Ford energy from waste

# FORD ENERGY RECOVERY FACILITY AND WASTE SORTING AND TRANSFER FACILITY, FORD CIRCULAR TECHNOLOGY PARK

## DESIGN AND ACCESS STATEMENT

JUNE 2020

GSDA Viridor GRUNDON

# Design and Access Statement

Ford ERF and WSTF, Ford Circular Technology Park

June 2020

GSDA

GARRY STEWART DESIGN ASSOCIATES

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# 1 Introduction

Viridor Waste Management Limited, Grundon Waste Management Limited and Ford Energy from Waste Limited (the latter a joint venture between Grundon Waste Management Limited and Viridor Waste Management Limited) are applying to West Sussex County Council (WSCC) for full planning permission to build and operate a conventional energy recovery facility (ERF) and a waste sorting and transfer facility (WSTF) to treat municipal, commercial and industrial wastes at the Ford Circular Technology Park at Ford Road, Ford. Grundon Waste Management is the sole owner / operator of the existing waste transfer station (WTS) that is operational at the site. Figure 1.1 shows an aerial view of the site.

This Design and Access Statement (DAS) has been prepared in support of this planning application and has been generally prepared in accordance with current government guidance and in parallel with advice given by the Commission for Architecture and the Built Environment's (CABE) document "Design and Access statements: How to write, read and use them" (CABE, 2006, revised edition 2007).

Accordingly, the DAS explains the assessment-involvement-evaluation-design process that has been undertaken to ensure that the design development and the final design have been informed by the wider context of the site. While not strictly following the CABE suggested structure the DAS covers their advised key areas of Use; Amount; Layout; Scale; Landscaping; Appearance in detailing the key aspects of the Design. The same applies to the CABE guidance on Access where their key areas of Vehicular and Transport Links and Inclusive Access have been covered within the DAS.

This DAS should be read in conjunction with the Environmental Statement (ES) and other supporting planning application documents and figures contained elsewhere in the planning submission.

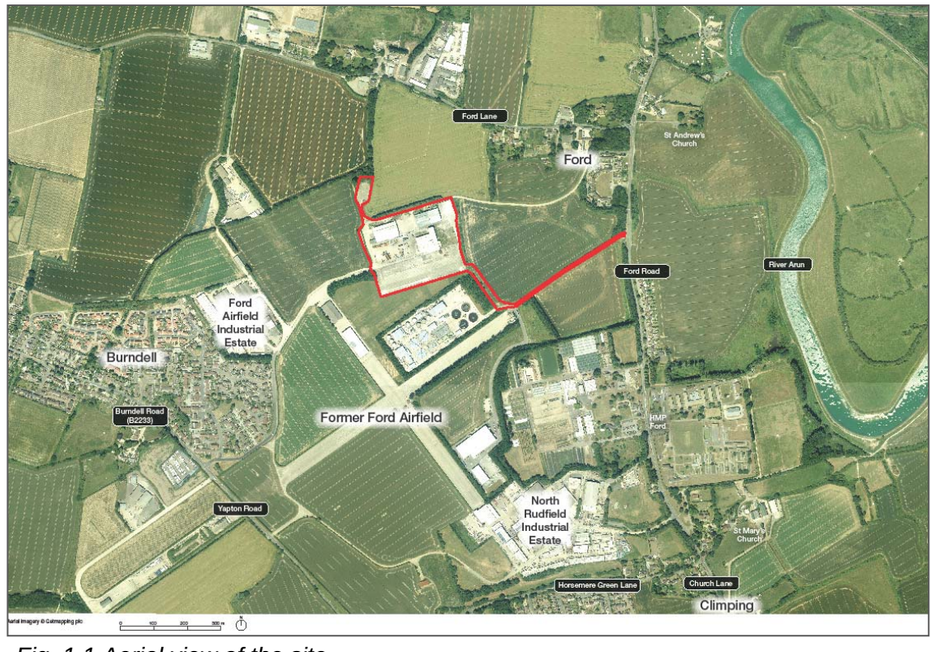



*Fig. 1.1 Aerial view of the site*

## 1.1 Purpose of this Statement

The overall purpose of this DAS is to provide information on the principles and approach that have guided the design process and it:

- Sets out the applicants' requirements for the architectural design of the proposed development;
- Describes how the design has been developed in line with current design guidance;
- Demonstrates how the site of the proposed development and its surroundings have been fully appraised to ensure that the Proposed Development is appropriately located and suitably designed;
- Identifies the overarching design aims, design objectives and key design considerations which influenced the design of the proposed development;
- Describes and explains the design evolution process undertaken; and,
- Reviews the finalised design of the proposed development against the overarching design aims, design objectives and key design considerations.

## 2.2 Statement Structure

In addition to this introduction, this DAS comprises the following sections:

Section 2: Site and Context Appraisal – provides an overview of the baseline characteristics of the development site that have informed the design strategy;

Section 3: Design Strategy – identifies the overarching design aims, design objectives and key design considerations which shaped the design process;

Section 4: Design Evolution – describes the design evolution process from initial concepts to the finalised design of the proposed development, focusing on the key design decisions.

Section 5: Design Solution – describes and evaluates in detail the finalised design of the proposed development and explains how it responds to current WSCC and CABE/Design Council design guidance.

Section 6: Access – provides a summary of access

Section 7: Conclusion – provides a summary and some concluding remarks.

# 2 Site and Context Appraisal

## 2.1 Introduction

This section of the report provides an overview of the existing context of the location of the Proposed Development, including the surrounding area.

The application site is identified in the adopted West Sussex Waste Local Plan (2014) as a Strategic Waste Site. In 2015, Grundon Waste Management Limited secured planning permission for an energy from waste facility and a materials recovery facility, known as the Circular Technology Park (application reference: WSCC/096/13/F). The application was subject to environmental impact assessment (EIA) and accompanied by an ES. The approved facilities have not been built, although the permission has been implemented and the site currently operates as a WTS that usually handles about 20 - 25,000 tonnes per annum (tpa). This year, however, the facility has experienced an increase in throughput as waste normally processed by Viridor's Westhampnett WTS, has been diverted to Grundon's Ford WTS for processing instead. This is a result of a significant fire at the Westhampnett WTS that put the facility out of operation. The facility is currently being repaired and is due to be operational in Autumn 2020. Once Viridor's facility is operating again it is expected that the throughput at Grundon's WTS will drop from the current tonnage of around 50,000 tpa back to its usual annual processing tonnage of 20 – 25,000 tpa.

Planning permission was granted in August 2019 for a new access road that has replaced the previous one-way circulation system (application reference: WSCC/027/18/F). The permission also increases the permitted heavy goods vehicle (HGV) movements to / from the site and amends the approved waste delivery hours. Construction of the road was recently completed, and vehicles are no longer using Rollaston Park Road to access the site or the private access road to the north of Rodney Crescent to egress onto Ford Road. The access road application was also subject to EIA and accompanied by an ES.

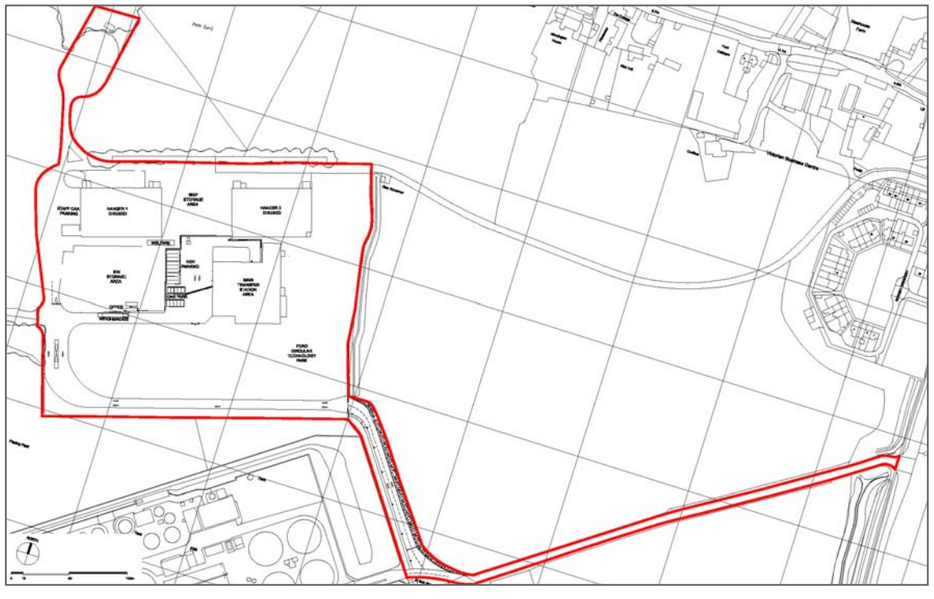


*Fig. 2.1 Existing Site Plan – Extract from drawing PL100*

## 2.2 Site Description

The proposed development will be located at the Ford Circular Technology Park (the former Tarmac blockworks site, which forms part of the former Ford Airfield) to the west of the village of Ford, and is centred at National Grid Reference (NGR) SU 994 033 (499460,103310).

An aerial view of the site is shown in Figure 1.1 and the application site boundary is shown in Figure 2.1.

The 7.11 ha site is currently partially used for the existing WTS operations and partially vacant. The existing WTS building is located towards the centre of the site and portacabins, parking, weighbridge and containers associated with this operation are situated to the west of the WTS. There are also two vacant, derelict former hangar buildings towards the north of the site and a large area of hardstanding is situated towards the south and east of the site. The site is flat and approximately 6.7 m above ordnance datum (AOD).

The application site also includes a small area of hardstanding to the north west of the main part of the site.

Yapton is situated approximately 1 km to the west of the site, Climping approximately 1 km to the south, Littlehampton approximately 2 km to the east, and Arundel approximately 3 km to the north east.

The site is currently surrounded by agricultural land to the north, east and west, while a sewage treatment works, and an area of sports pitches lie to the south. Ford Industrial Estate lies beyond the agricultural land to the west, beyond which is the residential area of Yapton. Ford Market and Viridor's materials recovery facility lies beyond the sewage treatment works to the south, beyond which there is another industrial estate, HM Prison Ford and the residential area of Climping. Ford village lies beyond the agricultural land to the north east, while Ford Lane and a small number of commercial premises lie beyond the agricultural land to the north. There is agricultural

land and the Ford to Barnham railway line beyond these. Beyond the agricultural land to the east of the site is Ford Road, more agricultural land and the River Arun.

There are several public rights of way in the vicinity of the site to the north, including footpaths 366 and 366/1, which run north-south to Ford Lane, and footpath 200/3, which runs from Ford along the site's north eastern edge and joins footpath 363, which runs to Yapton.

Two recent planning applications have recently been submitted for development within the immediate vicinity of the proposed Ford ERF and WSTF development site. One application, by Redrow Homes Southern Counties and Wates Developments Ltd ('The Landings'), is for a mixed use development including 1,500 residential dwellings and the other, by Ford Airfield Market, is for amending the layout of the existing market due to the proposed housing development (including the creation of a new car park and footpath and resurfacing of an existing access track). While decisions are not expected on these applications until later this year, granting permission for the mixed-use development will clearly change the character of the surrounding area.

### 2.2.1 Access

Vehicular access to the site is gained via the existing access road that connects the site at its south east corner to Ford Road, just to the north of Climping / HMP Ford (Fig. 2.2). As mentioned previously the access road has recently replaced the previous one-way circulation system that saw vehicles using Rollaston Park Road to access the site from the west and the private access road to the north of Rodney Crescent to egress onto Ford Road to the east.

### 2.2.2 Noise

The local noise climate is dominated by traffic noise from Ford Lane, Ford Road, Rollaston Park and Yapton Road, site traffic noise from the industrial park, industrial park activities, occasional train passbys and aircraft noise and site traffic movements at the existing waste management site.

### 2.2.3 Ecology

The site has been subject to an ecological desk study and extended Phase 1 habitat survey, with most of the site comprising colonised hardstanding, as well as areas of poor semi-improved grassland, scrub, broadleaved woodland, a non-native hedgerow and scattered trees. The site is generally considered to be of low ecological value. The proposed development will result in the removal of all existing buildings and most of the hardstanding. Areas of colonised hardstanding, scrub and amenity grassland will be lost, whilst the broad-leaved woodland will remain intact.

The only internationally designated nature conservation site within 10 km of the site is the Duncton and Bignor Escarpment special area of conservation (SAC), approximately 9.8 km to the north. There are two nationally designated nature conservation sites within 5 km of the site: Climping Beaches SSSI, 2.8 km to the south east, and Arundel Park SSSI, 4.2 km to the north east. There are no locally designated nature conservation sites within 2 km of the site.

Ford Ancient Woodland is located approximately 1.3 km to the north of the proposed development.

Biodiversity enhancement and mitigation measures are proposed on site as part of the design of the proposed development. An ecological appraisal of the proposed development is included in Chapter 14 of the ES.

*Fig. 2.2 Existing site viewed from the south east and showing the site access road*

*Fig. 2.3 Existing site viewed from the south west*

*Fig. 2.4 Existing site viewed from the east*

### 2.2.4 Cultural Heritage

The site has strong historical links to transport including the Portsmouth & Arundel Canal alignment, and the important role Ford Airfield has played in local aviation history (Fig. 2.5).

While there are no designated built heritage assets on the site, a number of features of the World War II and later development of Ford Airfield do survive. This includes sections of the runway, parts of the taxiways and perimeter road and some structures, including two hangars of World War II or early post-war date that were formerly in use as Ford Blockworks.

There are a number of designated heritage assets in the surrounding area. These include Yapton Church Lane and Main Road / Church Road conservation areas, approximately 1 km and 1.3 km to the west of the site respectively, which contain a number of listed buildings. There are also scattered listed buildings at Ford and Climping, the nearest of which is the Grade II listed Atherington House, Ford Place, Southdown House and The Lodge (one collective listing) approximately 190 m to the north east. Other built heritage assets in the area include the three churches at Yapton, Ford and Climping, all of which are listed at Grade I. There are no registered parks and gardens near the site.

The older part of Arundel, defined by the conservation area and with a concentration of listed buildings and Arundel Castle (scheduled monument), lie approximately 4 km to the north.

Further information on the cultural heritage baseline can be found in Chapter 10 of the ES.

## 2.3 Landscape and Visual Context

### 2.3.1 Landscape Context

The site is currently surrounded by land in agricultural use to the north, east and west. An area of sports pitches and a sewage treatment works lie to the south. Ford Industrial Estate lies beyond the agricultural land to the west, beyond which is a residential area on the edge of Yapton. Ford Market and Viridor's materials recovery facility lies beyond the sewage treatment works to the south, beyond which there is another industrial estate, HMP Ford and the residential area of Climping. Ford village lies beyond the agricultural land to the north east, while Ford Lane and a small number of commercial premises lie beyond the agricultural land to the north. There is agricultural land and the Ford to Barnham railway line beyond these. Beyond the agricultural land to the east of the site is Ford Road, more agricultural land and the River Arun.

The site lies within the North of Yapton Coastal Plain (29) character area on the former Ford Aerodrome airfield, between Burndell and Ford. The boundaries of the site follow the boundaries of the existing facility set within the wider airfield.

The topography of the site is generally very flat and being near the coast, the topography is approximately between 0m AOD and 5m AOD.

Tree cover on the site is sparse, being an operational waste site, however just beyond the northern boundary there is a dense belt of evergreen trees and on the eastern boundary is scrub vegetation including trees, planted on a low earth mound.

There are no public rights of way (PROW) within the site, but there are several PROW in the surrounding area and some pass close to the site.

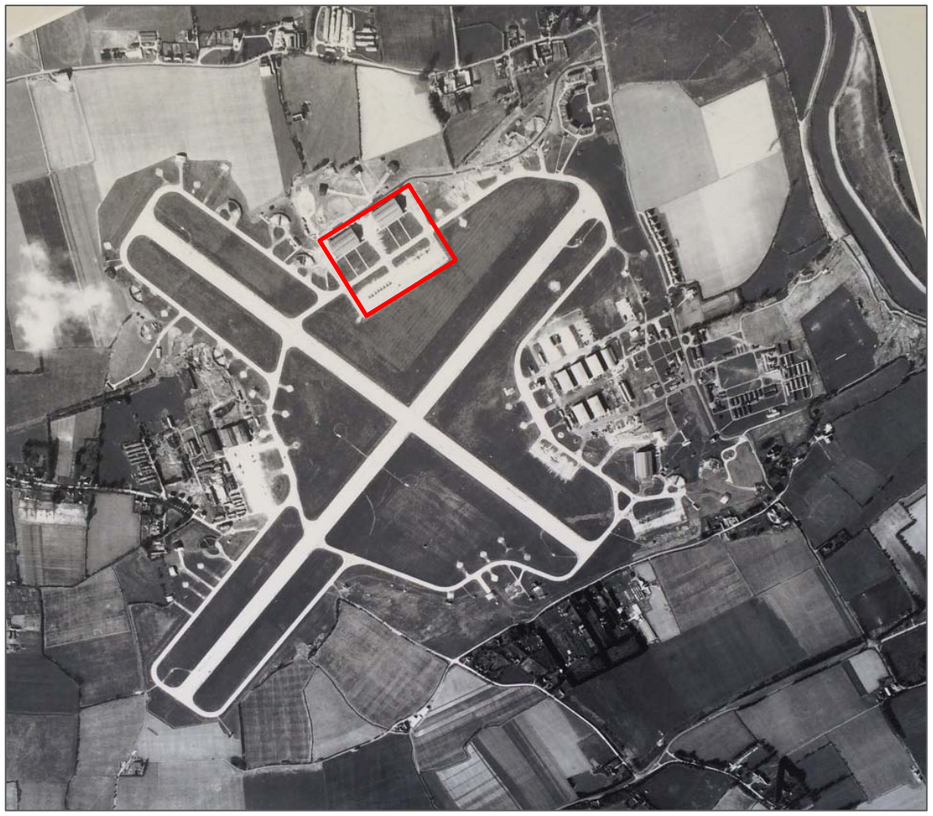


*Fig. 2.5 Historic aerial photo of Ford Airfield*

There are no landscape, ecological or heritage designations within the site, but the South Downs National Park (SDNP) lies 2.2 km to the north of the site and there are a number of cultural heritage designations in the local area including conservation areas in the village of Yapton and several listed buildings.

Within the site are two large former aircraft hangars, and the currently operational waste transfer building and associate infrastructure. The Southern Water waste water treatment works lies to the south and large industrial sheds can be seen in Ford Airfield Industrial Estate toward the west.

The residential allocation for 1500 homes at Ford Airfield (SD8) includes over half of the character area and so when this area is developed, the character will be substantially altered to become a predominantly developed area.

The sensitive key characteristics and landscape elements identified for this character type are:

- Large area of industrial land use located throughout the character area.
- Scattered areas of residential development of varying scales with no definitive pattern.
- Isolated areas of agricultural field within a mosaic of industrial and residential land uses.
- Disused aerodrome runway near the southern area of the character area.

### 2.3.2 Visual Context

Within a 1.5 km radius of the site, there will be visibility from local residential areas, PROWs, some of which cross Ford Airfield close to the site, local roads, local workplaces and some views in the settings of heritage features.

The majority of the visibility from the wider area between 1.5 and 4.5 km radius of the site, comes from PROWs in the surrounding agricultural land, transport links and the edges of some more distant settlements, but includes views from rising ground at Arundel 3.8 km to the north east.

Visibility of the proposals beyond this 4.5 km radius would be predominantly from elevated areas of the SDNP and from parts of the A259 that bridge over the railway line near Bognor Regis.

Energy recovery facilities require built structures of a relatively large size, and their scale is determined by the dimensions of the process equipment and operations that they contain. Consequently, the buildings comprising the proposed development will be visible from parts of the surrounding area. In order that the visual impacts can be fully understood, the ES includes photographs and photomontages taken from a series of viewpoint locations from public locations surrounding the site at close, medium and long range (Fig. 2.6). The selected viewpoints were agreed through consultation with WSCC.

A Landscape and Visual Impact Assessment (LVIA) has been undertaken in accordance with a methodology compliant with Landscape Institute Guidelines. The results of the LVIA are reported in Chapter 12 of the ES.

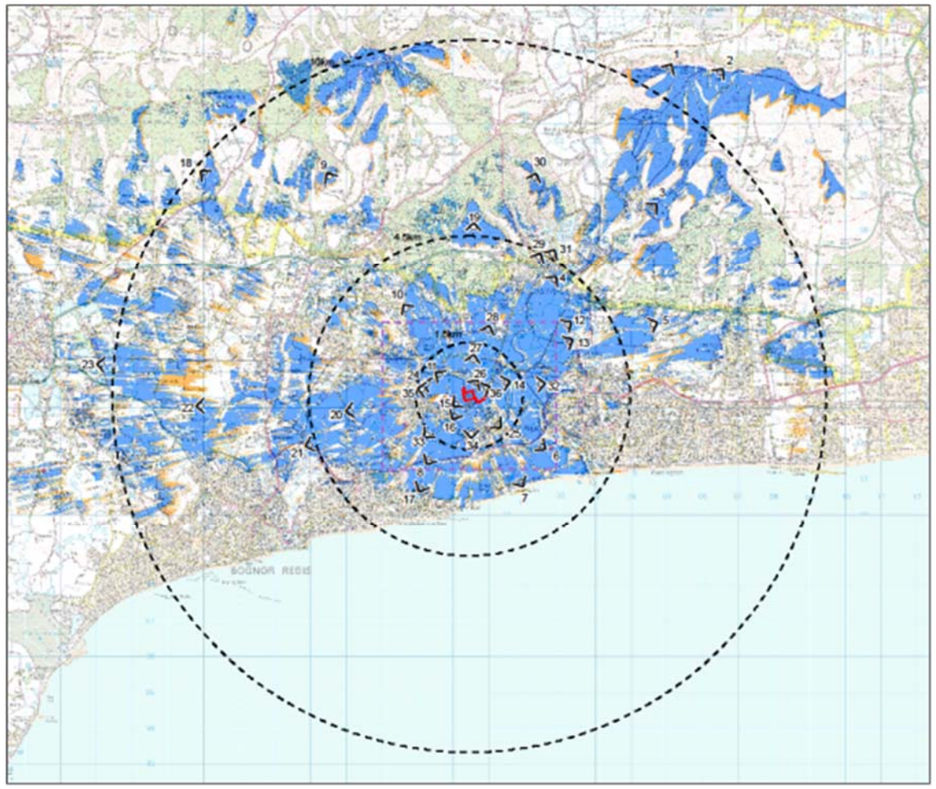



*Fig. 2.6 LVIA viewpoint location plan (extract)*

## 2.4 Local Character

How the local character of the site and its surroundings could be imbedded within the proposed development has been an important design consideration.

*Airfield*

Having previously formed part of the Ford Airfield the site including its existing two hangers has strong links with the history of aviation having being formerly the RAF Ford Battle of Britain airfield and the Royal Naval Air Station HMS Peregrine. The surrounding area has reused its former buildings and its runways still boldly mark the landscape (Fig. 2.7).

*Canal*

The Portsmouth and Arundel Canal built in 1823 ran between Portsmouth and Arundel before it was abandoned in 1855 (Fig. 2.9). The Ford to Hunston section of the canal connected the river Arun at Ford to the junction with the Chichester arm of the canal. The route of this section crossed the site west to east.

*Flint*

The use of flint in the construction of buildings and walls is one of the key features in the appearance of villages and towns in West Sussex and which is currently used today in a range of different styles (Fig. 2.8).

*Landscape*

It is important to appreciate the landscape character of the surrounding area with the site being located within the predominantly flat South Coast Plain, but also lying close to the grand sweep of the SDNP.

*Fig. 2.7 RNAS Hunter located at entrance from Ford Road*

*Fig. 2.8 Example of knapped flint*


*Fig. 2.9 Overlay map showing former route of the Portsmouth and Arundel Canal across the site*

## 2.5 Design Guidance

In developing the proposed design, we have referred to and drawn upon the design guidance offered by two key documents.

**West Sussex High Quality Waste Facilities – Supplementary Planning Document**: December 2006

The main aims of this SPD are:

- to improve the quality and design of waste facilities to ensure that they can be integrated with other land uses with minimum conflict; and
- to minimise the environmental and visual impact of waste facilities through high quality design.

This SPD also identifies a range of mitigation measures that should be considered in the design of new waste transfer and energy from waste facilities and includes issues relating to landscape; traffic/access; noise; and dust. How the proposed design has responded to and meets these design mitigation measures is summarised in Section 5.10 of this DAS.

**"A design-led approach to infrastructure"**: November 2012.

Reference has also been made to this CABE/ Design Council publication. It seeks to promote a design-led approach to large infrastructure projects to ensure that the opportunity for these projects to offer a positive response to their setting is not overlooked, and that without compromising their purpose and function deliver a confident and well considered architectural design can be achieved. How the proposed design has embraced the Ten Design Principles that they identify is described in Section 5.10 of this DAS.

# 3 Design Brief and Strategy

## 3.1 Design Brief and Process Technology

The proposed development includes:

A single stream energy recovery facility (ERF) with a design capacity to treat up to 275,000 tonnes per annum (tpa) of non-hazardous, non-recyclable, residual waste material. A mixture of commercial and industrial (C&I) waste and municipal solid waste (MSW) will be the main sources of waste for the facility and this will be sourced principally from within the West Sussex county area, but also from the neighbouring counties of East Sussex, Hampshire and Surrey. The ERF will incorporate a steam turbine generator which will utilise the high pressure steam created from the water heated by the combustion processes and generate approximately 31 MW of electrical power, of which approximately 28 MW will be exported to the local electrical distribution network which is equivalent to the powering approximately 68,250 homes over the lifetime of the plant. The proposals will also be able to export up to 10 MWth of heat in the form of steam or hot water in the future, should off-site recipients be identified. The ERF building will also include education, administrative and welfare facilities.

A waste sorting and transfer facility (WSTF) with a capacity to process up to 20,000 tpa of non-hazardous waste. The WSTF will take MSW and C&I wastes collected from local householders, businesses and industries principally from within the West Sussex county area, but also from the neighbouring counties of East Sussex, Hampshire and Surrey, including Portsmouth, Southampton, and Brighton and Hove.

The ERF and WSTF have specific and prescriptive process and operational requirements which have determined their building footprints and access arrangements for both their independent and their shared infrastructure.

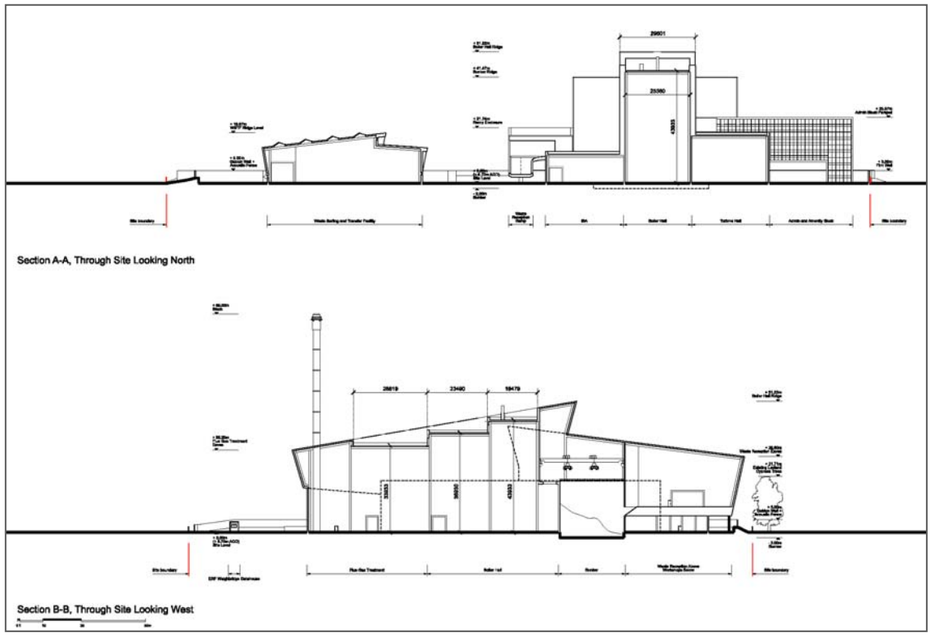



*Fig. 3.1 Proposed Site Sections – extract from drawing PL201*

## 3.2 Proposed Development

The main elements of the ERF building (Fig. 3.1 & 3.2) will include:

- Waste reception hall (inc. vehicle access ramp);
- Waste storage bunker;
- Ash storage building;
- Boiler hall;
- Flue gas treatment (FGT);
- Turbine generator hall;
- Workshops & maintenance rooms;
- Control room;
- Reception area;
- Offices and meeting rooms;
- Visitor facilities;
- Staff welfare and changing facilities; and
- Stack.

The ancillary buildings and infrastructure will include:

- Air cooled condensers (ACC);
- Gatehouse;
- Weighbridges (two for incoming vehicles, and one for outgoing vehicles) and a bypass lane for incoming vehicles;
- Staff and visitor car park (with cycle storage shelter and nearby coach drop off/parking);
- Hard standing areas for the manoeuvring of HGVs;
- Fire water storage tank and pump house; and
- Substation and switchyard.

The main elements of the WSTF building will include:

- Reception bays for unloading;
- Loading tunnel;
- Workshop;
- Reception area;
- Offices and meeting rooms; and
- Staff welfare and changing facilities.

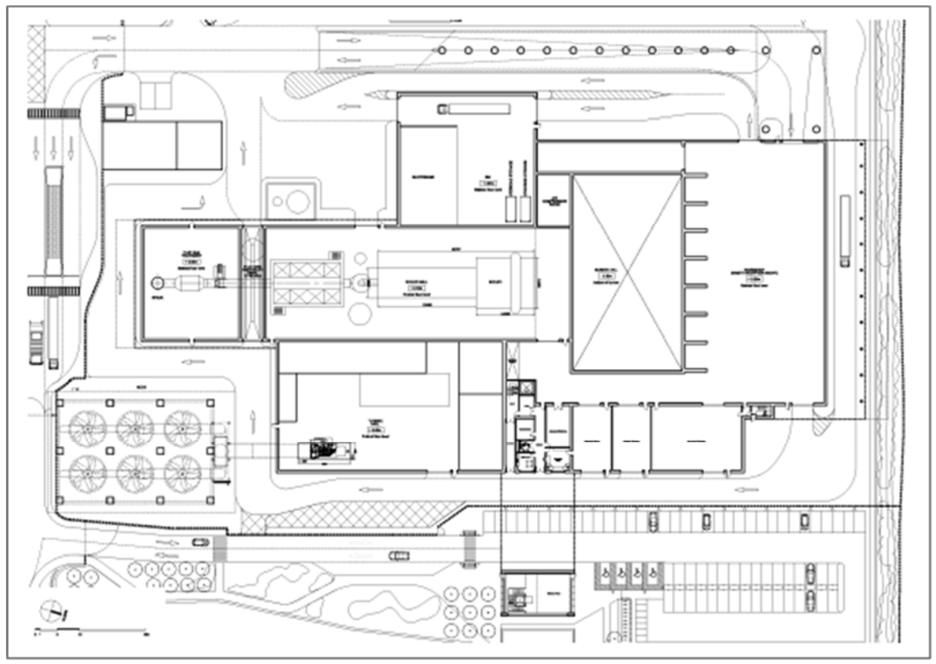


*Fig. 3.2 Proposed ERF ground level floor plan – extract from drg PL110*

The ancillary buildings and infrastructure will include:

- Gatehouse;
- Weighbridges (one for incoming vehicles, and one for outgoing vehicles) and a bypass lane for incoming vehicles;
- Staff and visitor car park (with cycle storage shelter);
- Hard standing areas for the manoeuvring and parking of HGVs;
- Fire water storage tank and pump house; and
- Vehicle washdown bays.

## 3.3 Site Constraints

The layout for the ERF and WTSF has been informed by the constraints and opportunities offered by the site, together with a consideration of the proposed development's potential impact within its setting, and the requirement for operationally efficient, state of the art facilities.

The design team undertook a thorough analysis of the site and identified a range of key opportunities and constraints. This established a number of key factors that would influence the layout and distribution of the proposed buildings and infrastructure. These included the plan shape of the site; access into and circulation within the site; segregation as far as possible between the proposed ERF and the WSTF operations; consideration of both current and potential future adjoining uses, including a large strategic housing allocation in the Arun Local Plan, and an associated outline planning application on part of the allocated area; nearby sensitive receptors; operational efficiency; orientation; security and safety; noise; air quality; and scale and visual impact.

The analysis identified a number of key constraints at the outset, which influenced the layout of the proposed development:

- Vehicular access to the site is gained via the single existing access road that connects the site at its south east corner to Ford Road, just to the north of Climping / HMP Ford;
- Groundwater level was initially recorded at - 6m below ground level and this has an impact upon the depth to which buildings might be able to be lowered into the ground;(note this level was subsequently updated, affecting future design iterations)
- Proximity to the closest residential properties on Ford Lane lying approximately 200m northeast of the site;
- Proximity to residential properties on Rollaston Park lying approximately 400m southwest of the site;
- Potential proximity to the proposed residential properties forming part of the future development of 'The Landings', a strategic housing / mixed-use allocation that surrounds the site
- Proximity to the public rights of way in the vicinity of the site to the north, including footpaths 366 and 366/1, which run north-south to Ford Lane, and footpath 200/3, which runs from Ford along the site's north eastern edge and joins footpath 363, which runs to Yapton.

## 3.4 Design Aims and Objectives

*Overarching Design Vision*

From the outset it has been recognised that due to the scale and the setting of the site it will be impossible for the proposed development to be 'hidden', and that while it would be important for it to be designed in such a way as to best mitigate its visual impact, it would nevertheless be a large building and as such it should make a positive and confident architectural statement, one which celebrates its presence whilst at the same time giving due consideration to its surroundings and context (Fig 3.3).

*Design Objectives*

At the start of the design process a wide range of design objectives were identified. These recognised the opportunities and constraints offered by the site and its surroundings and these are summarised below:

- Minimising the building footprints and their related road infrastructure in order to set aside zones around the perimeter for landform screening, landscaping, planting, and biodiversity improvements;
- Where appropriate imbedding within the design, direct or indirect references to draw upon the local character and the context of the site, particularly its historic transport links with the Portsmouth and Arundel Canal and the Ford Airfield;
- Minimising the individual building heights and volumes and considering opportunities to lower buildings into the ground;
- Providing self-contained areas for the ERF and WTSF operations;
- Establishing a logical and energy efficient 'linear' process layout for the ERF building;
- Segregating wherever possible operational HGV access from staff/visitor vehicular access;
- Establishing intuitive, efficient and safe traffic management for all vehicles circulating within the site and to enter/exit the various ERF and WSTF process areas;
- Maximising one-way traffic systems across the site and minimising the reversing of vehicles;
- Ensuring that HGVs have an optimal right-hand down reversing arrangement when reversing is required around the site and within the ERF waste reception hall;
- Establishing a public 'civic' eastern face to the main ERF building and a more visually concealed 'operational' western face;
- Developing a site layout which used the buildings themselves to shield internal operations and vehicle movements from outside receptors;
- Providing adequate queuing and manoeuvring space for all vehicles;
- Designating flexible areas on the site to accommodate the required contractors' cabins and parking
- Establishing a coherent family of buildings on the site which relate to one another and whose various functions can be understood by those visiting it;

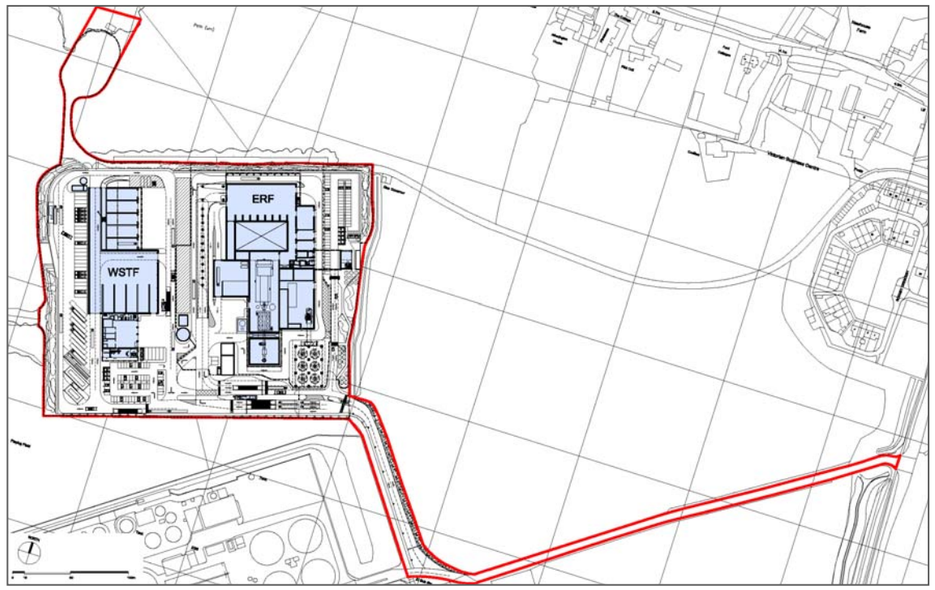



*Fig. 3.3 Proposed Site Plan – extract from drg PL105*

- Ensuring that the massing and scale of the proposed development was developed such that it best mitigates its visual impact from near and far;
- Locating the air cooled condensers (ACC) to best mitigate their potential acoustic impact upon nearby receptors;
- Incorporating an integrated drainage solution within the site; and
- Including a successful landscaping strategy to assist in achieving a biodiversity net gain on the site.

Another key design issue is that the relationship between the main components and spaces that make up the ERF and the WSTF buildings are very much process driven. In the most part the process arrangement in the ERF is linear in sequence and this together with the throughput of the facility has very much determined its footprint and layout. The segregation of the ERF and WSTF operations, and the internal process requirements of each, have also dictated their vehicular delivery and servicing requirements and these have determined the vehicular routing into and around them.

The layout design of the proposed development has been developed in response to the design objectives identified above. The design development of the site layout is covered in the following section.

# 4 Design Evolution

## 4.1 Design Development - Stage 1

The development of the site layout has been informed by a number of factors, including the constraints and opportunities offered by the site; meeting the stated design objectives; the requirement to ensure an operationally efficient state of the art ERF and WSTF; and consideration of how to best mitigate the development's impact within its setting.

The potential distribution and orientation of the principal components making up the ERF and WSTF across the site were explored, together with consideration of alternative vehicle access and circulation strategies to best optimise the overall layout, segregation of operational and non-operational vehicles, and to establish efficient and safe traffic movements across the site.

It was accepted from the outset that in order to allocate separate operational areas for the ERF and the WSTF that the square shaped site would essentially be spilt into two halves, with each sharing the single access in the south east corner of the site and a flexible central area for accommodating waste containers and bins, contractor vehicles, temporary cabins and storage areas during maintenance periods.

The first phase of work primarily focussed on the location for the ERF, with its footprint and arrangement having been determined in principal by a number of early key decisions, including:

- Adopting an optimised linear arrangement of the waste reception hall, waste bunker, boiler hall, and FGT hall/stack was assumed, with ash handling, administration wing, turbine hall, and ACC being located alongside;

- In order to minimise the height of the building the potential to lower areas of the building below ground level was considered. The information available at the time identified that the existing groundwater levels on the site were sitting at around -6m and this dictated the lowest level that parts of the building could be dug into the ground in order to minimise intrusion into the groundwater. To lower the boiler hall, the tallest structure into the ground, would require major excavation works in order to provide vehicle access ramps to the lowered level, and the footprint required for this roads infrastructure would be such that the resulting increase on footprint area for the ERF would leave insufficient space on the site for the WSTF. The general lowering of the ERF building process areas was therefore rejected; however, it was decided that the Waste Bunker would be set at -6m into the ground as it required no additional area for vehicle access;

- With the size of the waste bunker being determined by the volume of waste it is required to hold, the level at which the waste bunker is set into the ground has a direct impact upon its footprint. In order to minimise its footprint and the buildings overall size, it was decided to elevate the waste reception hall floor to +8m above ground level. This best balanced the building footprint and height and allowed for workshop and store areas to be located within the space created below the waste reception hall floor, thereby making the ERF footprint and its overall size more compact.

These early studies established that due to the site's shape being slightly more rectangular than square, and the access being in the SE corner, that a north – south orientation of the ERF (Fig. 4.1) made more efficient use of the site than an east - west orientation (Fig. 4.2) and ensured that a sufficient area would be left available for the WSTF. This orientation also enabled the highest parts of the building to be set back from current and potential future receptors (in the outline planning application for 1500 new homes) lying beyond the site's western boundary.

*Fig. 4.1 Initial site layout study – N/S alignment of ERF*

*Fig. 4.2 Initial site layout study – E/W alignment of ERF*

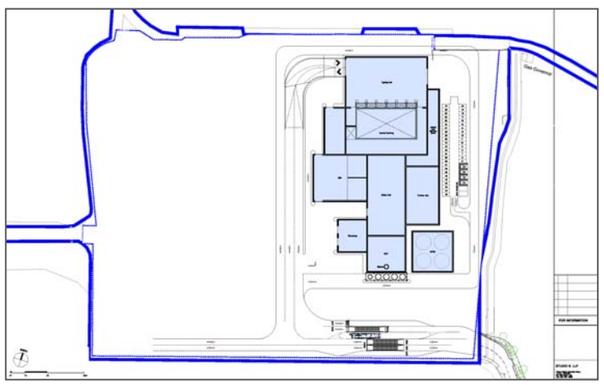


*Fig. 4.3 Initial site layout study – variant N/S alignment of ERF*

A variation of the north - south alignment (Fig. 4.3) which relocated the administration wing and the turbine hall with its connected ACC onto the eastern side of the ERF tended to be more successful. It switched the IBA drive through onto the western side and ensuring that the majority of operational vehicle movements to be contained within the centre of the site. It also allowed the eastern face of the building to be developed as a more 'civic' frontage and offered the opportunity for segregated car and HGV access to be explored further.

Mirroring the north - south alignment such that the waste reception hall was on the south was also tested, but it required the vehicle access ramp to the waste reception hall to be located on the eastern façade and this would result in HGV's having to circumnavigate the whole site on entering and leaving. It was considered that this would result in increased visual and noise concerns in relation to receptors to the east of the site, and therefore maintaining such activities in the centre of the site was considered preferable.

Having established in principle a preferred location and orientation for the ERF, layout studies were developed to incorporate the WSTF buildings and explore the relationship between the site's joint uses as well as their shared infrastructure (Fig 4.4).

There were several key principles adopted at this stage which informed the layout of the WSTF:

- The inclusion of areas around the site's perimeter within which landform screening, landscaping, planting, and biodiversity improvements could be incorporated. Located along the site's western, eastern, and northern boundaries these areas would be capable of being bunded or walled to up to 5m in height in order to visually and acoustically shield nearby receptors from the site's low-level operational activities, particularly that of manoeuvring vehicles. It has not been possible to provide a similar zone for bunding along the site's southern boundary due to the alignment of the access road into the site and the area required to incorporate the necessary entrance gatehouse and weighbridge arrangements. Sufficient area does however remain for planting and/or walls to be included along that boundary.
- Establishing a central operational zone sitting between the ERF and WSTF to offer shielding of HGV related activities from the east and the west by the buildings themselves, and within which to include an area to accommodate waste containers and bins, contractors' vehicles and temporary cabins during maintenance periods of the ERF;
- Achieving a coherent traffic strategy which optimises the independent operation of the ERF and WSTF and maximises the adoption of one-way traffic systems and the safer right hand down reversing arrangement for HGVs;
- Maximising the segregation of HGVs and cars within the site.

The key components forming the WSTF include a vehicle workshop building, which also contains administration and welfare facilities, and a main building where the WSFT unloading/sorting/loading activities would take place. The footprint and location of these were very much determined by the drive to satisfy the key principles identified above.

The WSTF layout developed at this stage located its workshop building at the southern end with its main building to its north. This ensured that the car park would be located close to the site entrance and its arrangement avoids cars having to circumnavigate the site and optimises their segregation from the HGV circulation routes.

Access doors into the northern component of the main building and the workshop, and their manoeuvring apron for reversing vehicles, are located on its eastern façade. Facing onto the central operational zone of the site ensures that these activities, including the opening of the 8m high doors to the unloading bays and vehicle workshop, are visually concealed from receptors to the east and west of the site.

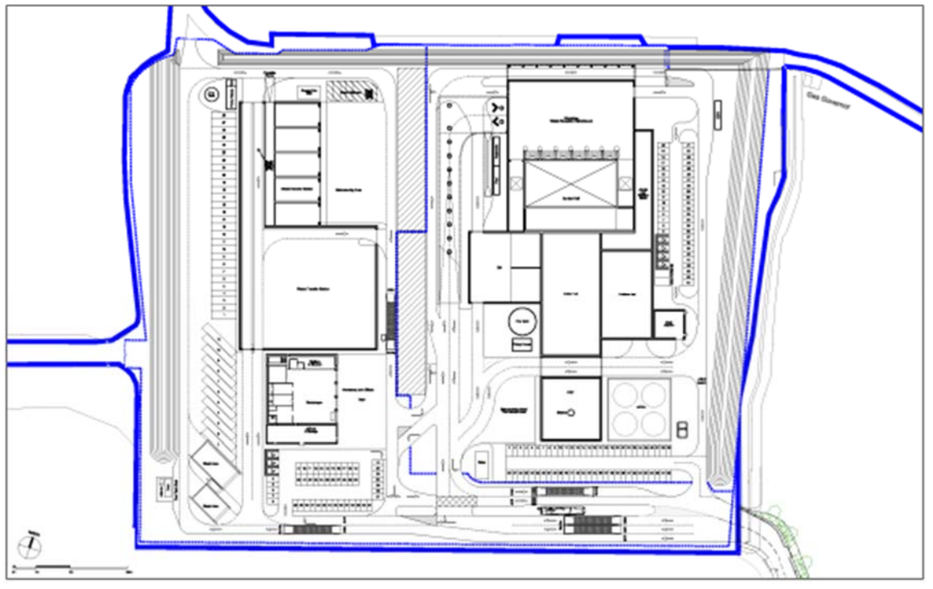


*Fig. 4.4 Interim layout – ERF and WSTF*

Access doors into the central part of the building and into the internal loading of the northern part are located on the south facade with exit doors on the north and east facades. This arrangement also ensures that there are no HGV access doors located on the western facade and allows that elevation to remain uninterrupted and visually uncluttered.

The location of the WSTF has been set back from the western boundary as far as possible. This reduces the apparent scale of the building when viewed along that boundary but also leaves sufficient space for the internal perimeter road and vehicle parking areas all of which are concealed from view beyond the site's 5m high bunding/wall arrangement.

In developing the overall layout for the site further refinements were made to the ERF to reflect detailed development of the facility. This included re-sizing of various components making up the facility and adjustment to traffic routing around the building. A key development was the 90 degree rotation of the administration wing such that it would span the internal roads system with its glazed facades facing north and south. This was in order to mitigate its potential night-time lighting impact on nearby receptors but orientating its facade to face the entrance to the site also afforded the opportunity for the architectural design to explore developing a more 'civic' frontage for the administration wing.

The conclusion of this stage of design development (Fig. 4.5) was a layout which fully integrated the ERF and WTSF within a single overall masterplan which best achieved the design objectives set at the outset.

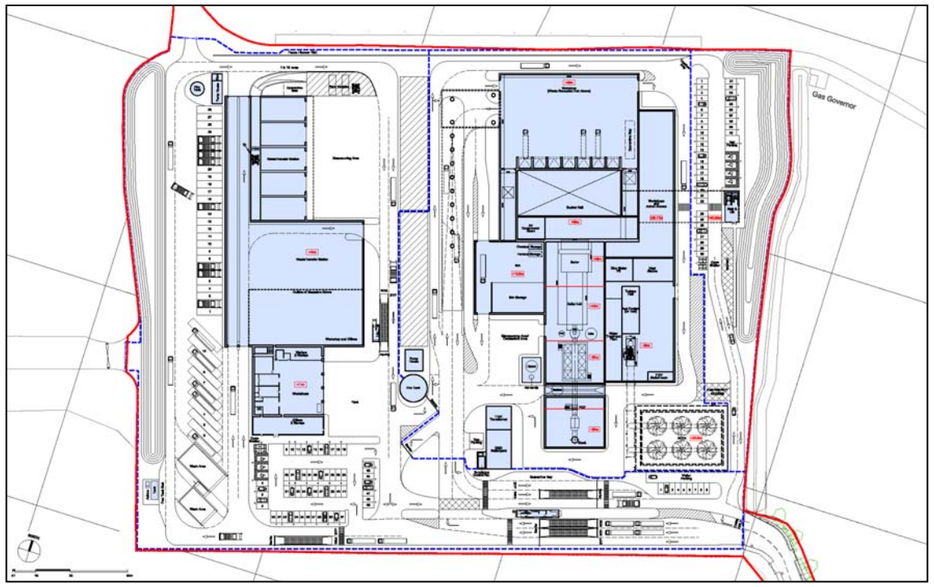



*Fig. 4.5 Developed layout – ERF and WSTF*

## 4.2 Design Development - Stage 2

The first stage of architectural design development mainly focussed upon the massing of the ERF building (this being the largest building) and was developed in parallel with the site layout work to enable the potential visual impact of the development to be considered from the outset. A number of key viewpoints were identified, and the design has been largely informed throughout its development by the use of 3D modelling and photomontages and the development of the Landscape and Visual Impact Assessment (LVIA).

Whilst recognising that the internal process equipment and related activities dictate the minimum building envelopes required for the main ERF structures, how the design might be developed to best mitigate its visual impact was a key consideration. While accepting that it would be impossible to make a facility of this size 'disappear' it was important that alternative design approaches be considered at an early stage in the design evolution process in order to best minimise the scale of the development.

Initial massing studies of the proposed design were prepared using outline 3D (CAD) models. As the design was being developed in parallel with LVIA assessment work, 'formal' record photographs from key viewpoints were not available at the time. Therefore two 'informal' eye level views were used to test the visual impact and appearance of the proposed design from the surrounding area.

The views (Fig. 4.6) against which the design studies were tested were identified as:

- View 1 - View westwards from the site's former exit road west of Rodney Crescent
- View 2 - View northwestwards from the site's access road leading from Ford Road

Having established the minimum building heights and footprints required for the main ERF process areas a basic 3D massing model (Fig. 4.7) was generated and tested in 3D in both views (Fig. 4.8). This identified several issues that would need to be addressed:

- The height and massing of the boiler hall appeared excessive in relation the remainder of the building;
- The overall profile of the building's roofscape against the sky was considered overly rectilinear and fractured and that alternative profiles should be explored;
- The overall visual scale of the building would need to be broken down by consideration of contrasting materials/colours.
- The ERF would clearly be seen as a large building within the landscape and that while consideration should be given to architectural designs which might assist in blending the building with its surroundings, designs which were focussed on making a positive and confident architectural statement should not be ignored.

*Fig. 4.6 Existing View 1 and View 2*

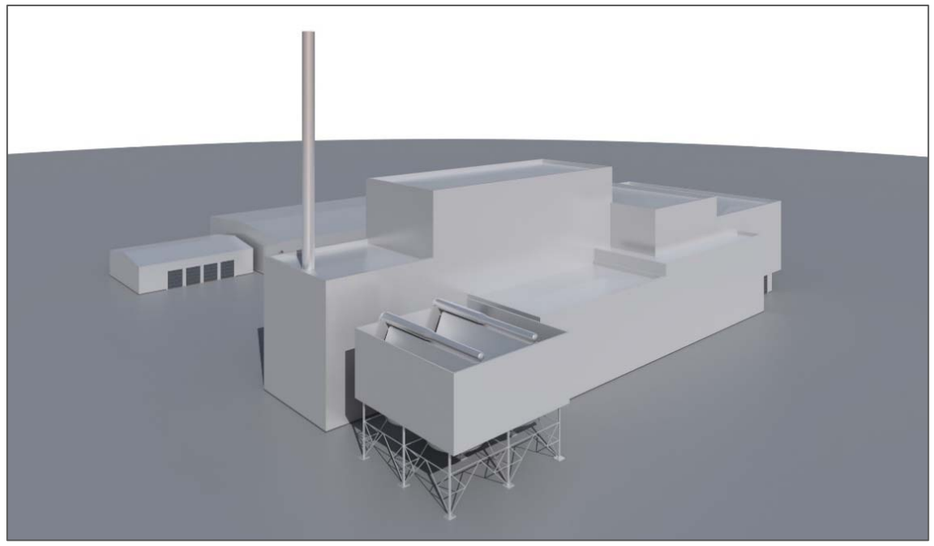


*Fig. 4.7 Basic massing – aerial view from the south east*

*Fig. 4.8 Basic massing from View 1 and View 2*

A range of design studies were then undertaken to test alternative approaches to the shape and the roof form of the main ERF facility. Using variations of the 3D CAD model several early massing / colour studies were developed (Fig. 4.9).

- How the overall massing might be broken down through the use of varying colours / tones was explored on the basic cubic massing. In the first option a dark colour banding was applied to the lower cubic forms to create a darker plinth around the building. This proved successful in breaking up its overall scale through colour contrast and also in reinforcing the stepping in scale between the lower and upper parts of the building. The opportunity for the base to be darker coloured than the upper parts of the building would allow the lower parts to be colour blended with the darker groundscape, and the upper parts with the lighter sky.
- The principle of layering the building in a series of dark and light tones was developed further. The darker plinth was retained and further options with 3 no. and 4 no. layers were developed.
- To further break down the overall scale, designs which accentuated and created additional ‘steps’ and layers in the buildings profile were developed, and bands of colour added at high level to add further visual interest.
- To address the scale of the tallest boiler hall structure alternative profiles for the building’s roofline were developed. Using the layered studies as a base several curved roof design options were considered. This culminated in a curved roof design where a single curved ‘wing’ over sailed the majority of the upper parts of the building, but to keep the overall height as low as possible it was set such that it intersected with the upper boiler hall rather than cover it. From the outset the design team was keen to include features that reflected the dynamism of flight, and the curved roof form clearly reflected the upper cross section of an aeroplane wing and hence was reminiscent of the site’s history as a former airfield.
- At this time the opportunity to use the office and welfare accommodation wing to create a ‘civic’ eastern frontage was also being explored. There was however consideration given to the possibility that the internal lighting of its glazed façade may result in an unwelcome night-time visual impact for receptors to the east of the site. To address this concern, it was decided that this accommodation wing should be rotated 90 degrees such that glazed areas would be more southerly and northerly facing and as such be less impacting as a result.

Accepting that while every effort would be made to best mitigate its visual impact the building would clearly remain a large feature within the landscape. Therefore, the opportunity to celebrate it as a confident piece of architecture, a landmark within its setting, was also explored in a number of design studies and included:

- Drawing attention to the boiler hall by applying folding overcladding to its facades to visually fracture its overall shape, or to ‘wrap’ a curved overcladding around it to visually soften it. Both approaches would add visual interest and each could be further enhanced through the careful selection of material/colour.

The final suite of design studies followed an internal technical review which established that the profile of the boiler hall and FGT could be further stepped to more closely follow the height of the internal equipment. This generated a 3-level roof to the boiler hall and the impact of this was explored.

- Further development of a steeped/layered shape to the building was developed and which further fragmented the overall height of the building and offered further opportunities to vary colour between the horizontal bands;
- Treating the stepped profile as a single dynamic sloping roof form offered an efficient fit to the internal process and helped lower the buildings profile at its southern end. Treating this upper volume in a

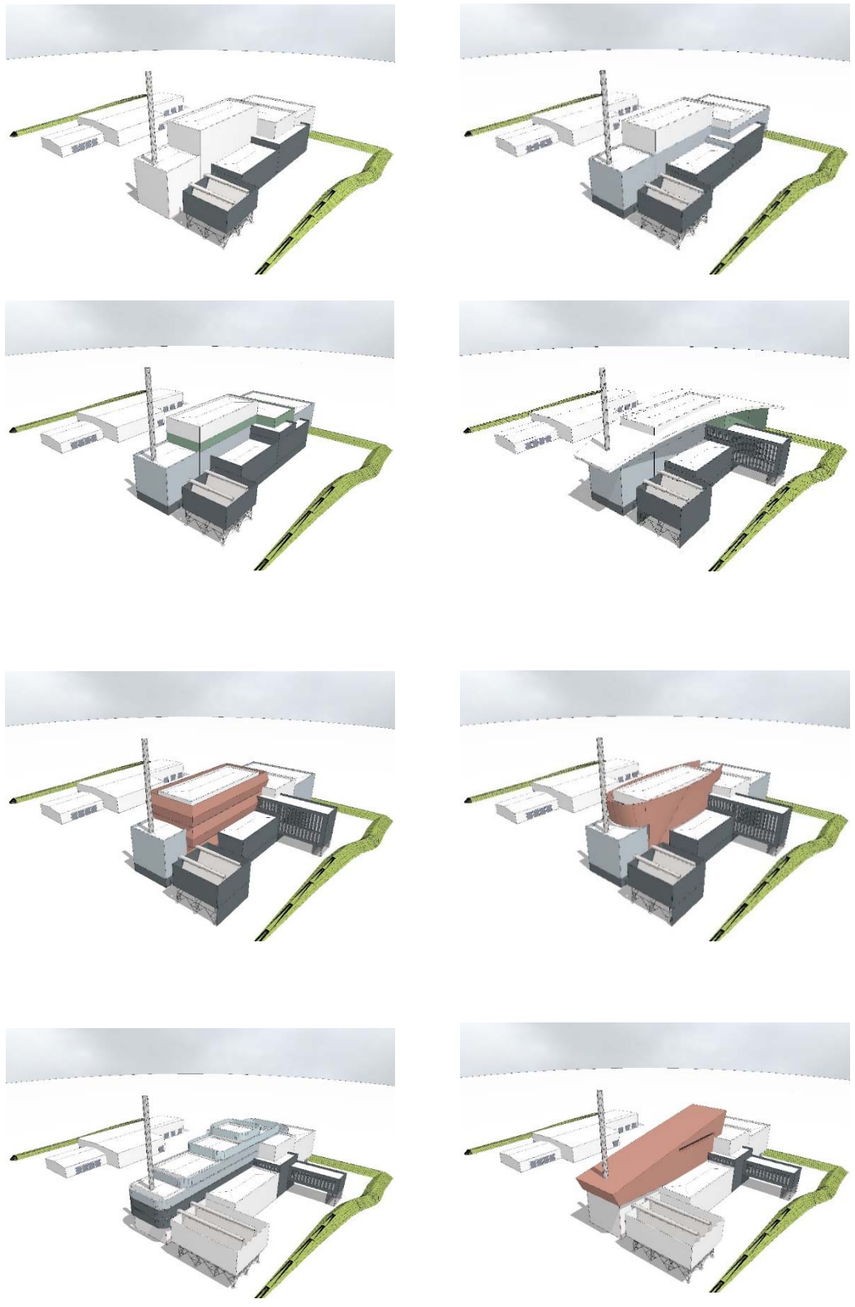


*Fig. 4.9 Range of early massing / colour studies*

contrasting colour would also assist in breaking up its scale but also make a bold architectural statement, and a dynamic representation of flight.

## 4.3 Design Development - Stage 3

Following several internal team reviews it was decided that a number of the previous range of design studies warranted further development, and this stage of design development focused on advancing three alternative concepts. Each was developed in 3D and reviewed in the previous views, but also from an additional eyelevel view from the west of the site. The design concepts were also repeated on the WSTF as being the closest part of the development to the west as this would offer an important visual foreground, and how the overall concept might achieve a visual 'family of buildings' on the site was an important design objective.

A key design feature that was brought through from the previous design studies included:

- the use of a darker colour on the lower parts of the building to create a visually grounded plinth upon which the upper parts of the building would sit;
- the 90-degree rotation of the administration wing to ensure glazing faces north and south rather than east;
- to conceal vehicles entering/leaving the elevated Waste Reception hall the access ramp would be clad such that it enclosed the upper part of the ramp including the access door and this was to partly shield moving vehicles and their lights from nearby receptors particularly on exiting the Waste Reception Hall.

For technical reasons an increase in the size of the ACC from 4 cell to 6 cells also had to be accommodated in all three designs.

**LAYERED**

Based upon one of the previous design studies, this design adopted a strict 'form follows function' approach and layered the building to relate to the differing stepped roof plates and to use 'blocks' of contrasting light and dark colours to break up the overall massing of the ERF. Being a tight fit to the internal process volumes this architectural design was the most volumetrically efficient and as such minimised its overall scale. The WSTF was treated similarly to the ERF but being lower in height would be less layered than the ERF.

*Fig. 4.10 'Layered' design study*

**CURVED**

This option explored wrapping the boiler and FGT enclosures in a single architectural form which would conceal the steeped roof profile of the ERF behind parapet walls, the tops of which would be angled/sloped to generate the curved appearance of the roofline, and conceal rooftop equipment and vents behind. The overall appearance offered a soft profile, and this was also applied to the corners, which being curved would visually soften the building further by removing its ‘corners’ and blurring the transition between facades in light and shadow. This feature was also applied to the roof of the WSTF to soften its appearance from western views by folding the wall into the roof.

*Fig. 4.11 ‘Curved’ design study*

**WINGS**

This design developed an alternative version of the curved roof principle. Rather than extend the upper volume as a single feature across the length of the building it sought to break up its scale into two angular upper forms. These would be treated as two dynamic and contrasting interlocking ‘wings’ which would celebrate the site’s historical links with aviation. As with the ‘Curved’ design the northern and southern extents of the building will be lower than the central area and assist in bringing its scale closer to ground, and the parapet approach would conceal rooftop equipment.

*Fig. 4.12 ‘Wings’ design study*

A pre-application meeting with the West Sussex County Council planning department was held to review the design development work that had been undertaken to date and included the shortlisted designs. WSCC offered the following comments and feedback:

- Given the likely scale of the building within the surroundings it will inevitably be visible;
- Industrial style ‘blocky’ buildings with limited aesthetic quality should be avoided;
- An outstanding, visually attractive and innovative architectural design which promotes high levels of sustainability and raises the standard of design in the area will be required. The design should consider taking cues from local heritage or character and respond carefully to the existing and future setting (noting surrounding housing allocation);
- Materials/finishes should be carefully considered to aid in reducing the impact in long distance views;
- A range of viewpoints within which to test the proposed design need to reflect the key sensitive receptors (i.e. Arundel Castle, PROW, Village Greens, and close-range viewpoints from around the site including related to the potential new development close to site);
- Ancillary structures, particularly the ACC needed to be carefully incorporated into the design to minimise impacts and to read cohesively;
- The buildings for the two facilities proposed on the site should be architecturally complimentary;
- Opportunities to maximise landscape screening (including bunds and planting around the site) and biodiversity enhancement must be taken.
- Consider opportunities for lowering building into the ground (to minimise maximum heights).

WSCC stressed that it would be important for the DAS to detail the design development process and explain the reasons why the final design approach had been chosen.

Following a subsequent internal design review the design team concluded that the design rationales that lay behind the **Curved** and **Wings** designs were favoured over the **Layered** option as while it offered the most visually compact design, it lacked ambition, and its more standard industrial building appearance would not be appropriate for its scale within its surroundings. Similarly, the ‘blocky’ appearance of the WSTF when viewed from the west did little to offer an appropriate architectural language to enhance its appearance.

## 4.4 Design Development - Stage 4

The next stage of design development sought to address the comments and concerns raised by WSCC.

When comparing the two design approaches it was considered that the **Wings** design offered a better visual balance and was more effective in breaking down the overall scale of the building. In reviewing the 3D views of the **Curved** design there were also concerns that the curving of corners on the ERF and the leading edge of the WSTF roof would lead to sun reflection highlighting these areas and thereby drawing attention to the building within the landscape. For these reasons the **Curved** design was rejected, and the **Wings** design was developed further by the team.

While the key principles of the site layout and architectural design remained unchanged, they were revisited, and the following changes made:

**Site Layout**

The revised proposal (Fig. 4.13) focused on improving the relationship between the ACC with the ERF building and considered in further detail the opportunity for landscaped screening around the site. It included the following changes:

- A 90-degree rotation of the ACC allowed it to be set further back from the eastern boundary to better blend with the main building when viewed from the east of the site;
- This change also allowed the access route to the ERF car park to be set further west and provide additional area for landscape screening along the site's eastern boundary
- The car park for the ERF was enlarged to ensure it catered for both staff and visitor numbers;
- The landscaped screening was extended along the site's northern and western boundaries and around its north-western corner to improve noise and visual screening to nearby receptors;
- Having plotted the route of the historic canal a break was introduced in both the western and eastern screening landforms to signify the former path of the canal, which on the eastern side was also marked by the location of the administration wing and at its base a water feature.

The internal layouts for both the ERF and WSTF were also revised. In the case of the WSTF this was to ensure that the internal material storage bays were sufficiently sized to accommodate the required material but also the internal unloading/loading of HGVs.

The layout changes to the ERF were mainly as a result of there being updated information from ongoing monitoring of the groundwater levels on the site. This showed that the actual level was between 2.3m and 2.45 m below ground level across the site. For that reason, it was decided that the base of the bunker would have to be raised from -6m to -2m to avoid interaction with the chalk and groundwater.

However, the relationships between the depth and footprint of the bunker and its relationship to the level of the waste reception hall are all interlinked and are determined by the volume of waste that it is required to be stored in the bunker, and to ensure an efficient plan grid for the crane grab operation. Therefore, as a result of the reduction in depth of the bunker the footprint of the bunker had to be adjusted as did the level of the waste reception hall which had to be increased from +8m to +10m above ground level. As a result, the length and plan arrangement of the vehicle access ramp also had to be revised.

The feasibility of lowering the building into the ground had been considered earlier in the design process and the reasons for its rejection are explained elsewhere in this DAS, and the new groundwater data further reinforced that decision.

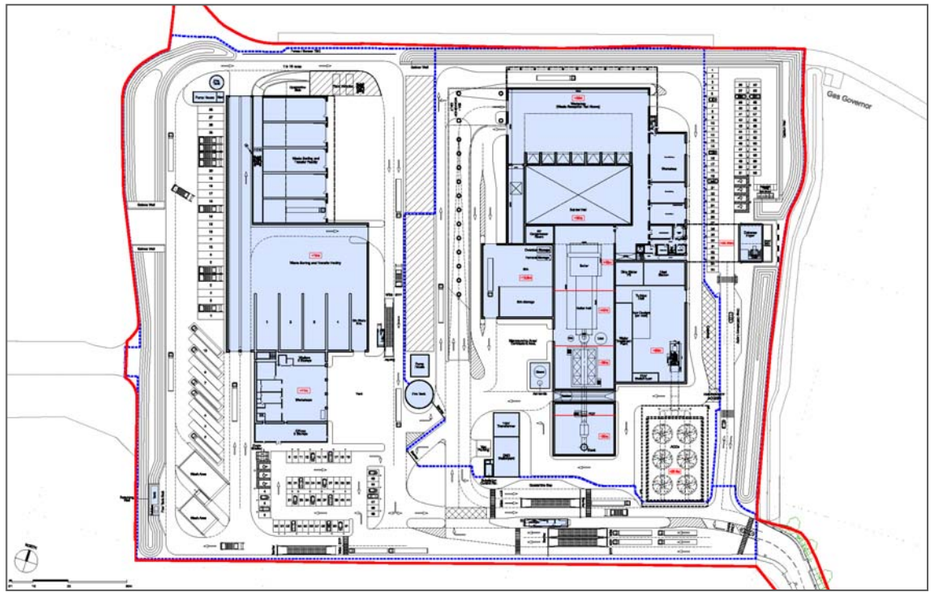


*Fig. 4.13 Refined site layout – ERF and WSTF*

**Architectural Design**

Alongside the development of the site layout, the scale and colouring of the proposed design was tested in a range of viewpoints identified by the LVIA team and agreed in discussions with WSCC.

*Fig. 4.14 Long range view – extract from LVIA Visualisation 1 ‑ Bridleway South Downs Way looking south west*

When considering the initial massing study in views from the South Downs National Park (Fig. 4.14) it was evident that the building would be read mainly against a backdrop of ground, and slightly against the seascape, and that while the shape of the building may not be discernible the colour would. Using mid tone colours instead of very light or very dark would better blend the building with the landscape whilst a light neutral colour would best mitigate the visual impact of the stack.

When tested in more medium range viewpoints from the north i.e. Arundel Castle, the shape of the ERF building is more apparent and seen mainly against a backdrop of ground, but with its upper volumes breaking the horizon line and seen against a backdrop of sky. From such views the dark plinth worked well in bedding the building into the foreground and that using mid tone colours instead of very light or very dark also better blended the building with the landscaped background. Again, the use of silver grey and coppery earthy colours for the different wings was successful in softening its appearance in these views, but also in breaking up its overall scale. Adopting a  light colour for the stack better blended it with the sky.

*Fig. 4.15 Mid-range view – extract from LVIA Visualisation 7 – Climping Beach looking north*

This colour palette also works well in medium range views from the south (Fig. 4.15) where the lower parts of the ERF building are essentially screened by foreground tree belts and where the upper part rises above the tree line and read against the raised landform of the SDNP. Again, this proved that the use of lighter colours would be less successful in mitigating its visual impact as the proposed colours helped blend the building with the tree belts and against the landscaped background.

In other medium range views, the ERF building would again be seen rising above foreground and adjacent tree lines and be partly read against a background of sky. However, in these views the building in the most part was

still considered to be relating more to the groundscape than the sky, and the combination of the inclined roof forms and their colouring were successful in breaking up its shape and scale and blending it with the landscape.

In contrast to the medium and long-range views, the more local views, including the previously tested views from the east, showed that much of the ERF building would be read against the sky. Two additional viewpoints were selected in order to consider how the design would appear when viewed from the west (Fig. 4.16) and northwest (Fig. 4.17). Both images illustrated that the inclined wing forms were successful in both breaking up the scale of the building but also in bringing the northern and southern extents of the ERF to the ground. The silver grey and coppery earthy colours on the different wings further fractures its overall size and balances the contrasting colour demands of ground and sky blending. The use of a light grey colour for the stack proved appropriate and best blended it visually against both clear and overcast sky backdrops.

Overall, the consideration of the proposed design from the range of selected viewpoints showed that the use of inclined and interlocking wings assist in breaking up the size of the ERF, and that contrasting silver grey and coppery earthy colours are appropriate in blending the building with its surroundings. At the same time the proposed design delivers a confident and visually dynamic architectural landmark which draws upon the aviation heritage of the site.

Having established the preferred design approach, the architectural design was revisited in order to try and address the remaining WSCC concerns while at the same time developed in further detail and included:

- Incorporating Photovoltaics on the inclined roof of the ERF and the flat roof of the WSTF workshop;
- Detailed development of the floor layout of the ERF administration wing including offices; meeting rooms; staff welfare facilities; and the visitor facilities;
- Incorporating a water feature at the base of the ERF administration wing, close to where the former canal entered the site;
- Identifying the location of ventilation louvres on both the ERF and WSTF;
- Refinement of the glazed facades of the ERF's administration wing and the inclusion of vertical solar shading fins to better shield the potential night-time light spill to receptors northeast and east of the site;
- The potential to visually screen lower areas of the ACC support structure was reviewed but due to technical requirement to maintain air flow around and below the ACC could not be implemented. However, it was decided that cladding would be applied to screen the pipe duct and support structure that would span between the Turbine Hall and the ACC;
- Developing the design of the WSTF roofscape to incorporate roof lighting that would face away from nearby receptors to minimise the potential for night-time light pollution.

A second pre-application (virtual) meeting was held with the West Sussex County Council planning department to offer an update on the design progress made since the last meeting. Several issues were raised:

- A decision would need to be taken on the inclusion of aircraft warning lights on top of the stack;
- Need to show integration with adjacent landscape including at site entrance/access road;
- The treatment along the southern boundary was questioned and the proposed design needs to make the most of opportunities for some planting and integration with anything off site on the adjacent playing fields (part of the housing application);
- It was considered that the northern elevation of the ERF appeared to be quite stark as a large blank area, and there might be some exploration of texture or other means to break this up;
- Explanation required on why the building can't be sunk further into the ground
- Need to show that the existing PROW at the north east is clearly provided for;
- Lighting issues should include impact on amenity and this is covered in Chapter 9 of the ES

*Fig. 4.16 Local view – PROW looking north east towards the site*

*Fig. 4.17 Local view – extract from LVIA Visualisation 24 - PROW looking south east towards the site*

## 4.5 Design Development - Stage 5

The final stage of design development sought to address the recent comments and concerns raised by WSCC.

With the landscape design being developed in further detail the interface between planting; screening; landforms; mitigation and ecology required there to be slight modifications to the site layout. Other operational related amendments were also being accommodated in the final design. The final iteration of the site layout (Fig. 4.18) included the following changes:

- Changing from double banked premier screening landforms to single banked in order to reduce their slope and reducing the overall height of the landforms from 5m to 2m in order to reduce the height of the gabion retaining structure but incorporating a 3m high acoustic timer fence. This would ensure that the concrete filled gabions would only be visible from within the site and the combination of landform and acoustic fence around the perimeter would still provide the required noise and visual mitigation but with a softer appearance;
- Relocating the WSTF refuelling bay further north to ensure that a regular width of perimeter landform is maintained along the sensitive western boundary;
- Relocating the perimeter security fence to along the northern boundary and in combination with a 5m high acoustic fence maximise the provision of planting between them;
- Replacing the landform originally proposed along the southern half of the eastern boundary with a 5m high flint wall in order to free up more space for planting in that area;
- Including for a 3m high acoustic timber fence along the southern boundary;
- Increasing the provision of vehicle washdown bays; and
- Providing additional vehicle parking bays adjacent to the WSTF workshop.

Changes to the architectural design included:

- Incorporating areas of flint walling to key areas on the ERF and the WSTF to add local character and visual interest and offer a visual contrast to the scale and finish of the metal cladding;
- The future capability to incorporate aircraft warning lights on top of the stack.

# 5 Design Solution

## 5.1 Design Summary

For the proposed development we have sought to adopt a design approach which minimises the volume and massing of the facility and in so doing seeks to minimise its visual impact when viewed from key views. The overall aim has been to create a design which is contextual, compact, functionally efficient, and an environmentally responsible development with a coherent and consistent design theme being applied to both the ERF and the WSTF.

## 5.2 Design Solution

The design solution has been determined by a number of principal requirements established from the outset and include:

- Ensuring that the main functions of the buildings are achieved in a sustainable manner;
- Embracing a clear design vision to develop a refined and dynamic architectural solution which both celebrates and unifies its process functions and in so doing offering a visual enhancement to its setting; and
- Developing an efficient and safe site layout for all users.

## 5.3 Orientation

Initial design studies explored various site layouts including different orientation for the main process areas. As previously mentioned, the development proposal has specific process led requirements prescribed by the technology solution. These were considered against the site constraints, characteristics and context to satisfy the ambition of providing a high quality and operationally efficient design solution.

The north to south orientation of the proposed ERF building and alignment of service yards are a direct contextual response to the site approach, access and building functionality as well as best mitigating its visual impact (Fig. 5.3) The rationale and benefits of this orientation is explained further in the previous Design Development section of this DAS.

*Fig. 5.1 Proposed design in View 1*

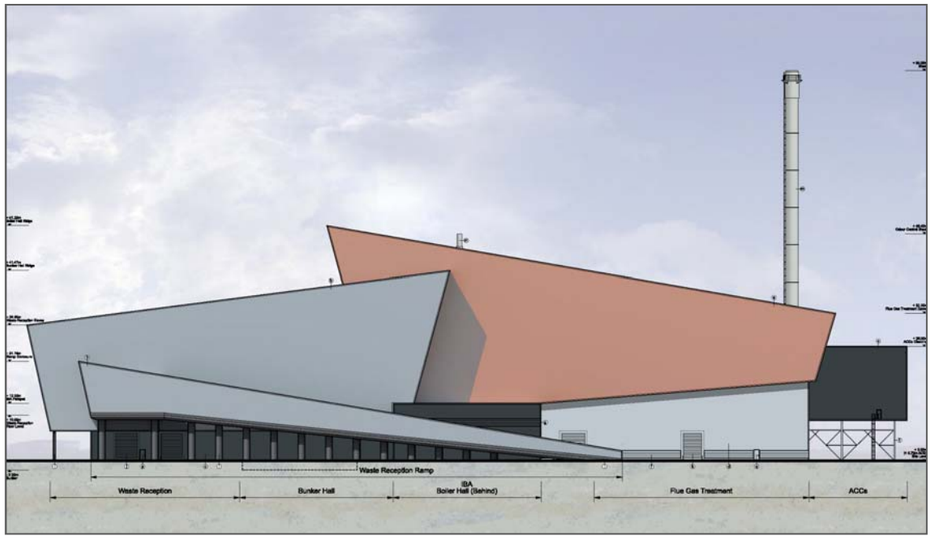



*Fig. 5.2 Proposed ERF west elevation – extract from drawing PL303*

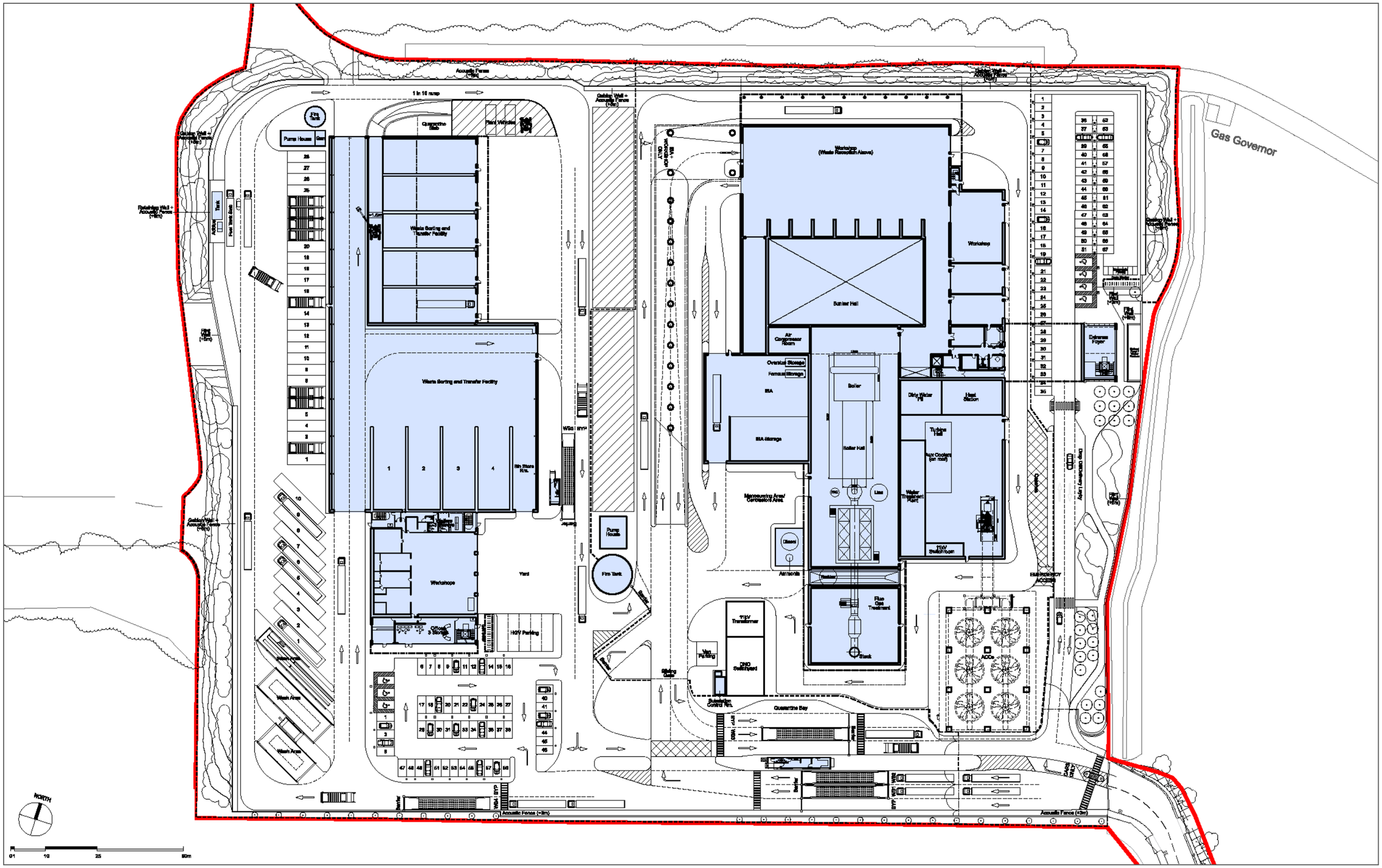



*Fig. 5.3 Proposed site layout – extract from drawing PL106*

## 5.4 Vehicular Circulation and Access

Maximising the segregation of operational and non-operational vehicles within the site has been an important feature of the layout design (Fig. 5.4).

All vehicles will access/egress via the single access in the south east corner of the site.

All vehicles will be controlled on site via designated roadways, road markings, traffic light systems and traffic control bollards. A speed limit of 10 MPH will be imposed and maintained across the site.

**ERF**

Directly upon entering the site, and prior to the main gatehouse/weighbridge arrangement, access is provided to the ERF car park for staff and visitors, including cyclists and pedestrians and has its own gated entry. The car park is located close to the administration wing of the ERF building and provides 68 standard EV car parking spaces and four Blue Badge EV bays. The car park also incorporates a drop off area for vans and passenger drop of bay. A visitor's coach parking lay-by is provided for within the main ERF operational site and visitors will access the admin car park via a secure gate in the fence between the two areas. Specific provision is made for cyclists with permanent, secure and sheltered cycle parking. This will be located close to the entrance to the administration wing where stair and lift access is provided to its upper floors. The cycle parking will comprise eight Sheffield stands, providing 16 cycle parking spaces for staff and visitors, and drying and showering facilities will be provided for within the main building.

All operational vehicles accessing the ERF site will be controlled by the gatehouse /weighbridge arrangement which is gated and when not in use will be secured outside of normal operating hours. Upon entering, vehicles will approach the two inbound weighbridges where access is controlled by vehicle barriers and the gatehouse. Leaving this weighing/control point vehicles will join the perimeter road which circuits the main building. This is a one-way traffic system which requires vehicles to circumnavigate in a clockwise direction to maximise the safety for vehicle manoeuvring and for accessing the building itself, and where required ensures right hand down reversing around the site. However, upon entering this road system the majority of vehicles will proceed onto the vehicle ramped roadway which leads to the waste reception hall and its combined access/exit on the north western corner of the building. This is the only stretch of two-way road on the site. Once inside, HGV vehicles will manoeuvre and reverse up to one of the tipping bay openings and deposit their waste into the waste bunker. The traffic flow into the waste reception hall ensures that this internal reversing manoeuvre is the safest right-hand-down operation. Once the unloading operations have been completed vehicles will then leave the waste reception hall through the door they entered and directly exit via the ramp which leads to the out-bound weighbridge and gatehouse control. This arrangement ensures that the number of HGVs circumnavigating the internal perimeter road is minimised and contained within the centre of the site. To further mitigate the potential noise and visual impact of the vehicles using the ramp it is enclosed at its upper level on its western and northern end and is also roofed. This also ensures that high level light spill from vehicle headlights during the hours of darkness, particularly those exiting, are shielded from nearby receptors to the west of the site.

The internal perimeter road system will also be used by non-tipping vehicles to access the other operational areas within the ERF building. Reversing of HGVs within the site is minimised, with drive through arrangements for the western side IBA storage area, the FGT hall, and the workshop/stores areas located beneath the waste reception hall.

Whilst most of the process equipment is located within the building envelope, there are pieces of process plant equipment that have to be located externally for operational reasons. These include the air cooled condensers (ACC); the ammonia store; the fire water tank and pump house; and an electrical substation and switchgear

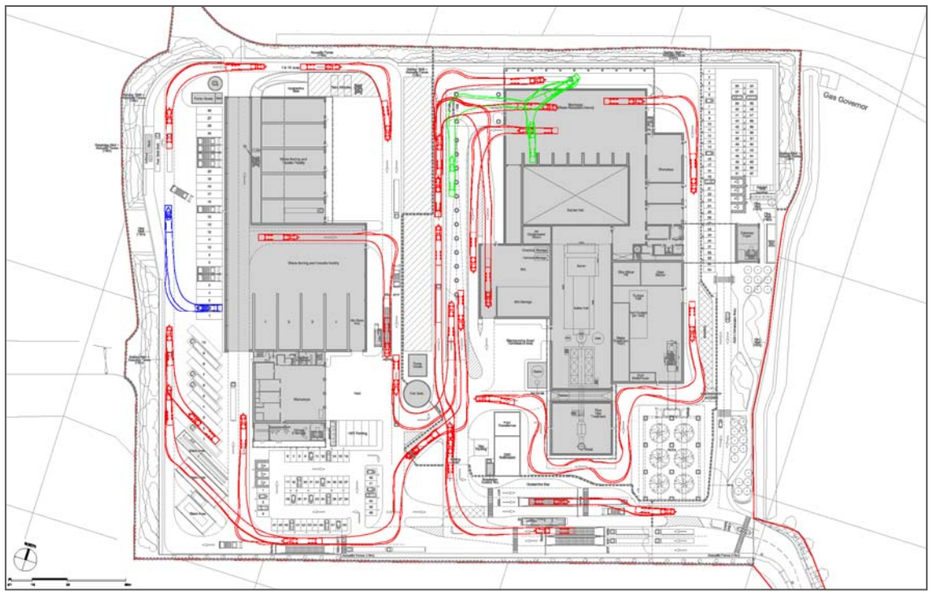


*Fig. 5.4 Proposed vehicle tracking layout*

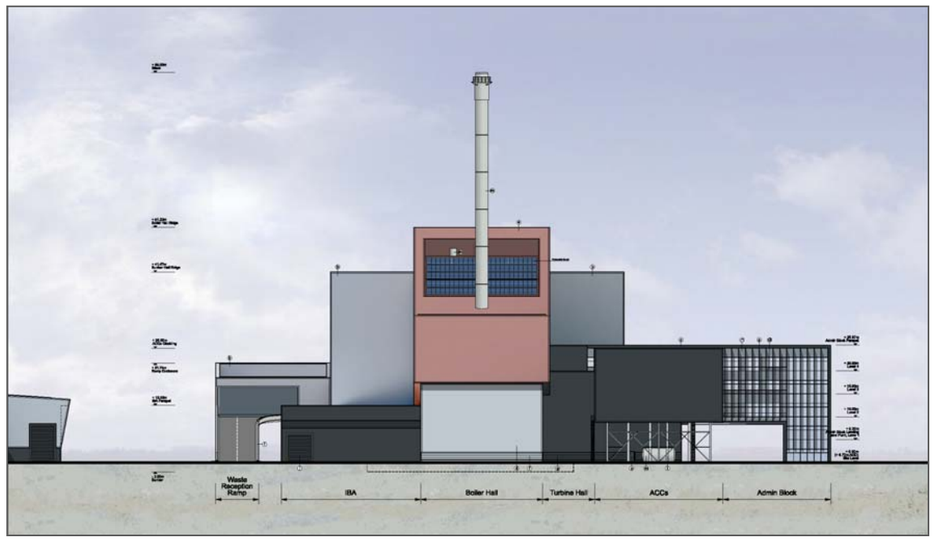



*Fig. 5.5 Proposed ERF south elevation – extract from drawing PL302*

compound. Hard standing areas around the site have been sufficiently sized to cater for the required vehicle routes, manoeuvring areas, and to facilitate entry and exit to these areas.

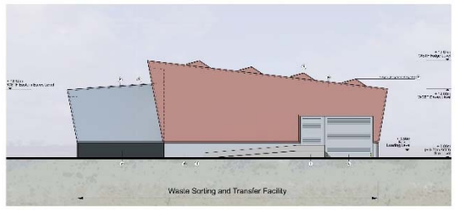
All HGVs exiting the site will return to the gatehouse / weighbridge where one outbound weighbridge and one bypass lane allows exit from the site.

**WSTF**

Upon entering the site all vehicles accessing the WSTF will use the bypass lane adjacent to the main gatehouse/weighbridge arrangement beyond which alternative routes are provided for operational and non-operational vehicles. Immediate access is provided to the WSTF car park for staff and visitors, including cyclists and pedestrians. The car park is located in front of the entrance to the administration wing of the WSTF building and provides 59 standard EV car parking spaces and three Blue Badge EV bays. Specific provision is made for cyclists with permanent, secure and sheltered cycle parking. This will be located close to the buildings entrance. The cycle parking will comprise eight Sheffield stands, providing 16 cycle parking spaces for staff and visitors, and drying and showering facilities will be provided for within the main building.

All operational vehicles accessing the WSTF site will access via its own weighbridge arrangement. On leaving the weighbridges HGV's will join the WSTF's internal one-way road system which provides access to the full perimeter of the building and HGV parking areas, and sufficiently around other parts of the site to allow for maintenance of the building and for emergency vehicles. All loading and unloading of HGV's will take place inside the building. The site arrangement is such that the west side of the building is used for HGV parking areas while the eastern side is where most outdoor vehicle manoeuvring will take place. This is to ensure that these operational movements and accesses into the building via large roller shutter doors are best shielded by the WTSF building from receptors to the west. This arrangement also avoids the need for tall roller shutter doors on the western façade which when opened could lead to potential light spill concerns over the top of the perimeter bund, and ensures that the western elevation can remain visually clean and uncluttered.  All HGV parking bays can be accessed using the preferred right hand down reversing manoeuvre.


South Elevation


North Elevation

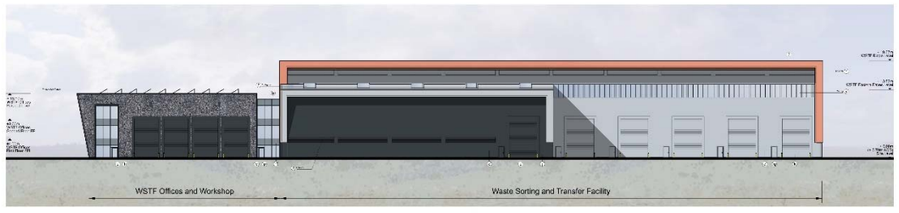



*Fig. 5.6 Proposed WSTF elevations – extract from drawings PL305 & 306*

## 5.5 Scale and Appearance

Reducing the overall scale of the ERF building has been carefully considered from the outset. Ensuring that the building envelope will be as volumetrically efficient has in the most part been followed, balanced with the desire to create a contextually appropriate and confident piece of architecture.

Careful consideration has been given to the form of the main buildings, and the use of a limited palette of high quality materials, and the articulation of the architectural elements, to ensure that a cohesive and striking design is achieved.

The overall raking shapes of the ERF (Fig. 5.7), and to lesser degree the WSTF, are dynamic and reflect the aviation heritage of the site. The inclined upper ‘wings’ of the ERF resemble the swept wings of the Royal Navy Air Services Hunters which previously flew from the airfield and incorporate the raking form of the supersonic 'Fairey Delta’ (Fig. 5.8) which once held the air speed record during the 1950’s (first to over 1,000 mph) and which while not based at Ford set its 1,000mph plus speed record over a stretch of airspace between Chichester and RNAS Ford with monitoring equipment on the ground at the airfield.

The upper ‘wings’ also help to visually ground the ERF building, as does treating much of its lower level ‘plinth’ as refined darker linear features. Both upper and lower levels are further differentiated in their materials and colour with the upper level being clad in lighter coloured cladding. All high level roofs are enclosed behind parapet walls to ensure safe service access to roof areas for personnel and to help visually shield much of the rooftop equipment from view.

The only component to interrupt this language is the administration wing which spans across its car park and the internal road system, and its large scale glazed facades assist in establishing a ‘civic’ frontage on the eastern side of the building.

The scale of the other buildings and external equipment included within the proposed development are all essentially lower in height and tend to relate to the scale of the plinth of the ERF. Other than the WSTF whose appearance directly embraces the design approach adopted for the ERF, the other buildings/equipment are coloured to match that of the plinth and make them part of the family of buildings. The ladder on the stack has been located to minimise its impact from nearby views.

The Design Team has chosen not to suggest elaborate designs for the single stack as they have a slightly different set of visual and operational issues which influence how its design is approached. It will be a significant feature read against the sky and will in fact be the only feature of the proposed development seen from many areas. For that reason, it was decided that the stack should be played down in its form and colour and be left as a slender column to best minimise its appearance against a backdrop of sky.

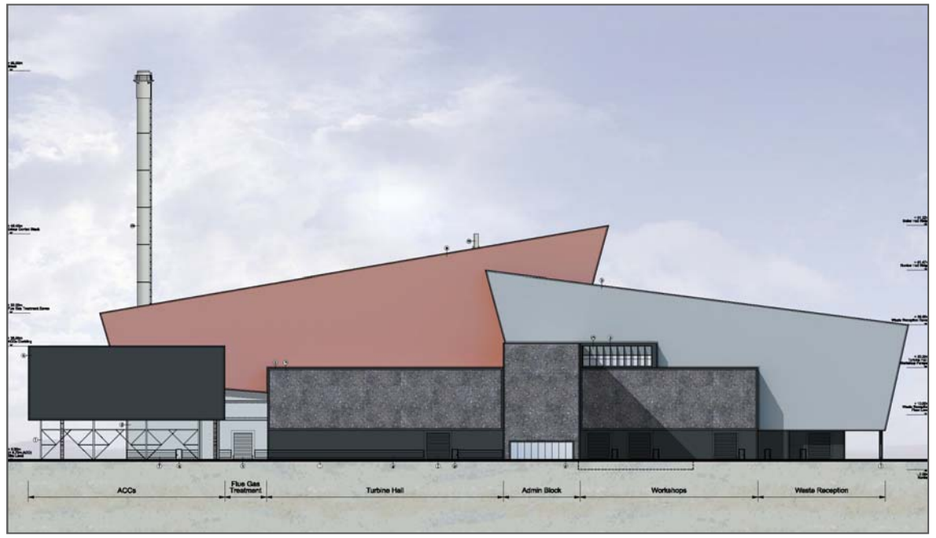



*Fig. 5.7 Proposed ERF east elevation – extract from drawings PL301*


*Fig. 5.8 ‘Fairey Delta’ supersonic jet*

## 5.6 Material Colours & Textures

A range of materials, textures and colours have been fully considered in the context of the proposed design solution and a mixture of standing seam coated aluminium, trapezoidal profile steel, flint walling, and glazed cladding systems will be used to clad the buildings and create a visually striking, durable and low maintenance series of buildings (Fig. 5.9).

The ERF and WSTF elevations will be refined and controlled and will employ a limited palette of high quality materials to ensure the required differentiation between the 'plinth' and the upper 'wing' forms, but at the same time ensuring that a 'family of buildings' is established across the site.

The 'plinths' will be clad in the most part with trapezoidal profile metal cladding with colour matched integrated ventilation louvers. The colour of the 'plinths' varies between a light or a dark grey depending upon their location in relation to the colour of the upper volumes. The upper level of the ERF's eastern facades (Turbine Hall; Workshop; and the administration wing) and the west and east elevations of the WSTF admin/workshop building will be clad in knapped flint in a random pattern (Fig. 5.10).

Aluminium standing seam cladding will be used on both of the walls and roofs forming the upper 'wing' forms and will be in contrasting colours to help break up the scale of the buildings and in texture and colour will offer a strong visual contrast to the dark monolithic 'plinth' as well as blend with the surrounding landscape and background of sky.

The location of louvres on the buildings has been carefully considered to be in keeping with overall design approach and within cladding areas will be coloured to match that surrounding.

The low-pitched roofs will be clad in metal cladding and laid to a minimum pitch of 1.5 degrees. Perimeter parapet walls will provide safe and permanent perimeter guarding for service personnel accessing the building's roof plates, and help visually screen less prominent roof mounted equipment and access hatches etc.

The metal roofs to the WSTF will include inclined glazed rooflights to naturally light the spaces below.

Glazed areas will incorporate areas of coloured spandrel panels to the administration wing which will add visual interest and fragment the scale of these facades. Vertical aluminium fins will run the full height of both north and south facades on the ERF administration wing, and aluminium brise soleil will run horizontally above the windows on the WSTF south facing glazed façade.

The principal material finishes are as follows:

- Trapezoidal profile steel wall cladding vertically orientated (colours – Anthracite RAL 7016 & Albatross RAL 240 80 05);
- Knapped flint walling;
- Euroclad Vieo standing seam aluminium wall and roof cladding (colours - Colourcoat Prisma colours – Seren Copper and Seren Silver);
- Steel trapezoidal roof cladding (colour – Anthracite RAL 7016);
- PPC double glazed curtain walling system (colour – Anthracite RAL 7016);
- Coloured spandrel panels within areas of curtain walling (colour – Alaska Grey RAL 7000); and
- Stack – coated steel (colour – Oyster RAL 7035)
- Metal fencing (colour – Anthracite RAL 7016)

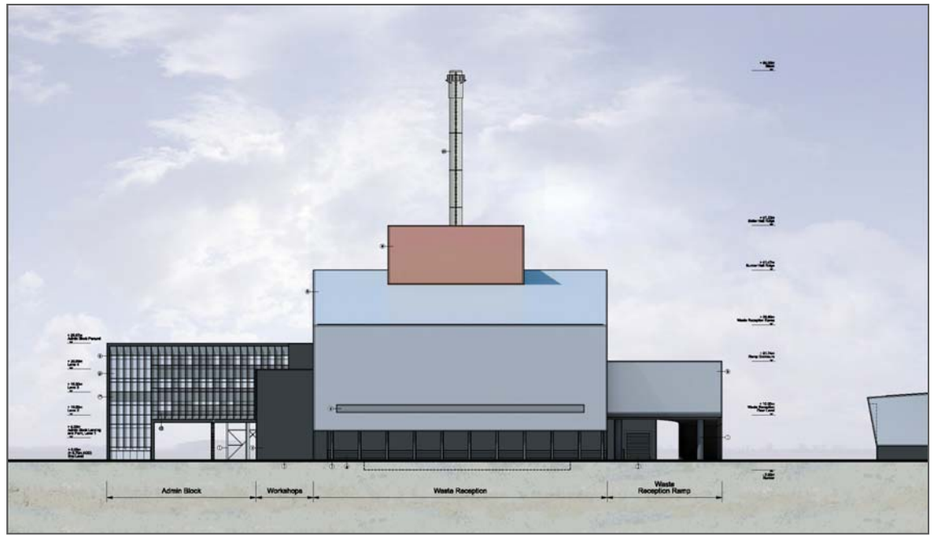



*Fig. 5.9 Proposed ERF north elevation – extract from drawings PL300*

*Fig. 5.10 Proposed ERF viewed from the east in View 2*

## 5.7 Landscape and Ecology

**Landscape**

The overall objectives for the proposals (Fig. 5.11) are to assist the integration of the proposed development into its surroundings; to provide an attractive entrance to the facility; and to enhance the biodiversity value of the Site.

The northern and western perimeters and northern part of the eastern perimeter of the facility incorporate belts of scrub planting set within conservation grassland. These areas will sit within the security fence but outside of proposed acoustic fencing and will present a naturalistic edge to the facility. Along the western boundary a native hedgerow will be planted at the site perimeter (immediately inside the security fence).

The areas of conservation grassland and scrub will be implemented on an embanked landform, sloping inwards from the site boundary up to approximately 2m height above existing levels. This landform will be created using lightly consolidated suitable subsoil material ameliorated as necessary to support planting. Topsoil will not be imported as this will be more fertile than required and less suited to creating a biodiverse plant assemblage. The inner face of the landform will be defined by a gabion wall. A verge on the site side of the gabion wall will also be spread with subsoil and seeded. The inner face of the gabion walls will be planted with native climbing plant species.

A further area of conservation grassland will be created within a strip of land between the security fence and acoustic fence along the southern boundary. Where there is sufficient space, specimen oak trees will also be planted within this strip.

Along the southern half of the eastern perimeter of the facility, south of the car parking area, an attractive and biodiverse approach to the facility will be created. This will primarily comprise of areas of ornamental meadow sown onto a subsoil substrate with areas of flint gravel. The meadow seed mix will comprise a diverse range of flowering perennials to create a long flowering season and support a diverse assemblage of invertebrates. Specimen trees (Fastigiate Oaks) will be planted close to the entrance to soften the appearance of the ACC in views from the east. Close to the entrance to the administration wing specimen ornamental pear trees will provide seasonal interest (including spring blossom and autumn colour) as well as vertical structure and shade for a small south facing seating area. Pedestrian walkways will lead through this area, leading to the staff and visitor entrance where an ornamental wildlife pond will be created immediately east of the entrance foyer. This whole area will be bounded by a tall flint wall which will provide a locally characteristic boundary feature incorporating habitat elements. North of the entrance foyer, further areas of flint wall and perennial meadow planting structure the approach to/from cycle and motor vehicle parking areas and access through the flint wall to a nature trail path that will run through the scrub and grassland.

**Ecology**

In order to comply with the NPPF framework the development is required to demonstrate net gain in biodiversity on site. This will be achieved through the habitat enhancement proposed above together with the following measures:

- Provision of bat boxes and nest boxes for bird species such as robin and house sparrow on the walls of the buildings or trees. Bat boxes and tubes, and bird boxes would enhance the habitat for the local bat and bird population.

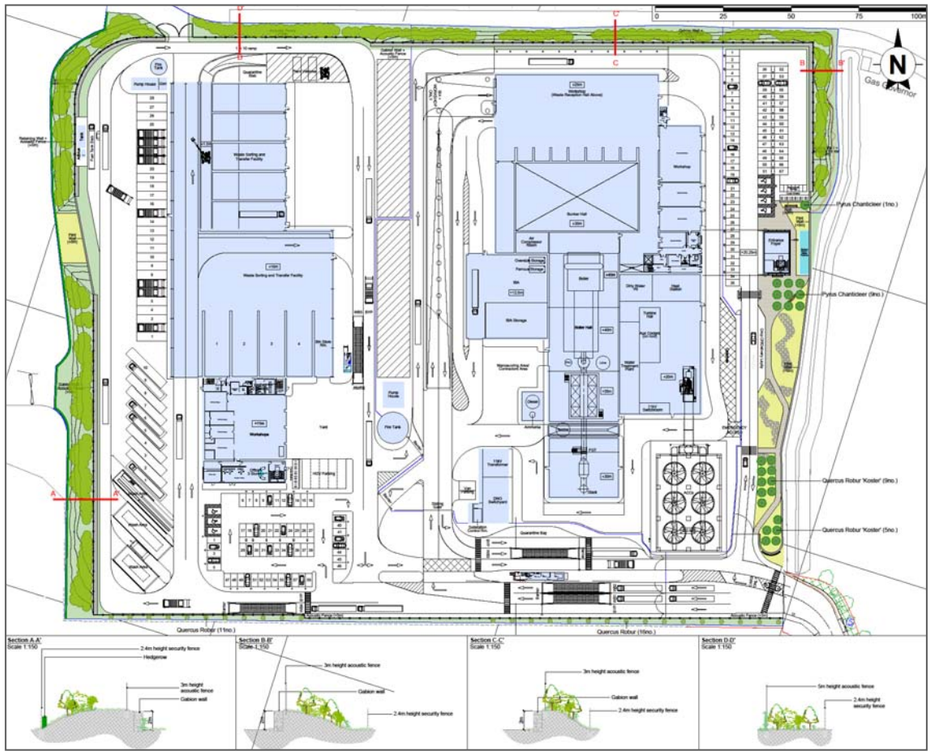



*Fig. 5.11 Proposed landscape design layout*

- Use of native shrubs and trees for landscaping schemes provides foraging habitat for a range of bird species. Suitable species include hazel, ash (Fraxinus excelsior), dog-rose (Rosa canina), elder, blackthorn (Prunus spinosa), hawthorn (Crataegus monogyna) and field maple (Acer campestre).

- The landscaping scheme include the planting of nectar rich flowering plants, with a variety of species, to provide a nectar source throughout the year. This will benefit local populations of invertebrates, including pollinating insects.

Further information on the proposed biodiversity enhancements can be found in the natural heritage Chapter 13 of the ES.

## 5.8 Lighting and Overshadowing

**Lighting**

The lighting design is based on the use of appropriate lighting to provide safe working conditions in all areas of the development area, whilst minimising light pollution and the visual impact on the local environment using the lighting guidance for the External Environment and Obtrusive Light. The lighting has been designed in accordance to the environmental lighting zone E3/E4.

The site access and internal access roads will be illuminated during the hours of darkness to permit night time working (mainly during the winter period) as the ERF is operational for 24 hours per day. The lighting proposals allow for lighting control options of photocells and time clocks.

A mixture of wall and column mounted light fittings and lighting columns will provide the lighting of walkways, roads and car parking areas. All lights will produce zero upward light pollution and have low glare reflector systems, which help to minimise the amount of glow, glare and flicker.

The landscaped bunding, acoustic timber fencing and flint walls forming the site's perimeter will help in minimising light spill from the proposed lighting and the headlights of moving vehicles.

The part wall and roof enclosure at the top of the ERF ramp is designed to visually shield the headlights of vehicles entering and exiting the waste reception hall.

**Overshadowing**

WSCC also requested that the potential for overshadowing from the plant to affect local amenity be examined. The sun path modelling that illustrates the predicted overshadowing produced by the proposed development during the spring equinox and summer and winter solstices is included here (Figs. 5.12; 5.13 and 5.14). This shows that the shadowing produced by the proposed development will be very limited during the spring and summer equinox. Neither existing properties nor the proposed residential development adjacent to the site will experience increased overshadowing during these times.

Existing properties are not predicted to experience increased overshadowing during the December solstice either, except late in the afternoon when a small number of properties to the north east will experience a brief period of overshadowing as the sun sets. Proposed residential properties to the north west of the site will experience overshadowing in the morning, but this will pass by 11:00. Given these extremely limited predicted periods of overshadowing, which will be restricted to winter when the sun is low in the sky, no significant effects are predicted overall on residential amenity.

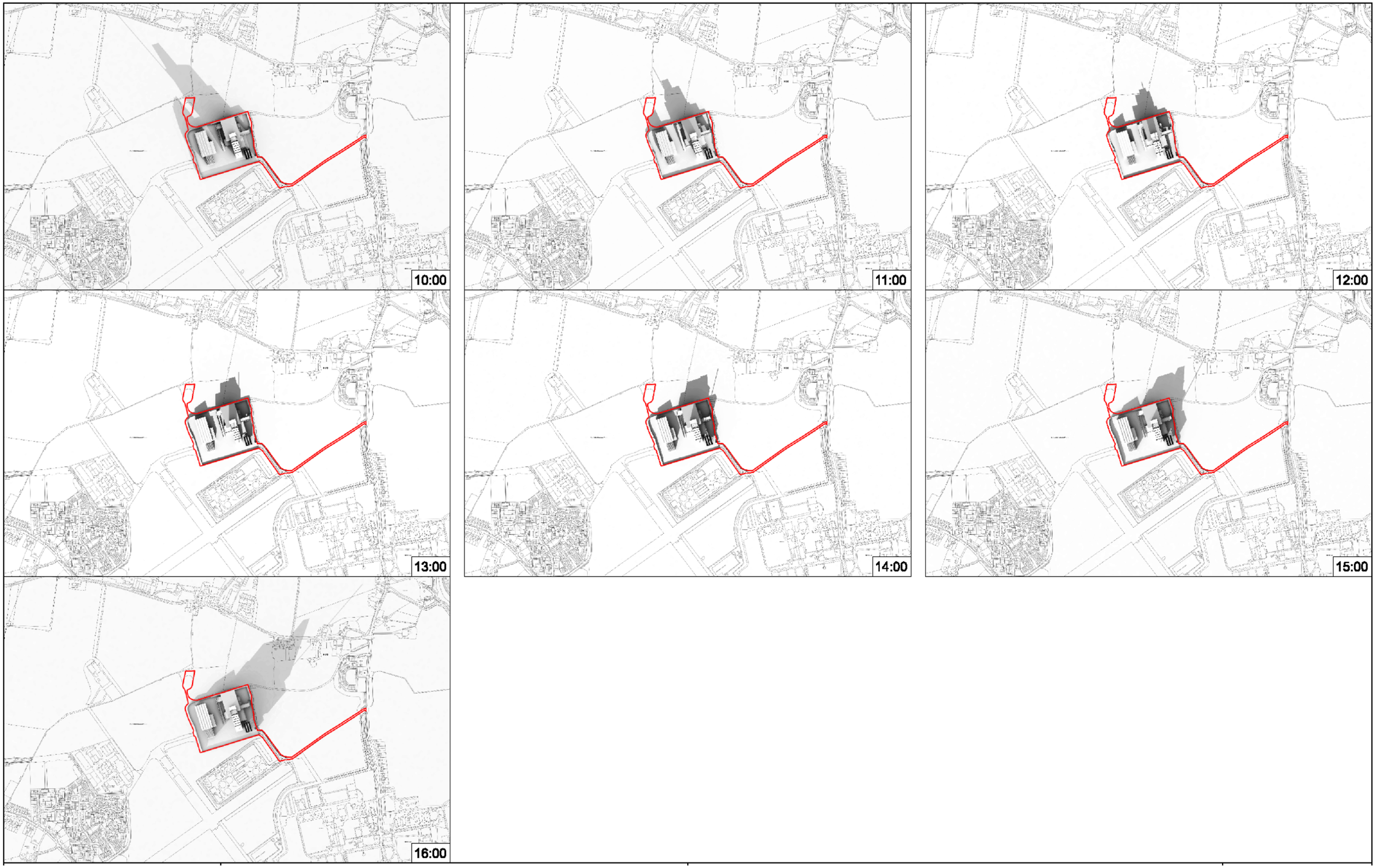



*Fig. 5.12 Sun Path Study - December 21st*


*Fig. 5.13 Sun Path Study – March 20th*


*Fig. 5.14 Sun Path Study – June 20th*

## 5.9 Noise Mitigation

A number of noise mitigation measures will be included in the proposed development.

- The majority of plant equipment with potential to create noise will be housed inside the main ERF and WSTF buildings;
- Within the ERF very high levels of acoustic insulation will be installed around the turbines and generator sets. Other potentially noisy equipment such as fans and motors will also be insulated;
- The site has been designed to provide sufficient distance between the low speed fans on the ACCs and surrounding noise receptors. The ACCs are also proposed in a location that takes advantage of the barrier effects of the ERF and WSTF buildings in relation to noise sensitive receptors located (or potentially located) to the north and west of the site;
- Surplus spoil following construction will be used to create bunds which in combination with acoustic timber fencing will provide noise and visual screening around the Site's perimeter;
- Unloading and loading of vehicles will be undertaken inside the ERF and WSTF buildings;
- The traffic system has been designed to minimise the need for reversing vehicles and the use of reversing alarms;
- The majority of vehicle deliveries and collections will be made between 06:00 to 20:00 Mondays to Fridays, 08:00 to 18:00 on Saturdays).

Further detail and assessment of noise is provided in Chapter 14 of the ES.

## 5.10 Visitor Experience

In order to promote the value of the proposed development, fully accessible visitor facilities will be strategically located on the top floor of the administration wing of the ERF building (Fig. 5.15). They will provide the opportunity to raise awareness amongst visitors of the role of energy recovery, and key issues in waste management, climate change and biodiversity, be easily accessible from the main car park and coach drop off point. School parties and other community groups will be encouraged to visit the Ford ERF.

The ground floor reception area of the administration wing is sized to cater for large groups of visitors including school classes. The entrance to the visitor reception area will be clearly visible on arrival by car, coach cycle or foot. The reception area will have educational displays and will be welcoming and inviting.

The proposed visitor facilities will include a seminar room capable of hosting up to 45 people in either seminar or classroom type layouts and will enable the visitor experience to be provided within a suitable environment and to demonstrate the facility in a safe manner. It will be equipped with audio visual aids including projectors, screens and a public address system. Audio-visual presentations might include the operation of the ERF, the WSTF and wider environmental awareness topics. The potential for selectable live CCTV feeds from parts of the facility showing activities taking place in real time may also be made available. All materials will be managed to promote awareness and education about the ERF and WSTF.

For those visitors intending to tour the ERF a dedicated Personal Protective Equipment (PPE) room is also provided and is where visitors can change prior to entering the secure zone of the facility from where any site tour will start.

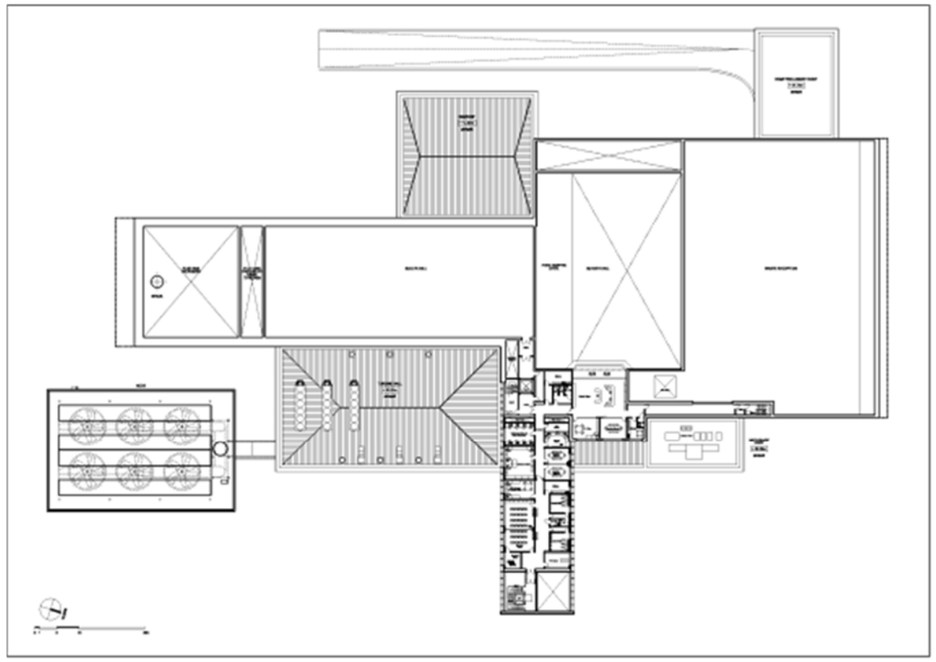


*Fig. 5.15 Proposed ERF level 4 floor plan – extract from drawing PL114*

## 5.11 Response to Design Guidance

**West Sussex High Quality Waste Facilities – Supplementary Planning Document**: December 2006

In relation to the Design Mitigation Measures for Energy from Waste facilities referred to in the WSCC SPD we have considered those measures applicable to the proposed development and offer the following summary of how the proposed design responds to these.

**Landscape**
*Design of building and stack will depend on local context, but should take an appropriate form, massing and size as well as use appropriate materials, colours and detailing to seek to enhance the local landscape where possible.*
The architectural design and the materials and colour being proposed for the ERF and WSTF have been carefully considered from the outset. The proposed design strikes a balance between mitigation of its visual impact, while at the same time recognising that it would be a large building and embracing the opportunity for it to be a dynamic and exciting design (Fig. 5.16).

*Appropriate orientation and reprofiling of ground should be considered where appropriate.*
Reprofiling of the ground has been considered but lowering the ERF into the ground has been rejected due to the level of groundwater on the site and the land take that would be required to incorporate the necessary road/ramp infrastructure to service a lowered structure. However, the opportunity to create landforms around the site's perimeter to assist in mitigating noise and visual impacts has been adopted.

*Tree and hedgerow planting.*
Tree planting to the site's perimeter will assist in visually softening the edge of the site where it interfaces with the adjoining areas, and this will be reinforced with a hedgerow which will run along the site' s western boundary.

*Appropriate design, positioning and colour of fencing consistent with setting.*
There are a number of boundary treatments proposed. Most of the outer perimeter of the site will be fenced in a 2.4m high paladin type metal fence to ensure security of the site and safety of those around it. It will be coloured 'dark grey' and is successful in being sufficiently transparent that it does not present the same 'hard' visual barrier as its palisade alternative. Planting between the outer fence and the inner acoustic fence will visually soften the appearance of the site and visually dominate the security fence (Fig. 5.17). The stretch of boundary along the southern half of the eastern boundary will be enclosed by a 5m high flint faced wall which will offer a dramatic arrival for those entering the site and reflects the use of flint walling on the main buildings.

*Hard landscaping including soil bunds where appropriate.*
The majority of open areas within the site will be hard landscaped to cater for the required vehicle movements around the site. Soil bunds have been focussed on the site perimeter zone for reasons described above. The entrance forecourt to the ERF administration wing will have its own unique hard and soft landscape treatment details of which can be found elsewhere in this DAS.

**Traffic/Access**
*Design internal roads and operations for ease of access and vehicle routing and manoeuvring.*
The roads arrangement has been designed to maximise efficiency and safety and on the most part is based upon a one-way traffic system and where necessary the safer right hand down reversing arrangements for HGVs. The entire site has used vehicle tracking computer software to ensure sufficient turning and manoeuvring space for all vehicle types.

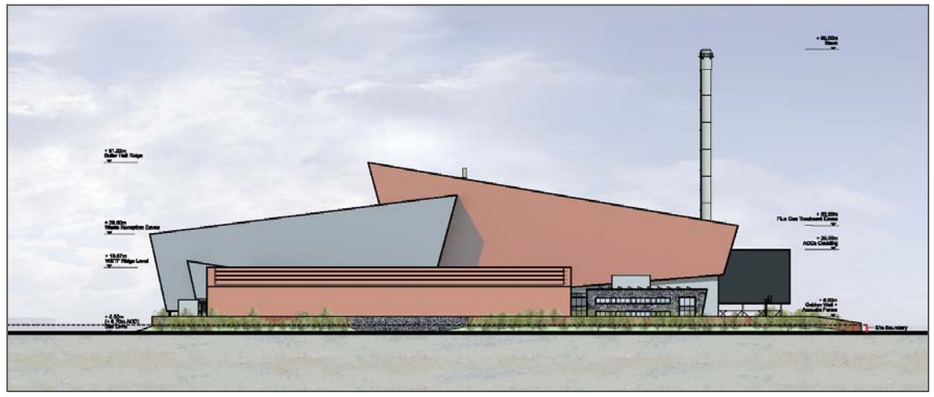


*Fig. 5.16 Proposed west site elevation – extract from drawing PL313*

*Fig. 5.17 Proposed south site elevation – extract from drawing PL312*

*Good access to site and facility including necessary visibility splays.*
The proposed design makes no alterations to the current access to the site.

*Provision of adequate parking for operator vehicles, staff and visitors.*
The ERF has its own separate car parking, motorcycle and cycle storage area all sufficiently sized to cater for staff and visitors. The WSTF also has its own car parking, motorcycle and cycle storage area. All car parking spaces will include EV charging points. Onsite parking has been developed in detail with the WSTF operations team and sufficient spaces for both artic and smaller rigid axle vehicles are catered for. Recognising the need for additional areas for contractor's parking and temporary cabins during major service periods, the central strip of the site is flexibly arranged to be shared by both ERF and WSTF operations in order accommodate these increases in provision when required. When not in use for service periods they will be used for storage of containers and bins.

**Noise**
*Design of building with acoustic features, e.g. sound proofing.*
The cladding of the buildings will be designed to achieve the required acoustic rating determined to satisfy the sites acoustic requirements. Ventilation louvres will be attenuated to achieve the same level of performance.

*Appropriate orientation of building.*
Alternative orientations for the main ERF have been considered during the early design stages and all reasonable measures have been taken in the site layout design to reduce noise exposure to the nearest receptors.

*Acoustic fencing.*
Perimeter acoustic timber fencing contribute to mitigating noise from the site.

*Hard landscaping, including soil bunds.*
Perimeter landscaped bunds combined with the acoustic fencing contribute to mitigating noise from the site.

*Fit silencers to plant and machinery.*
Inherent mitigation measures designed into the scheme include a 3m acoustic fence along the southern site boundary and a total of 5 m screening around the remaining site perimeter, using a 2m gabion wall and 3m acoustic fence. Screening has also been allowed for around the air cooled condensers.

During the detailed design of the facilities, low noise emission plant would be sought to reduce the potential for noise impacts at the nearest receptors. As such, additional mitigation is not proposed.

Continuous on-site monitoring is not proposed during the operational phase of the facility. However, commissioning measurements will be completed to demonstrate compliance with the predicted plant and activity noise emission levels

*Use of 'Smart' reversing bleepers.*
Mobile plant will be fitted with white noise reversing alarms (also known as broadband reversing alarm).

**Dust**
*Dust suppression integral building and machinery.*
Combustion air from the ERF will be drawn from above the waste pit so that odours and airborne dust are drawn from the bunker into the primary air system of the incineration line thus creating negative pressure and preventing their escape to atmosphere. Odour will also be controlled by keeping the entry and exit door to the tipping hall closed when there are no waste deliveries occurring.

Potential emissions of dust and fumes from the ERF bottom ash discharger will be minimised by the quenching process and storage systems proposed.

Dust emissions from the WSTF will be minimal as all waste materials will be contained within the building. Doors to the WSTF will be shut when the facility is not open and the movement of waste throughout the building will be minimised where possible. As a precaution, however, a rotary atomiser will be installed within the WSTF to provide dust suppression. This system will be fed from a mains water supply and will be in use during normal working hours.

The site access road will be properly maintained and regular checks will be carried out on road conditions. Cleaning will be carried out as necessary. Vehicles will also be checked to ensure that they are clear of loose waste and that their loads are secure.

*Operational management practices.*
The existing WTS is currently certified to ISO50001 Energy Management System and also has a Competence Management System in place. It is intended that the proposed WSTF will also be certified to those standards and in addition be certified to ISO14001 Environmental Management System, ISO9001 Quality Management System and ISO45001 Health and Safety Management.

The ERF will also be accredited to ISO14001 Environmental Management System, ISO9001 Quality Management System and ISO45001 Health and Safety Management, thus indicating Ford EfW Limited's aim to achieve the highest practical standards of quality, safety, occupational health, environmental control and performance at the proposed site.

*Wheel cleaning facilities*
A vehicle wash area incorporating 3 wash bays will be located at the southern end of the WSTF and this will provide for vehicle washing and if required wheel washing before leaving the site.

**"A design-led approach to infrastructure" CABE/ Design Council:** November 2012

Throughout the design development process the design of the proposed development has taken into consideration the design guidance given within this detailed CABE/Design Council document and embraced the Ten Design Principals that they identify. How the final design has responded to these principals is described below:

**Setting the scene**
Viridor Waste Management Limited, Grundon Waste Management Limited, and Ford Energy from Waste Ltd have recognised from the outset that the project would require careful consideration of its impact upon the context and surroundings of the site and that a typical 'industrial shed' design approach would not be appropriate. It was also acknowledged that a creative design which did not conflict with the functional and operational requirements of the ERF and WSTF would be integral to the project's success. As such, a contextual but bold design in which everybody concerned could be proud of has been a key feature of the initial design brief.

**Multi-disciplinary teamwork**
In designing the project, the applicants have embraced the principles of collaborative teamwork and effective consultation. The architect and landscape architect have been key members of the team from the start of the design process and this has allowed the technical and architectural design of the project to be developed in parallel rather than in isolation from each other. Furthermore, the applicants have selected a design team that

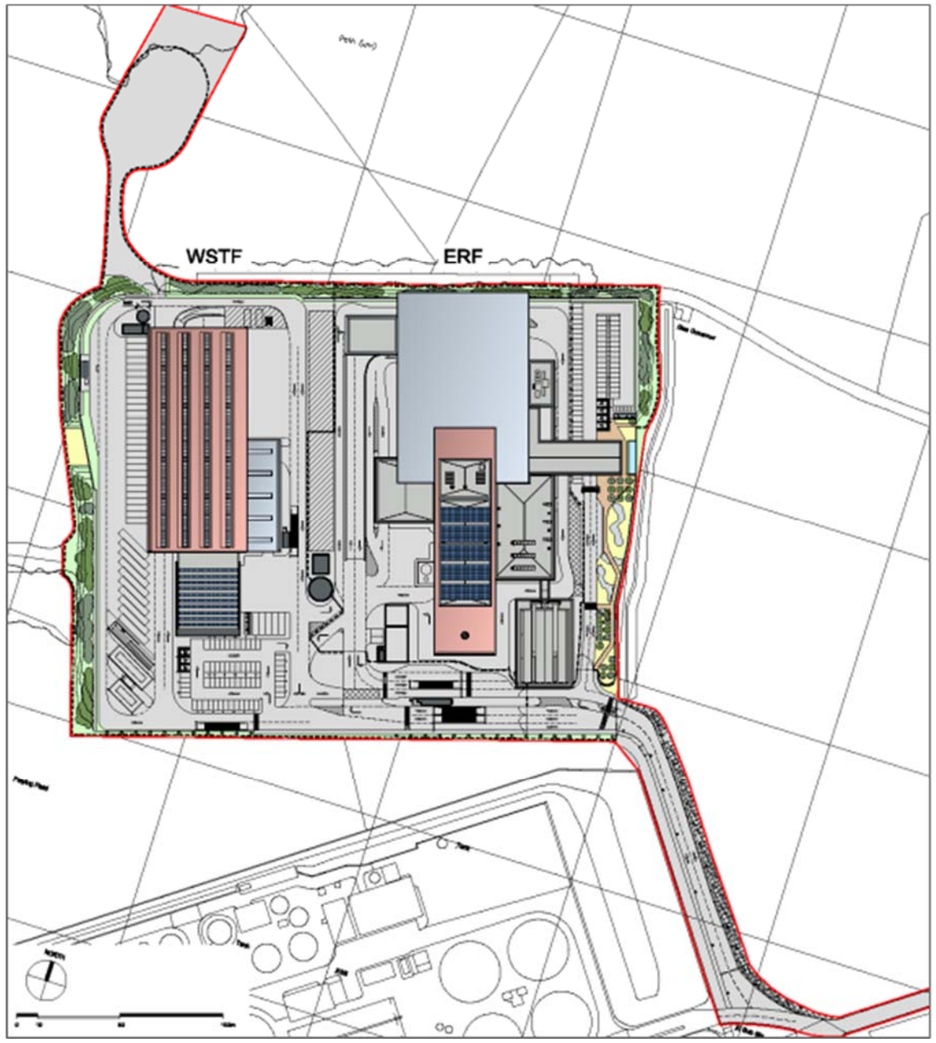


*Fig. 5.18 Proposed masterplan – extract from drawing PL107*

has a wealth of experience in the design of similar facilities but also with a successful track record of working together. The team has also included a wide range of consultants who being specialists in their fields have influenced the design process ensuring that the potential impacts of the development could be identified, and appropriate mitigation and enhancement measures imbedded in the design. The layout of the site has where possible been developed to improve the development's relationship with the site's surroundings.

**The bigger picture**

The opportunity for the project to have a broader influence in the area has been and is continuing to be explored. As previously mentioned the applicants include Grundon Waste Management who are the sole owner / operator of the existing WTS and have been providing job opportunities and investment at the site for 4 years. The proposed development would be a significant investment in the area and would offer further job opportunities.

The applicants are fully aware of the benefits that district heating would offer the project and the surrounding area. For that reason, the potential of the ERF providing district heating is currently being explored and the Heat Plan submitted with the planning application provides more information on this.

The ERF and WSTF will be available for visits by local interested parties during the normal day shift opening hours, by prior arrangement, subject to health and safety and operational priorities. Grundon and Viridor have a history of supporting education and research projects and specific provision will be made for the presentation of the facilities and operations as a resource for local schools and educational establishments. Audio-visual presentations might include the operation of the ERF, the WSTF and wider environmental awareness topics. The potential for selectable live CCTV feeds from parts of the facility showing activities taking place in real time may also be made available. All materials will be managed to promote awareness and education about the ERF and WSTF.

The heritage of the site will be celebrated, and its awareness increased by the implementation in a number of physical and technological interpretations within the new ERF itself, but also in the external landscape spaces. There are no physical remains of the sites rich transport history either in terms of the canal and the aviation history is hard to unravel after many recent changes to the site.

Proposed heritage appreciation opportunities include:

- The landscape proposal includes an appropriate break in the western perimeter mounding to reflect the alignment of the former Canal and the perimeter fence will include a sign which will include the historic seal (Fig 5.19) and supporting information on the canal;
- The reception area will have educational displays – some of which should reflect the aviation history of the site (including audio visual presentations also);
- Educational resources will include the transport history of the canal and aviation importance of the site;
- The water feature proposed on the eastern site boundary will have a basic heritage interpretation board equipped with a QR code that allows further information & visualisations about the development and the history of the site to be explored and which will be produced in conjunction with local history groups;
- Opportunities will be explored with either with local schools or the local history groups to involve them in a local community art installation and design project.

**Site masterplan**

The context and surroundings of the site have heavily informed the site's layout (Fig. 5.18). This has included the location of buildings and external equipment and the layout of the road's infrastructure required to serve these. Minimising the overall footprint of the development has been a key feature of the design in order to maximise the areas within the site that could be developed for landscaping and biodiversity enhancement, and


*Fig. 5.19 Historic Seal of the Portsmouth & Arundel Canal*

to use these areas to assist in mitigating the potential visual and noise impacts upon the surrounding area. The masterplan of the site also located the main buildings such that they ‘shielded’ most of the internal vehicle movements within the centre of the site.

**Landscape and visual impact assessment**
Due to the scale of the proposed development, assessments of the visual impact and landscape character of the proposed development were instrumental in determining its layout and architectural design. The developed LVIA photomontages allowed there to be careful consideration of the cladding materials/colours that might be applied.

**Landscape design**
The architect, landscape architect and ecologist have worked closely together to develop a multi layered landscape design, one which uses earth bunding and concrete filled gabion cages to best utilise the site’s excavated material and which combined with 3m high acoustic timber fencing provide visual and acoustic mitigation around the site’s perimeter.

With the existing site being covered on the most part by either buildings or concrete hardstanding, the proposed design also offers major planting and biodiversity improvements which includes a range of contrasting landscapes and habitats, and provides staff areas for relaxation set within the landscape.

The inclusion on and within areas of the ERF’s external walls and boundary walls of wildlife habitats will add another layer to the design.

**Design approach**
From the outset it has been recognised that due to the scale and the setting of the site it will be impossible for the proposed development to be ‘hidden’, and that while it would be important for it to be designed in such a way as to best mitigate its visual impact, it would nevertheless be a large building and as such it should make a positive and confident architectural statement, one which celebrates its presence whilst at the same time giving due consideration to its surroundings and context. The proposed design embraces this design approach and applies a clear architectural concept across an integrated family of buildings.

**Materials and detailing**
Not surprisingly for a development of this nature, metal cladding has been used as the predominant cladding material across the proposed development. However, two different types of metal cladding are being proposed. The lower levels of the buildings are required to be robust and easily replaced if damaged, and for those reasons a vertically orientated trapezoidal metal cladding is proposed for those areas. In contrast the upper volumes are less easily damaged and to create a visual contrast with the lower trapezoidal cladding a standing seam coated aluminium cladding is proposed. This allows the upper volumes walls and roofs to be seamless in appearance and offers a different visual texture to the lower levels. All proposed cladding systems are low maintenance and their durability (i.e. colour retention and corrosion resistance) will ensure that the high quality appearance of the proposed development will be retained over time.

From the beginning we have been keen to develop a design that embraces the context of the site and character of the area, and where appropriate incorporate local materials in the design. For that reason, flint walling, which is one of the key features in the appearance of villages and towns in West Sussex, is proposed to clad some areas of the building facades and segments of the site’s boundary enclosure. It is proposed that the style of flint work would be flint knapped in a random pattern.

In recognising the potential night-time lighting impact upon the surrounding area, the use of large areas of glass to ‘expose’ the inner workings of the ERF have been avoided.

**Sustainability**
Sustainability is embedded in the design.

Where possible the size and volumes of the buildings are volumetrically efficient in their design to minimise the use of materials, and materials have been chosen for their longevity and/or robustness as well as their visual appearance.

The need for rooflights has been balanced with the need to mitigate the potential night-time visual impact of the development. Where appropriate rooflights have been incorporated on the main roof areas of the WTSF to maximise internal daylighting, but the location and form of these have been carefully considered to ensure that the glazed areas face east towards the ERF building and therefore shielded from receptors to the west of the site.

Where not competing with rooflights or rooftop equipment large areas of photovoltaic solar panels (PV) are proposed for their roofs. The WSTF will have an optimally inclined series of PVs covering the roof of its Admin/Workshop building, while the open stepped roofs of the main ERF building will include a sweep of PVs which will be suspended above the stepped roof profile and integrated within the angled roof form.

**Visitor facilities**
In order to promote the value of the proposed development, visitor facilities will be incorporated within the administration wing of the ERF building.

# 6 Access

## 6.1 Connectivity

**Vehicular Access**
The site is served by a single access from Ford Road.

**Pedestrian accessibility**
Public rights of way within the vicinity of the proposed development are summarised below:

- Footpath 363 which runs to the north of the site and provides a connection to Footpaths 170, 200.2, 360 on towards Burndell and Yapton;
- Footpaths 200.3 and 200.4 which run to the north east of the site and provide a connection between the site and Ford Road;
- Footpath 366 and 366.1 which provide a connection to Ford Lane and Footpath 365; and
- Footpath 175 which runs to the south of the site and provides a connection between Ford Road and Yapton Road.

None of these give access to the site directly although one of them (footpath 200.3) runs along the north eastern site boundary for a short distance as shown in Figure 6.1. The proposed development will not affect the line of the existing path, which will be retained and separated from the proposed development by a security fence and a landscaped bund.

A footway of circa 2.5 m wide running north-south along the west side of Ford Road crosses the access road without deviation from its course. Dropped kerbs are provided across the access road.

There is no footway provision along the site access road from the Ford Road junction to the entrance of the Southern Water waste water treatment works site, however, a footway is provided on the SLR section of the access road, that runs from the Southern Water entrance to the main part of the proposed development site.

To the north of the site, Ford Road leads into Station Road and along its length the footway is separated by a wide grass verge circa 2.5 m wide. To the south, Ford Road leads into Church Lane where the pedestrian footway continues on the western side of the carriageway. A signalised pedestrian crossing is located on Ford Road, approximately 550 m south of the site access road. A pedestrian refuge island is provided to the north of the access to Rudford Industrial Estate allowing pedestrians to cross to the eastern side of the carriageway. The footway on the western side ends to the south of the junction with Horsemere Green Lane, but the route continues on the A259 on the eastern side.

A pedestrian footway is also present on the east side of Yapton Road, along its entire length to the north west of its junction with Rollaston Park and until the bus stop at approximately 50 m south-east of the junction. On Rollaston Park footways are present on both sides of the road, apart from a section of approximately 90m to the north-west of its junction with Sproule Close.

No footways are present on either side of Ford Lane.

**Cycle accessibility**
There are no dedicated cycling facilities within the study area. West Sussex County Council’ s website identifies the section of Yapton Road between Horsemere Green Lane and Bilsham Road as part of the Local Cycle Network 38. It should be noted that this section of Yapton Road is subject to a 40 mph speed limit.

National Route 5 of the National Cycle Network (NCN) runs along the A259 to the south of the development site and the closest access points to the national cycle lane are the junctions of the A259 Crookthorn Lane with Yapton Road and Church Lane.


*Fig. 6.1 Proposed site layout and adjacent PROW*

**Public transport network**
The nearest bus stops to the proposed development are located approximately 0.9 km from the site on Yapton Road at the junction with Rollaston Park. Services 700 and 665 (a school bus service) operate from these bus stops.

The nearest railway station to the site is Ford Railway Station which is approximately 1.8 km to the north east and is served by Southern Railway with a large number of services throughout the day. The station has step-free access and ramps are available for train access. There is sheltered storage provided for 14 cycles with CCTV coverage.

## 6.2 Design Issues

Policy relating to disabled access is derived from the Equality Act 2010 (which replaced the previous Disability Discrimination Act 1995) and the relevant legislative requirements, including the Building Regulations, have been used to inform the policy basis for disabled access and have been taken fully into account in the design of the Ford ERF and WSTF.

In developing the designs of the site layout and the main building, access and accessibility issues have been fully considered from the outset. This has included assessing the range of modes of access, and the accessibility needs of the operational staff, waste contractors, administration staff and visitors (public and operational) with mobility difficulties, to ensure that the proposed development, and each element of its design, provides “access for all”.

## 6.3 Access Arrangements

Maximising the segregation of operational and non-operational vehicles within the site has been an important feature of the layout design. All vehicles will access/egress via the single access in the south east corner of the site.

**ERF**
Directly upon entering the site, and prior to the main gatehouse/weighbridge arrangement, access is provided to the ERF car park for staff and visitors, including cyclists and pedestrians and has its own gated entry. The car park is located close to the administration wing of the ERF building and provides 68 standard EV car parking spaces and four Blue Badge EV bays. The car park also incorporates a drop off area for vans and passenger drop of bay. A visitor’s coach parking lay-by is provided for within the main ERF operational site and visitors will access the admin car park via a secure gate in the fence between the two areas. Specific provision is made for cyclists with permanent, secure and sheltered cycle parking. This will be located close to the entrance to the administration wing where stair and lift access is provided to its upper floors. The cycle parking will comprise eight Sheffield stands, providing 16 cycle parking spaces for staff and visitors, and drying and showering facilities will be provided for within the main building.

All operational vehicles accessing the ERF site will controlled by the gatehouse /weighbridge arrangement which is gated and when not in use will be secured outside of normal operating hours.  On leaving the weighbridges HGV’s will join the ERF’s internal roads system provides access to the full perimeter of the ERF building, and sufficiently around other parts of the site to allow for maintenance of the building and for fire vehicles.

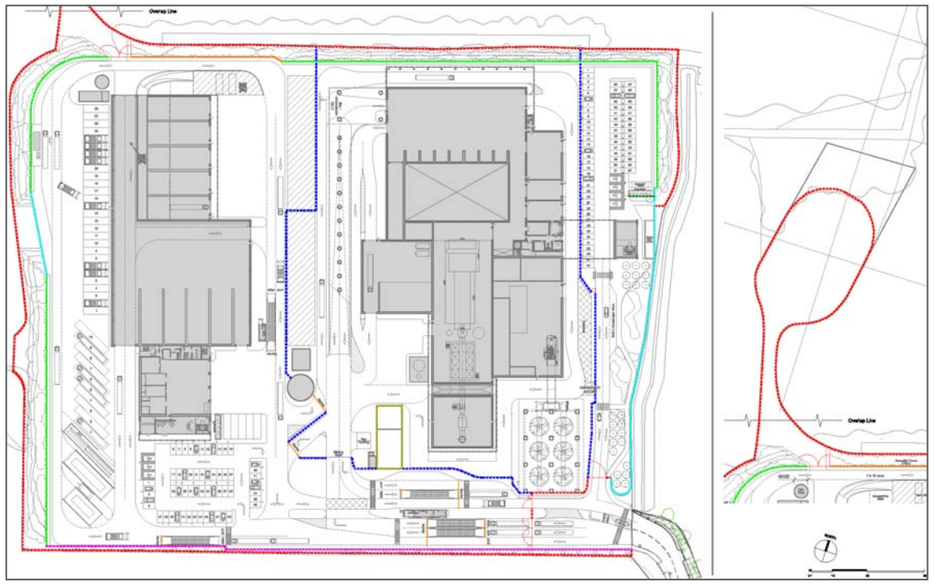


*Fig. 6.2 Proposed fencing layout – extract from drawing PL108*

**WSTF**

Upon entering the site all vehicles accessing the WSTF will use the bypass lane adjacent to the main gatehouse/weighbridge arrangement beyond which alternative routes are provided for operational and non-operational vehicles. Immediate access is provided to the WSTF car park for staff and visitors, including cyclists and pedestrians. The car park is located in front of the entrance to the administration wing of the WSTF building and provides 59 standard EV car parking spaces and three Blue Badge EV bays. Specific provision is made for cyclists with permanent, secure and sheltered cycle parking. This will be located close to the buildings entrance the cycle parking will comprise eight Sheffield stands, providing 16 cycle parking spaces for staff and visitors, and drying and showering facilities will be provided for within the main building.

All operational vehicles accessing the WSTF site will access via its own weighbridge arrangement. On leaving the weighbridges HGV's will join the WSTF's internal one-way roads system provides access to the full perimeter of the building and HGV parking areas, and sufficiently around other parts of the site to allow for maintenance of the building and for fire vehicles.

Further detail on the access and control arrangements within the site for operational vehicles can be found in the 'Vehicular Circulation and Access' section in section 5.4 of this DAS.

Other design features incorporated within the design of the ERF and WSTF include:

- Generally level, or reasonably level, smooth, slip resistant paved footpaths will be provided, where applicable, with tactile paving at ramps and thresholds to the pavements;
- Level access has been provided to the main entrances to the buildings, together with an automated door for the main access to the ERF administration wing;
- Clear and logical external/internal signage will be provided to ease navigation to and within the buildings;
- All internal circulation areas have a minimum clear width of 1200mm and with 1800mm square passing places for wheelchair users;
- Ambulant disabled stairs will be provided and each will contain identified disabled refugee areas with intercom facilities as appropriate;
- Passenger lifts suitable for wheelchair access have been provided for within both buildings;
- Means of escape will comply with requirements for means of escape for disabled people;
- Accessible WC's have been provided for on each floor level of accommodation;
- Segregated accessible showering facility have been provided;
- Wall and floor surfaces to minimise light reflection and sound reverberation will be selected so as not to hinder users with sensory impairments;
- Tonal & textural contrasts will be used throughout the building interior;
- Lifts and lift lobbies will conform with Lift Regulations 1997 (SI 1997/831);
- A colour palette will be employed to highlight key elements and provide contrast. This will enhance the logical space planning and arrangement of facilities to aid way finding through the buildings;
- Signage, visual and auditable information systems will be provided throughout the buildings but specifically at key junctions of horizontal and vertical circulation routes that give clear direction, information and instructions;
- Internal materials and finishes will provide contrast but avoid glare or high resistance to movement;
- An operational access statement to explain any areas which, due to the nature of the building and its operation, may be unsuitable for ambulant disabled/wheelchair access will be provided for each building;
- Reception desks and kitchen areas will be designed to accommodate wheelchair users; and
- An induction loop at both staff and visitor reception desks will cater for those with hearing impairment.

# 7 Conclusion

The overall design solution for the proposed development is the result of a well-considered process which has taken account of the site's constraints and been mindful of sensitive receptors nearby. As the design has developed the Design Team has carefully considered comments and advice offered by all of those consulted, including the WSCC planning department. The design proposals have been adjusted where it has been considered appropriate and practical to do so, and we believe that the final design is all the better for adopting this approach.

The final overall design of the proposed development ensures that all aspects of the site layout design and the architectural design approach have been met. As a result, the design offers a safe and efficient site layout which contributes to mitigating as far as possible its visual impact without compromising its operational functionality.

The perimeter bunding and acoustic timber fencing screening around the site and the careful selection of light fittings and their layout ensure that potential light spill both from the internal lighting and from the headlights of vehicles on the site is minimised. This acoustic screening is also one of a number of noise mitigation measures that will be incorporated in the proposed development. Other measures include ensuring that the external cladding of the buildings meets the required acoustic rating and acoustic insulation is applied to any noisy equipment.

Architecturally a refined 'form follows function' approach was the underlying starting principle for the building design, and every opportunity has been taken to reduce its overall scale. However, it was also recognised that due to the scale of the main building it would be impossible for it to be hidden and that in areas the final design would likely stray from that principle.

The proposed design is made up of a number of key architectural components. A lower level 'plinth' relates to the scale of the hanger buildings that previously occupied the site, and the upper interlocking 'wings' offer a strikingly confident architectural form which assist in breaking up the overall size of the building but at the same reflect the dynamism of flight and refer back to the site's aviation heritage. Their inclined rooflines help bring the building to ground at its northern and southern extents and the simplicity of their shape take a cue from large aircraft hangers and the design of the WSTF is no less dynamic.

The careful selection of materials and colour add another layer to the design and further accentuates the architectural components, and local character has been incorporated within the design with the use of large areas for flint walling which will add visual texture to the eastern elevation of the ERF and the WSTF admin/workshop building.

The segregation of operational and non-operational vehicles has been optimised in the design of the site layout. An efficient and safe routing and manoeuvring of vehicles across the site has been carefully considered and incorporated in the design, and the design has been fully considered to ensure that the proposed development provides access for all.

The form and colour of the proposed design sets it apart from the other industrial buildings in the surrounding area and it embraces the principles of current WSCC and CABE/Design Council design guidance for waste related infrastructure projects.

The overall design solution successfully combines a well-considered site layout with a confident and contextual architectural design. It employs high quality materials that will stand the test of time, and its refined, yet striking design makes it a bold and positive addition to the area.

*Fig. 7.1 Proposed development from the south east in View 1*