yard as shown on the site plan 3RSP001.

Deposited hot loads

The primary risk of hot loads will come from the Small Mixed WEEE shred and lithium batteries that may still be present although this is considered a small risk as the waste will have been through a shredding process by the supplier. We will operate a hand held temperature device and will monitor all loads as they arrive. Should a load be deposited and be found to be either smouldering or be picked up on the thermal CCTV as being hot, it will immediately be removed to the external quarantine area and spread out to identify the heat source. This will then be isolated and dealt with by fire suppression methods, primarily sand.

Prevent self-combustion

General self-combustion measures

We will be monitoring all input loads for any temperature variation. Bags and loose material will emptied into the incoming WEEE storage bays. These bays will also be continually monitored these bays with the thermal CCTV camera to identify any heat increases that may point towards self combustion. In the event of this occurring, the waste will be removed to the external quarantine area.

Manage storage time

Method used to record and manage the storage of all waste on site

WEEE input waste – there will be two bays for incoming WEEE waste storage. The operation will work on a strict first in first out basis with one bay being emptied for treatment as the other bay is used for incoming storage. This waste will be stored for a maximum of one week under normal circumstances and may only exceed that during any unplanned shut down for repairs or unexpected maintenance.

The bays are each capable of storing up to 50 tonnes of shredded WEEE. The equipment has capacity to process up to 20ktpa on three shifts but initially, we expect to process on a single shift at a rate of approximately 6ktpa or 20 tonnes per day. We would therefore anticipate that waste will be cleared from each bay every 2-3 days.

WEEE output waste – there will be a number of streams that will be sorted from the input stream into individual material types and stored in polypropylene bulk bags prior to transport to separate recycling and disposal routes:

Waste type	Estimated Percentage	Expected daily volumes	Storage	Max storage time
Hazardous (POPs) plastic	25% of input	6 tonnes/day	PP bulk bags	5 days
Non-haz recyclable plastic	60% of input	14 tonnes/day	PP bulk bags	3 days
Stones, glass and heavy metal contamination – non-hazardous	10% of input	2.4 tonnes/day	PP bulk bags	5 days
Mixed general waste – non-hazardous	4.8% of input	1.2 tonnes/day	PP bulk bags	5 days
Hazardous sludge	0.2% of input	0.24 tonnes/week	tank	4 weeks

Stock rotation policy

This is not relevant as there will be no baled waste stored on site and the input and output WEEE wastes will be on site no more than one week under normal circumstances.

Monitor and control temperature

Reduce the exposed metal content and proportion of 'fines'

The WEEE waste will not be on site long enough for there to be a risk of self-combustion. Metals will be separated out through the sorting and shredding process. The only metal that will be present will be small items left in the primarily plastic residue from the small mixed WEEE treatment facility. This is not considered to be an area of combustion risk given the maximum storage time and the heat monitoring of the material on arrival.

Monitoring temperature

We will monitor temperature through the identification of hotspots using thermal imaging. There will be a thermal CCTV covering the waste receiving bays and CCTV at various stages in the process. Incoming loads will also be scanned by a hand held thermal device.

We are unable to give trigger temperatures at this stage, but we would expect these to be approximately 30 degrees centigrade above ambient.

All staff will be trained in fire detection and reaction procedures and specific staff will be trained in the monitoring of the CCTV screens and the hand-held device.

Controlling temperature

For WEEE-derived material, if there is evidence of temperature build up, we will remove the material to the external quarantine areas with the bucket loader and spread the material to identify the cause. If there has been no combustion, the offending article will be removed and placed in a bucket of sand. If there is combustion or a perceived danger of combustion ie smoke, then sand would be quickly poured onto the hot area and supervised for an hour before uncovering to determine if the risk of fire had disappeared. If it had, the offending item would be removed and placed in a bucket of sand for 24 hours to ensure there was no further risk and then disposed of.

Dealing with hot weather and heating from sunlight

There will be no waste exposed to direct sunlight.

Manage waste piles

Maximum pile sizes for the waste on your site

Waste stream	Location (must match site plan)	How it is stored	Max. length / m	Max. width / m	Max. height / m	Volume / m ³	Max. time it will be stored
Input WEEE shred	Internal A	Loose in 2 bays each of measurement shown	6m	6m	3m	108cu.m	2 weeks
Output Sorted heavy plastics	Internal B	2cu.m bags	6m	6m	2m	72cu.m	2 weeks
Output sorted light plastic	Internal C	2cu.m bags	6m	6m	2m	72cu.m	1 week
Output heavy (stones, lass and heavy metals)	Internal D	2cu.m bags	4m	4m	2m	32cu.m	2 weeks
Output mixed general waste	Internal E	1100 litre wheelie bins	4m	4m	1.2m	15cu.m	2 days

Storing waste materials in their largest form

There will be two types of material storage:

Loose Small Mixed WEEE shred input. This will be stored in the input bays for no longer than 1 week prior to treatment. This will be varying particle sizes.

Output streams from treatment process. These will be in varying particle sizes, none larger than 16mm. These will be stored no longer than 1 week on site.

Where maximum pile sizes do not apply

Waste stored in containers

Types of containers you are using

Non-recyclable waste from the WEEE sorting facility will be stored in 1100 litre wheelie bin containers. As the volume of these is slightly greater than 1100 litres, these are considered to be outside the pile size limits. These can be rapidly moved by manually handling the containers out of the way.

Other output streams from WEEE processing stored in polypropylene bulk bags. This will be stored in such a way as to be well below the pile size restriction of 450cu.m. These will be able to be moved using the onsite forklift.

Accessibility of containers

The building has large roller-shutter door access front and back.

Output containers described above will all be stored inside the building easily accessible through the front roller-shutter door.

Moving containers in a fire

In the event of a fire, the supervisor would assess the location and potential scale of the fire and the risks in moving any waste at risk of igniting.

This would be balanced by the evacuation drills and the need to clear the building to prevent any danger to life.

The only waste stored in containers would be the output material in 1100 litre wheeled containers. Two of these would be in use by the WEEE treatment equipment near the front roller shutter door which could be easily moved manually to a safe place aware from any fire including to the outside front of the building through a roller shutter door. Containers awaiting emptying would be stored to the rear of the building and would be able to be easily moved manually into the rear yard through a roller shutter door.

Prevent fire spreading

Separation distances

WEEE input – loose and bagged material will be stored in bays constructed of fire-resistant concrete blocks.

WEEE output – material will all be contained in 2cu.m polypropylene bags that will be stored in bays constructed of fire-resistant concrete blocks.

Fire walls construction standards

The bays would be constructed of fire-resistant materials to BS 476 or BS 8810:1997 to provide fire resistance for a minimum of 120 minutes.

Walls and bays would be sealed to ensure their fire resistance. The height, thickness and construction of firewalls would be sufficient to stop a fire spreading and minimise radiant heat. BS8810 specifies a minimum wall thickness of 160 mm to resist fire for two hours. The design, installation and maintenance of bay walls would be covered by an appropriate UKAS accredited third party certification scheme.

Storing waste in bays

Response to the bullets stated in the Guidance:

- *resist fire (both radiative heat and flaming)* – the storage bays will be enclosed on three sides by fire resistant concrete blocks with 1m freeboard.

- *have a fire resistance period of at least 120 minutes to allow waste to be isolated and to enable a fire to be extinguished within 4 hours – the concrete blocks will be to a specification and will be sealed to enable a minimum of 2 hours resistance to fire.*
- *you will carry out full and frequent stock rotation, ensuring you have a first in, first out policy, and how this will be monitored and recorded you will check the temperatures of all the waste within the bay so that you carry out representative checks on the entire volume of the pile – all material storage will be recorded with numbers and dates on bags to indicate date of entry. Storage will be organised such that the material can be removed in date order.*
- *you have taken into account the calculation of flame height and radiation in preventing the spread of fire between piles – there will be 1m freeboard height and from the front of each bay to prevent radiation of fire.*
- *you will prevent brands or lighted material moving outside the bay walls and igniting other wastes – as above.*
- *you will keep a 'freeboard' space at the top and sides of the walls clear at all times to prevent fire spreading over the walls – if you store waste at the maximum pile sizes as detailed in section 9.2 then you need a minimum freeboard space of 1m to reduce fire spread – confirmed as above*
- *you'll quickly and effectively remove wastes at risk of ignition to the quarantine area to isolate any bays with burning waste during an incident – confirmed as previously stated.*

Quarantine area

Quarantine area location and size

It is proposed to operate one main quarantine area in the building for both the waste input and output storage areas as shown on the site plan. This will be 50% of the largest pile size. In addition, it is proposed to maintain a separate bay in the output storage area for any small incidents occurring that would be best dealt with an enclosed space.

The main quarantine will have dimensions 4m x 4m with a 3.5m height limit, providing an overall volume of 56cu.m.

The quarantine bay in the output storage area will be 3m x 6m x 3m providing an overall volume of 54cu.m.

How to use the quarantine area if there is a fire

In the event of a fire in one of the storage areas, the supervisor will assess the risk of moving material and if it is deemed safe, will instruct the relevant plant operator to access the material and to move it to the main quarantine area.

For loose infeed material, this will entail the front-loader moving material out of the bay to get access to the combusted material and then moving that to the quarantine area. However, it may be that once accessed, it will be considered safer to suppress the fire in situ as with this sort of material, it is likely to be a highly localised hot spot that may simply be best moved away from the remaining material to immediately cover in foam from the fire extinguishers. If the assessment was that this should be isolated for fire suppression, it would be moved to the quarantine area.

For the output material, the level of treatment and rapid turnaround would suggest self-combustion would be extremely unlikely. But should a hotspot be identified that indicated the risk of a fire, the supervisor would instruct the fork lift operator to move the bags to get access to the hot spot and to then move that bag to the quarantine bay if a small isolated incident or to the main quarantine area if it is likely to be more than one bag.

In all cases, the remaining material would be monitored with the thermal detector to identify any further potential risks.

At all times, the supervisor would need to assess the risks of moving material and whether by moving it, it increases the risk to staff, the environment and the building.

Procedure to remove material stored temporarily if there is a fire

Any material placed in the quarantine area would be assessed for the correct disposal route following the completion of the fire suppression. This would consider the damage caused by the fire to determine if material could be salvaged and the suppression materials to determine the residual contamination.

Detecting fires

Detection systems in use

The site will be fully covered by CCTV both inside and out.

Thermal CCTV will cover the waste storage areas and the WEEE processing equipment. This will be linked to a 24 hour monitoring service and will be set to trigger an online warning to specific staff through their mobile phone.

A hand held thermal device will also be used for carrying out daily checks on all waste stored and checks on each delivery of WEEE for treatment.

Certification for the systems

The CCTV will be UKAS-accredited but will not be installed until the permit is granted as it is a big investment that cannot be justified under the conditions of the exemptions the site currently operates.

Suppressing fires

Suppression systems in use

We believe that the scale of the operation and value of the business and building does not justify a high-cost automated fire-suppression sprinkler system. We propose that the following measures mitigate the need for this by satisfying the requirement to prevent the spread of fire:

- As previously stated, the waste piles would all be covered by thermal CCTV with online mobile warning technology.
- The nearest Fire Station is 2.6 miles distance from the site.
- There is easy access to waste piles for the Fire Service in the event that the keyholder is not present quickly enough. Internally, both input and output waste is stored in bays next to roller shutter doors that the fire service can easily cut through.
- Key holders will be able to reach the site within 20 minutes.
- Given that the waste stored internally will have either been treated prior to arrival or will be the output from the 3R treatment, then it is considered that it presents a very low risk of combustion.

Certification for the systems

As above, it is not intended to have a certified sprinkler system.

Firefighting techniques

Active firefighting

The site operation will include the use of mobile plant to move the waste. This will include a front bucket-loader for moving loose in-feed waste into the treatment process and a fork lift to move output waste bags internally.

These remain on site at all times and will be available for the movement of waste into the quarantine areas and the separation of any hot spots in delivered and stored waste.

There will be a portable fire suppression system available for staff to use if considered safe to do so.

There will be standard fire extinguishers around the site near the waste piles and the waste treatment equipment.

The site would also deploy two other measures:

- Sand buckets next to the input storage area and next to the treatment process. These would be used to bury a lithium battery if identified showing signs of excess heating.

- [Elide fire extinguisher ‘bombs’](#). These would be placed next to the WEEE input and output storage areas for use in the event of combustion taking place in a part of the pile that would either be inaccessible for a normal fire extinguisher or too hot. The ‘bomb’ would be thrown onto the burning area and almost immediately explodes spreading extinguisher powder. Whilst on its own, unlikely to extinguish a fire within a pile, it is expected that this would enable a fire to be controlled until the arrival of the fire service.

Water supplies

Available water supply

The site will not have its own water supply (eg storage tanks/lagoons) beyond normal on-site taps.

Fire hydrants have been identified in the site plan Appendix 1 and would be expected to provide the necessary water supply for the fire service to deal with an incident in relation to the calculated requirement below.

Show the calculation for your required water supply

Maximum pile volume in cubic metres	Water supply needed in litres per minute	Overall water supply needed over 3 hours in litres	Total water available on site in litres
Internal 108 cu.m	720.36 litres/minute	129,665 litres	Unlimited from hydrants

Managing fire water

Containing the run-off from fire water

The calculation above has been used to determine the maximum volume of water that would need to be retained in the event of a fire.

The Area of the building is 3492sq.m. 198cum is deducted for stored waste for stored waste footprint leaving 3294sq.m of internal free floor space for water retention. For 129,665 litres, a bund of 3.93cm would be applied across all entrances.

There is no internal draining but there are surface water drains in the yard. In case of leakage from the building, a lock off valve will be installed on the exit surface water drain to the front of the building. In the case of a fire, this would be closed off remotely therefore preventing fire water from entering the surface water drainage outlet..

During and after an incident

Dealing with issues during a fire

In the event of a fire requiring the Fire Service, the site would be closed to all incoming waste and suppliers would be immediately informed to retain waste or find alternative disposal arrangements until the fire was extinguished and further information was available on re-opening. As there will be a limited number of suppliers, this would be done by phone and text message to ensure immediate action.

Notifying residents and businesses

The following would be notified in the event of a fire, dependent on severity.

Severity 1 – contained by site staff

Severity 2 – fire service called but fire contained in building.

Severity 3 – fire spreading to the building and need for evacuation of local businesses.

Severity 4 – fire out of control with risk of widespread air pollution

Name	Contact details	1	2	3	4
Next door business	HMT logistics, 20 Roman Way, Preston Tel: 01772 786900 TGM Ltd, Unit 23 Roman Way, Preston Tel: 01772 909306 Astra Business Centre, Roman Way, Preston - Tel: 01772 797589	x			
Other businesses in Roman Way	Kuehne & Nagel. 24 Roman Way, Preston Tel: 01772 704139 Misfits, Unit 25 Roman Way, Preston Tel: 07732 333236 HIQ Tyres, 26 Roman Way, Preston Tel: 01772 652662 Alston, 27 Roman Way, Preston Tel: 01772 700590		x	x	
Environment Agency	General enquiries - 03708 506506 Incident hotline - 0800 807060		x	x	x
Preston Fire and Rescue Service	Non-emergency – 01772 795222 Emergency - 999		x	x	x
Police	Non-emergency - 101 Emergency - 999			x	x
Preston City Council	Environmental Health – 01772 906907 Emergency out of hours – 01772 906916 General enquiries – 01772 906900			x	x

Clearing and decontamination after a fire

Once the site had been made safe to the satisfaction of the Fire Service, the damage and clean up requirements would be assessed by the management to determine the potential for re-opening.

The immediate priority would be the appropriate disposal of any residual fire water, foam and polluted stock. This would require chemical analysis to determine the hazardous content – in particular, POPs - and disposal route.

A clean-up specialist company would be contracted to remove all fire-damaged and contaminated material and to prepare the site for continued operations.

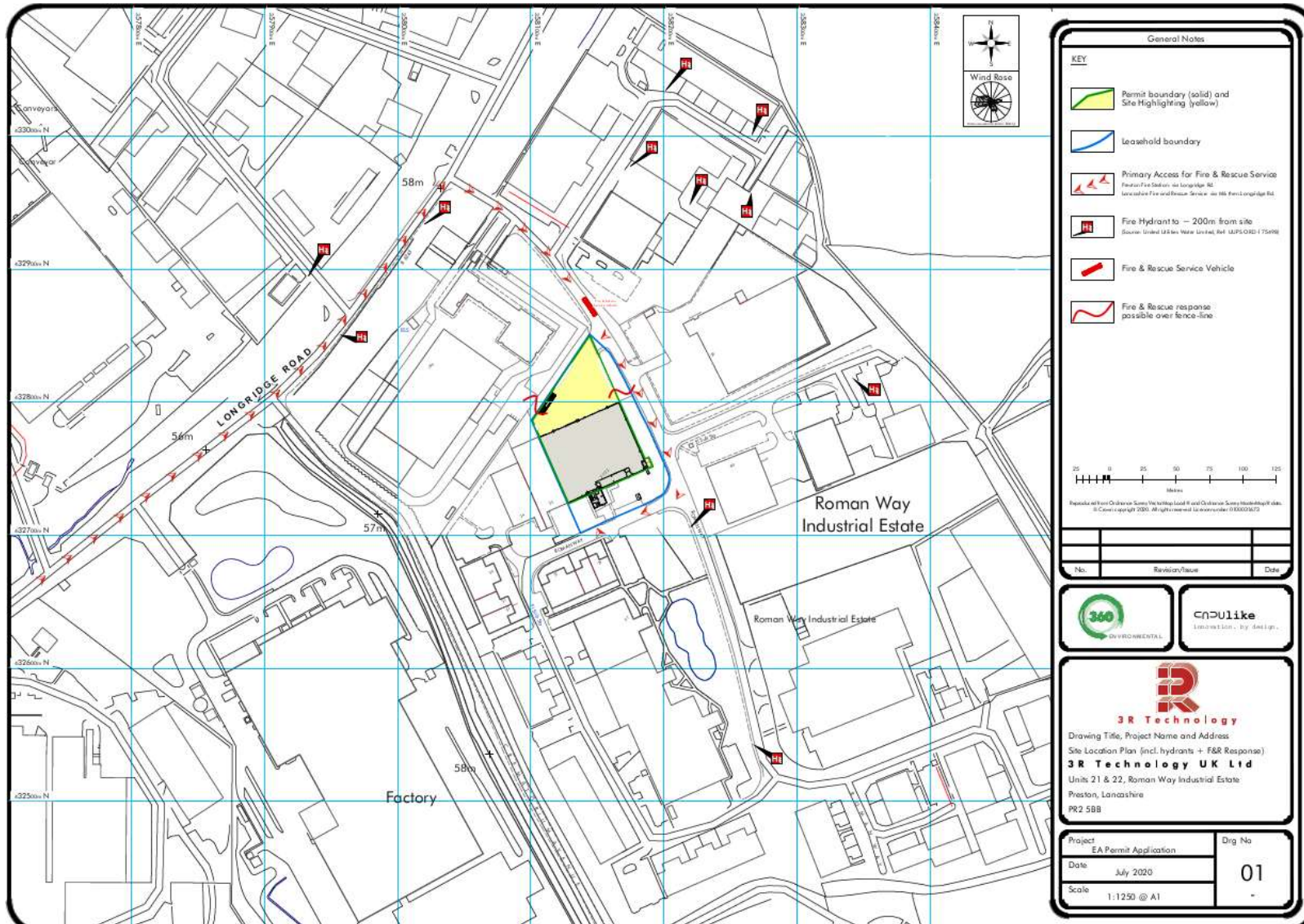
The EA would be consulted as to the extent of the restoration back to pre-fire state to be able to recommence waste receipt and processing.

Making the site operational after a fire

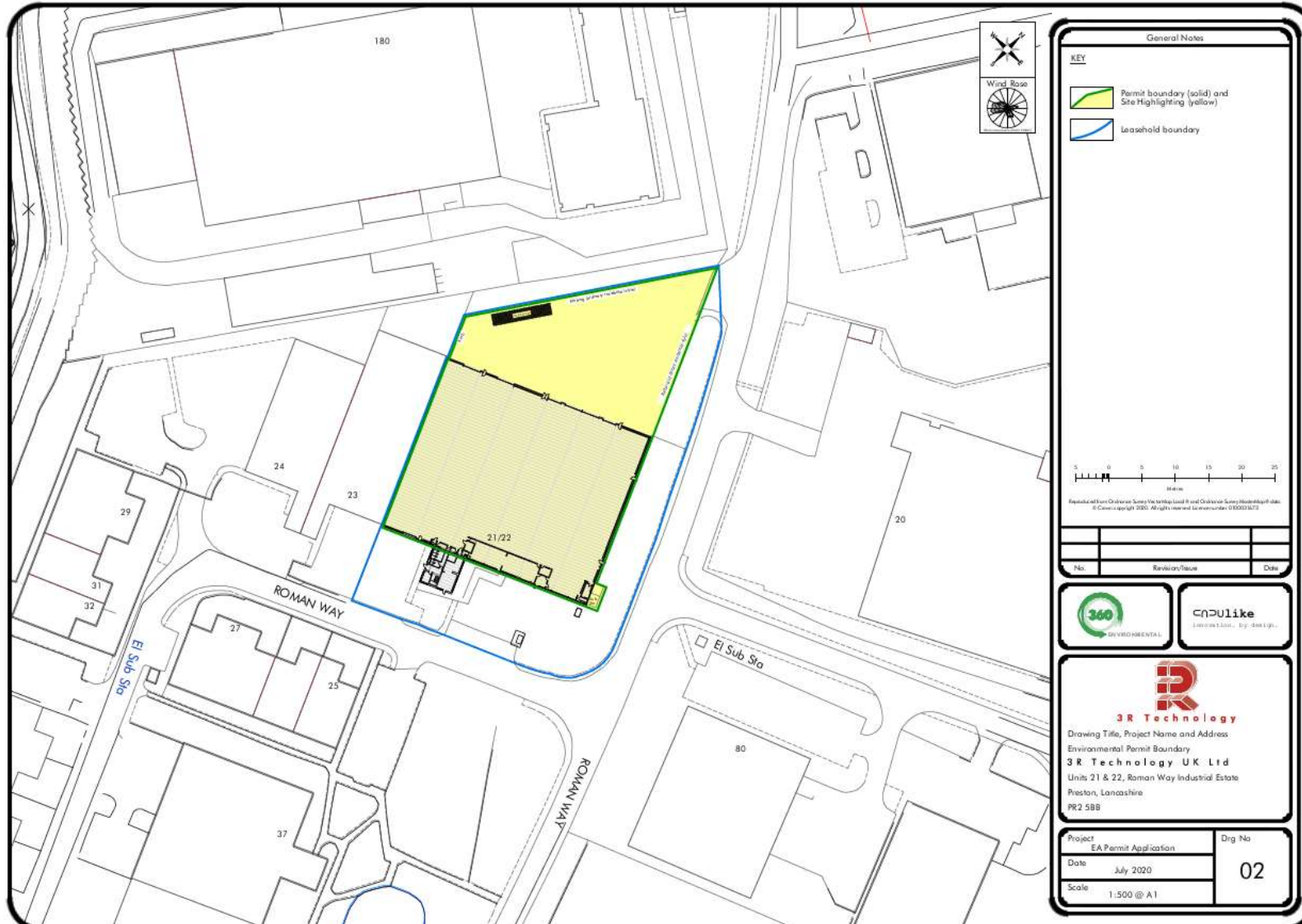
A full report on the cause of the fire would be compiled and action taken where possible to mitigate the possibility of further similar fires.

Once all damaged and contaminated waste had been removed, damage to the building and equipment repaired and the site was considered fit for continued operation, the Environment Agency would be called to visit the site to agree that operations could recommence.

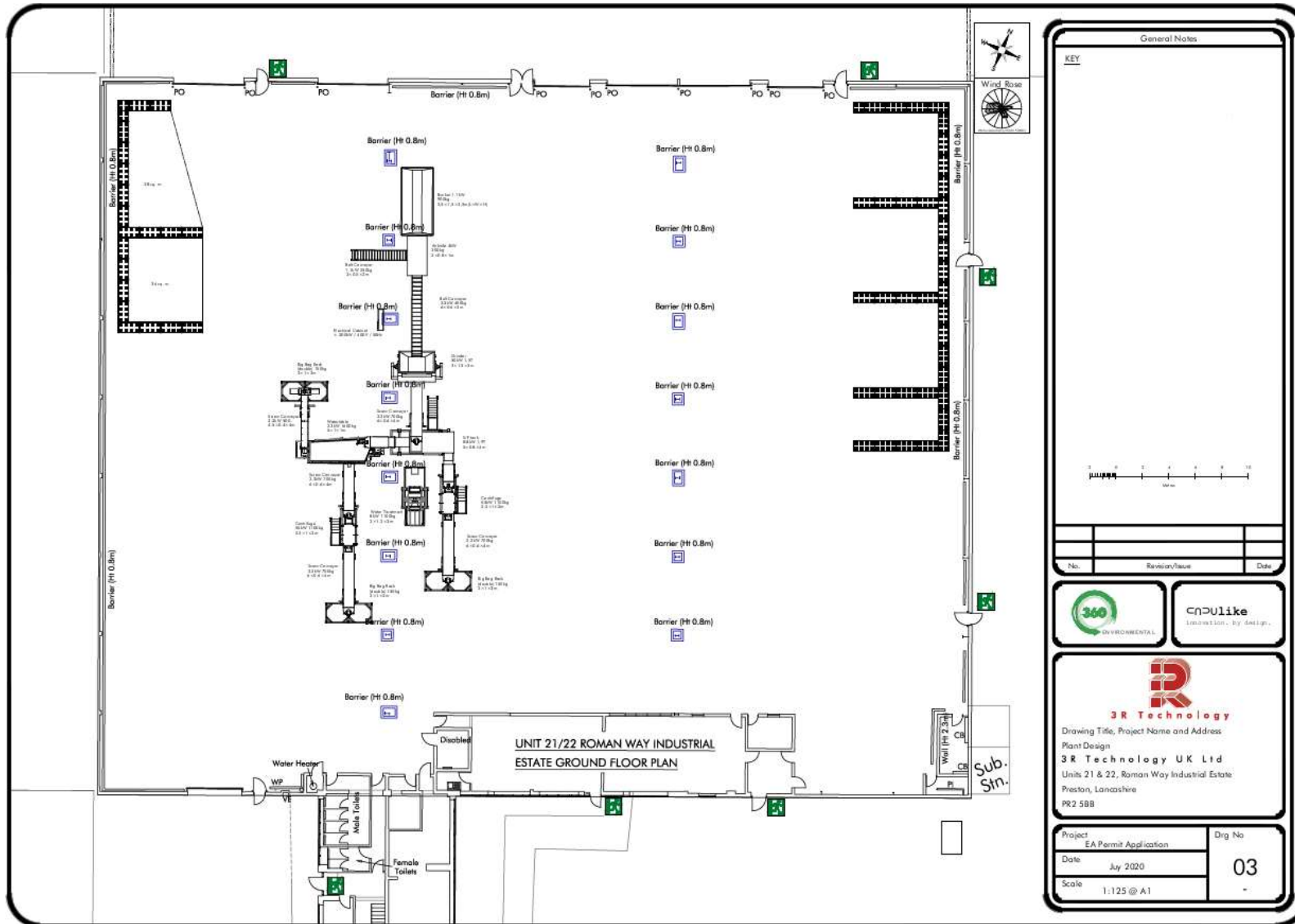
Appendix 1 – Site Location Plan (Drawing No.01)



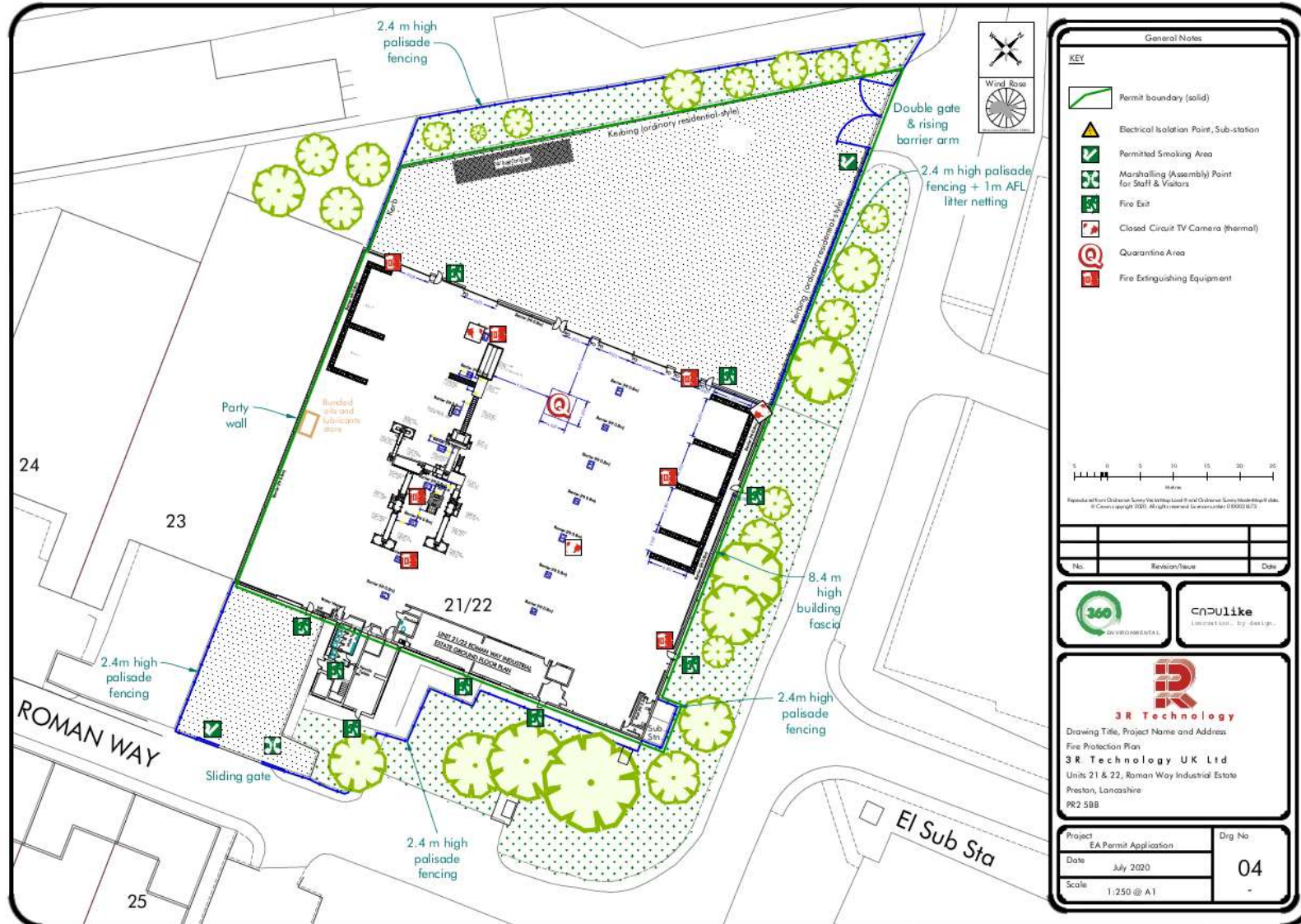
Appendix 2 – Environmental Permit Boundary Plan (Drawing No.02)



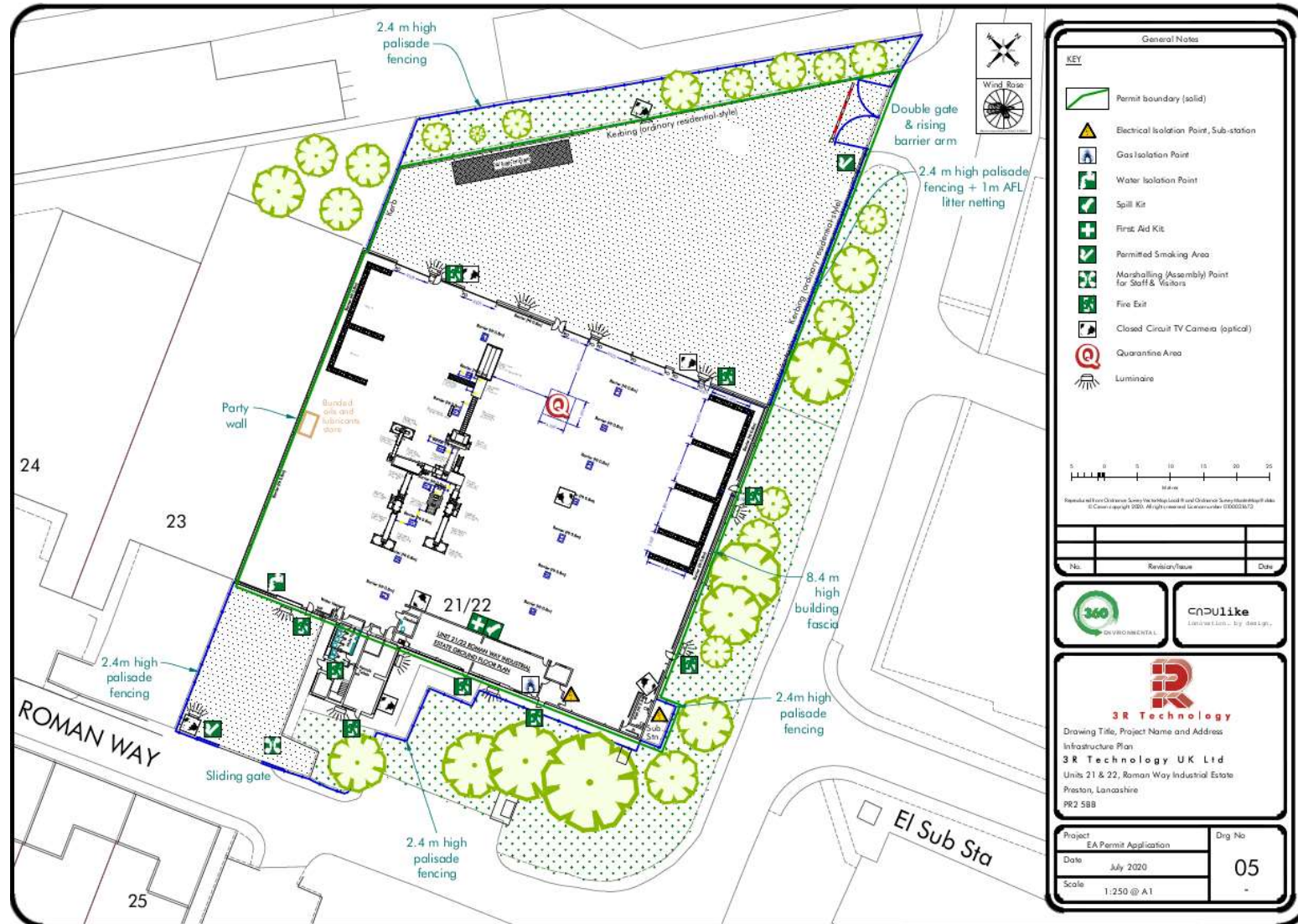
Appendix 3 – Plant Design Plan (Drawing No.03)



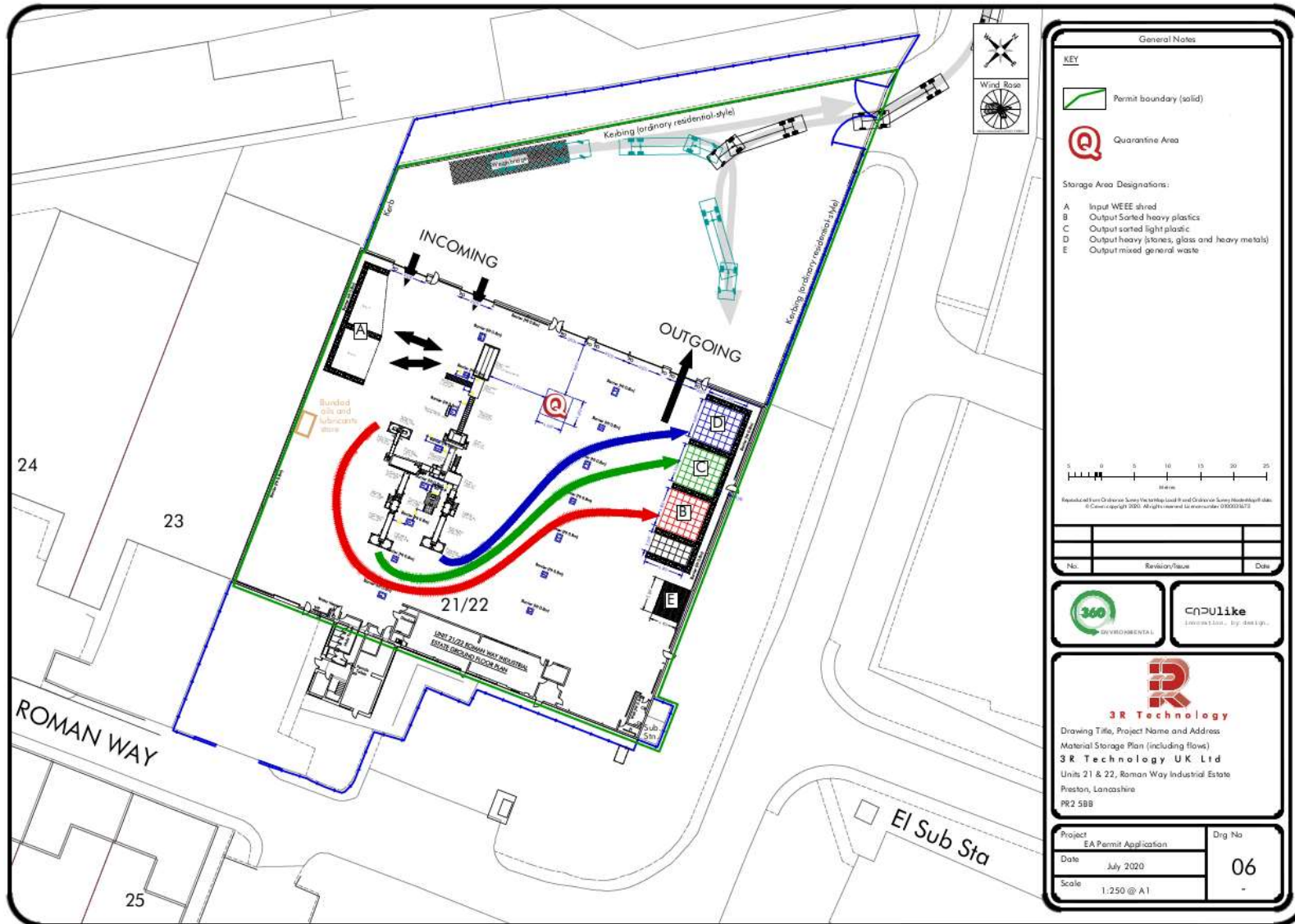
Appendix 4 – Fire Protection and Fire Hydrant Location Plan (Drawing No.04)



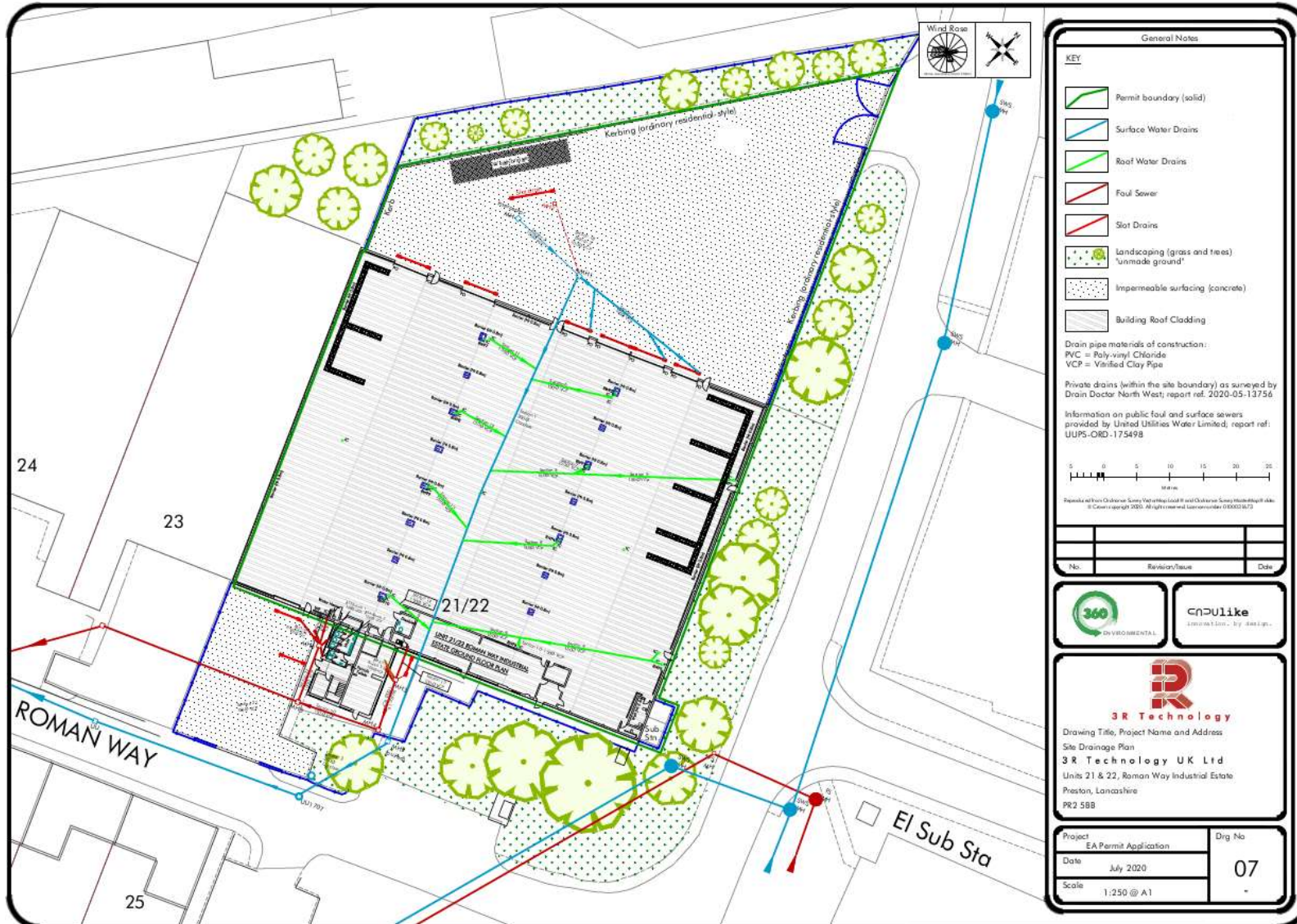
Appendix 5 – Site Infrastructure Plan (Drawing No.05)



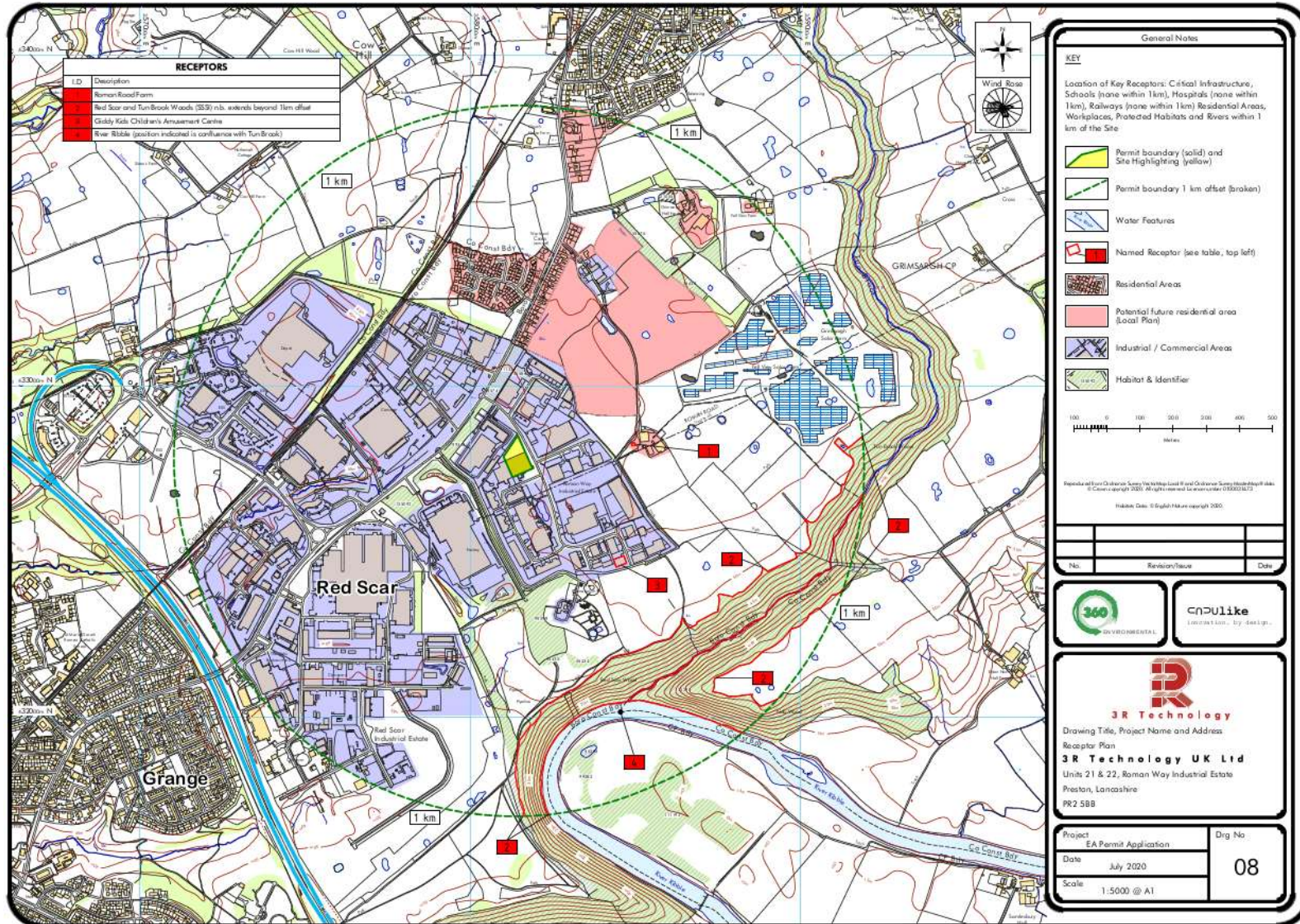
Appendix 6 – Material Storage Plan (Drawing No.06)



Appendix 7 – Site Drainage Plan (Drawing No.07)

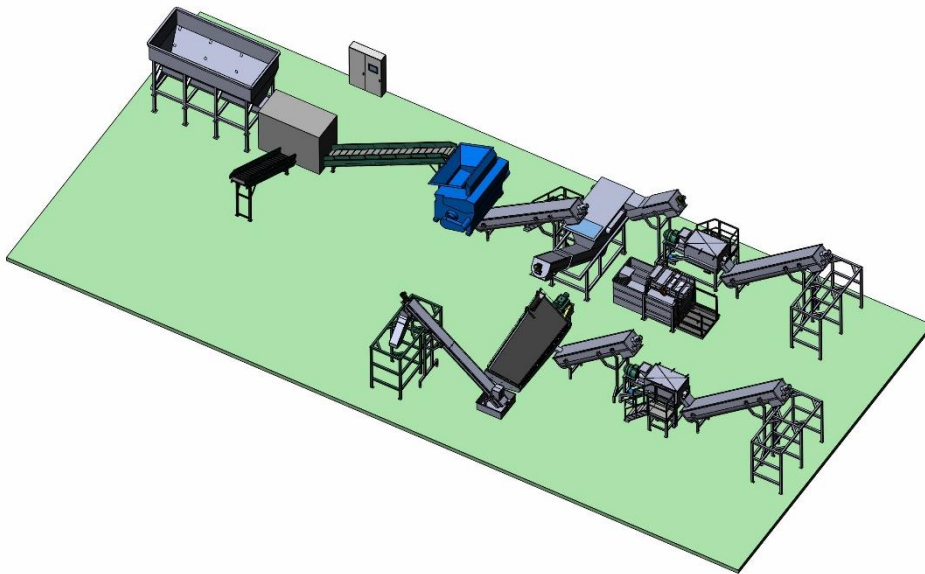


Appendix 8 – Receptor Plan (Drawing No.08)



Appendix 9 – Equipment Technical Booklet

Technical Booklet



PLASTIC RECYCLING PLANT

3RT - UK

HERMION B.V.

Keurweg 16 – 5145 NX Waalwijk – The Netherlands
Tel. 0031(0)416820218
Email mbdriessen@hermion.nl - Rabobank 10.14.58.681
KvK 17237316 - BTW nr. NL8201.46.675.B01

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PREFACE

This booklet describes the “Plastic Recycling Plant” designed for 3RT.
No rights can be obtained from this information.
Kindly note all used pictures/figures are purely indicative.

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1. General information

This recycling plant has been designed for the recycling, separation and upgrading of mixed plastics. This waste stream is treated and turned into clean, valuable raw materials. In her designs Hermion always uses the BAT (best available technology).

1.1 EC DECLARATION

During the design of the Recycling Plant, the requirements as established by the European Community in the Machinery and EMC directive, have been observed.

All machinery and parts delivered by Hermion are in conformity with EC Regulations. Should the EC regulations and standards followed not meet the local regulations, the required ones have to be made available to HERMION in English. Technical changes due to any local standard may cause additional works which are not included.

The CE Certificate will be released after delivery and installation.

1.2 SCOPE OF DELIVERY

The delivery of Hermion's Plastic Recycling Plant consists of a turnkey installation.

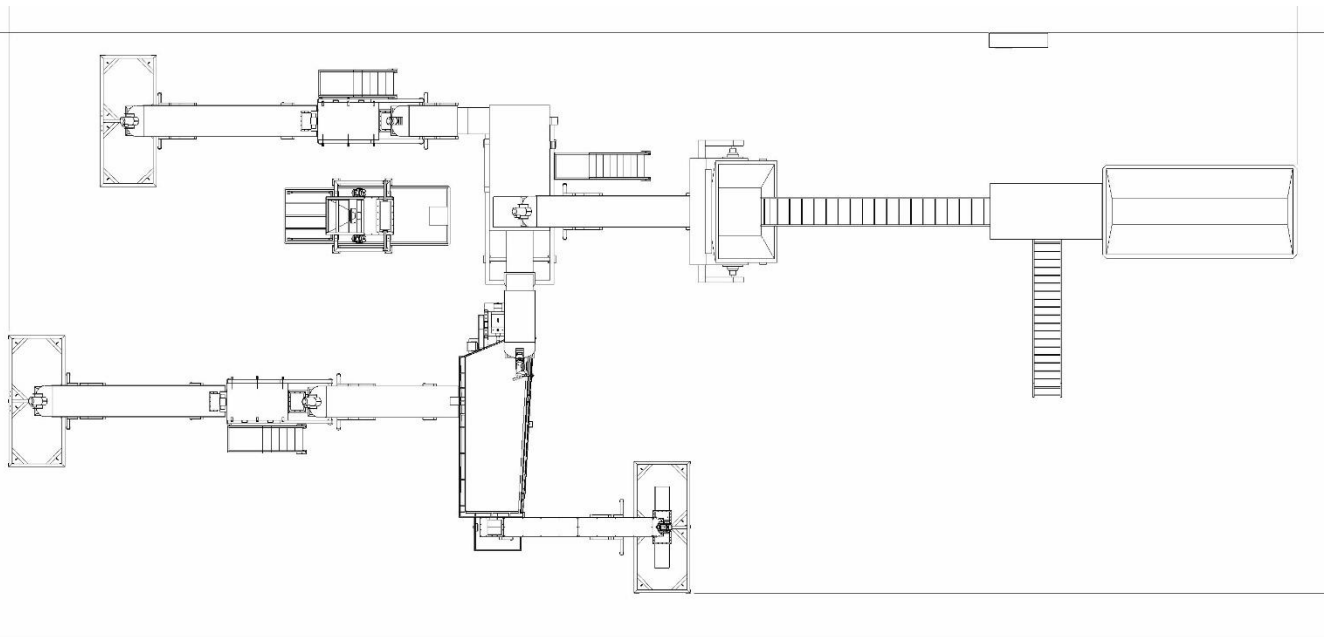
1.3 ADAPTATIONS

Adaptations to the Recycling Installation can only take place with the approval of HERMION BV.

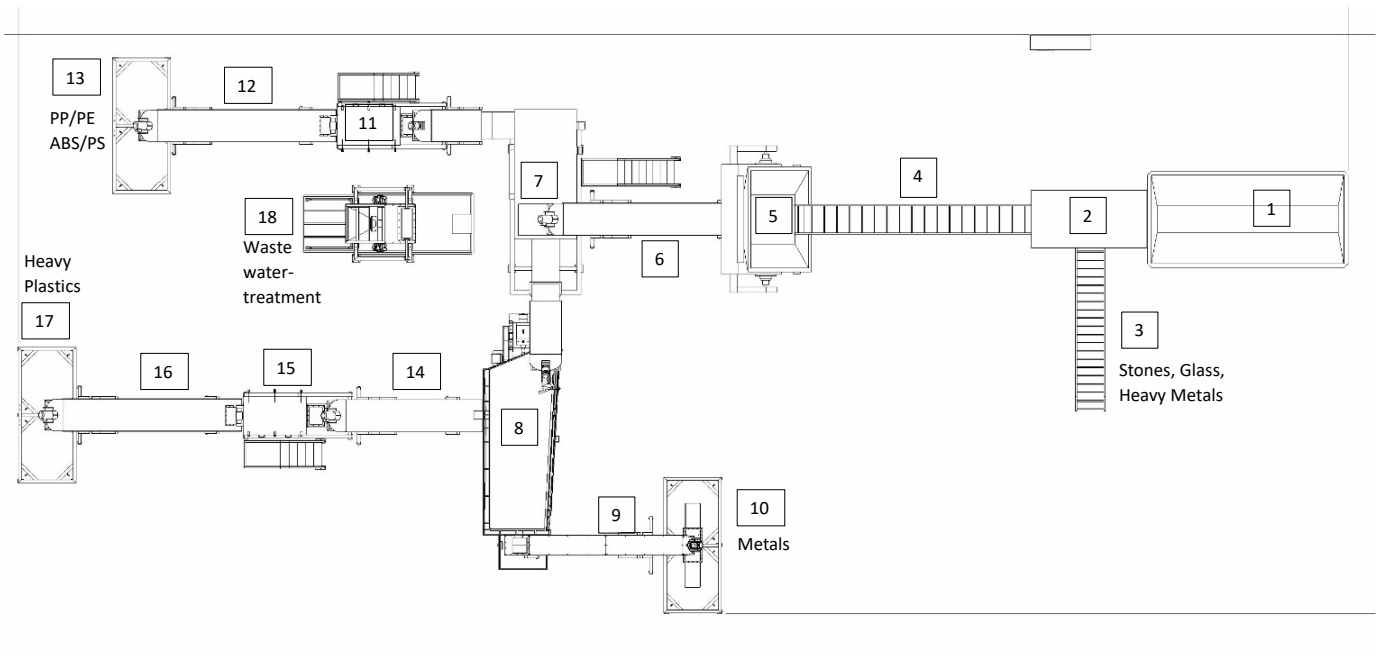
In case of changes and/or adaptations all conditions in the applicable directives must be observed.

2. Plant components

2.1. LAYOUT






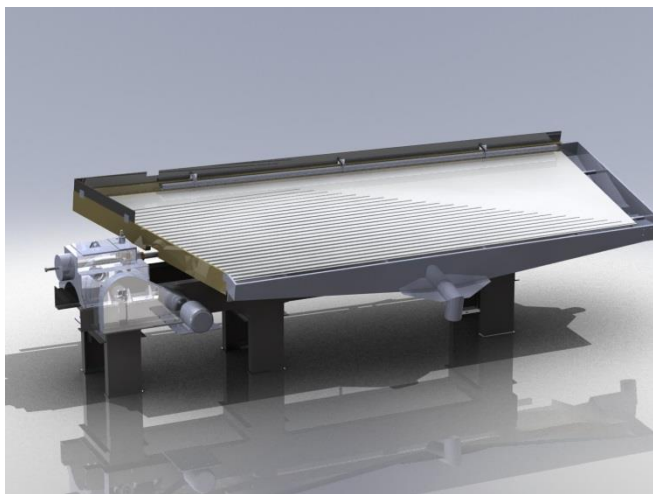
2.2 MATERIAL FLOW

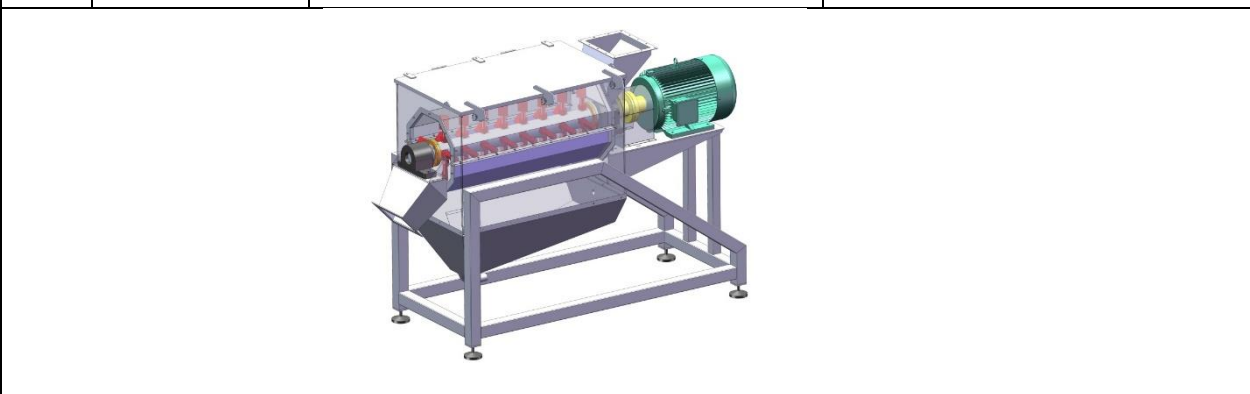


2.3 COMPONENTS – TREATMENT STEPS

Nr.	Name	Description/working	Details
1	Bunker	The input material for the installation is inserted in the bunker. This Bunker is equipped with a vibrating bottom which slowly doses the input material into the Airknife nr. 2	Volume: 6.5 m ³ Vibrating exit Material: Stainless Steel Power: 1.1kW
			
2	Airknife	The Airknife separates the heavies from the lights with air, in a close loop.	Material: Iron Power: 4 kW Length: 2m
3	Belt Conveyor	The heavies on the belt conveyor are removed.	Width: 500mm Length screw: 2000mm Material: Painted Steel Power: 1.1 kW
			
4	Belt Conveyor	Transport of the lights towards the grinder	Width: 600mm Length screw: 3000mm Material: Painted Steel Power: 2.2 kW

5	Grinder	The plastics are grinded into small pieces.	Material: painted steel Power: 50 kW
			
6	Screw Conveyor	This Screw Conveyor transports the grinded material to the Sink/Float tank	Screw Conveyor: Ø400mm Material: Stainless Steel Power: 4,4kW Length screw: 5000 mm
			
7	Sink/Float Separator	This density Sink/Float separator separates the PP/PE/PS/ABS from the heavy plastics and metals. Is equipped with a landing.	Volume: 3 m ³ Screw Conveyors: Ø400mm Material: Stainless Steel Power: 8.8kW
			

8	Watertable	Separates the heavy parts (metals, glass, stones) from the plastics.	Material: painted steel Power: 2,2kW
			
9	Metal Screw HD	The metals are transported into big bags	Screw Conveyor: Ø500mm Material: Stainless Steel Power: 2,2kW Length screw: 4500 mm
10	Big bag rack (double)	Contains the metals	Material: Stainless Steel
11	Twister 55	Dries the plastics from the sink/float tank. Is equipped with a landing	Material: Stainless Steel Power: 55kW
12	Screw Conveyor	This Screw Conveyor transports the dry material from Twister to the Big Bag rack.	Screw Conveyor: Ø400mm Material: Stainless Steel Power: 2.2kW Length screw: 6000mm
13	Big bag rack (double)	Contains the dried plastics	Material: Stainless Steel
14	Screw Conveyor	This Screw Conveyor transports the material from the Watertable to the Twister	Screw Conveyor: Ø400mm Material: Stainless Steel Power: 2.2kW Length screw: 6000mm
15	Twister 55	Dries the plastics from the watertable. Is equipped with a landing	Material: Stainless Steel Power: 55kW



16	Screw Conveyor	Transports the dried plastics to the double big bag rack.	Screw Conveyor: Ø400mm Material: Stainless Steel Power: 2,2kW Length screw: 6000 mm
17	Big bag rack (double)	Contains the dried plastics	Material: Stainless Steel
18	Water Treatment	Brings clean water to Sink Float tank and Watertable in a closed loop system, waste is discharged to a big bag.	Material: Stainless Steel Power: 8kW

3. Plant performance

3.1. INPUT MATERIAL SPECIFICATIONS

The maximum mixed plastics input size does not exceed 50mm in length x 50mm width x 10mm thickness. Moisture does not exceed 3% in order to prevent dust formation while loading the bunker, total contamination (paper, cardboard, PUR, metals, etc.) does not exceed 15%.

Any metal contamination particle size cannot exceed 50mm in length x 50mm width x 10 mm thickness. Other materials such as oils and chemicals are not allowed as they can damage the plastic recycling installation and/or influence the performance of the recycling installation.

3.2. INPUT QUANTITY PERFORMANCE

The technical capacity of the plastic upgrading unit is input of approx. 2000 kg/h depending on input size, contaminations and screen size.

3.3. OUTPUT

The output materials will be consisting of clean and dry mixed plastics, depending on the quantity, quality and composition of the input material.

4. QUALITY, HEALTH & SAFETY

4.1. GENERAL

This plastic upgrading system is atomized, except for quality check.

Labour is required for filling and dismounting the raw material into the process, tapping the final product into big bags, changing waste containers and keeping the plant clean.

Maintenance is required on a highly regular basis.

Variations in input qualities requires a pro-active attitude and adjustments of parts of the installation.

Keeping the plant and the installation clean is a condition for quality.

As the recycling plant is filled with water, the risk of fire is almost nihil.

4.2. LICENSES AND PERMITS

All local licenses and permits for the proper installation and running of the plastic upgrading unit have to be arranged by the user. Hermion cannot be hold responsible for any fault or submission in this matter.

4.3. ASSEMBLY

During the assembly of the Plastic Upgrading Unit, the buyer will ensure the security of the site and the industrial building.

Hermion will comply with the EC Workplace Health and Safety regulations, as well as with general safety rules to prevent accidents and injuries during assembly.

Hermion is in possession of VCA Work Safety Certifications and will supervise the installation of the plant.

4.4. TRAINING / WORKING INSTRUCTIONS

Hermion will train the buyer's personnel to perform work for the operation and maintenance of the Plastic Recycling Unit.

5. NOISE LEVELS

Noise levels in dB, idle machinery , measured 1,0 m from machinery and 1,3 m above the floor

Machinery	dB (idle)
Silo with vibration transport	77
Screw conveyor 600	74
Watertable	64
Transport screw conveyor 400	74
Twister 55	83
Float/Sink tank	73
Water Treatment Vibro	75
Airknife	75
Water pumps	75

Source: test plant at Hermion's site in The Netherlands

6. WATER MANAGEMENT

The Plastic Recycling Plant is a separation system using the medium water. The water works are operating in an environmental friendly closed loop.

When the system is fully operating about 6m³ of water is running through the entire unit. Depending on the degree of pollution (dirt, sludge, fibers, etc.) of the input material this water can be used during the throughput of 100 to 2000 tons of materials.

After clearing, the process water will be reused within the recycling process. The contamination of the water will be discharged in a big bag around the water treatment system. The Water Treatment Unit is designed for a specific capacity and a certain level of contamination.

The quality of the water has to be checked regularly in order to safeguard the working of the Water Treatment and the Recycling Installation. When the quality of the water is no longer acceptable, the water will have to be discharged according to the local environment regulations.