Clayton Hall MRF	
Prepared by	QSHEE Manager
Date of Origin	11/12/2015
Revision	V2 13/12/2023
Reference	EP31c Fire Procedure/Fire Prevention Plan Clayton Hall
Circulation	Clayton Hall Staff; Environment Agency

PURPOSE

The purpose of this Fire Prevention Plan FPP is to outline the procedures to be adopted, to reduce the risk of injury to personnel, or damage to plant, equipment or the environment through fire and to ensure the safe evacuation of the site in the event of a fire.

Assessment of the site for fire prevention has been conducted in accordance with Environment Agency (EA) guidance on Fire Prevention Plans.

The FPP contains details to demonstrate that the site can be operated to meet the three objectives stated in the EA guidance of:

▪ Minimise the likelihood of a fire happening
▪ Aim for a fire to be extinguished within 4 hours
▪ Minimise the spread of fire within the site and to neighbouring sites

SCOPE

This procedure applies to the Clayton Hall site and includes all buildings and areas of operation Materials Recovery Facility, Welfare, Weighbridge, Storage units Maintenance areas.

RESPONSIBILITIES

a)   It is the responsibility of all employees at the Clayton Hall Site to ensure that they are familiar with this procedure.

b)   The Health, Safety, Environmental and Estates (QSHEE) Manager in conjunction with the Site Manager will review and improve this procedure as necessary particularly where emergency situations have occurred.

b)   It is the responsibility of the Site Manager to maintain adequate fire precautions at the site.

c)   The Site Manager shall ensure that this Fire Prevention Plan is clearly understood and complied with by all employees and visitors to the site.

d)   The Site Manager or nominated Fire Warden's shall supervise the safe evacuation of the site and ensure all personnel report to the Fire Assembly Point in the event of a fire or during a drill exercise.

e)   The QSHEE Co-ordinator will conduct monthly inspections of fire points, fire exits, Fire Service access and monitor the requirements of this Fire Prevention Plan to ensure a fire safe working environment at all times.

f)   The QSHEE Manager will maintain records of all fire drills.

Section 1 Overview of the site

Activity

Waste treatment and transfer as permitted by Permit EPR/AP3897CJ.

Site Location and Receptors

Drawing No 110/01 in Appendix 5 of this document shows the site location. Receptors within 1 km of the site are shown on Drawing No 110/03.

Fire Prevention Plan

Drawing No 110/04 in Appendix 2 shows the site layout identifying the building, any combustible materials, access routes, access points, hydrant points or any other water supply, watercourses, natural or unmade ground drainage on site.

Section 2 Preventing Fires

Arson/Vandalism

The site is under 24hour CCTV monitoring that is housed off site. In the event of any issue being raised the CCTV Company will make contact with the site manager direct. The site is fenced round the perimeter, this is inspected on a regular bases any repairs are undertaken within 24hours.

Plant and Equipment

All plant on site undergo a maintenance regime, hire plant is on an external maintenance contract internal plant will be serviced and maintained as per the manufactures guidelines. Insurance companies carry out annual insurance inspections, any faults identified will be reported on NWM015 Corrective Action Report.

Infrastructure and site inspections

The site operates the general housekeeping policy EP25, the site also has a cleaning team that operate at the end of the normal shift approx. 6.00pm, there is an additional cleaning shift that operates from 10.00-6.00am. In addition the Quality, Health, Safety, Environmental and Estates (QSHEE) team conduct monthly site inspections. There are members of staff on site 24hours a day.

Electrical faults

The site conducts two yearly PAT testing and 5 yearly hardwire testing. This is carried out by trained and qualified Electricians. All Electricians are qualified to the required standards of the New Electricity at Work Regulations.

Industrial Heating

This site does not have any industrial heating, and there are no plans in the future to introduce any sure items of equipment.

Ignition sources

No hot work should be undertaken within 6 metres of combustible material. Any combustible materials shall be removed or suitably protected against heat or sparks. All loose waste must be swept up to at least 6 metres away from any proposed hot work. Exits are to be available near the vicinity of the working area.

Hot work to be undertaken by authorised, experienced personnel only.

A fire safety check must be made in the vicinity of the work for a period of 30 minutes after completion of work.

If hot work cannot be done elsewhere a second authorised employee should have available, adjacent to the hot work, fire extinguishers to extinguish any fire that may ignite.

Contractors must be issued with a Hot Work Permit as per work instruction EWI002.

No Smoking

Quercia Ltd operates a total No Smoking Policy. Smoking is NOT permitted in any area of the Clayton Hall Site or in any company vehicles at any time. Smoking is only permitted in a designated area to the rear of the welfare cabin.

Heat and spark prevention

Bucket loaders operate in the waste reception areas, there is no possibility for any rubbers strips being fitted due to the conditions of the floor, all operators are trained on the plant they drive, additional training for drivers as fire marshals, fire extinguishers situated near working area.

All vehicles are operated on the outside of the premises, the grab loader for the MRF is a high cab that prevents any risk of the exhausts becoming into contact with the waste. All vehicles are parked overnight away from any waste material. All keys are removed and locked away. Vehicles are regular maintained in accordance to the manufactures instructions.

Batteries

Staff keep a watching brief for batteries or battery powered appliances during waste acceptance and transfer from the waste reception area into processing. Any items spotted are removed from the waste before processing.

Gas Canisters

The site does not permit gas canisters on site, unless they are for the use in welding equipment that will be covered in contractors permit to work.

Fuel Tank

The site has a double bunded diesel fuel tank on site, as identified on the site plan.

Training/Staff-visitors

Staff are responsible for ensuring that accurate details of the numbers of subcontractors and visitors on site are recorded at any one time. All visitors must sign in and out at reception as per procedure EP15 – Procedures for Site Visits.

In the event of a fire or during a fire drill, details of any missing persons and their likely location must be reported to the senior management immediately.

The nominated fire warden will check that all employees are present at the fire assembly point, together with all authorised visitors by checking the visitors' book.

It is the responsibility of the nominated fire warden to ensure that all buildings are empty of personnel in the event of a fire or during a fire drill.

All MRF staff are trained as fire marshals.

Section 3 Management and Storage of waste

Waste acceptance

Waste acceptance procedures are in place to ensure only permitted material is brought to site. Rejection and quarantine procedures are also in place. Hot loads (greater than 50 degrees) are not accepted, nor any loads with signs of smoulder or combustion.

Waste acceptance/permitted waste

Waste is booked in at the weighbridge following pre-acceptance confirmation in accordance with the waste acceptance procedure.

Waste Treatment

Treatment includes passing the waste through the plant to expose it to magnets and eddy current separators to extract metal. The residual waste will be stored loose as RDF or it will be shredded to reduce the particle size to < 150 mm to produce SRF and then baled.

Hazardous waste accepted for treatment is:

19 10 03* fluff-light fraction and dust containing hazardous substances

19 10 05* other fractions containing hazardous substances

Hazardous and non-hazardous waste is stored and processed separately, with equipment cleaned down in between campaigns.

Waste storage/pile size/volumes

Ref*	Waste Type	Format	Maximum Waste Pile Dimensions (m) (L x W x H)	Maximum Waste Pile Volume (approx m³)
1	Incoming Non-haz waste	Waste reception bay-unprocessed	7 x 5.8 x 4	127.6
2	Incoming Hazardous waste		7 x 5.8 x 4	127.6
3	Heavies	Storage bay - processed	6.5 x 4.5 x 4	90
4	Fines		6.5 x 4.5 x 4	90
5	Ferrous metals	Wheeled container - processed	1.3 x 1.2 x 1.5	1.1
6	RDF	Storage bay - processed	5 x 5 x 4	75
7	RDF		11 x 10 x 4	350
8	Baled SRF/RDF		7 x 15 x 4	330
9	Ferrous metal	2 x 40 yd³ Ro-Ro container - processed	(6.5 x 2.3 x 3.15) x2	61
Total				**1285.3**

Notes:

1. Stockpile reference as per Drawing No 110/03 FPP in Appendix 5.

2. Voulmes as per stockpile calculation sheet in Appendix 4.

Fire walls and Separation Distances

Stockpiles inside the building will be separated by a minimum of 6m unless separated by a fire wall. Stockpile locations and firewalls are shown on the FPP drawing.

The incoming waste bays are surrounded by firewalls consisting of 6 m steel walls against the sides of the building and 3 m concrete panel walls as dividers. Likewise the RDF/SRF internal storage bay is surrounded on 3 sides by 4 m high steel walls.

Each of the bunker bays for external storage serve as a fire wall between each bay and the building. These are of a concrete and steel wire solid construction, secured to the floor.

Quarantine area

The Quarantine area is marked on the site plan, this area is kept clear at all time so that it can be used in the event of a fire.

Monitoring

Daily temperature monitoring of RDF and SRF will carried out and recorded. If stockpile temperatures increase above 50 degrees the stockpile will be dismantled, spread out and allowed to cool or doused with water.

Waste storage/duration for material at risk of self-combustion

Loose waste will be turned to dissipate heat if it has been in storage for more than 3 days. First l n- first out principles will be followed to prevent build up of older waste. This will be achieved by adding to the storage bay at one side and removing from the opposite site, with waste being pushed across the bay as space is created.

Contingency

In the event that there is a plant breakdown, the material supply will be cancelled from all our suppliers for the duration of recovery.

Seasonality

Temperature monitoring of stockpiles will be carried out twice daily during prolonged warm spells in summer months. This will be recorded and kept in the site office. If stockpile temperatures increase above 50 degrees the stockpile will be dismantled, spread out and allowed to cool or doused with water.

Section 4 Detecting Fires

Fire Watch

The site currently has two shifts of cleaners with maintenance teams, there operate 6-10pm and a 10-6am. Staff clean the plant down during these hours.

Smoke/heat/flame detectors

Throughout the plant there are smoke detection and a fully operational sprinkler system, which operates with an annual maintenance contract. The sprinkler system is pump fed from a water storage tank located outside the transfer station building. The tank has a capacity of approximately 500,000 litres.

The sprinkler system fitted is in line with the Insurance company specifications, these being:

BS EN1284:2009 as approved by our insurance provider.

The system was fitted as approved by our insurance company by Pyro Protection ltd.

Section 5 Fire Fighting Strategy

Equipment

All plant on site are fitted with fire suppression systems as part of their construction, additionally fire extinguishers are also fitted in vehicles. Staff are trained in the use of this equipment.

2 water hydrants – location shown on site plan

Multiple eire extinguishers – shown on plan

Site fire fighting

The site is covered with a suppression system, throughout the building there is a sprinkler system that is serviced and maintained on an annual maintenance contract.

Active fire fighting

The company currently operates a two shift system of cleaners and maintenance staff this operates throughout the night, the building has a fully serviced sprinkler system and fire extinguishers located throughout the building.

Control burn

This would not be possible due to the site layout and water courses in the vicinity.

Machinery and Training

The QSHEE Co-ordinator will ensure that fire drills are carried out at least biannually or when circumstances change and new procedures need to be tested.

The QSHEE Co-ordinator shall record the details on the Fire Drill Report (NWM073). Copies of Fire Drill Reports must be forwarded to the QSHEE Manager for filing.

The QSHEE Department will ensure that relevant personnel are trained in the use of portable firefighting equipment.

Access to site

Access to site is possible both in hours and out of hours, this information and maps will be included in the PIB that will be situated on the weighbridge building.

Contingency during the incident

In the event of a fire and or a shutdown of the site waste will be diverted to other related sites that are suitable for taking the same permitted waste as Clayton Hall these will be

1 Whinney Hill

2 Pilsworth

Section 6 Fire Fighting Water

Access to Water

The sprinkler system is pump fed from a water storage tank located outside the transfer station building. The tank has a capacity of approximately 500,000 litres.

The site has two hydrant points;

1 situated at the end of the site cabins used for the QSHEE/Supervisors/Plant manager

2 situated at door 5 between the storage walls

Additional information is attached in relation to the testing of the Hydrants in Appendix 3.

The fire hydrants are fed by mains water, on site there are two stand pipes already in place to assist the fire authority.

Managing fire water

The permitted area for the transfer station is fully concreted and drains to a sump in the yard, shown on the site plan. Water from the sump will be pumped into the landfill leachate treatment tanks from where it is discharged to sewer.

Fire water will be allowed to pool around the sump in the yard from where it can be recirculated. This can then be pumped directly into the leachate tanks on site. The leachate tanks are operated at two thirds capacity which allows 720 m^3 of emergency storage.

Appendix 4 contains a stockpile calculation spreadsheet which details how much water would be required for a 3 hour burn based on EA guidance. The excess storage capacity in the leachate tanks is in excess of the 420 m^3 firewater requirement for the largest stockpile, as shown in the stockpile calculation sheet.

Section 7 Recovery Plan post incident

Fire water disposal

As above, into the leachate tanks and or directly pumped off site using additional tankers.

Burnt material

Dependent of the nature of the waste and or damage to the plant this would be processed through the plant. If the plant is damaged it will be sent off site to example sites below or deposited in Clayton Hall landfill if this is not effected by the fire.

Diverting incoming waste

The company has access to additional sites as above:

1 Whinney Hill landfill

2 Pilsworth landfill

ATTACHMENTS

Appendix 1 – Fire Action Plan

Appendix 2 – Fire Assembly Points and Exits

Appendix 3 – Fire Hydrant testing

Appendix 4 – Stockpile calculation spreadsheet

Appendix 5 – Drawings:

Drawing No 110/01 Site Location Plan

Drawing No 110/02 Site Layout Plan

Drawing No 110/03 Receptors

Drawing No 110/04 Fire Prevention Plan

RELATED DOCUMENTS

EP14	Management Review
EP15	procedures for Site Visits
EP19	Incidents
EP25	General Housekeeping
EP30c	Emergency Spillage Procedure
EP33	Clayton Hall Landfill Gas Emergency Plan
EP28c	Clayton Hall Waste Acceptance Procedure
EWI002	Hot Work Permit (Issue)
EWI015	Fire extinguisher & Appliance Check
NWM015	Corrective Action Report

Integrated Management System Manual

Hazardous Waste Operations Manual

Emergency Preparedness & Response

Fire Risk Assessment Report for Clayton Hall

Clayton Hall Generating Plant – Ener-G Accident Management Plan

Gas Engine Compound Emergency Procedures Drawing ENPL-SN125-024

Fire Action

ANY PERSON DISCOVERING A FIRE:

SOUND THE ALARM CONTACT WEIGHBRIDGE/RECEPTION (IF MANNED) TO

CONTACT FIRE BRIGADE BY DIALLING 999

IF WEIGHBRIDGE/RECEPTION NOT MANNED DIAL 999

ATTACK THE FIRE WITH A FIRE EXTINGUISHER IF IT IS SAFE TO DO SO

THE FIRE BRIGADE NEED TO KNOW WHO YOU ARE /WHERE YOU ARE AND

LOCATION OF FIRE CLOSE ALL DOORS BEHIND YOU MEET THE FIRE

BRIGADE AT: **MAIN ENTRANCE**

WHEN YOU HEAR THE ALARM

LEAVE THE BUILDING BY THE QUICKEST ROUTE REPORT TO THE

ASSEMBLY POINT AT: **CAR PARK**

Do not run.

Do not stop to collect personal belongings.

Do not return to the building until officially told to do so.

neales
WASTE MANAGEMENT

Power Room

Fire assembly point

Toilets

Welfare
Fire point

Fire point

ENTRANCE
ROAD

Fire point

Fire point

IN

Offices

Out

CAR PARK

Electric Sub Station

Pump House
Fire point

EnerG

Deasil Storage

Quercia
Clayton Hall Sand
Dawson Lane
Chorley   18
February 2016

FIRE HYDRANT TESTING

Based on the flow & static test, listed below is the results of the tests.

Hydrant No 1
Location⋯. Weighbridge

Static Test 2.25 Bar

Hydrant No 2
Location⋯Main Yard

Static Test 2.25 Bar

FLOW TEST

Hydrant No 1 open (fully)⋯⋯ 2.25 Bar
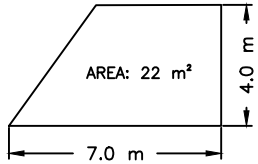
Hydrant's No1 & 2 open (fully)⋯⋯ 2.00 Bar

Hydrant No 2 open (fully)⋯⋯2.00 bar

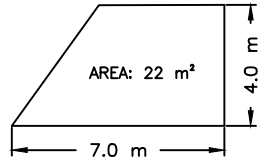Hydrant No 2 requires new Type 2 underground Hydrant to BS750 (if the pressure can be increased)
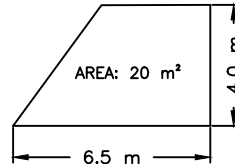

S Jackson   Service Technician

Ref	Location	Waste Type	Length	Width	Height	Stockpile Type	Truncated (c)	Truncated (d)	Other Calculations	Volume (m^3)	Water Req'd (m^3)
1	Waste Processing Building	Non-hazardous Waste	7	5.8	4	One Sided Truncated Pyradmid	-	-	Area of side of stockpile = 22 m^2 29 m^2 x 5.8 m = 127.6 m^3	127.6	153.12
2	Waste Processing Building	Hazardous Waste	7	5.8	4	One Sided Truncated Pyradmid	-	-	Area of side of stockpile = 22 m^2 29 m^2 x 5.8 m = 127.6 m^3	127.6	153.12
3	Waste Processing Building	Heavies	6.5	4.5	4	One Sided Truncated Pyradmid	-	-	Area of side of stockpile = 20 m^2 20 m^2 x 4.5 m = 90 m^3	90	108
4	Waste Processing Building	Fines	6.5	4.5	4	One Sided Truncated Pyradmid	-	-	Area of side of stockpile = 20 m^2 20 m^2 x 4.5 m = 90 m^3	90	108
5	Waste Processing Building	Ferrous Metals	1	1	1	Container	-	-	Container: = 1.1 m^3	1.1	1.32
6	Waste Processing Building	RDF	5	5	4	One Sided Truncated Pyradmid	-	-	Area of side of stockpile = 15 m^2 15 m^2 x 5 m = 75 m^3	75	90
7	Waste Processing Building	RDF	11	10	4	One Sided Truncated Pyradmid	-	-	Area of side of stockpile = 35 m^2 35 m^2 x 10 m = 350 m^3	350	420
8	Yard	SRF Bales	7	15	4	Bale Stack	-	-	7 x 15 bales + 6 x 15 bales + 5 x 15 bales + 4 x 15 bales = 330 m^3	330	396
9	Yard	Ferrous Metals	6.1	2.4	2	Skip Container	-	-	2 x 40 yard skips = 30.5 $m^{3 \times 2}$	61	73.2
	Quarantine Area	Unburnt Waste/Burnt Waste	10	10	4	Truncated Pyramid	2.5	2.5	See Truncated Pyramid Calulation	175	210

COMBUSTIBLE WASTE CALCULATION SPREADSHEET

1. NON-HAZARDOUS WASTE
AREA: 22 m² x 5.8 m = 127.6 m³

AREA: 22 m²
4.0 m
7.0 m

2. NON-HAZARDOUS WASTE
AREA: 22 m² x 5.8 m = 127.6 m³

AREA: 22 m²
4.0 m
7.0 m

3. HEAVIES
AREA: 20 m² x 4.5 m = 90 m³

AREA: 20 m²
4.0 m
6.5 m
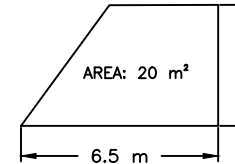
4. FINES
AREA: 20 m² x 4.5 m = 90 m³

AREA: 20 m²
4.0 m
6.5 m

5. FERROUS METALS
WHEELED CONTAINER:
1.1 m³

6. RDF
AREA: 15 m² x 5 m = 75 m³
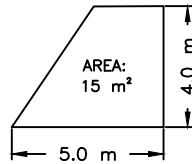
AREA: 15 m²
4.0 m
5.0 m
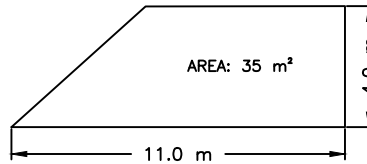
7. RDF
AREA: 35 m² x 10 m = 350 m³

AREA: 35 m²
4.0 m
11.0 m
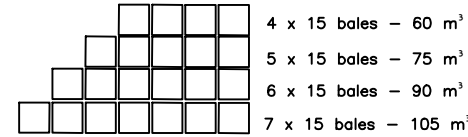
7. RDF
Stacked Bales = 330 m³

4 x 15 bales — 60 m³
5 x 15 bales — 75 m³
6 x 15 bales — 90 m³
7 x 15 bales — 105 m³

9. FERROUS METALS
SKIPS:
2 x 22.91 m³ = 45.82 m³

2.0 m
6.1 m
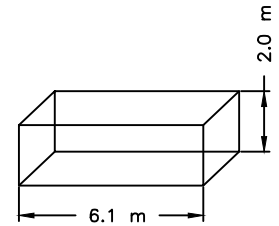
Truncated (c)
2.5 m
4.0 m
45°
10.0 m

Truncated (d)
2.5 m
4.0 m
45°
10.0 m
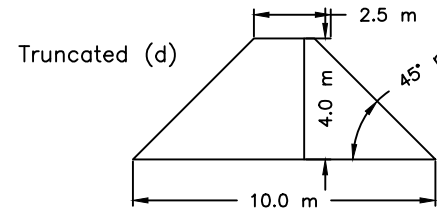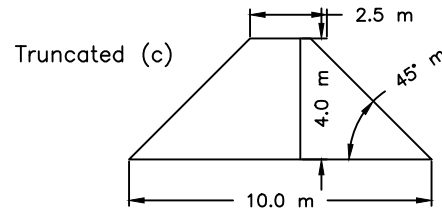
QUARANTINE AREA = 175 m³
(REFER ALSO TRUNCATED PYRAMID CALCULATION)

Truncated Pyramid Calculator
Calculate volume of a truncated rectangular pyramid
and surface areas, surface to volume ratio, lengths of slants and length of edge for right truncated rectangular pyramids

Truncated pyramid or **frustum of a pyramid** is a pyramid whose vertex is cut away by a plane parallel to the base. The distance between the bottom and the top bases is the truncated pyramid height **h**. This page calculates volume of any truncated pyramid whose bottom and top bases are rectangles with sides **a, b** and **c, d** respectively. This truncated pyramid has 6 faces: base, top and 4 lateral faces.

Base a: 10   Base b: 10

Top c: 2.5   Top d: 2.5   Height h: 4   in: [meter   ⌄]

precision: [2 ⌄]   Surface to volume | Convert 175 m³ to weight for: compounds | foods | gravels

☐ show all units   ☐ show all units

The volume of the truncated pyramid = **175**

centimeter³	175 000 000	inch³	10 679 155.22
foot³	6 180.07	**meter³**	**175**

The length of the edge of the truncated pyramid = **6.64**

centimeter	664.27	inch	261.52
foot	21.79	**meter**	**6.64**

The surface to volume ratio of this truncated pyramid = **1.39**

Surface area to volume ratio is also known as *surface to volume ratio* and denoted as sa÷vol, where sa is the surface area and vol is the volume.

Unit	The area of the	
☐ all	base of the truncated pyramid = **100**	top of the truncated pyramid = **6.25**
centimeter²	1 000 000	62 500
foot²	1 076.39	67.27
inch²	155 000.31	9 687.52
meter²	**100**	**6.25**

Unit	The area of the plane	
☐ all	ac of the truncated pyramid = **34.27**	bd of the truncated pyramid = **34.27**
centimeter²	342 683	342 683
foot²	368.86	368.86
inch²	53 115.97	53 115.97
meter²	**34.27**	**34.27**

Unit	The lateral surface area of the truncated pyramid = **137.07**	The total surface area of the truncated pyramid = **243.32**
☐ all		
centimeter²	1 370 732.01	2 433 232.01
foot²	1 475.44	2 619.11
inch²	212 463.89	377 151.72
meter²	**137.07**	**243.32**

Unit	The length of the			
☐ all	base side a = **10**	base side b = **10**	top side c = **2.5**	top side d = **2.5**
centimeter	1 000	1 000	250	250

Unit	The perimeter of the	
☐ all	base of the truncated pyramid = **40**	top of the truncated pyramid = **10**

Unit	The length of the		
☐ all	height h of the truncated pyramid = **4**	slant_a of the truncated pyramid = **5.48**	slant_b of the truncated pyramid = **5.48**

foot	32.81	32.81	8.2	8.2
inch	393.7	393.7	98.43	98.43
meter	**10**	**10**	**2.5**	**2.5**

centimeter	4 000	1 000
foot	131.23	32.81
inch	1 574.8	393.7
meter	**40**	**10**

centimeter	400	548.29	548.29
foot	13.12	17.99	17.99
inch	157.48	215.86	215.86
meter	**4**	**5.48**	**5.48**

About this page: *Truncated Pyramid Calculator*

Calculation formulas:

How to find the volume of a truncated pyramid?
$V = \frac{1}{6} \times h \times (A_{base} + (a+c) \times (b+d) + A_{top}) = \frac{1}{6} \times h \times (a \times b + (a+c) \times (b+d) + c \times d)$

How to find the area of the base of a truncated pyramid?
$A_{base} = a \times b$

How to find the area of the top of a truncated pyramid?
$A_{top} = c \times d$

How to find the area of the plane *ac* of a truncated pyramid?*
$A_{ac} = \frac{1}{2} \times (a+c) \times slant_a = \frac{1}{2} \times (a+c) \times \sqrt{\frac{1}{4} \times (b-d)^2 + h^2}$

How to find the area of the plane *bd* of a truncated pyramid?*
$A_{bd} = \frac{1}{2} \times (b+d) \times slant_b = \frac{1}{2} \times (b+d) \times \sqrt{\frac{1}{4} \times (a-c)^2 + h^2}$

How to find the lateral surface area of a truncated pyramid?*
$A_{lateral} = 2 \times A_{ac} + 2 \times A_{bd} = (a+c) \times slant_a + (b+d) \times slant_b = (a+c) \times \sqrt{\frac{1}{4} \times (b-d)^2 + h^2} + (b+d) \times \sqrt{\frac{1}{4} \times (a-c)^2 + h^2}$

How to find the total surface area of a truncated pyramid?*
$A_{total} = A_{base} + A_{top} + A_{lateral} = a \times b + c \times d + 2 \times A_{ac} + 2 \times A_{bd} = a \times b + c \times d + (a+c) \times slant_a + (b+d) \times slant_b = a \times b + c \times d + (a+c) \times \sqrt{\frac{1}{4} \times (b-d)^2 + h^2} + (b+d) \times \sqrt{\frac{1}{4} \times (a-c)^2 + h^2}$

How to find the perimeter of the base of a truncated pyramid?
$p_{base} = 2 \times (a+b)$

How to find the perimeter of the top of a truncated pyramid?
$p_{top} = 2 \times (c+d)$

How to find the length of the slant_a of a truncated pyramid?*
$slant_a = \sqrt{\frac{1}{4} \times (b-d)^2 + h^2}$

How to find the length of the slant_b of a truncated pyramid?*
$slant_b = \sqrt{\frac{1}{4} \times (a-c)^2 + h^2}$

How to find the length of the edge of a truncated pyramid?*
$e = \sqrt{\frac{1}{4} \times (a-c)^2 + slant(a)^2} = \sqrt{\frac{1}{4} \times ((a-c)^2 + (b-d)^2) + h^2}$

where:
$slant_a$ is the distance between the pyramid's sides a and c;
$slant_b$ is the distance between the pyramid's sides b and d.

[*] denotes calculations that are valid for *right* rectangular truncated pyramids only.

Reference (ID: N/A)

1. I.N. Bronshtein, K.A. Semendyayev, Gerhard Musiol, Heiner Mühlig. Handbook of Mathematics 6th ed. Springer. Berlin, Heidelberg, New York. 2015. Last accessed: 29 August 2020 (amazon.com paid link).

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LEGEND ——— SITE LOCATION

CLIENT	DRAWN BY.	APPROVED BY.
QUERCIA LIMITED	M.Y.B	C.G

JOB TITLE.	DATE.	DRAWING No.
CLAYTON HALL MRF	04/12/23	110/01

DRAWING TITLE.	SCALE @ A4.	
SITE LOCATION PLAN	1:50,000	

Labels on plan:

356800E
356900E
421900N
421800N

Hardcore surface
S1
Product tank 3
Aeration tank 2
Aeration tank 1
Control
Gas flare
Gas compound
LANDFILL WASTE ACCEPTANCE BAY
Concrete slab
Bund wall
Tank
PUMP HOUSE
SPRINKLER TANK
ELECTRIC SWITCH ROOM
Yard Concrete surface
WASTE RECEPTION
IN
FUEL TANK
Leachate storage tank
Bund wall
MAINTENANCE
GAS CAGE
FITTERS AREA
Emergency Storage Area
PRE-SHRED
Quarantine Area
METALS SKIPS
Car park Tarmac surface
Concrete yard
PICKING LINE
Weigh bridge
FLIPFLOP
TROMMEL
Ponding
OPTICAL SEPARATOR
LANDFILL WASTE ACCEPTANCE BAY
BALLISTIC
MAGNET
EDDY CURRENT
FE
SRF BALES
Weigh bridge office
Weigh bridge
DRAINAGE TO BYMNING BROOK
ELECTRIC POWER ROOM
OPTICAL SEPARATOR
Office
Laboratory
Security bollards
Fence
POWER DISCONNECTION POINT
DUST FILTERS
A1 A2
SRF SHREDDER
SRF BALER
SS
Car park
Site entrance
Path (um)
Path

LEGEND

	PERMIT AREA
	PRIORITY HABITAT WOODLAND
	RESIDENTIAL
	SCHOOL/CARE FACILITY/HOSPITAL
	INDUSTRIAL/COMMERCIAL
	PUBLIC RIGHT OF WAY
	1 KM RECEPTOR BOUNDARY
1	RECEPTOR REFERENCE

PREDOMINANT WIND DIRECTION IS
FROM THE WEST

REV.	DESCRIPTION	DATE	BY

CLIENT.

QUERCIA
LIMITED

JOB TITLE.

CLAYTON HALL
MRF

DRAWING TITLE.

FIRE LAYOUT
PLAN

DRAWN BY.	APPROVED BY.	DRAWING No.
M.Y.B	C.G	110/03
DATE.	SCALE @ A3.	
04/12/23	1:4000	

NOTES

△ FIRE ASSEMBLY POINT

Ⓕ FIRE EXTINGUISHER

✳ S1 SUMP/ INTERCEPTOR (EMISSION POINT TO SEWER)

Ⓒ FIRE CALL POINTS

Ⓗ FIRE HYDRANT

[SS] SUB STATIONS

—··— SITE BOUNDARY

——— TRANSFER STATION PERMIT BOUNDARY

→ DRAINAGE FLOW DIRECTION

- - - FIRE WALL

�[red] COMBUSTIBLE WASTE

▨[red hatched] COMBUSTIBLE WASTE FOR LANDFILL

⊠ A1 DUST FILTER (EMISSION POINT TO AIR)

NOTES:

COMBUSTIBLE WASTE FOR LANDFILL IS ACCEPTED UNDER THE LANDFILL PERMIT WHICH IS NOT SUBJECT TO THE FPP.

STARLING ENVIRONMENTAL LIMITED

67 Chorley Old Road, Bolton, Greater Manchester, BL1 3AJ

www: starlingenvironmental.co.uk
email: claire@starlingenvironmental.co.uk
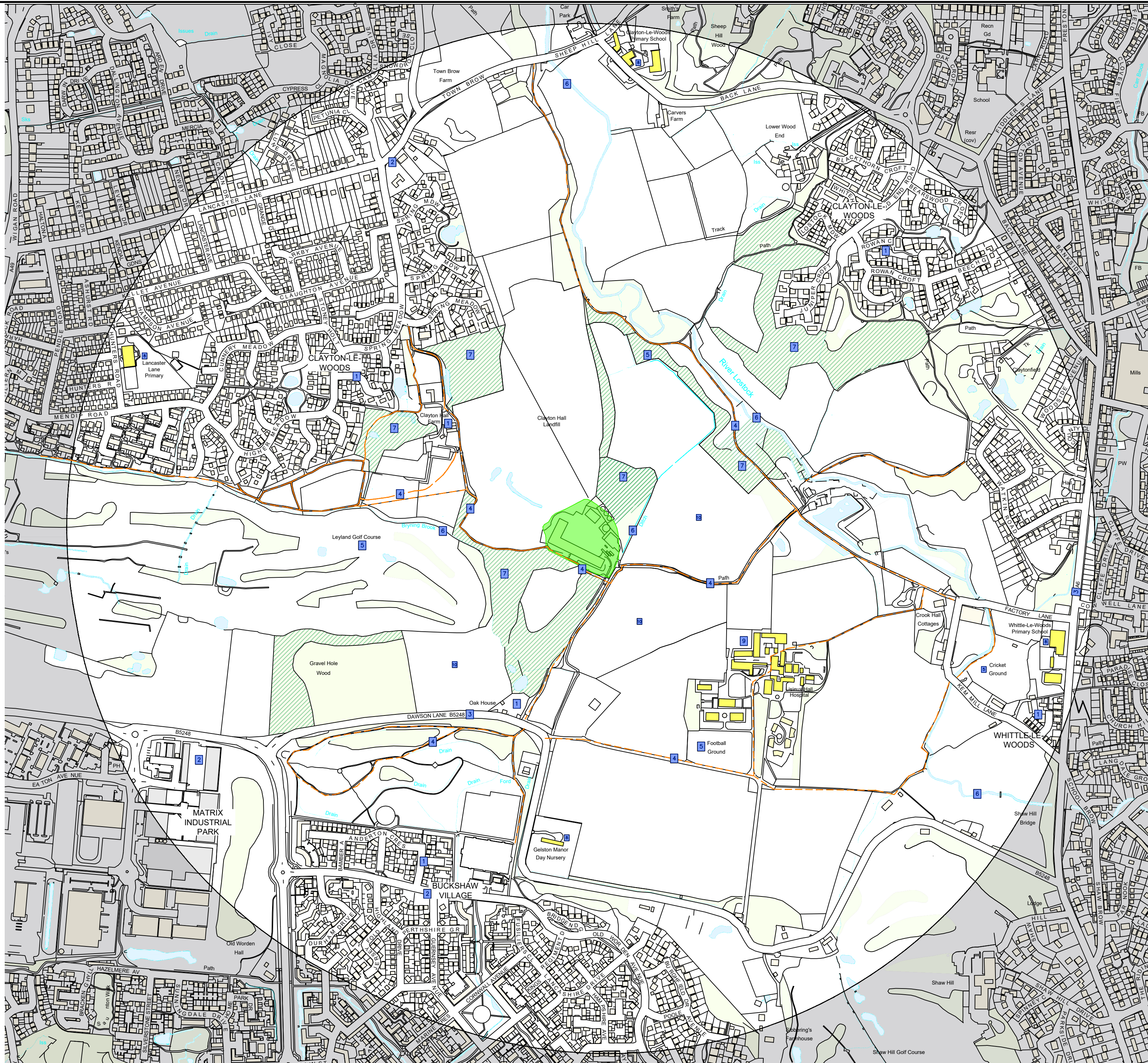Tel: 07989 673122

CLIENT.

QUERCIA LIMITED

JOB TITLE.

CLAYTON HALL MRF

DRAWING TITLE.

FIRE LAYOUT PLAN

DRAWN BY.	APPROVED BY.	DRAWING No.
M.Y.B	C.G	110/04

DATE.	SCALE.@A2	
30/11/23	1:500	

Map labels:

356800E   356900E
421900N
421800N

N / W E / S (compass)

S1

Hardcore surface

COMBUSTIBLE WASTE FOR LANDFILL

Gas flare
Control
Gas compound

Product tank 3
Aeration tank 2
Aeration tank 1

Concrete slab
Bund wall

Yard Concrete surface

Leachate storage tank

MAINTENANCE
GAS CAGE
FITTERS AREA
Emergency Storage Area
Car park Tarmac surface

ELECTRIC SWITCH ROOM
PUMP HOUSE
HAZARDOUS WASTE
2. NON-HAZ WASTE
5.8 m   5.8 m   7.0 m

SPRINKLER TANK

WASTE RECEPTION
MOBILE PLANT STORAGE
IN
FUEL TANK

3. HEAVIES   4. FINES
6.5 m   4.5 m

PRE-SHRED

NON-FE METALS SKIPS

9. FE METALS SKIPS

Quarantine Area (10 x 10m)

Concrete yard

Weigh bridge
Weigh bridge office
Office
Weigh bridge
Security bollards

PICKING LINE

Ponding

DRAINAGE TO BYMNING BROOK

TROMMEL
FLIPFLOP
MAGNET
BALLISTIC
OPTICAL SEPARATOR
EDDY CURRENT

ELECTRIC POWER ROOM
POWER DISCONNECTION POINT

5. FE METALS
OPTICAL SEPARATOR
A1 A2
DUST FILTERS

COMBUSTIBLE WASTE FOR LANDFILL
8.3 m

8. SRF BALES   15.0 m   7.0 m

6. RDF   5.0 m   5.0 m
SRF SHREDDER
SRF BALER
SS

7. RDF WASTE   10.0 m   11.0 m

Laboratory

Car park
Site entrance
Path
Path (um)