Ford | energy from waste

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

DESIGN AND ACCESS STATEMENT

MARCH 2021

Viridor

GRUNDON

FORD ERF AND WSTF
DESIGN AND ACCESS STATEMENT

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

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Figure 1.1: Aerial view of the site

01 INTRODUCTION

Viridor Energy Limited, Grundon Waste Management Limited and Ford Energy from Waste Limited (the latter a joint venture between Grundon Waste Management Limited and Viridor Energy 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.

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.

1.2 Statement Structure

In addition to the 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; and

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

The DAS is supported with additional visualisations and drawings contained within the following Appendices:

Appendix A: Design Development Stage 2

Appendix B: Design Development Stage 3

Appendix C: Design Development Stage 4

02 SITE CONTEXT AND 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).

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.

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 6.72 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, 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).

Figure 2.1 Existing Site Plan – Extract from drawing PL100

02 SITE CONTEXT AND APPRAISAL

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 (Figs 2.3 and 2.4). 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 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 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.

Figure 2.3 Existing site viewed from the south west

Figure 2.2 Existing site viewed from the south east

Figure 2.4 Existing site viewed from the east

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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 13 of the ES.

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 played in local aviation history (Fig. 2.5).

While there are no designated built heritage assets on the site, a number of features dating to World War II and later development of the site as 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 210 m to the north east. Other built heritage assets in the wider area include the three churches at Yapton, Ford and Climping, all of which are grade I listed. There are no registered parks and gardens near the site or within the wider landscape.

The historic core of Arundel, defined by the conservation area and with a concentration of listed buildings and Arundel Castle (scheduled monument), lie more than 4 km to the north.

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

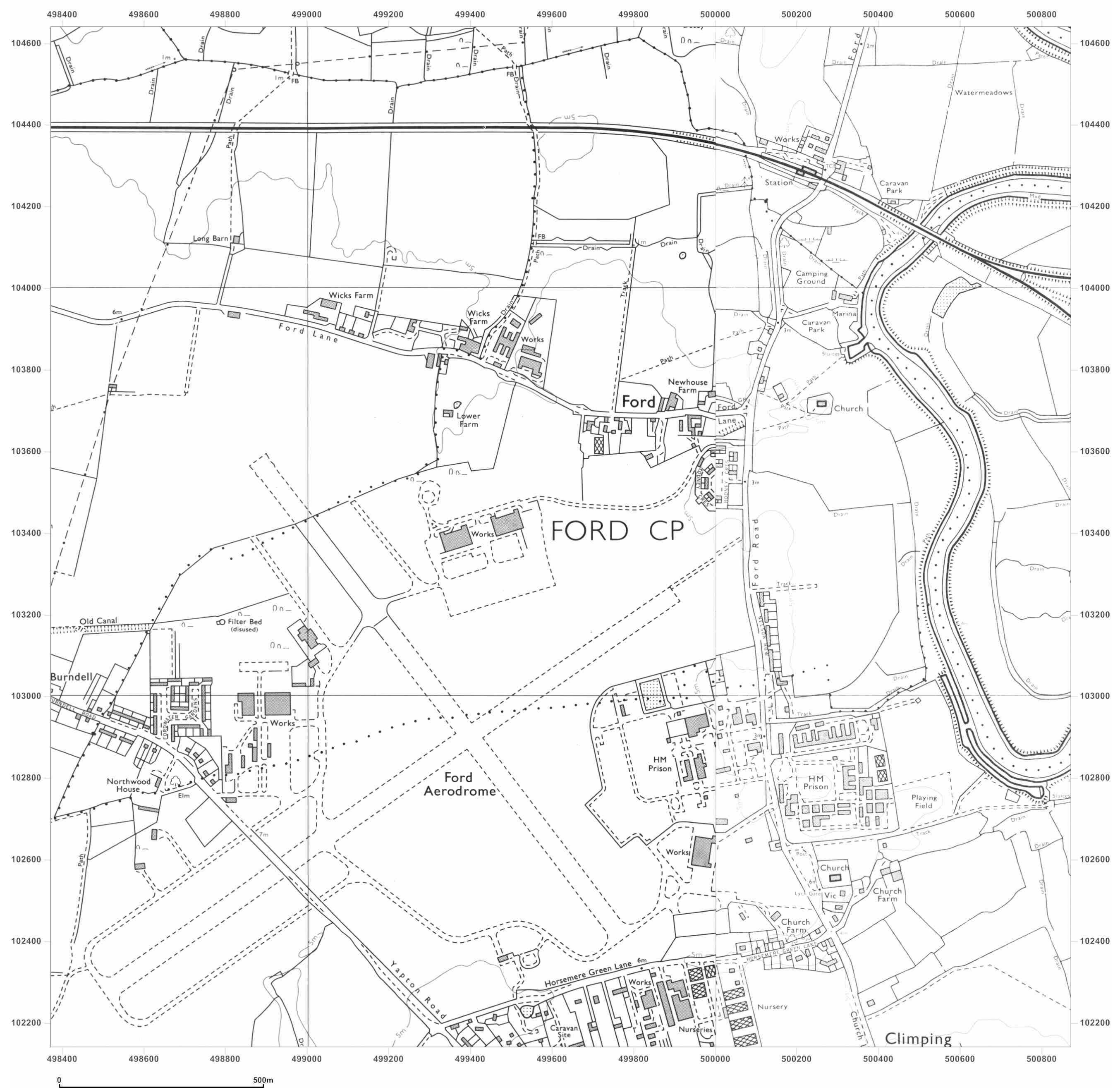


Figure 2.5 1980-81 Ordnance Survey

02 SITE CONTEXT AND APPRAISAL

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.

There is no significant vegetation within the site, 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.

A public right of way (footpath) lies just within the north eastern boundary of the site, running along the existing concrete road for a short distance before heading north out of the site and across the adjacent field. There are several other public rights of way in the surrounding area.

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 in the surrounding area.

Within the site are two large former aircraft hangars, and the currently operational waste transfer building and associated infrastructure. The Southern Water wastewater 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 a very large proportion 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.
- Mostly agricultural land in the part of the character area north and west of Ford Airfield
- 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

The landscape and visual effects of the proposed development, including effects on the settings of cultural heritage features, have been a primary consideration in developing the design strategy for the proposals and several views from a range of distances, elevations and orientations have been studied to inform the design process.

Within a 1.5 km radius of the site, the proposals will be visible from some local residential areas, some public rights of way, 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) is from some public rights of way in the surrounding agricultural land, some transport links and some of the edges of some more distant settlements. It also includes views from rising ground at Arundel, 3.8 km to the north east.

Visibility of the site beyond this 4.5 km radius is predominantly from elevated areas of the South Downs National Park and from parts of the A259 that bridge over the railway line near Bognor Regis.

As with any building of this scale, the heights of the ERF and WTSF mean that whilst the substantial areas of planting provided will provide effective screening for much of the proposals, the upper parts of the buildings and stacks would remain visible. The design strategy has therefore been to screen the lower 'busier' and active parts of the development with earth-shaping (i.e. bunding), fencing and planting, leaving visible the upper volumes of the buildings and structures in a simple architectural form designed to be low key and to minimise visual effects, rising above the planting and landform that surrounds the site.

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.

02 SITE CONTEXT AND APPRAISAL

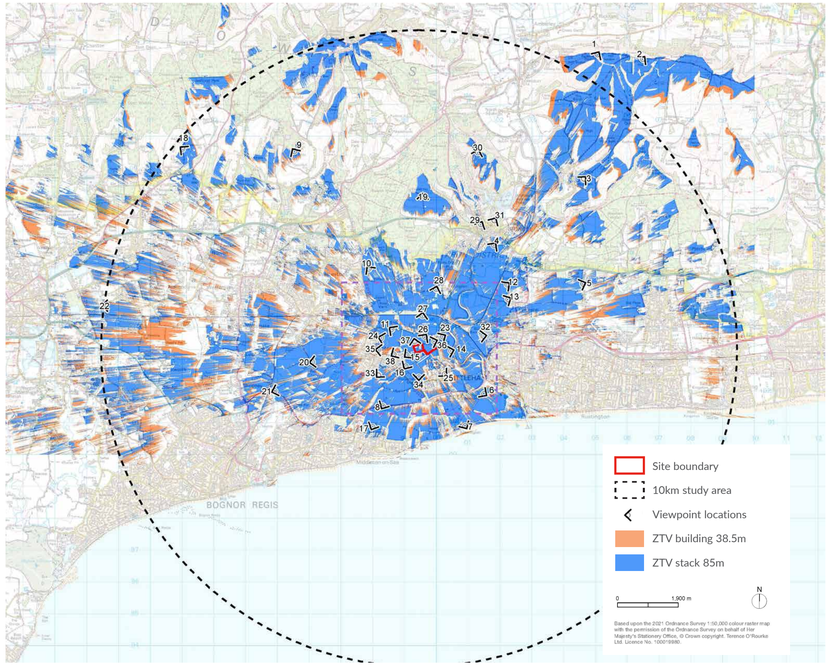


Figure 2.6 LVIA viewpoint location plan (extract)

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).

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).

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 once traversed the site west to east.

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.

02 SITE CONTEXT AND APPRAISAL

Figure 2.7 RNAS Hunter located at entrance from Ford Road

Figure 2.8 Example of knapped flint

Figure 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

Whilst this SPD is now quite old and is not consistent with the National Planning Policy Framework (NPPF), we have, where relevant, paid due regard to its content.

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 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. How the proposed design has embraced the ten design principles that they identify is described in Section 5.12 of this DAS.

03 DESIGN BRIEF AND STRATEGY

3.1 Design Brief and Process Technology

The proposed development includes:

- A twin 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. The proposals will also be able to export up to 10 MWth (megawatt therms) 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 administrative, welfare and visitor facilities.
- A waste sorting and transfer facility (WSTF) with a capacity to process up to 20,000 tpa. 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 shared infrastructure.

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
- Stacks.

The ancillary buildings and infrastructure for the ERF will include:

- Air cooled condensers (ACC);
- Staff and visitor car park (with cycle storage shelter)
- Coach drop off/parking bay;
- 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; and
- Baled recyclates store.

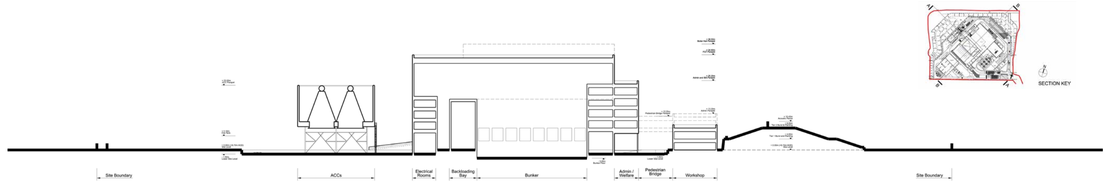
The ancillary buildings and infrastructure for the WSTF will include:

- Staff and visitor car park;
- Hard standing areas for the manoeuvring and parking of HGVs and mobile plant;
- Quarantine bay;
- Fire water storage tank and pump house;
- Vehicle washdown bay; and
- Vehicle fuelling bay.

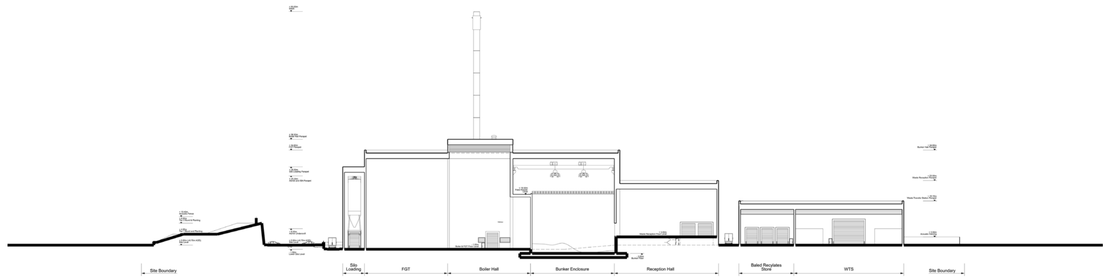
The ancillary buildings and infrastructure shared by the ERF and WSTF will include:

- Gatehouse; and
- Weighbridges (three for incoming vehicles, and two for outgoing vehicles).

03 DESIGN BRIEF AND STRATEGY



Section A-A, Through Site Looking South



Section B-B, Through Site Looking East

Figure 3.1 Proposed Site Sections – extract from drawing PL201

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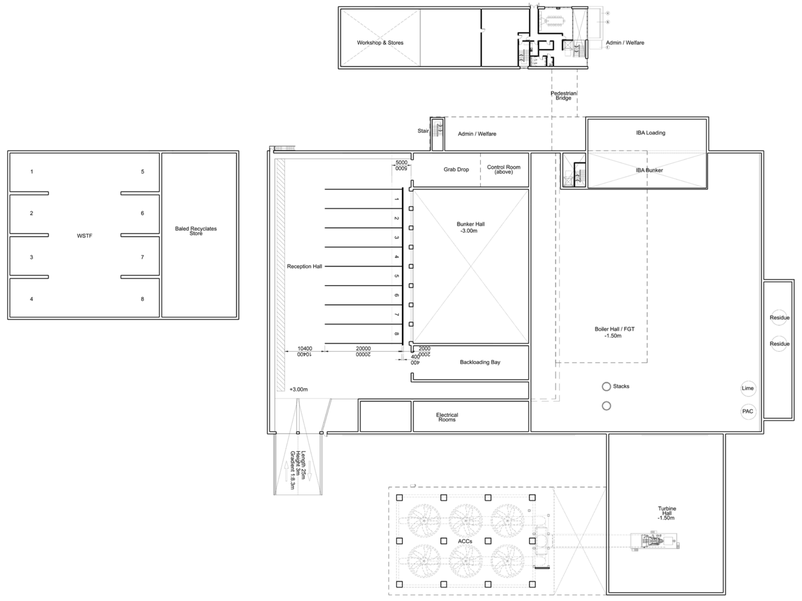

Figure 3.2 Proposed ERF & WSTF ground level plan – extract from drg PL112

03 DESIGN BRIEF AND STRATEGY

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;
- Proximity to the closest residential properties on Ford Lane lying approximately 200m north east of the site;
- Proximity to residential properties on Rollaston Park lying approximately 400m south west 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 PROW 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 and passes inside the site's north eastern edge for a short distance, and joins footpath 363, which runs to Yapton.

Another constraint has been groundwater levels, as they dictate the depth to which buildings might be lowered into the ground to reduce the scale of the proposed design.

Groundwater monitoring visits were undertaken by Enzygo in 2015 and Grundon Waste Management Ltd carried out groundwater level monitoring visits between 2018 and November 2020. Ramboll also carried out a groundwater monitoring visit on 18 February 2020 immediately following Storm Dennis (15 February 2020), in order to observe the impacts of winter rain infiltration on groundwater level at the site. Groundwater elevations were monitored at the site during the period 2015 to 2020; since 2018 this has been at approximately monthly intervals. The highest recorded groundwater elevation event during this monitoring period occurred on 11 March 2020, when the elevation of the groundwater table was recorded to be approximately 3.5 mAOD (3.0 metres below ground level (mbgl) in the area of the site which is proposed to be subject to lowering of ground levels; to the west groundwater levels were recorded at up to 4.5 mAOD (2.0 mbgl), and to the east at up to 3.0 mAOD (3.5 mbgl). Groundwater was broadly within the Chalk and granular River Terrace Deposits. Allowing for groundwater level to rise higher than that recorded on 11 March 2020, a worst-case expected groundwater elevation of 4 mAOD (2.5 mbgl) in the area of the site proposed for ground level lowering was determined and upon which the final design is based.

3.4 Design Aims and Objectives

Background

In July 2020 an application (WSCC/036/20) was submitted to WSCC for the demolition of existing buildings and structures, and the construction and operation of an ERF and a WSTF for treatment of municipal, commercial and industrial wastes, including ancillary buildings, structures, parking, hardstanding and landscape works.

Following consultation on the submitted application and discussion with WSCC officers, it was considered that the landscape and visual impact, together with the associated impact on the setting of designated heritage assets, was unlikely to be acceptable. WSCC also provided an EIA Regulation 25 request for further information.

A detailed re-design and analysis of the related technical issues was subsequently undertaken, and the proposals revised to take account of this feedback. Application WSCC/036/20 was then subsequently withdrawn on the submission of this new planning application.

The design development process sought to achieve a significant reduction in the height and mass of the buildings and an increase in space for landscape provision, with colours and materials that would help to reduce visual impacts, and this is explained further in this document.

Overarching Design Vision

From the outset it has been recognised that due to the setting of the site and the scale of the development it would be impossible for it to be 'hidden'. In giving due consideration to its surroundings and context it would be important for it to be designed to best mitigate its visual impact, and through high quality design make a positive contribution to the character and quality of the area (Fig 3.3). The design objectives below are framed to reflect this vision and to reflect the comments received on the withdrawn proposals, where relevant.

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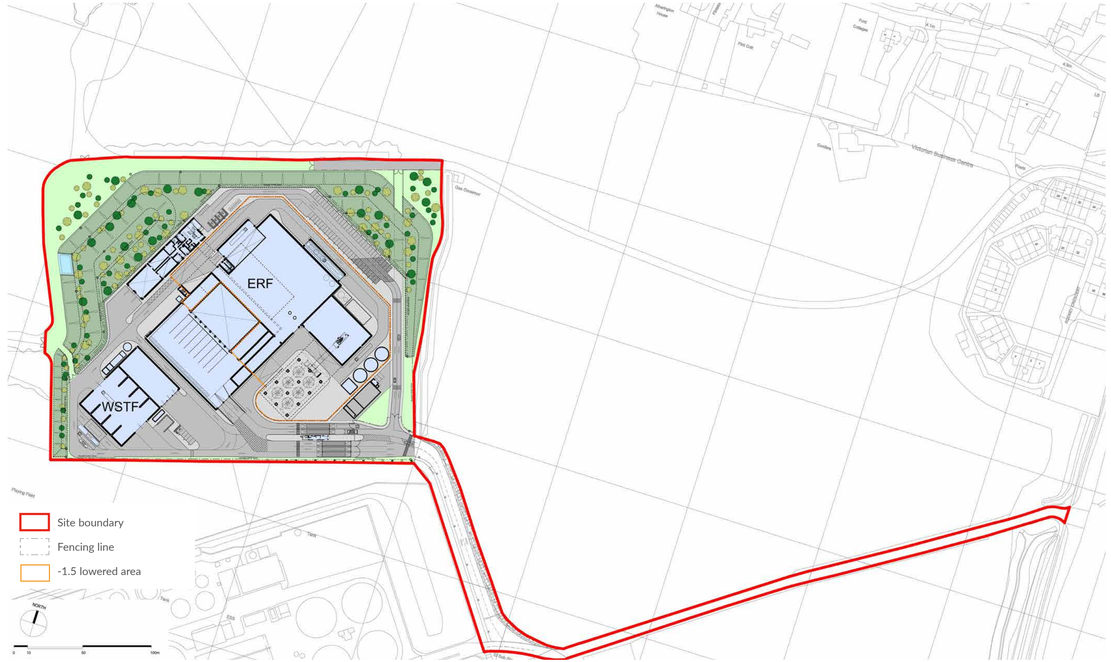

Figure 3.3 Proposed Site Plan – extract from drg PL105

FORD ERF AND WSTF
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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, and focus the main buildings centrally within the site 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;
- Minimising the individual building heights and volumes;
- Maximising opportunities to lower buildings into the ground whilst at the same time giving due consideration to minimising the environmental impact of any proposal;
- Providing self-contained areas for the ERF and WTSF operations;
- Establishing a logical and energy efficient 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;
- Developing a site layout which best utilises the buildings and perimeter landform bunding to visually and acoustically 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 for servicing the facility and during shutdown periods;
- Establishing a visually coherent family of buildings on the site which relate to one another and whose various functions can be understood by those visiting it;
- Ensuring that the massing and scale of the proposed development was developed such that it best mitigates its visual impact upon near and far landscape and heritage assets;
- Locating the air cooled condensers (ACCs) 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 significant biodiversity net gain on the site.

The overall size and massing of the main ERF building is dictated by the internal process equipment and related functions that it has to contain, and the overall height has been minimised by adopting a twin stream rather than a single stream process arrangement. While the overall size of the ERF is also influenced by the throughput capacity of the facility, a reduction in throughput would not result in a reduction in the scale of the buildings. Further explanation of this, and a justification of the need for the facility, is addressed in chapter 3 of the Planning Supporting Statement.

Another key design issue is that the relationship between the main components and spaces that make up the ERF and the WSTF buildings are also very much process driven. In the most part the process arrangement in the ERF is linear in sequence and has 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 and design of the proposed development (Fig 4.3) has been developed in response to the design objectives identified above. The design development of the site layout is covered in the following section.

04 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, while at the same time contribute positively to the character and quality of the area, and promote community acceptance of waste facilities through high quality design.

A number of key issues had to be addressed:

- Minimising the overall footprint of buildings and road infrastructure to maximise areas for landscaping;
- Developing a proposed layout that would assist in mitigating the visual impact upon the identified landscape and heritage assets;
- Locating the ACCs in the south of the site and use the main building scale to best shield them from nearby noise receptors; and
- Centralising the highest parts of the ERF within the site to best mitigate the scale of the development from key nearby views, and maximise areas for landscaping and bunding around the site's boundaries.

Figure 4.1 Initial site layout study – U-shaped arrangement of the ERF

The potential distribution and orientation of the principal components making up the ERF and WSTF across the site were explored.

It was accepted from the outset that the ERF and the WSTF would share the single access point in the south east corner of the site as well as the entrance gatehouse and its weighbridge arrangement.

The first phase of work focussed on developing alternative arrangements and locations for the ERF and it was decided that in order to minimise the development footprint of the ERF, rather than adopt the most common linear arrangement for the waste reception hall, waste bunker, boiler hall, and FGT hall/stacks, that either a U-shaped or L-shaped arrangement would need to be adopted. Site layouts were developed for both options.

U-shaped

This option (Fig 4.1) centrally located the ERF within the site and incorporated:

- The waste reception hall at the eastern and boiler hall at the western end of the ERF;
- The FGT hall and turbine hall rotated 180 degrees to run along the southern face of the boiler hall to form the 'U-shaped' arrangement;
- A linear arrangement of ACCs running parallel to the south of the ERF;
- Standalone administration and workshop buildings and car parking running parallel to the north of the ERF;
- The WSTF facility to the west of the ERF; and
- Landscaped bunding along the site's west, north, and east boundaries.

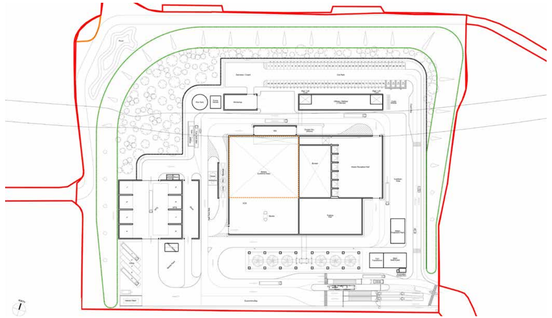

Figure 4.1 Initial site layout study – U-shaped arrangement of the ERF

Figure 4.2 Initial site layout study – L-shaped arrangement of the ERF

04 DESIGN EVOLUTION

L-shaped

This option (Fig 4.2) centrally located the ERF within the site, but rotated it and the WSTF 45 degrees on plan. It incorporated:

- The WSTF in the south western corner of the site and the ERF arranged with its waste reception hall at its SW end, and boiler hall at its north east end;
- The FGT hall and turbine hall rotated 90 degrees to run to the south east of the boiler hall to form the 'L-shaped' arrangement;
- A 3 x 2 arrangement of ACCs located south of the ERF and acoustically shielded between the bunker hall and the turbine hall;
- Standalone administration and workshop buildings and car parking running parallel to, and north east of the ERF; and
- Landscaped bunding along the site's west, north, and east boundaries.

While both layouts successfully addressed the previously identified key issues, it was considered that the rotated L-shaped arrangement offered several benefits:

- The building's angled rotation maximised the areas that could be set aside for earth bunding and landscaping, particularly in the north west and north east corners, where mitigating the visual impact of the development to nearby sensitive receptors to the north east and north west was a key concern. Located along the site's western, eastern and northern boundaries these areas would be capable of being bunded and in some areas up to 8m in height in order to visually and acoustically shield nearby receptors from the site's low-level operational activities, particularly that of manoeuvring vehicles and the buildings themselves. 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 a timber acoustic fence to be included along that boundary;
- This orientation also enabled the highest parts of the building to be set back from the site perimeter and the current and potential future receptors (i.e. the outline planning application for 1500 new homes) lying beyond these;
- It used the main building to best shield the ACCs from the same areas as well as being located away from the eastern boundary;
- It best segregated ERF and WSTF operations within the site;
- Delivers 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 across the site; and
- The layout's arrangement and roads infrastructure offered the opportunity to explore lowering the ground level in the vicinity of the highest parts of the ERF.

This L-shaped arrangement was further refined and in order to better balance the allocation of landscaped areas across the site it was decided to increase the extent of landscaped bunding in the north east corner. In order to achieve this the administration reception building and the workshop were relocated to the north west side of the ERF. This allowed the car park layout to be rationalised and this in turn increased the area available for landscaping in the north east corner.

As a result of reviews with the applicant's internal operations teams and with technology providers, the footprints of both the ERF and the WSTF were revised and the site layout adjusted accordingly and included:

- A widening of the main ERF building to accommodate internal technology arrangements;
- A realignment of the ERF turbine hall to stagger the north east face of the building and assist in breaking up the scale of that facade; and
- A slight increase in footprint of the WSTF was made to ensure that the internal material storage bays were sufficiently sized to accommodate the required storage of material but also the internal unloading/ loading of HGVs.

This stage of design development (Fig. 4.3) established a site layout which fully integrated the ERF and WTSF within a single overall masterplan, which best achieved the design objectives set at the outset (see Section 3.4). While the site layout would still go through a number of future design iterations it was this principal layout that formed the basis for the development of the architectural design.

Figure 4.3 Developed layout – ERF and WSTF

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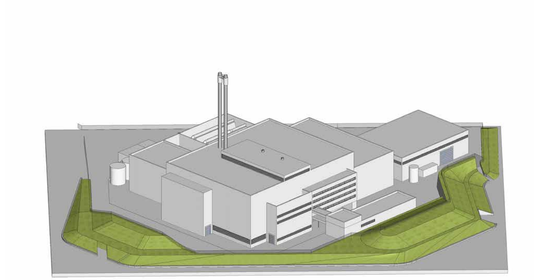

Figure 4.4 Aerial view of 3D model from the north

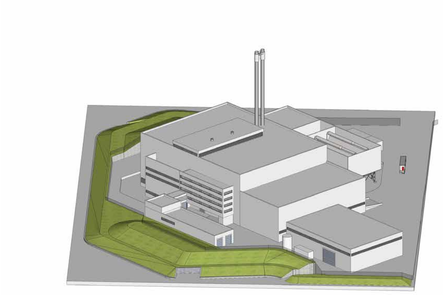

Figure 4.5 Aerial view of 3D model from the west

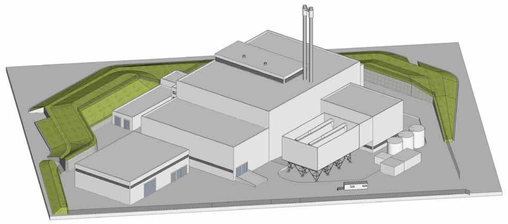

Figure 4.6 Aerial view of 3D model from the south

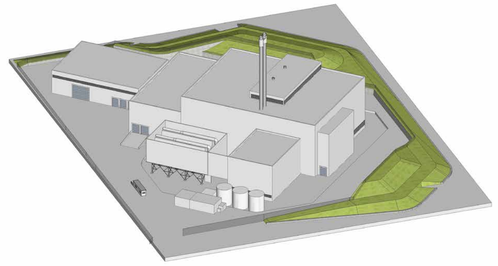

Figure 4.7 Aerial view of 3D model from the east

04 DESIGN EVOLUTION

4.2 Design Development - Stage 2

The design team have carefully considered how to best mitigate the visual impact of the proposed development when seen from key views and this has determined the development of the architectural design.

The first stage of architectural design focussed upon the massing of the ERF building (this being the largest building) and was developed in parallel with the refinement of the site layout design 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, 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 (computer aided design) models. As the design was being developed in parallel with LVIA assessment work, the views used to test the alternative approaches included a selection of 'formal' record photographs as well as 'informal' eye level views from key viewpoints and all were used to test the visual impact and appearance of the proposed design from near, mid-range and distant views from the surrounding area.

The importance of assessing the proposed development in elevated views from the South Downs National Park (SDNP) is well documented within the LVIA, however once tested in visualisations it was considered that these views were too distant to be a main driver for determining the design of the buildings form, or the selection of materials and colour of the proposed cladding. For that reason, this stage of design development focussed on reviewing the impact the proposed design would have upon views in the nearer surrounding area, as it was considered that these would better inform the development of the architectural design and that any measures adopted would be similarly successful in more distant views.

There are several designated heritage assets within the surrounding area and a number of viewpoints were selected in which to test the proposed design:

- View from near St Andrews Church in Ford which lies 0.7 km to the north east of the site;
- View from PROW near to St Marys Church in Yapton which lies approximately 1 km to the west of the site; and
- View from Arundel Castle Keep which lies more than 4 km to the north of the site.

There are also several public rights of way (PROW) close to the site and a selection of viewpoints from these were considered in testing the proposed design:

- View from PROW - Lyminster and Crossbush 2207-1 looking west towards the site); and
- View from PROW - Ford 175-1 looking north east towards the site.

A 3D massing model (Figs 4.4 to 4.7) which included the main buildings and the perimeter landform bunds was generated and tested in a range of the selected viewpoints (Figs. 4.8 to 4.12). In order to minimise the overall size and scale of the main ERF building the design that was tested treated the buildings as a series of refined interlocked cubic forms. The design included parapet 'flat' roofs to avoid the creation of high level shadows that would otherwise be created by oversailing roof plates. This reduces the darker colour contrast that high level shadows would create when seen against a background of sky and avoid 'drawing the eye' up to the upper parts of the facades. While it was considered that the recessive appearance of this design approach was successful in the views when read within the flat landscape and the skyline, it also identified several issues that would need to be addressed:

- 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, alternative building roof profiles should be reviewed and include straying from strictly volumetrically efficient form in order to ensure that softening or curving the roof profile of the building might have visual benefits when seen from the selected viewpoints;
- The impact of the choice of cladding materials and the colour being used on the buildings would be important in softening its visual impact and alternatives would need to be reviewed, as would how the overall visual scale of the building might be broken down by consideration of contrasting materials/ colours;
- Further review of the recorded and current groundwater levels on the site would need to be undertaken and opportunities to lower parts of the buildings below ground should be explored in order to lower the overall height of the main ERF buildings as far as possible;
- While the raised bunds clearly assisted in both visual and acoustic mitigation further review of their size and form would need to be tested to ensure that they visually imbed themselves within the predominantly flat landscape;
- How the planting of the bunds might appear would need further investigation, both in terms of the extent and type of planting, and that testing the appearance of new trees at year 0 and at year 15 in the visualisations would be important in order to show screening effects will advance with time;
- Consideration would need to be given to increasing the range of viewpoints to fully test the proposed design in principle and in its detail; and
- How the design might respond to the former canal and incorporating references to this within the design would need further exploration.

Additional visualisations and drawings prepared as part of this stage of design development can be found within Appendix A: Design Development Stage 2.

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Figure 4.8 View from Arundel Castle Keep Initial massing study

Figure 4.10 View from near St Andrew's Church Initial massing study

Figure 4.9 View from PROW Lyminster and Crossbush 2207 Initial massing study

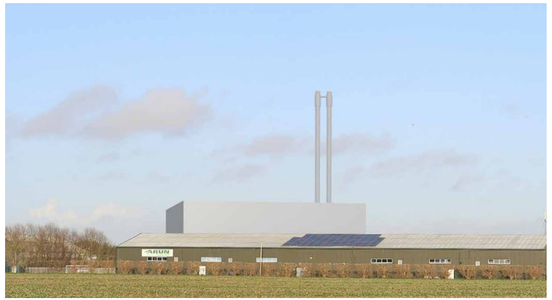

Figure 4.11 View from PROW - Ford 175-1 Initial massing study

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Figure 4.12 View from nearby PROW to the east of St Mary's Church, Yapton Initial massing study

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4.3 Design Development - Stage 3

At the start of this stage of work the site layout was updated to incorporate a number of changes which focussed upon the layout of the WSTF and the ERF workshop building and fine tuning of the road's infrastructure within the site (Fig.4.13).

The range of viewpoints within which the proposed design was being tested was increased, and the following views added:

- View from the site's former exit road lying to the west of Rodney Crescent looking west towards the site);
- View from Public Footpath 366 - looking south towards the site); and
- View from southern airfield near Horsemere Green - looking north towards the site.

Using the expanded range of viewpoints within further design studies were then undertaken to seek to address the issues raised from the previous stage of design development.

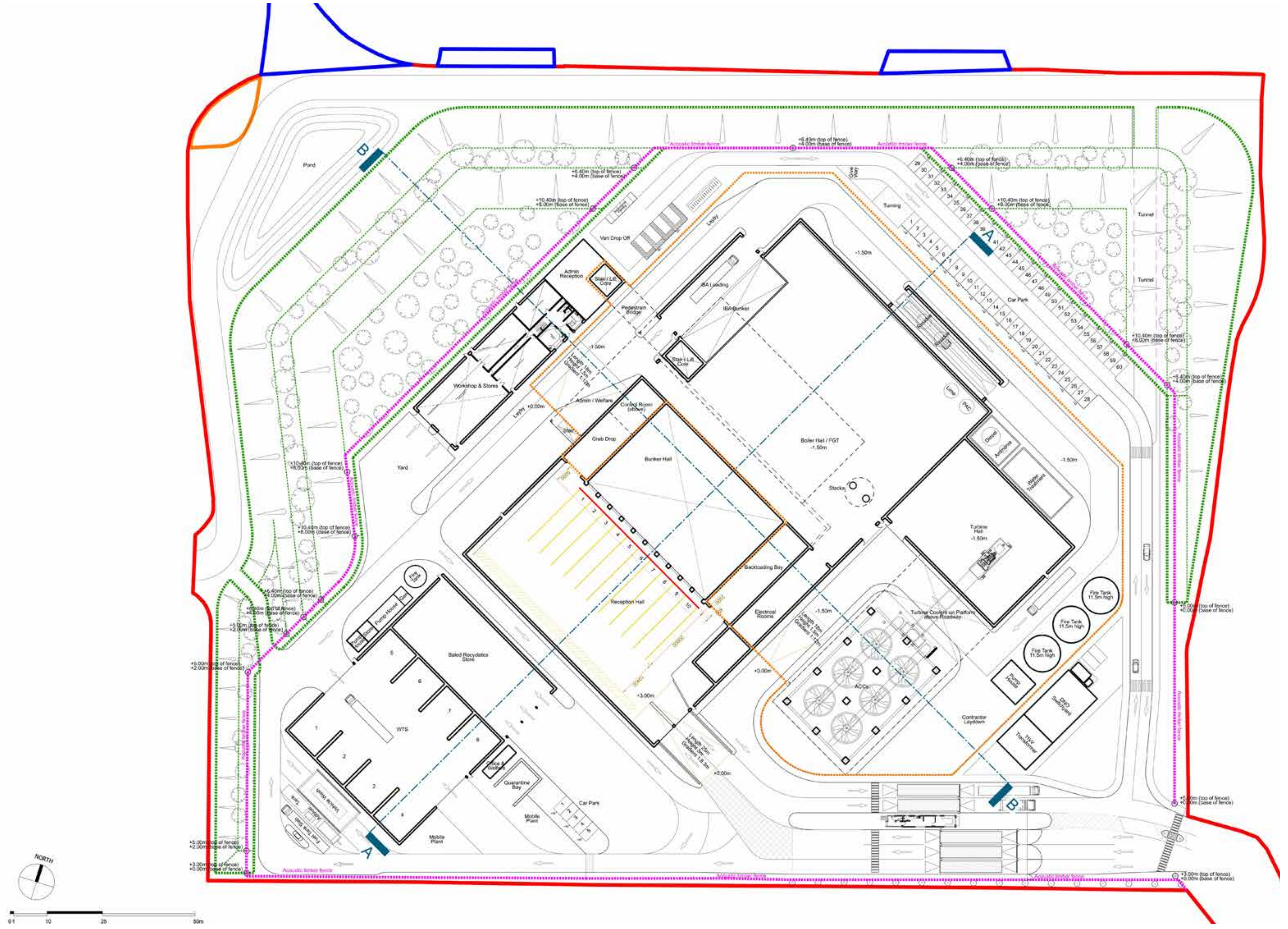

Figure 4.13 Refined site layout design

04 DESIGN EVOLUTION

Building Form

A range of design options were developed and tested. Figures 4.14 to 4.36 show alternative building profiles and roof forms of the main ERF building in selected visualisations, with an initial site section included in Figure 4.23.

Cubic

This design was basically a repeat of that used in the first stage of design development work. It ignored the stepped 'top hat' profile of the flat roofs on top of the main ERF building and instead maintained a single consistent parapet line in order to simplify its appearance and to visually conceal the stepped profile (Fig 4.14).

Stepped

This option explored a more volumetrically efficient design. It allowed the parapet along the top of the ERF to follow the stepped profile of the roofs behind in order to reduce the overall scale and massing of the building. Parapets were incorporated around most of the roof plates to maintain a clean edge to the building's profile (Fig 4.15).

Radiused

A variant of the Cubic design this applied curves to the vertical corners of the main building to test if by removing its 'corners' and blurring the transition between facades in light and shadow there would be softening in the appearance of the building (Fig 4.16).

Vaulted

This option explored softening the profile of the upper part of the ERF by profiling the top edge of the parapet walls to give a curved appearance to the roof line. The roof plates behind could either be retained as stepped flat roofs or areas of curved roof could be added if this offered further improvement to the design (Fig 4.17).

Curved

This design option incorporated a single curved roof plate, which in covering both the upper and lower parts of the ERF and being continued over the WSTF building created a single architectural form and sought to test if this would offer an overall softer profile and appearance (Fig 4.18).

Figure 4.14 View from near Rodney Crescent looking west
Cubic design

Figure 4.15 View from near Rodney Crescent looking west
Stepped design

Figure 4.16 View from near Rodney Crescent looking west
Radiused design

Figure 4.17 View from near Rodney Crescent looking west
Vaulted design

Figure 4.18 View from near Rodney Crescent looking west
Curved design

Figure 4.19 View from near Rodney Crescent looking west
Stepped design with indicative 15 year tree growth

04 DESIGN EVOLUTION

Landscaped Bunds

The design of the proposed landscaped bunds was taken further and updated in the 3D model. A representation of trees at 15 years was also added and tested in the views. A key view was that from the site's former exit road lying to the west of Rodney Crescent, as it was closer to the site than other views and offered a better understanding of the scale of the bunds and the planting within the surrounding landscape and the context of the site. To further test the tree growth at 15 years another image was prepared which included an artistic representation of the trees instead of a simple representation (Fig 4.19).

Colour Studies

How the overall massing might be broken down through the use of varying colours / tones was explored on the Stepped design option. It was recognised from the outset that the use of any dark colour on the upper parts of the main buildings would undermine efforts to soften the overall appearance and mitigate its visual impact, and adopting a lighter colour would best blend and soften the appearance of the buildings against a background of sky. Therefore, the colour studies focussed on applying different colours to the lower building forms and considered their effectiveness and the relationship with the proposed landscaped bunds (Appendix 2).

Stacks

The early decision to minimise the overall height of the ERF building by adopting a twin stream, rather than single stream process, led to the requirement for two flue stacks. It was concluded that in order to best mitigate their appearance against the sky from nearby and distant views that the stacks should be treated simply and played down in their appearance rather than adopting a more adventurous design. This led to there being two options for the stacks, either wrap them within a single 'cylindrical' or 'oval' wind shield or alternatively treat then as a pair of 'pencil' stacks. All options were tested in the visualisations (Fig 4.20 to 4.22).

These studies showed that while the single shielded version of the stack would appear as a single 'column', the large width of both options presented a greater visual impact against the sky, particularly in the cylindrical option where it would maintain the same width when viewed from all viewpoints. In contrast, the twin 'pencil' stack arrangement was, on the whole, narrower than the single wind shield. The twin stack appearance changed depending upon the viewpoint - at times appearing as twin and when overlapped, visually appearing as a much slenderer single stack.

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Figure 4.20 View from near St Andrew's Church
Single 'cylindrical' stack

Figure 4.22 View from near St Andrew's Church
Twin 'pencil' stacks

Figure 4.21 View from near St Andrew's Church
Single 'oval' stack

04 DESIGN EVOLUTION

Development Level

It has always been a requirement for the floor level of the bunker to be set below ground level for it to cater for the required waste storage capacity. However, it was also decided that in order to minimise the overall height of the ERF building that subject to groundwater levels the potential to lower to a lesser extent the floor levels of the boiler, FGT, and turbine halls should also be explored. These studies were included within this stage of design development.

The existing groundwater levels on the site had been reviewed and established as sitting at around -6mbgl. At this time concurrent studies were being undertaken to test the feasibility of lowering the building into the groundwater and to establish if the impacts of dewatering would be acceptable, and if the volume of water that would be generated by dewatering be manageable. As these studies had yet to be concluded it was assumed that the extent the boiler hall, the tallest structure, could be lowered into the ground, was assumed to be -5mbgl.

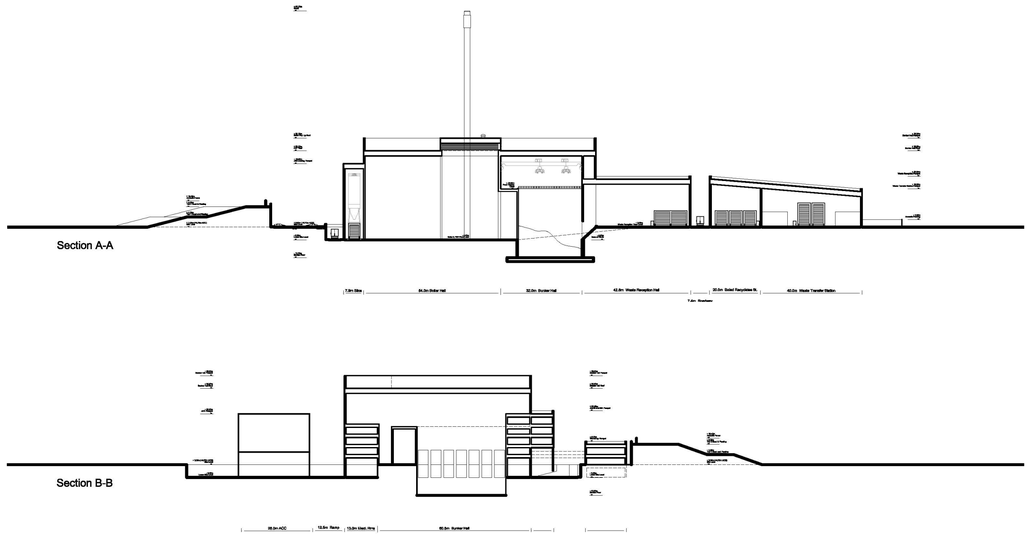

Figure 4.23 Initial site sections – lower development level assumed at -5mbgl

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Figure 4.24 View from near St Andrew's Church
Cubic design

Figure 4.25 View from near St Andrew's Church
Stepped design

Figure 4.26 View from near St Andrew's Church
Radiused design

Figure 4.27 View from near St Andrew's Church
Vaulted design

Figure 4.28 View from near St Andrew's Church
Curved design

04 DESIGN EVOLUTION

A number of conclusions were drawn from this second stage of design development:

- When considering the alternative designs in the view from Arundel Castle it was clear that with it being so distant it was difficult to differentiate between the alternative designs, particularly as the curved profiles of the vaulted and curved designs were not apparent in this view due to the orientation of the building. However, it did show the reduced massing offered by the stepped profile design over the others;
- The simpler cubic and stepped building designs tended to offer a more refined appearance and tended to easier to read in all views when compared with the vaulted and curved designs;
- The increased massing generated by the curved design was particularly evident in many of the views and when considering the context of the site, the benefit of creating a larger building than operationally needed was questioned;
- While the orientation and visibility of the curved profiles of the vaulted and curved designs varied form view to view, it was clear that at certain times of day any curved roof, whatever its colour, might lead to sun 'glinting' from its surface. This raised concerns that on those occasions the building would appear much brighter and stand out within the landscape;
- While the curved corners of the radiused design had the potential to soften the views from nearby heritage assets, the visualisations also raised concerns that the potential for 'glinting' on the curved corners could accentuate the corners and in so doing frame the outline of the building against the sky;
- It was considered that the twin 'pencil' stacks offered visual benefits over the single windshield options and was therefore adopted into the final design, as was the decision to adopt a light sky blending colour having been tested in the views;
- The further development of the design of the proposed bunds and their landscaping, and their testing in the views, showed that their scale would be in keeping with the scale of existing tree belts in the area;
- The additional versions of the views from Arundel Castle and from Rodney Crescent, which included more representative images of the likely tree growth over 15 years ,reinforced the benefit that the planted bunds would have in screening low levels within the site and reducing the apparent scale of the larger building; and
- It was concluded that treating the elevations with darker colour banding at lower levels offered little benefit when seen in more distant views and was considered to have more of a negative impact in closer views, and that a light, sky blending colour should be consistently applied to the building to ensure a clean and refined appearance.

Overall, this stage of design development had established that the stepped design was the most successful in reducing the overall mass and scale of the building, and when compared with the other designs it best mitigated the visual impact of the building from the selected views.

However, a number of issues remained to be resolved at the next stage of design development including:

- The impact of the choice of cladding materials and the colour being used on the buildings would be important in softening its visual impact and alternative cladding materials and finishes would need to be reviewed;
- Reviewing how the preferred design might look in elevated views from the SDNP;
- Testing the shadow path from the proposed design, particularly in respect of the nearest residential property to the north east, Atherington House; and
- Considering how the design might respond to the former canal and incorporate references to this within the design.

Additional visualisations and drawings prepared as part of this stage of design development can be found within Appendix B: Design Development Stage 3

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Figure 4.29 View from nearby PROW to the east of St Mary's Church, Yapton Cubic design

Figure 4.30 View from nearby PROW to the east of St Mary's Church, Yapton Stepped design

Figure 4.31 View from nearby PROW to the east of St Mary's Church, Yapton Radiused design

Figure 4.32 View from nearby PROW to the east of St Mary's Church, Yapton Vaulted design

Figure 4.33 View from nearby PROW to the east of St Mary's Church, Yapton Curved design

04 DESIGN EVOLUTION

4.4 Design Development - Stage 4

Development Level

Further investigations had concluded that to allow construction of lowered ground levels at the assumed -5mbgl in the chalk would require the abstraction of groundwater on a temporary basis (approximately six months) in order to lower the groundwater table. However, this could also result in impacts to groundwater quantity at nearby existing groundwater abstractions, base flow to the River Arun and water quality of waterbodies which would receive the abstracted water. It was also concluded that dealing with the required volumes of dewatering would be unmanageable.

In order to avoid any adverse impacts and to deliver a manageable dewatering strategy, the design was revised in order to substantially reduce the extent to which the groundwater table would need to be lowered.

As a result, the extent to which the tallest parts of the ERF building and their associated floor construction build ups could be lowered into the ground were revisited and changed to -1.5mbgl (finished floor level). The depth of the waste bunker and its floor construction build up was similarly revisited and changed to -3.0mbgl depth. These height changes impacted upon both how the proposed building design would sit in the selected viewpoints, and in the layout of the site.

Architectural Design

While the key principles of the architectural design remained unchanged, they were developed to add further detail, and the following changes made:

- Reducing the depth of the waste bunker required the floor level of the waste reception hall to be elevated to +3m above ground level in order to ensure sufficient storage capacity was maintained within the bunker;
- Incorporating areas of flint walling to key areas on the ERF administration / reception building and to face the wall forming the western edge of the car park and its access road, to add local character and visual interest and offer a visual contrast to the scale and finish of the metal cladding;
- Incorporating photovoltaics on the majority of high level flat roofs of the ERF and the WSTF buildings;
- Detailed development of the floor layout of the ERF administration accommodation including offices; meeting rooms; staff welfare facilities; and reception and visitor facilities;
- Identifying the location of ventilation louvres on both the ERF and WSTF and avoiding their location on the higher parts of the main building to ensure visual darkening of the facades does not occur;
- Refinement of the glazing arrangements of the ERF's administration wing and the decision to include blackout roller blinds to prevent the potential night-time light spill to receptors around the site;
- Including a screen that would span between the turbine hall and the ACCs and which would shield outdoor equipment and the pipe duct and support structure;
- A review of cladding material options and finishes / colours was undertaken, and this is covered in detail within Section 5.6; and
- Shadow path studies were undertaken which showed there to be no significant effects upon residential amenity and this is covered in Section 5.8.

Site Layout

While the key principles of the site layout remained unchanged the development of the landscape design and the detail of interfaces 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:

- A 1 in 10 gradient vehicle ramp was added to allow HGVs to access the +3m raised waste reception hall;
- An additional inbound weighbridge and an additional outbound weighbridge were added to reduce potential queuing of HGVs;
- The secure boundary of the site was adjusted in the north east corner to maintain the route of the existing PROW at the north east of the site;
- The development of the landscape design and planting proposals were developed and led to adjustments in the design and contouring of the landform bunds and the addition of a flint faced wall at the foot of the bunds to add local character and visual interest when viewed from outside of the site; and
- A flint faced cutting and recessed pond was added into the side of the landform bund adjacent to the site's western boundary to mark the alignment of the former canal route, and a change in paving colour and texture within the site's car park to mark its alignment at the eastern end of the site;

Figure 4.34 Viewpoint 19 from junction of PROWs Arundel 3067-1, 415-4 and 415-5 looking south toward site Representative viewpoint photograph.

04 DESIGN EVOLUTION

Visualisations

An additional view was added to those that had been used to test the design from the outset:

- View from the site's access road looking north towards the site entrance - Fig 4.36;

The 3D model of the proposed design was updated in order to reflect the developments in the design and included:

- The change in depth of the lowered site level to -1.5m;
- The selection of standing seam aluminium cladding for the main facades of the building and its matt silver finish; and
- The updated design for the landscaped bunds.

When considering the initial massing study when viewed from Arundel Castle 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. While it may be considered that using mid tone colours instead of very light or very dark from such long distance views would better blend the building with the landscape, it would have a negative impact from more mid-range and short-range views where the building is read against a background of sky. For that reason, it was decided that on balance the adoption of light neutral colours for both the buildings and the stacks would on the whole best mitigate their visual impact upon their surroundings.

The proposed design was also reviewed in a number of additional viewpoints. This included consideration of a range of views from the South Downs National Park (SDNP) that had been identified through the LVIA work (Fig 4.34).

These studies concluded that in the more distant views from the higher ground of the SDNP, the simple building form and the strategy to maintain the minimum necessary height helped to reduce its perceived scale and the selected colour of the envelope, whilst light in colour, assimilated well with the other many lighter coloured elements also seen in the view, such that the overall composition of the view of the coastal plain appears largely as existing.

From the limited closer areas of the SDNP with clear views towards the site, for example from the Binsted area, the proposed design is not seen in the wider context of coastal plain development and from a lower elevation, so the change in the view is a result of its partial appearance on the skyline in some views.

This is also the case in the closer, more local views, where the relatively flat landscape results in upper parts of the building being seen partly against the sky, and often partially screened and filtered by skyline vegetation.

In both these instances the light and partially reflective colour of the building envelope appeared light against the sky and responded to prevailing weather and light conditions. These visual effects and, particularly in the immediate locality, the existing industrial context, helped to reduce the magnitude of change experienced in the views.

Overall it was concluded that the incorporated changes raised no significant concerns and that no further changes were required to be made to the proposed design. The orientation and form of the proposed building and its combination with the proposed landscaped screening bunds has consistently proved to be the optimised design in mitigating its visual impact and best blends the proposed development with its surroundings.

Visualisations of the proposed design are shown in selected viewpoints in figures 4.38 to 4.40. Additional visualisations and drawings prepared as part of this stage of design development can be found within Appendix C: Design Development Stage 4

Figure 4.35 View from Arundel Castle Keep
Cubic design with indicative 15 year tree growth

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Figure 4.36 View from site's access road looking north
Proposed design

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Figure 4.37 View from nearby PROW to the east of St Mary's Church, Yapton
Proposed design

Figure 4.38 View from PROW - Ford 175-1
Proposed design

Figure 4.39 View from near Rodney Crescent looking west
Proposed design

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Figure 4.40 View from Public Footpath 366 north of the site
Proposed design

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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 landscape views and cultural heritage assets. 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 architectural solution which best mitigates its visual impact within its setting; and
- Developing an efficient and safe site layout for all users.

Figure 5.1 View from site's access road looking north
Proposed design

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5.3 Orientation

Initial design studies explored various site layouts including different orientations 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 L-shaped arrangement of the main process building and its 45 degree rotation upon the site has been adopted to:

- Maximise the area available for landscaped bunding in those areas closest to nearby receptors and PROWs, to best shield internal operations and vehicle movements, and to break down the overall scale of the main building;
- Use the main building massing to best shield the ACCs from nearby receptors.

The final layout is illustrated in Figure 5.3 The rationale and benefits of this orientation are expanded upon within the previous Design Development section of this DAS.

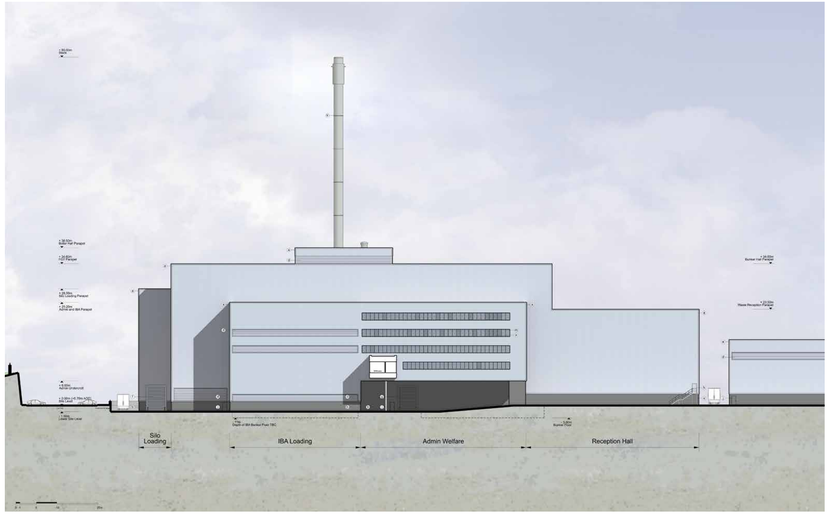

Figure 5.2 Proposed ERF west elevation – extract from drg PL303

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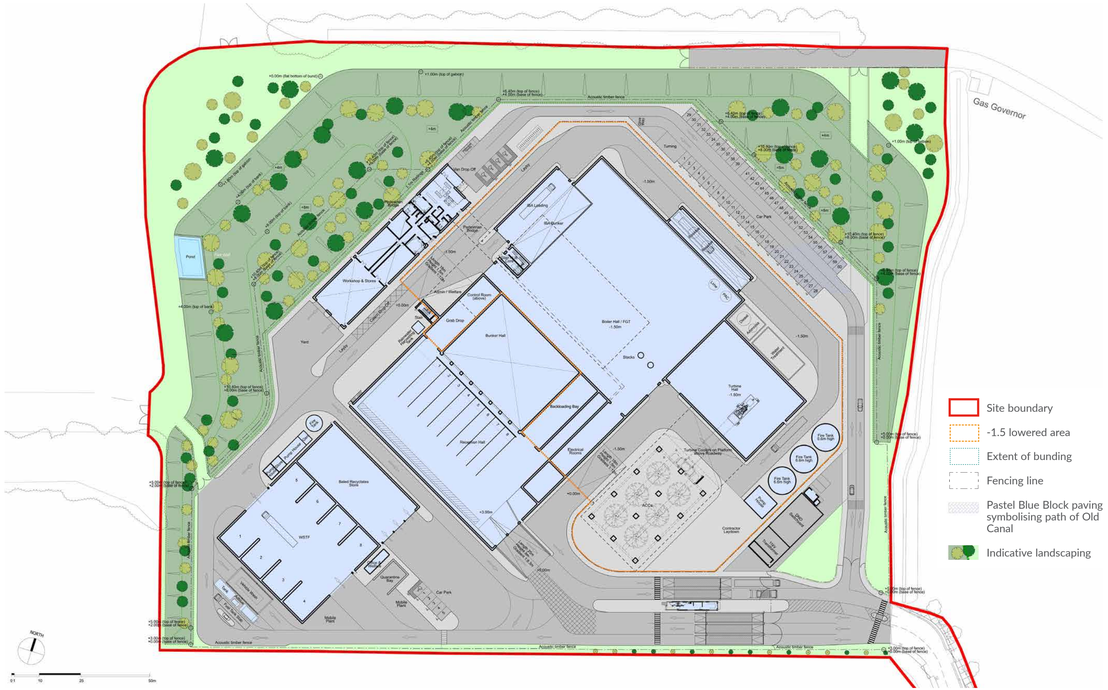

Figure 5.3 Proposed site layout – extract from drawing PL106

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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.

A maximum gradient of 1:10 has been adopted for the ramps which service the -1.5m lowered area of the ERF site and the access ramp into the +3m raised waste reception hall.

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 consists of two areas. The main car park is located close to the administration reception building of the ERF and provides 60 standard, electric vehicle (EV) car parking spaces. The secondary car park is located in front of the administration reception building and provides four Blue Badge EV bays, a drop off area for vans and passengers, and motorcycle parking bays. Specific provision is also made for cyclists with permanent, secure and sheltered cycle parking within this area. The cycle parking will comprise eight Sheffield stands, providing 32 cycle parking spaces for staff and visitors, and drying and showering facilities will be provided for within the main building. This will be located close to the entrance to the administration wing, where stair and lift access is provided to its upper floors and where an internal footbridge connects its upper level to additional accommodation fronting the north west face of the ERF.

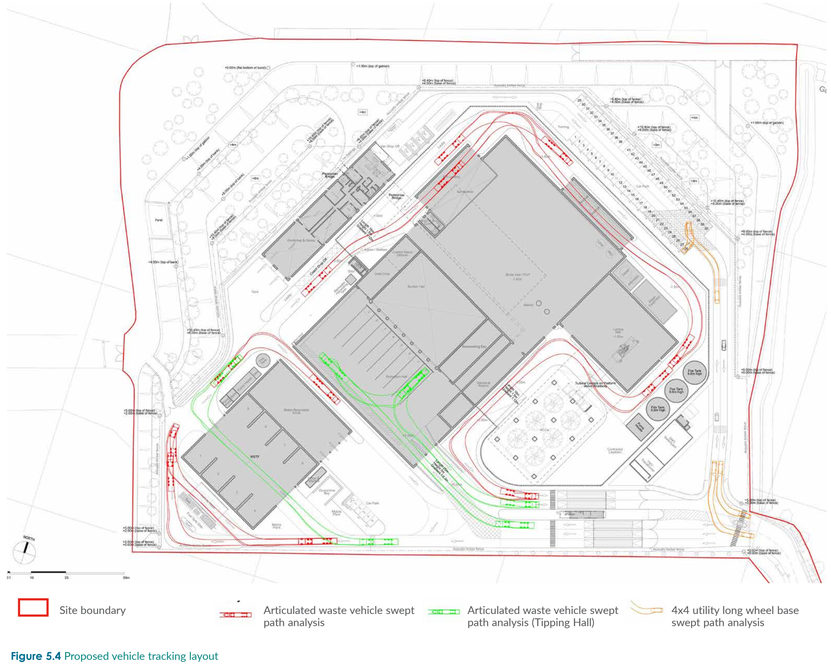

Figure 5.4 Proposed vehicle tracking layout

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A visitor's coach parking lay-by is provided for within the main ERF operational site and a secondary visitors entrance will allow access to the administration reception area directly from the coach drop off area.

All operational vehicles accessing the ERF and WSTF site will be controlled by the gatehouse/ weighbridge arrangement which is gated and secured outside of normal operating hours. Upon entering, vehicles will approach the three inbound weighbridges where access is controlled by vehicle barriers and the gatehouse. Leaving this weighing/ control point vehicles will join the perimeter road system which circuits the site. This is predominantly 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 buildings, and where required ensures right hand down reversing around the site. 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 south eastern corner of the building. This is the only stretch of two-way road within the operational area of 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.

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 north western side IBA storage area, and the north eastern FGT silo arrangement. The workshop/stores building abuts the administration reception building at its north eastern end and will have a manoeuvring/unloading area at its south western end.

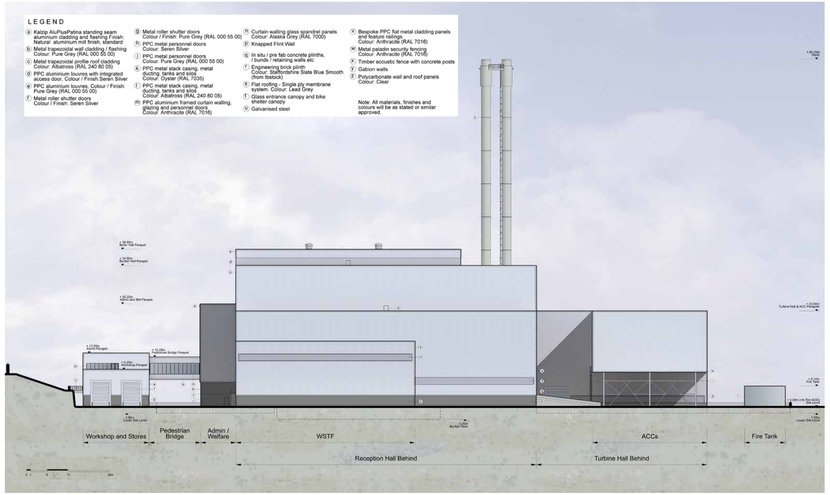

Figure. *5.5* Proposed ERF south elevation – extract from drg PL302

Whilst most of the process equipment is located within the building envelope, there is some that needs to be located externally for operational reasons. These include the ACCs; the ammonia store; the fire water tanks and pump house; and an electrical substation and switchgear 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 two outbound weighbridges allow exit from the site.

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WSTF

Upon entering the site all vehicles accessing the WSTF will use the southern-most inbound weighbridge. Immediate access is provided to the WSTF car park for staff and visitors, which is located on the southern side of the WSTF building and provides five standard EV car parking spaces and one Blue Badge EV bays. Specific provision is made for cyclists and is shared with that for the ERF, with permanent, secure and sheltered cycle parking provided adjacent to the administration reception building. This will avoid cyclists having to enter the main operational site.

On leaving the weighbridge all WSTF HGV's will join the site's internal one-way road system which provides access to the full perimeter of the WSTF building and its HGV manoeuvring areas. The roads system has been designed to ensure that WSTF vehicles can circumnavigate the site without needing to access the roads system around the main ERF building. All loading and unloading of HGV's will take place inside the building. Those accessing the western area, containing transfer station storage bays, will have a drive through arrangement and will enter from the south east and exit from the north west of the building. Those accessing the baled recyclates store will gain access from the south east manoeuvring apron and reverse into the building.

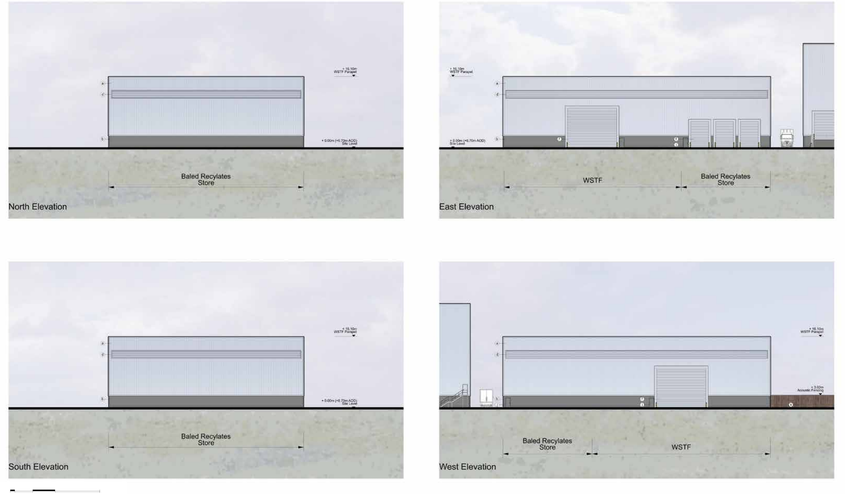


Figure *5.6* Proposed WSTF elevations – extract from drawings PL305 & 306

05 DESIGN SOLUTION

5.5 Scale and Appearance

Minimising the overall scale of the ERF building has been carefully considered from the outset and several measures were adopted to minimise the overall height of the ERF building and to best mitigate its visual impact:

- A 'twin' rather than a 'single' stream plant was selected in order to minimise the height of the boiler hall;
- It was decided that areas of the ERF building would be set as far below ground level as groundwater levels would allow; and
- A 'form follows function' design approach was adopted to ensure that the building envelope would be volumetrically efficient, ensuring that the overall scale of the ERF would be minimised.

On the whole these initial measures were adopted to create a contextually appropriate piece of architecture which best mitigates its visual impact and how the buildings will be visually perceived from near, mid-range and distant views has been the subject of many visual studies. These studies tested alternative designs for the site layout and the architectural form and colouring of the buildings themselves, and led to the proposed design.

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

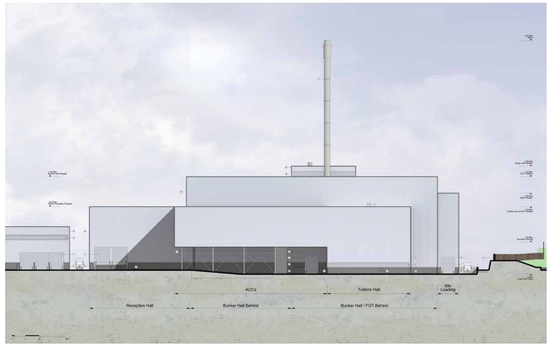
The overall shapes of the ERF (Figs 5.5 to 5.7) and the WSTF are treated as refined cubic forms. In the case of the ERF a series of interlocking cubic forms make up the overall building. The principle high level roofs of both are enclosed behind parapet walls to ensure safe service access to roof areas for personnel and to help visually shield much of the rooftop photovoltaics and equipment from view.

Maintaining a refined appearance has been a key objective in order to best mitigate the visual impact of the building. As such, the extent of louvres and glazing at high level have been minimised both to avoid interrupting the visual continuity of these facades, but also to reduce the shadowing that such features generate on uninterrupted expanses of cladding and which would otherwise draw the eye to the upper parts of the building.

The proposed cladding has been carefully selected to support the design approach and this is described in detail in Section 5.6.

The scale of the other buildings and external equipment included within the proposed development are all essentially lower in height and largely visually shielded by the perimeter landscaped bunds. All buildings/equipment are colour matched to establish a 'family of buildings' across the site.

The Design Team has chosen not to suggest elaborate designs for the stacks as they have a slightly different set of visual and operational issues which influence how its design is approached. They 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 stacks should be played down in their form and colour, and be left as twin slender columns to best minimise their appearance. Their required access ladder has been located between them to minimise its impact from nearby views, as has the upper gantry which spans between, rather than around, the outer edge of the stacks to remain discreet and minimise the casting of shadow on the top of the stacks. The light neutral colour of the stacks ensures they best blend with the sky.



LEGEND

A Kalzip AluPlusPatina standing seam aluminium cladding and flashing Finish: Natural aluminium mill finish, standard
B Metal trapezoidal wall cladding / flashing Colour: Pure Grey (RAL 000 55 00)
C Metal trapezoidal profile roof cladding Colour: Anthracite (RAL 7016)
D PPC aluminium louvres, with slotted access door, Colour / Finish Senlin Silver
E PPC aluminium louvres, Colour / Finish: Pure Grey (RAL 000 55 00)
F Metal roller shutter doors Colour / Finish: Seren Silver
G Metal roller shutter doors Colour / Finish: Pure Grey (RAL 000 55 00)
H PPC metal personnel doors Colour: Seren Silver
I PPC metal personnel doors Colour: Pure Grey (RAL 000 55 00)
K PPC metal tanks-in-casing, metal ducting, tanks and silos Colour: Oyster (RAL 7035)
L PPC metal stack casing, metal ducting, tanks and silos Colour: Alabaster (RAL 240 80 05)
M PPC aluminium framed curtain walling, Colour / Finish: Senlin Silver Colour: Anthracite (RAL 7016)
N Curtain walling glass spandrel panels Colour: Alaska Grey (RAL 7000)
P Knapped Flint Wall
Q In situ / pre fab concrete plinths, / bunds / retaining walls etc
T Engineering brick plinth Colour: Staffordshire Slate Blue Smooth (from Ibstock)
S Flat roofing - Single ply membrane system. Colour: Lead Grey
T Glass entrance canopy and bike shelter canopy
U Galvanised steel
V Bespoke PPC flat metal cladding panels and feature railings Colour: Anthracite (RAL 7016)
W Metal paladin security fencing Colour: Anthracite (RAL 7016)
X Timber acoustic fence with concrete posts
Y Gabion walls
Z Polycarbonate wall and roof panels Colour: Clear

Note: All materials, finishes and colours will be as stated or similar approved

Figure. 5.7 Proposed ERF east elevation – extract from drawings PL301

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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 aluminium, trapezoidal profile steel and glazing systems will be used to clad the buildings and create a visually striking, durable and low maintenance series of buildings.

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 'cubic' forms, but at the same time ensuring that a 'family of buildings' is established across the site.

A range of cladding materials have been considered in developing the design. A metal cladding system has been selected in order to achieve a light reflective finish which would best mitigate the overall scale and appearance of the buildings. A review of suitable alternative products was undertaken and it was decided to avoid cladding types which would be generally associated with industrial shed developments, and cladding which would require extensive use of joints / flashings / fixings and which would tend to break up the clean refined lines being sought.

For those reasons the use of trapezoidal steel cladding and flat composite metal cladding were rejected in favour of aluminium standing seam cladding. This has been chosen to be the principle cladding for all walls forming the main facades of the 'cubic' forms and the proposed Kalzip cladding in AluPlusPatina (natural aluminium; mill finish - Fig 5.10) has been selected for several reasons:

- Its matt metallic 'silver' appearance is light and reflective enough to be responsive to different lighting conditions and therefore will best blend the building with a background of sky;

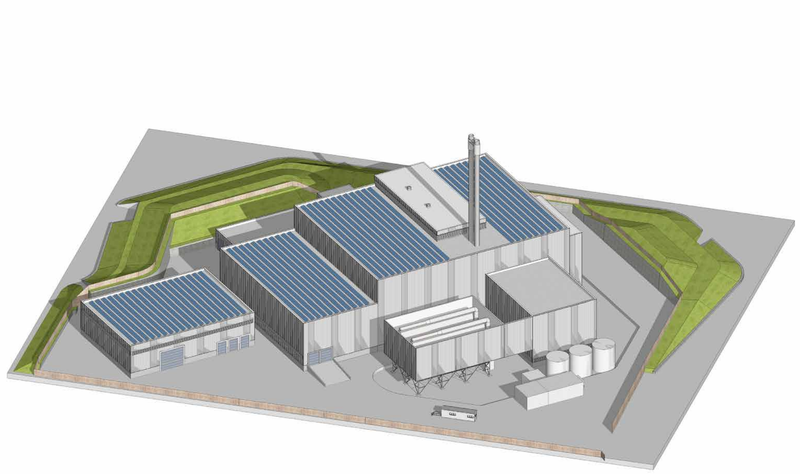

Figure. 5.8 Aerial view of proposed design

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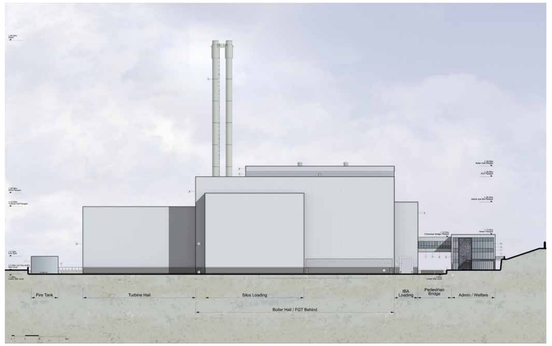
- Its overall pre-weathered finish is consistent in colour and its dirt repellent surface is impervious to fingerprints ensuring a high quality appearance;
- Its matt finish avoids typical light reflections and therefore reduces glare;
- The large span interlocking standing seam trays system minimises the need for joints and surface fixings thereby ensuring a more refined overall appearance; and
- The visual texture of the vertical standing seams adds visual interest and detail when viewed from nearby views.

The location of louvres on the buildings has been carefully considered to be in keeping with the overall design approach. They have been focussed on the step between the highest central boiler volume and the lower remaining boiler hall and FGT roofs to ensure that they are avoided on the principle facades to maintain the continuity of the standing seam cladding and the visual darkening that high level louvres can create. The louvres will also be coloured to match their surrounding.

The 'plinths' will be clad with trapezoidal profile metal cladding, with colour matched integrated ventilation louvres and doors. The colour of the 'plinths' will be dark grey to contrast with the light silver colour of the upper volumes (Fig. 5.9).

The low-pitched roofs will have metal cladding and be 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.

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. All high level areas of glazing will be fitted with blind systems which will close during the hours of darkness to prevent internal lighting being visible from surrounding areas.



LEGEND

a. Kalzip AluPlusPatina standing seam aluminium cladding and flashing Finish: Natural aluminium mill finish, standard
b. Metal trapezoidal wall cladding / flashing Colour: Pure Grey (RAL 000 55 00)
c. Metal trapezoidal profile roof cladding Colour: Albatross (RAL 240 80 05)
d. PPC aluminium louvres with integrated access door, Colour / Finish Seren Silver
e. PPC aluminium louvres, Colour / Finish: Pure Grey (RAL 000 55 00)
f. Metal roller shutter doors Colour / Finish: Seren Silver
g. Metal roller shutter doors Colour / Finish: Pure Grey (RAL 000 55 00)
h. PPC metal personnel doors Colour: Seren Silver
j. PPC metal personnel doors Colour: Pure Grey (RAL 000 55 00)
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l. PPC metal stack casing, metal ducting, tanks and silos Colour: Albatross (RAL 240 80 05)
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t. Glass entrance canopy and bike shelter canopy
u. Galvanised steel
v. Bespoke PPC flat metal cladding panels and feature railings Colour: Anthracite (RAL 7016)
w. Metal paladin security fencing Colour: Anthracite (RAL 7016)
x. Timber acoustic fence with concrete posts
y. Gabion walls
z. Polycarbonate wall and roof panels Colour: Clear

Note: All materials, finishes and colours will be as stated or similar approved.

Figure 5.9. Proposed ERF north elevation – extract from drgs PL300

The principal material finishes are as follows:

- Kalzip standing seam aluminium wall cladding (finish – Alu Plus Patina natural aluminium; mill finish);
- Trapezoidal profile steel wall cladding vertically orientated (colour – Pure Grey RAL 000 55 00);
- Steel trapezoidal roof cladding (colour – Albatross RAL 240 80 05);
- PPC double glazed curtain walling system (colour – Anthracite RAL 7016);
- Coloured spandrel panels within areas of curtain walling (colour – Alaska Grey RAL 7000);
- Stacks – coated steel (colour – Oyster RAL 7035); and
- Metal fencing (colour – Anthracite RAL 7016).

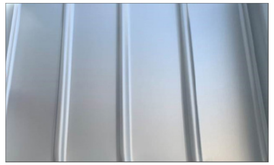

Figure 5.10. Photograph of standing seam cladding sample

Figure 5.11. View from near Rodney Crescent looking west
Proposed design

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5.7 Landscape and Ecology

Landscape

The overall objectives for the proposals (Fig. 5.12) 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.

There will be a Paladin security fence which will run around the perimeter of the site. Inside of the fence to the north and west there will be a wide strip of wildflower grass on crushed concrete substrate to provide a rich habitat for wildlife.

Bordering the wildflower grass strip will be a low height, flint gabion wall forming the bottom of the bund slopes. On top of the gabion wall will be a native hedgerow, reflecting the local character along rural lanes and connecting existing vegetation in the east to the west through an ecological corridor. There will also be sections of scrub planting on the lower slopes behind the hedgerow to enhance the ecological value.

Two areas of meadow grass will be created on the north west and eastern corners, with mature specimen trees creating attractive features to walkers on PROW to the north east and south west of the site, as well as enhancing biodiversity of the site.

The proposed bund which contains the facility on the west, east and north boundaries, will extend from the low gabion flint wall up to an 8m terrace on the north east and west corners, and 4m along the northern boundary. The slopes will be planted with native woodland, which as it matures will tie into the wider tree cover in surrounding views and soften views of the facility. The bund will drop to ground level in the south. There is a proposed wooden acoustic fence that will run around the top of the bund, which will be stained in a colour similar to the facility cladding to minimise its appearance. On the terraces feathered trees will be planted, further softening the acoustic fence from northern views on completion.

In the north west corner there will be wildflower grass on the internal slope to provide an attractive outlook from the administrative building, along with a small break out area with seating connected by a bridge from the building. The internal gabion retaining structure will be planted with trailing plants to soften the walls' appearance.

A tall flint wall will be cut into the western bund slope, with a wildlife pond indicating the former western alignment of the canal. The pond will be seeded with a marginal wetland mix. Inside the facility, in the eastern carpark there will be a blue block treatment on the paving to indicate the former canal's eastern alignment.

A further area of meadow 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 trees (Ornamental pears and Fastigiate Oaks) will also be planted within this strip. There are additional areas of meadow grass at the entrance and tree planting where possible to create an attractive entrance to the site.

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 five bat boxes, five invertebrate hotels and fifteen nest boxes for bird species such as swift (Apus apus), grey wagtail (Motacilla cinerea), spotted flycatcher (Muscicapa striata) and house sparrow (Passer domesticus), on the walls of the buildings or trees. Bat boxes and tubes, invertebrate hotels and bird boxes would enhance the habitat for the local bat and bird population;
- 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; and
- The long term management plan for these habitats will ensure a net gain in biodiversity in perpetuity.

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

Figure 5.12. Proposed landscape design layout

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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 and to E2 within 8m of the site boundary, as defined by Guidance Notes for the Reduction of Obtrusive Light (Institution of Lighting Professionals). Environmental lighting zone E2 is defined as a rural area with low district brightness, with E3 defined as suburban with medium district brightness, which are considered appropriate for the future surrounding area.

The site access and internal access roads will be illuminated during the hours of darkness to permit nighttime 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 and acoustic timber fencing forming the site's perimeter will assist in minimising light spill from the proposed lighting and the headlights of moving vehicles.

In addition all high level areas of glazing will be fitted with blind systems which will close during the hours of darkness to prevent internal lighting being visible from surrounding areas.

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Figure 5.13. Sun Path Study – March 20th

Overshadowing

West Sussex County Council also requested that the potential for overshadowing from the plant to affect local amenity be examined. Sun path modelling (Figs. 5.13; 5.14 and 5.15) that illustrates the predicted overshadowing produced by the proposed development during the spring equinox and summer and winter solstices was therefore undertaken. The results showed that the shadowing produced by the buildings 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.

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Figure 5.14. Sun Path Study - December 21st

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, except for a small section of the very thin shadow associated with the proposed stacks, which will pass by 13:00. 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.

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Figure 5.15. Sun Path Study – June 20th

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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 L-shaped ERF building in relation to noise sensitive receptors located (or potentially located) to the west, north and east of the site;
- Perimeter landscaped bunds will be formed around the site's west, northern and eastern perimeter, and in combination with acoustic timber fencing will provide noise and visual screening of the site from key receptors;
- 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 Hydrology

In order to limit visual impacts on the surrounding landscape, it has been necessary to minimise the overall height of the proposed development, which will be facilitated by extension of structures to a greater depth below ground. Initial proposals for design were considered at Stage 1 Design to provide for this reduced level, with design completed by GSDA that comprised incorporation of the following to meet the ideal requirements of the ERF facility:

- A reduced level dig across a large portion of the site to a finished floor level (FFL) of 5 metres below ground level (mbgl); and
- Creation of two bunker areas, one to 10 m depth (FFL) (IBA bunker) and the other to 15 m depth (FFL) (bunker hall).

The proposed elevations of the reduced level dig and bunkers for Stage 1 Design would be below the groundwater table, and therefore construction of the proposed development would require groundwater control by lowering of the water table to produce a dry working environment to allow construction operations to proceed. The environmental impact of dewatering to achieve this has been assessed as part of the Hydrogeological Impact Assessment to be significant in terms of impact on availability of water in the Chalk aquifer which is already limited in resource, impact to existing abstractions in the vicinity of the site and base flow to surface water courses, as well as water quality of the receiving waterbody of abstracted water. Potentially, there may also have been risks caused relating to erosion of banks of surface water courses, scour and flooding (Fig 5.16).

The Stage 1 Design would likely have required groundwater to be recharged to the Chalk aquifer to mitigate risks of surface water flooding and erosion/scour of watercourses and to mitigate derogation of existing groundwater supplies.

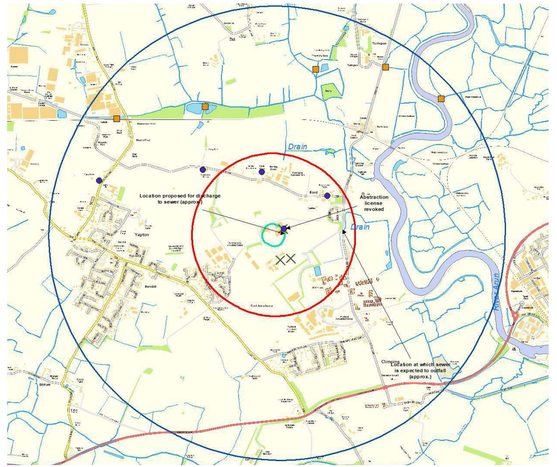

Figure 5.16 Hydrogeological Setting

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Such a recharge scheme would require careful design and management, and access to land outside of the boundaries of the Site, which the Applicant does not have control over. Due to the expected depth of piles that would be required, the proposed development may also have created a barrier to groundwater flow, which could have caused groundwater mounding and increases in groundwater elevation on the up-hydraulic gradient side of the proposed development. This could potentially increase risk of groundwater flooding in the long term.

Due to these an iterative design approach has been undertaken, with the design evolving to Stage 2. This was completed by GSDA to reduce the volume of water required to be managed during construction, and thus to reduce environmental impacts relating to groundwater derogation and impacts on surface water as far as is reasonably practicable whilst still enabling delivery of the proposed development. The key elements of the Stage 2 Design are:

- A reduced level dig across a large portion of the site to a finished floor level (FFL) of 2.5 metres below ground level (mbgl);
- Creation of one bunker area to 4 m depth (FFL) (bunker hall); and
- Installation of a small surface water pumping system to 5 m depth (FFL).

These evolutions in design will substantially reduce the extent to which the groundwater table is required to be lowered with the associated potential impacts as described above. As part of the Stage 2 Design discharge of abstracted groundwater would be to the River Arun via the existing surface water drainage network on site, and it is likely that the existing drainage network would be suitable to accommodate the smaller volumes of water which would be abstracted. It is also noted that potentially, and depending on seasonal groundwater elevations, the works could be constructed with the need for minimal or possibly no dewatering if they are carried out when groundwater levels in the Chalk aquifer are low. Furthermore, the estimated zone of influence from any dewatering would be such that impacts to existing abstractions in the vicinity of the site and base flow to surface water courses would be unlikely.

5.11 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 reception building (Fig. 5.17). 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. The facilities will 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.

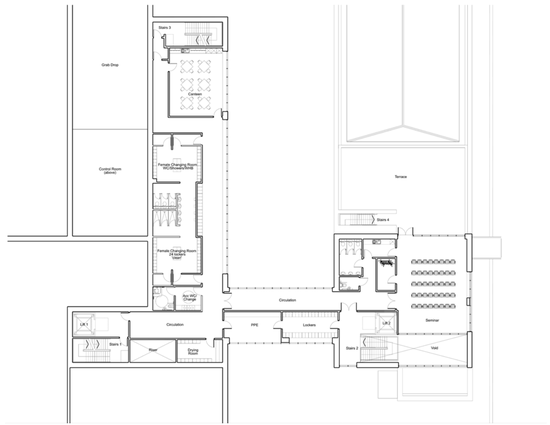

Figure 5.17 Proposed ERF level 4 floor plan – extract from drg PL114

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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. The seminar room will also have access to a rooftop terrace.

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.

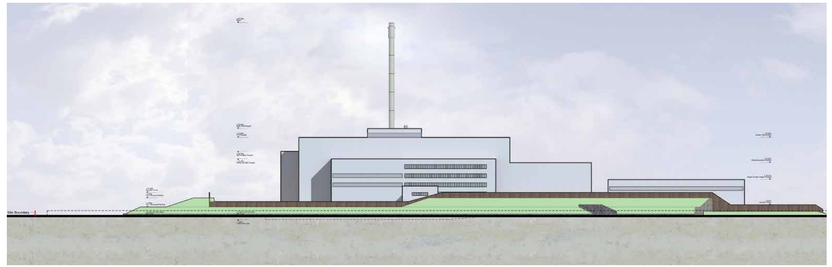

Figure 5.18 Proposed west site elevation – extract from drawing PL313

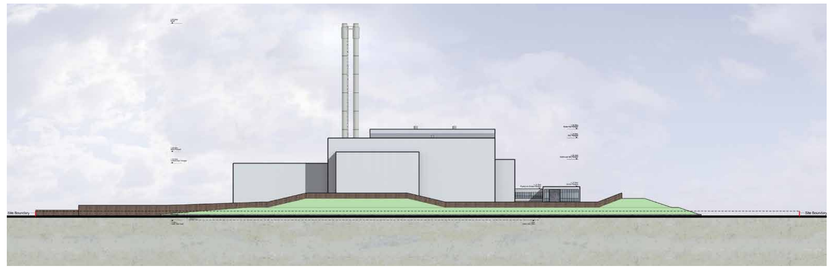

Figure 5.19 Proposed north site elevation – extract from drg PL310

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5.12 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 seeks to best mitigate its visual impact in both form and materials.

Appropriate orientation and reprofiling of ground should be considered where appropriate.

Reprofiling of the ground has been considered and reviewed against the level of groundwater on the site. The tallest parts of the ERF (boiler hall and FGT hall) have therefore been lowered by 1.5m below ground level to reduce the overall height of the ERF building. The opportunity to create landforms around the site's perimeter to assist in mitigating noise and visual impacts has been adopted, with perimeter bunding up to 8m in height proposed around the western, northern and eastern boundaries of the site (Figs 5.18 and 5.19).

Tree and hedgerow planting.

Tree planting around the site's perimeter will assist in visually softening the edge of the site where it interfaces with adjoining areas and where included on landscaped bunding will further visually screen the proposed development. At the lower outer edges of the bunds a hedgerow running along the site's western, northern and eastern boundaries will further soften the edge of the site.

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 by 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. In keeping with the setting a 1m high knapped flint wall will be set inside this fence and define the foot of the landscaped bunds along the northern extent of the western and eastern boundaries, and along the entire northern boundary. This will add local character and visual texture and contrasting colour on the sites boundaries. A 3.0m high timber acoustic fence will be set inside the perimeter fence running along the southern boundary. Elsewhere a 2.4m or 3.0m acoustic timber fence will run along the top of the landscaped bunds. In all cases the timber fence will be stained dark grey to best blend it with the setting.

Planting between the outer fence and the inner acoustic fences will visually soften the appearance of the site and visually dominate the security fence (Fig. 5.17).

Hard landscaping including soil bunds where appropriate.

Soil bunds have been focussed on the site perimeter zone for the reasons described above. The majority of remaining open areas within the site will be hard landscaped to cater for the required vehicle movements around the site. The entrance forecourt to the ERF administration wing will have its own hard and soft landscape treatment details of which can be found elsewhere in section 5.7 of this DAS.

Traffic/Access

Design internal roads and operations for ease of access and vehicle routing and manoeuvring.

The road arrangement has been designed to maximise efficiency and safety, and is mostly 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.

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 car parking, motorcycle and cycle storage area all sufficiently sized to cater for staff and visitors. The WSTF also has its own car parking in addition to that provided for the ERF, but its motorcycle and cycle storage is shared with that for the ERF. All car parking spaces will include EV charging points. On site 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, an area will be provided for contractor's laydown adjacent the ACCs.

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 site's acoustic requirements. Where required, 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. This has included the building being located centrally and southerly within the site, and to be set as far back from the site's nearest receptors. The layout of the main ERF building has also been designed to best shield the ACCs (Fig 5.20).

Acoustic fencing.

Perimeter acoustic timber fencing will 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.

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.

FORD ERF AND WSTF
DESIGN AND ACCESS STATEMENT

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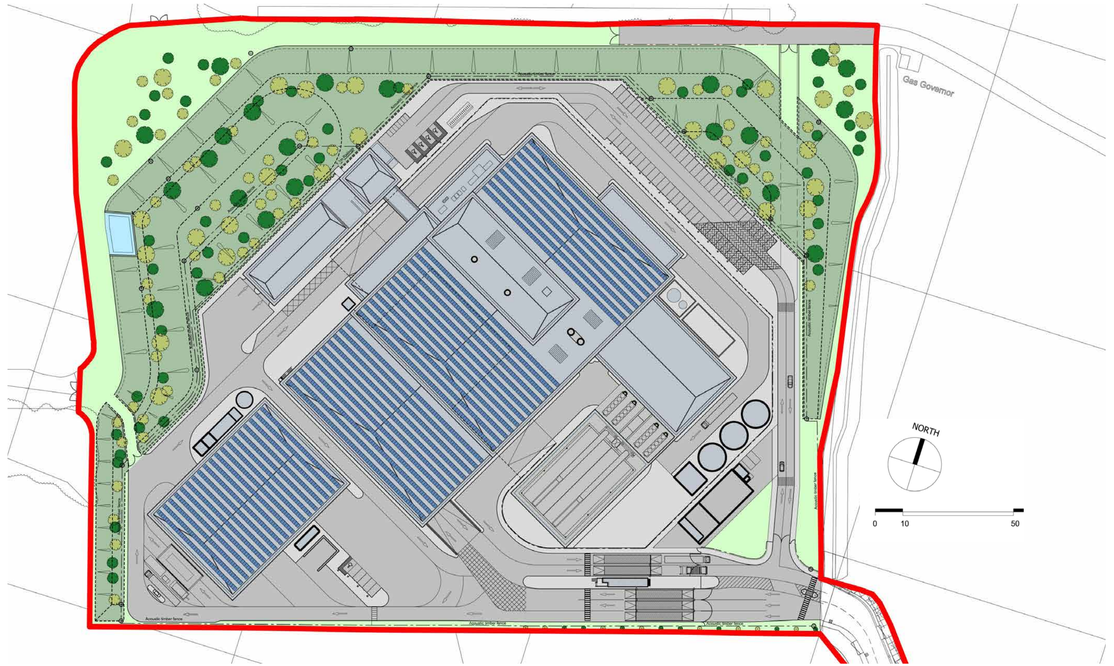

Figure 5.20 Proposed masterplan – extract from drg PL107

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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.

The operation of the ERF will be regulated by the Environment Agency under the conditions of an Environmental Permit. This will include conditions to control dust and odour emissions from the site.

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 bay will be located at the southern western 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 development design process the guidance given within this detailed CABE/ Design Council document has been taken into consideration and the ten design principals that they identify have been embraced. How the final design has responded to these principals is described below.

Setting the scene

Viridor Energy 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 bold architectural design should be avoided in favour of one which best mitigated the visual impact of the development. This was 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 one another. Furthermore, the applicants have selected a design team that 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 5 years. The proposed development would be a significant investment in the area and would offer further job opportunities.

Figure 5.21 Historic Seal of the Portsmouth & Arundel Canal

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 CHP Ready Assessment report 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 of a number of physical and technological

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interpretations within the new ERF itself, but also in the external landscape spaces. There are no physical remains of the site's rich transport history 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 cutting into the western perimeter mounding to reflect the alignment of the former canal. This will be reinforced by the inclusion of a pond within this cutting and the inclusion of a sign on the site's boundary;
- The alignment of the former canal will also be reflected in the hard landscaping of the car park, where a change in paving type and colour will also mark its route crossing;
- A basic heritage interpretation board which will include the historic seal (Fig 5.19) and supporting information on the canal will be included at one or both locations, and be equipped with a QR code that allows further information and visualisations about the development, and the history of the site to be explored and will be produced in conjunction with local history groups;
- The reception area will have educational displays – some of which will reflect the aviation history of the site (including audio visual presentations); and
- Educational resources will include the transport history of the canal and aviation importance of the site.

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 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 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 focussed most of the internal HGV vehicle movements as far as possible within the centre of the site.

Landscape and visual impact assessment

Due to the scale of the proposed development, assessments of the potential visual and landscape impacts 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 acoustic timber fencing provide visual and acoustic mitigation around the site's perimeter.

With the existing site being covered in 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 it would need to be designed in such a way as to best mitigate its visual impact. 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. In contrast the upper volumes are less easily damaged and to create a visual contrast with the lower trapezoidal cladding, a standing seam aluminium cladding is proposed. This allows the upper volume walls and roofs to be more seamless in appearance and the standing seam profile offers a contrasting vertical 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 face the lower walls of the perimeter landscaped bunds, the western wall defining the main pedestrian route and car park within the site, and feature walls on and within the administration reception building. 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 and the extent of glazing on higher parts of the administration wing of the ERF minimised. In addition, it is proposed that all windows will be fitted with blackout roller blinds which will automatically close in the hours of darkness.

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. In addition, materials have been chosen for their longevity and/or robustness, as well as their visual appearance.

The benefit of rooflights has been assessed against the need to mitigate the potential night-time visual impact of the development and for that reason no rooflights are proposed.

Large areas of photovoltaic solar panels (PV) are proposed for the main roof areas. These will not be visible as they will be shielded behind the perimeter roof edge parapets.

Visitor facilities

In order to promote the value of the proposed development, visitor facilities will be incorporated within the administration reception building.

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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 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 run to the north east of the site and provide connections between the site and Ford Road;
- Footpath 366 and 366.1 provide connections to Ford Lane and Footpath 365; and
- Footpath 175 runs to the south of the site and provides a connection between Ford Road and Yapton Road.

None of these give access to the ERF and WSTF directly, although one of them (footpath 200.3) runs on the existing concrete road within the north eastern site boundary for a short distance before leaving the site to the north, as shown in Figure 6.1. The inset of the site perimeter security fence in this area will ensure that the proposed development will not affect the line of the existing right of way.

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 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 Local Cycle Network 38. It should be noted that this section of Yapton Road is subject to a 40 mph speed limit.

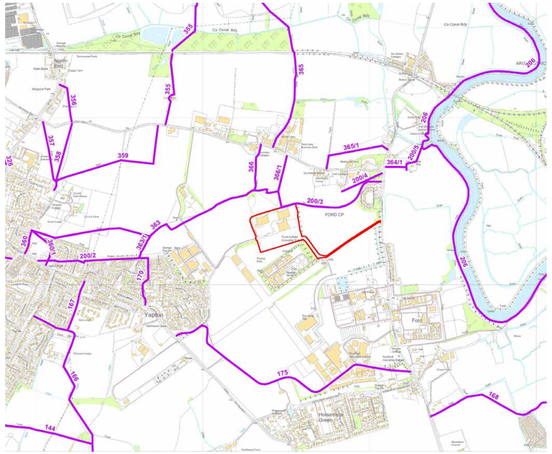

Figure 6.1 Proposed site layout and adjacent PROW

National Route 5 of the National Cycle Network 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.

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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 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 (Fig 6.2).

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 on the route to the administration reception building of the ERF building and provides 60 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 administration reception building via a doorway on its south eastern face. Specific provision is made for cyclists with permanent, secure and sheltered cycle parking. This will be located close to the entrance to the administration reception building where stair and lift access is provided to its upper floors. The cycle parking will comprise eight Sheffield stands, providing 32 cycle parking spaces for staff and visitors, and drying and showering facilities will be provided for within the main building.

Figure 6.2 Proposed fencing layout – extract from drawing PL108

06 ACCESS

All operational vehicles accessing the ERF site will be controlled by the gatehouse / weighbridge arrangement which is gated and secured outside of normal operating hours. On leaving the weighbridges HGV's will join the ERF's internal road system which 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.

WSTF

Upon entering the site all vehicles accessing the WSTF will use the southern-most inbound weighbridge. Immediate access is provided to the WSTF car park for staff and visitors, which is located on the southern side of the WSTF building and provides five standard EV car parking spaces and one Blue Badge EV bay. Specific provision is made for cyclists and is shared with that for the ERF with permanent, secure and sheltered cycle parking provided adjacent to the administration reception building. This will avoid cyclists having to enter the main operational site.

On leaving the weighbridge all WSTF HGV's will join the site's internal one-way road system which provides access to the full perimeter of the WSTF building and its HGV manoeuvring areas. The road system has been designed to ensure that WSTF vehicles can circumnavigate the site without needing to access the road system around the main ERF building.

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

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

- Generally level, or reasonably level, smooth, slip-resistant paved footpaths where appropriate, with tactile paving at ramps and thresholds to the pavements;
- Level access 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 to ease navigation to and within the buildings;
- All internal circulation areas will have a minimum clear width of 1200mm and with 1800mm square passing places for wheelchair users;
- Ambulant disabled stairs, each will contain identified disabled refugee areas with intercom facilities as appropriate;
- Passenger lifts suitable for wheelchair access within both of the administration buildings;
- Means of escape will comply with requirements for means of escape for disabled people;
- Accessible WC's for on each floor level of accommodation;
- Segregated accessible showering facilities;
- Wall and floor surfaces to minimise light reflection and sound reverberation so as not to hinder users with sensory impairments;
- Tonal and textural contrasts throughout the building interior;
- Lifts and lift lobbies will conform with Lift Regulations 1997 (SI 1997/831);
- A colour palette 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 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 to provide contrast, but avoid glare or high resistance to movement;
- An operational access statement for each building to explain any areas which, due to the nature of the building and its operation, may be unsuitable for ambulant disabled/ wheelchair access;
- 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.

07 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 fence 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. The location and extent of glazing has been carefully considered and minimised, and windows will incorporate blackout blinds which will ensure light spill is prevented during the hours of darkness.

The extensive perimeter landscaped bunds and acoustic screening are some of the 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 that acoustic insulation is applied to any noisy equipment.

Architecturally, a volumetrically efficient 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. This includes the selection of a twin stream technology to minimise the overall height of the building and the lowering of part of the, site within which the highest building components would be located.

The careful selection of materials and colour add another layer to the design and further accentuates the architectural components and the matt silver finish of the main cladding material will respond to different lighting conditions and best blend the building against a background of sky.

The form and colour of the proposed design best mitigates its visual impact upon the surrounding area, and it embraces the principles of current WSCC and CABE/Design Council design guidance for waste related infrastructure projects.

Local character has been incorporated within the design, with the use of areas for flint walling which will add visual texture to the perimeter of the proposed development and references to the route of the former Portsmouth and Arundel Canal are embedded in the design.

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.

From the outset it has been recognised that due to the setting of the site and the scale of the development it would be impossible for it to be 'hidden', and that in giving due consideration to its surroundings and context it would be important for it to be designed in such a way as to best mitigate its visual impact. The testing of the design in key views has from the outset been a consistent part of the design review process and has fully informed the final design.

The overall design solution successfully combines a well-considered site layout with a well-considered high quality architectural design that, incorporating high quality materials, will stand the test of time and make a positive contribution to the character and quality of the area.

Figure 7.1 View from site's access road looking north Proposed design

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